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NikoniansPress



Darrell Young

Mastering the Nikon D7000

Mastering the Nikon D7000



Darrell Young (*DigitalDarrell*) is an information technology engineer by trade. He's been an avid photographer since 1968 when his mother gave him a Brownie Hawkeye camera.

Darrell has used Nikon cameras and Nikkor lenses since 1980. He has an incurable case of Nikon Acquisition Syndrome (NAS) and delights in working with Nikon's newest digital cameras.

Living near Great Smoky Mountains National Park has given him a real concern for the natural environment and a deep interest in nature photography.

He loves to write, as you can see in the Resources area of the Nikonians Online community (www.Nikonians.org). He joined the community in the year 2000, and his literary contributions led to his invitation to become a Founding Member of the Nikonians Writers Guild.

Mastering the Nikon D7000

Darrell Young



Darrell Young (aka Digital Darrell)

Editor (Rocky Nook): Gerhard Rossbach

Editor (Nikonians): Tom Boné

Production Editor: Jocelyn Howell

Copyeditor: Jeanne Hansen

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This book is printed on acid-free paper.

This book is dedicated to:

My wife of many years, Brenda; the love of my life and best friend...

*My children, Autumn, David, Emily, Hannah, and Ethan,
five priceless gifts, growing wings ...*

*My mother and father, Barbara and Vaughn, who brought me into this world and
guided my early life, teaching me sound principles to live by ...*

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without whose assistance I could not possibly write books ...*

*My friends J. Ramon Palacios and Bo Stahlbrandt, who make it possible to belong to
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*My copy editor, Jeanne Hansen (www.hansenedits.com), whose eye for detail and
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And, finally, to Nikon, who makes the world's best cameras and lenses.

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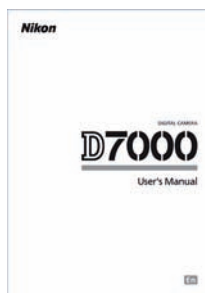
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User's Manual Information

All User's Manual page references mentioned in this book are from the 2011 manual production year. If you have a newer User's Manual, there may (or may not) be minor page variances due to changes by Nikon.

Foreword



Nikonian Darrell Young, known to us as Digital Darrell for many years, has outdone himself with this book (his seventh under the NikoniansPress imprint). This joint venture between nikonians.org and Rocky Nook has developed a strong following in the “camera instruction” genre and Darrell’s fastidious attention to detail has been the key ingredient in that trend.

Darrell is never satisfied with any of his successful books. As soon as the printing presses have finished their work and distribution commences he begins a self-imposed torturous review phase. The reviews and comments of his readers are mixed with his own critique and the result is invariably seen in his next book. Photography instruction books are plentiful and they enjoy a fairly decent lifespan. Photography books based on a single camera platform are destined for a relatively short lifespan. They are at the mercy of technical advances that may make the subject camera platform obsolete within a year of printing. The only way to add value to a book that has a specific camera in the title is to fill it with equal doses of excellent photography advice, and Darrell has mastered that art.

Darrell Young’s unique ability to mix highly specific camera instruction with solid photography basics has been his pathway to success. He merges his friendly style of advice with the necessary layout and graphics improvements suggested by reader comments. He then adds the improvements gleaned from his and other’s criticism and suggestions. The result is always a new and better book. This book is a perfect example of Darrell’s penchant for perfection and it clearly shows his enthusiasm for the Nikon D7000. We are proud to include his impressive credentials and body of work in our ever growing and never ending resources for our community such as the forums, The Nikonian eZine, Nikonians Academy Workshops, Nikonians News Blog, Nikonians podcasts, our Wiki, and eBooks. Our community now has three language versions (English, German, and French) and we continue to grow as we surpass 300,000 members.

Nikonians, now in its 11th year, has earned a reputation as a friendly, reliable, informative, and passionate Nikon® user’s community thanks in great measure to members like our own Digital Darrell, who have taken the time to share the results of their experiences with Nikon imaging equipment. As you read and learn from this book, you will inevitably benefit from not only the quality of the information, but also the spirit in which it is presented. That spirit of friendly advice sharing is the hallmark of our community and we are proud to say Darrell has long ago mastered it—and the Nikon D7000.

J. Ramón Palacios (jrp) and Bo Stahlbrandt (bgs)

Nikonians Founders

www.nikonians.org

Camera Body Reference



Figure 1 – Back of camera

See Figure 1 – Back of camera

- | | |
|---------------------------------------|--------------------------------|
| 1. Delete button | 11. Speaker |
| 2. Playback button | 12. Main command dial |
| 3. MENU Button | 13. Live view switch |
| 4. Help/protect/WB button | 14. Movie-record button |
| 5. Thumbnail/playback zoom out button | 15. Multi Selector |
| 6. Playback zoom in button | 16. OK button |
| 7. Monitor | 17. Infrared receiver (rear) |
| 8. Viewfinder eyepiece | 18. Focus selector lock switch |
| 9. Diopter adjustment control | 19. Info button |
| 10. AE-L/AF-L button | 20. Memory card access lamp |
| | 21. Memory card slot cover |

See Figure 2 – Top of camera

- | | |
|---|-------------------------------------|
| 22. Flash mode button | 28. Built-in flash (pop up) |
| 23. BKT button (bracket) | 29. Accessory shoe (hotshoe) |
| 24. Infrared receiver (front) | 30. Metering button |
| 25. Mode dial (shooting) | 31. Power switch (On/Off/Backlight) |
| 26. Release mode dial lock release button | 32. Shutter-release button |
| 27. Release mode dial | 33. Exposure compensation button |
| | 34. Control panel |



Figure 2 – Top of camera



Figure 3 – Front of camera

See Figure 3 – Front of camera

- | | |
|-----------------------------------|--------------------------------|
| 35. AF-assist illuminator | 41. Meter coupling lever |
| 36. Sub-command dial | 42. CPU contacts (lens) |
| 37. Fn button | 43. Lens release button |
| 38. Lens mount (F-Mount) | 44. AF-mode button |
| 39. Image sensor (CMOS) | 45. Focus-mode selector switch |
| 40. Depth-of-field preview button | |

(Continued)



Figure 4 – Camera connectors

See Figure 4 – Camera connectors

- | | |
|----------------------------------|---------------------------------------|
| 46. A/V connector (Audio/visual) | 49. Accessory terminal (GPS, etc.) |
| 47. USB connector | 50. Connector for external microphone |
| 48. HDMI mini-pin connector | |

Colors and Wording Legend

Throughout the book you'll notice that in the numbered, step-by-step instructions there are colored terms as well as terms that are displayed in *italics*.

- **Blue** is used to refer to the camera's physical features.
- **Green** is for functions and settings displayed on the camera's LCD screens.
- *Italics* are for textual prompts seen on the camera's LCD screens.
- *Italics* or ***Bold Italics*** are also used on select occasions for special emphasis.

Here is a sample paragraph with the colors and *italics* in use:

Press the **MENU button** to reach the **Setup Menu** and then scroll to the **Format memory card** option by pressing the down arrow on the **Multi Selector**. You will see a message reminding you, *All images on Memory card will be deleted.* **OK?** Select **Yes** and then press the **OK button**. ***Please make sure you've transferred all your images first!***

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1



Basic Camera Setup



SnowCross Racer – Courtesy of Michael R. Goodman (*mrginhop*)

The Nikon D7000 – A Mature Camera

As a writer of photography books I have a cool hobby. I buy cameras. Lots of cameras! In fact, I've owned nearly every SLR camera Nikon has made in the past 30 years. All the Nikon cameras are excellent and have personalities of their own. Once in a while, though, I get a camera that goes out of its way to impress me.

Looking back I think of the Nikon F4, a camera that could use virtually any lens made by Nikon, had its controls on the camera body for ease of adjustment, and simply worked when I pressed the button.

Fast forward a few years and the Nikon D100 appeared. It was the start of my digital life and the reason I have the nickname Digital Darrell. The D100 was so bold and new and set so many standards that it literally changed the world. Not long afterward the D300 came along and set the Nikon world on fire. Here was a camera with all the image quality of the big cameras and a robust build that set new standards for semipro digital single lens reflex (DSLR) cameras.

Then, with the suddenness of a tornado, Nikon blew me away, again! This may sound like an exaggeration, but Nikon has now made the ultimate enthusiast's DSLR: the Nikon D7000. This camera combines so many things that made me love previous Nikon cameras. The total package is professional, smooth, slick, fast, and several other adjectives I haven't thought of yet. Nikon has truly outdone itself with the D7000.

Why do I make such a bold statement about a midrange, advanced enthusiast's camera? Why not about a much more expensive Nikon? Because the D7000 simply has everything a photographer will need to bring home incredibly good images, without jumping through hoops to do so. It's what I have recently been referring to as a mature camera. What does that mean? With the D7000, digital photography has reached a level of maturity that will allow you to use your camera for years instead of months.

Rather than buy a new camera every couple of years, the D7000 gives you what you'll need for many more years of use. With this camera we can return to the days when we seldom bought a new camera body and instead put our money in new Nikkor lenses. Wouldn't you like to have some new lenses?

Sure, new Nikon cameras will come out, and, like me, you'll be attracted to the newest camera. However, with the D7000 you have to buy a new one only if you really want to; you won't need to any time soon. With this camera body—as long as you take care of it—you are set for many years of faithful service.

Now, let's learn how to configure and use your new D7000.





Learning about the Nikon D7000

The difficulty in writing a book on a powerful camera like the Nikon D7000 is balancing it for multiple types of users and their varying levels of knowledge. With too much technical detail, the book will read like a user's manual. With too little technical detail, advanced users will get no benefit from the book.

Some new users of the Nikon D7000 DSLR camera have come over from the world of fully automated point-and-shoot cameras. On the other hand, many photographers are upgrading to the D7000 from cameras like the Nikon D3000, D3100, and D90. Then, there are professionals who buy the D7000 to have a backup for their pro-level and semipro-level cameras, like the Nikon D300S, D700, D3, D3S, and D3X. Others are coming over from the film world, drawn by the siren call of immediate image use and very high quality.

In *Mastering the Nikon D7000* I've tried my best to balance the needs of new and experienced users. I remember my first DSLR and my confusion about how to configure the camera compared to my old film SLR: What's all this white balance and color space stuff?

The bottom line is that the Nikon D7000 is a rather complex camera, and it requires careful study of resources like this book, and the User's Manual, to really get a grasp on the large range of features and functions. According to Nikon, it's an "advanced" camera, with features not found in lesser "consumer" models. It's designed for people who really love photography and have a passion for image making that far exceeds just taking some nice pictures at a family event. The D7000 has most of the features found in cameras like the D300S and D3S, which are considered professional cameras.

Following the publication of my books *Mastering the Nikon D300/D300S* and *Mastering the Nikon D90*, I compared the D300S, D90, and D7000 side by side. I'm here to tell you that the Nikon D7000 has all the critical functions found in the semipro D300S and seriously extends the feature set of the advanced Nikon D90.

The D7000 has a full range of functions that allow you to shoot images and post-process them in the camera instead of on your computer. If you don't like computers but want to take digital photographs and videos, the Nikon D7000 is the camera for you!

I could go on for hours raving about all the cool features in the D7000. In fact, I do go on raving about this camera for the next 11 chapters. I hope you can sense my enthusiasm for this cool, new imaging machine as you read this book. There are few cameras in the world with this level of capability, and you own one!



First Use of the Camera

Surprisingly, quite a few brand-new DSLR users are buying a Nikon D7000 instead of a lower-cost, entry-level model. Even new users appreciate the robust high quality of the camera.

The upcoming sections and chapters are best read with your camera in hand, ready for configuration. There are literally hundreds of things to configure on this advanced DSLR. In this chapter, I'll give new D7000 users a place to start. Later, as you progress through this book, we'll look at all the buttons, switches, dials, and menu settings in detail. That will allow you to fully master the operation of your Nikon D7000.

Each menu in the camera has its own chapter or section. Plus, there is additional information on how to put it all together in chapters like **Metering, Exposure Modes, and Histogram; White Balance; Autofocus, AF-Area, and Release Modes; and Speedlight Flash**. Since the D7000 has several movie modes, we'll cover movies in their own chapter, Live View and Movie Modes.

First Time DSLR Users

Although the D7000 is an enthusiasts' or advanced camera, many brand-new DSLR users have purchased a D7000 as their first digital single lens reflex camera. New users may not know how to attach and remove a lens or battery, and they may need help with inserting, formatting, and using memory cards.

The majority of this book's readers, however, already know how to perform these tasks. I do not want to ask a more experienced DSLR user to read over the basics of DSLR use, so I've created a document called **Initial Hardware Considerations**, which you can download at:

<http://rockynook.com/NikonD7000>

There are also several other articles of interest to new Nikon D7000 users on this webpage.

Now, let's start with the initial configuration of a brand-new Nikon D7000. There are five specific steps you must complete when you first turn on the camera.



Five Steps for First-Time Camera Configuration

This section is devoted to the first-time configuration of the camera. There are certain settings that must be set up immediately (covered in this section) and others that should be configured before using the camera extensively (covered in the next section, **Camera Functions for Initial Configuration**).

I'm not going to go into detail on all possible settings in this chapter. That is reserved for the individual chapters that cover the various menus and functions. Instead, I'll walk you through five steps for first-time configuration of the camera. In the next section I'll refer you to the chapter sections and page numbers in this book that provide the screens and menus for each function that should be configured *before* using the camera for the first time. Later chapters will cover virtually all camera settings.

When you first insert the battery into a factory-fresh Nikon D7000 you will notice that the word **CLOCK** flashes on the camera's upper LCD Control panel. If you don't see **CLOCK** flashing, then your camera has already been set up for initial use.

Let's examine how to configure a new camera. You'll see the following five screens when you first turn the camera on, and they must be set up immediately.

Setting the Camera's Language – Step 1

The D7000 is multilingual or multinational. As partially shown in figure 1.1, the menus can be displayed in 22 languages. Most likely the camera will already be configured to the language spoken in your area since various world distributors have the camera somewhat preconfigured. The following is a list of the display languages available in the D7000, firmware version A1.00, B1.00, L1.002 (Setup Menu > Firmware version):

- Czech
- Danish
- German
- English
- Spanish
- French
- Indonesian
- Italian
- Dutch
- Norwegian
- Polish
- Portuguese
- Russian
- Finnish
- Swedish
- Turkish
- Arabic
- Traditional Chinese
- Simplified Chinese
- Japanese
- Korean
- Thai

Here are the steps to select your language:

1. Refer to [figure 1.1](#) for the **Language** list the camera presents on startup.
2. Use the circular **Multi Selector**—with arrows pointing left, right, up, and down—to scroll up or down until your language is highlighted.
3. Press the **OK button** to select your language.



Figure 1.1 – Setup Menu Language screen



The camera will now switch to the second screen in the setup series, the Time zone screen.

Setting the Camera's Time Zone – Step 2

This is an easy screen to use as long as you can recognize the area of the world in which you live. Use the map shown in [figure 1.12](#) to find your area, then select it. Here are the steps to select the correct Time zone for your location:

1. Refer to [figure 1.2](#) for the **Time zone** screen you'll use. You'll see yellow arrows pointing to the left and right on either side of the small black and gray world map.
2. With the **Multi Selector**, scroll to the left or right until your world location is highlighted in yellow. You will see either a vertical yellow strip or a tiny yellow outline with a red dot. At the top of the screen below the **Time zone** words, you will see the currently selected **Time zone**. Mine is set to **New York, Toronto, Lima (UTC-5)**, as shown in [figure 1.2](#).
3. Press the **OK button**, and your **Time zone** will be locked in place.

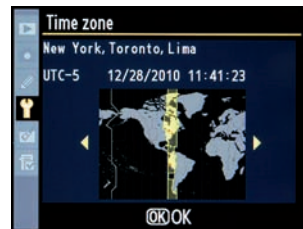


Figure 1.2 – Setup Menu Time zone screen

The camera will now present you with the next screen in the series, the Date format screen.

Setting the Camera's Date Format – Step 3

The English-speaking world uses various date formats. The Nikon D7000 allows you to choose from the most common ones. There are three date formats you can select ([figure 1.3](#)):

- Y/M/D – Year/Month/Day (2010/12/31)
- M/D/Y – Month/Day/Year (12/31/2010)
- D/M/Y – Day/Month/Year (31/12/2010)



American residents usually select the M/D/Y Month/Day/Year format. However, you may prefer a different format. Here are the steps to select the date format you like best:

1. Refer to [figure 1.3](#) for the **Date format** screen you will use.
2. Using the **Multi Selector**, scroll up or down to the position of the date format you prefer.
3. Press the **OK button** to select the format.



Figure 1.3 – Setup Menu
Date format screen

When you have the Date format selected, the camera will switch to the Daylight saving time screen.

Setting the Camera's Daylight Saving Time – Step 4

Many areas of the United States observe daylight saving time. In the springtime, many American residents set their clocks forward by one hour on a specified day each year. Then in the fall they set it back, leading to the clever saying, “spring forward and fall back.” To enable automatic Daylight saving time, follow these steps:

1. Refer to [figure 1.4](#) for the **Daylight saving time** screen you will use.
2. There are only two selections: **On** or **Off**. Choose the one you prefer by scrolling with the **Multi Selector**.
3. Press the **OK button** to select your choice.

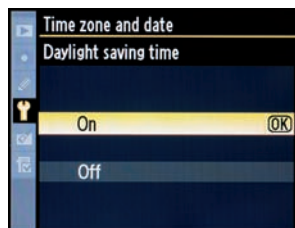


Figure 1.4 – Setup Menu
Daylight saving time screen

If you set Daylight saving time to On, your D7000 will automatically spring forward and fall back, adjusting your time forward by one hour in the spring and back one hour in the fall.

Now that you've made the Daylight saving time decision, the camera will move on to the last screen in the series of five, the Date and time screen.

My Recommendation: If you live in an area that observes daylight saving time, it's a good idea to set your camera to make this adjustment automatically. I always leave Daylight saving time set to On. Why not let the camera remember to change the time twice per year?

Setting the Camera's Date and Time – Step 5

This screen allows you to put in the current Date and time. It is in year, month, day (Y, M, D) and hour, minute, second (H, M, S) format.

Here are the steps to set the Date and time:

1. Refer to [figure 1.5](#) for the screen you'll use.
2. Using the [Multi Selector](#), scroll to the left or right to select the various date and time sections. Scroll up or down to set the values for each one. The time values use a 24-hour clock, or military time. Use the 12- to 24-Hour Time Conversion Chart on page 242 to convert the 12-hour time you are probably using (for example, 3:15 p.m. equals 15:15).
3. Press the [OK button](#) when you've finished inputting the [Date and time](#).

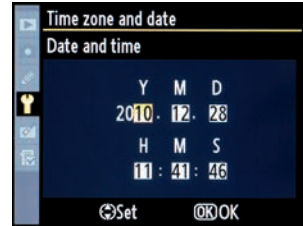


Figure 1.5 – Setup Menu Date and time screen

Please note that the time setting uses the 24-hour military-style clock. To set 3 p.m., you would set the H and M settings to 15:00. As mentioned, there is a 12- to 24-Hour Time Conversion Chart on page 242 for your convenience.

Accessing the Camera Menus

To access the various configurable menus in the D7000, you'll use the MENU button found on the back of the camera near the top left of the Monitor. Please remember the location of this button since it will be used often in this book ([figure 1.6](#)). To avoid unnecessary repetition, I won't mention that you need to press the MENU button to get into the camera menus in the upcoming chapters.

There are six primary menu systems found in the camera, and this book has a chapter devoted to each one. Let's take a brief look at the opening screens of the six menus, shown in [figure 1.7](#). You get to these six menus by pressing the MENU button and scrolling up or down with the Multi Selector. A selector bar with tiny icons appears on the left side of the Monitor when you press the MENU button. You can see it at the left of each of the menus in [figure 1.7](#).

As you scroll up or down in the selector bar, you'll see each menu appear with its icon highlighted in yellow—one at a time—to the right of the bar. The name at the top of the menu will help you figure out which one you are currently using.



Figure 1.6 – Press the MENU button to open the menus



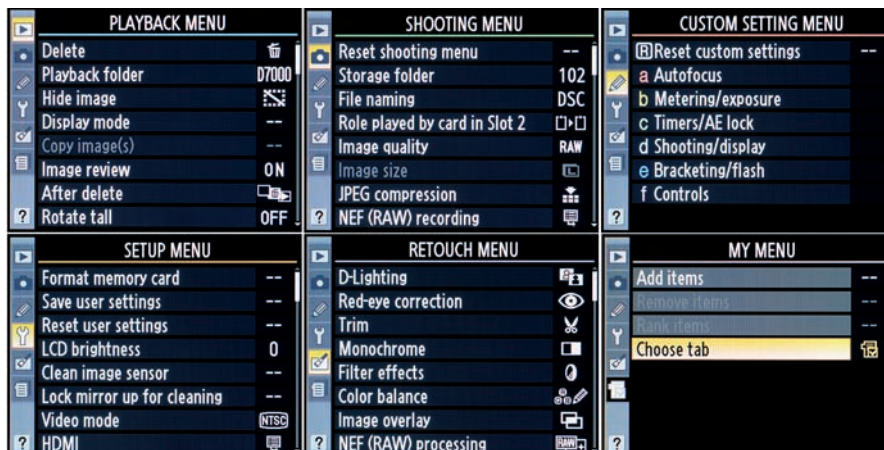


Figure 1.7 – Six primary camera menus

The six menus that are found in the D7000 menu system are, in order, as follows (figure 1.7):

- Playback Menu
- Shooting Menu
- Custom Setting Menu
- Setup Menu
- Retouch Menu
- My Menu or Recent Settings

Notice that My Menu can be toggled with an alternate menu called Recent Settings. These two menus can't be active at the same time. My Menu is much more functional for most people, so it is shown in figure 1.7. The chapter titled My Menu and Recent Settings covers both of them in detail so you can choose which one you want to appear most of the time on your camera. My Menu allows you to add the most-used menu items from any of the other menus to your own personal menu, and Recent Settings shows you the last 20 menu items you've changed.

Camera Functions for Initial Configuration

The following is a list of functions that you may want to configure before you take many pictures. These set up the basic parameters for camera usage. Each function is covered in great detail on the page number shown, so I did not repeat the information in this chapter. Please turn to the indicated page and fully configure the function, then return here and move on to the next function. When you are done, your camera will be ready for use. Place a bookmark here since you'll refer back to this chapter for each configuration item.



Setup Menu

- Format memory card – [Page 227](#) (format your memory cards)
- LCD brightness – [Page 232](#)
- Time zone and date – [Page 240](#) (if not configured earlier in this chapter)
- Language – [Page 245](#)
- Auto image rotation – [Page 247](#)
- Copyright information – [Page 254](#)

Shooting Menu

- Role played by card in Slot 2 – [Page 56](#)
- Image quality – [Page 57](#)
- Image size – [Page 67](#)
- JPEG compression – [Page 68](#)
- White balance – [Page 75](#)
- Set Picture Control – [Page 77](#)
- Color space – [Page 94](#)
- Active D-Lighting – [Page 96](#)
- Long exp. NR – [Page 99](#)
- High ISO NR – [Page 102](#)
- ISO sensitivity settings – [Page 105](#)
- Movie settings – [Page 115](#)

Playback Menu

- Display mode – [26](#)
- Image review – [Page 36](#)
- Rotate tall – [Page 39](#)

Custom Setting Menu

- AF-C priority selection – [Page 132](#)
- AF-S priority selection – [Page 133](#)
- Live view/movie AF – [Page 143](#)
- Monitor off delay – [Page 160](#)
- Beep – [Page 164](#)
- Viewfinder grid display – [Page 167](#)
- File number sequence – [Page 175](#)
- Flash sync speed – [Page 185](#)
- Assign Fn button – [Page 207](#)
- Assign AE-L/AF-L button – [Page 207](#)



Personal Camera Setting Recommendations

All through the book I offer my personal recommendations for settings and how to use them. Look for the My Recommendation paragraphs at the end of most sections. These suggestions are based on my own personal shooting style and experience with Nikon cameras. You may eventually decide to configure things in a different way, according to your own needs and style. However, these recommendations are good starting points while you become familiar with your camera.

Things to Know When Reading This Book

Here are a few things that you'll need to remember as you read this book. There are a lot of buttons and controls on the camera body. I have provided a **Camera Body Reference** section in the front of the book, as well as a downloadable document titled **Camera Control Reference** on this book's downloadable resources webpage. It is found at: <http://rockynook.com/NikonD7000>.

What's the difference between the two sections? The **Camera Body Reference** is a place to go when you want to locate a control, including covers and doors, while the **Camera Control Reference** provides a deeper discussion of each of the buttons and dials on the camera.

I use Nikon-assigned names for the controls on the camera, as found in the D7000 User's Manual. For instance, I'll say something like "press the Thumbnail/playback zoom out button" to show you how to execute some function, so you'll need to know where this button is located.

I have provided User's Manual references at the beginning of most sections in case you want to refer to the manual for an additional view of the camera settings. Using these references is entirely optional and not required to fully learn how to use your camera with this book. If you have no interest in using the User's Manual, simply ignore the references.

Downloadable Resources Webpage

To keep this book small enough to carry as a reference in your camera bag, I have provided some less-used information in downloadable sections at this web address: <http://rockynook.com/NikonD7000>. There will be references to these downloadable sections throughout the book when they apply to the material being discussed.

My Conclusions

This chapter's primary concern has been the initial setup and basic configuration of your new camera. The next several chapters will look at each menu and setting in a detailed way. The final chapters will cover the application of those settings as we consider ways to use the camera most effectively.

The Nikon D7000 is an advanced camera in all respects. It is designed so you can take it places that lesser cameras shouldn't go. The imaging capability in this complex but powerful DSLR could only be dreamed of a few years ago. Take the time to work through this book with your camera in hand, changing the settings to your best choices, and you'll come out in the end as a master of your new Nikon D7000.



Playback Menu

2



Hungry Northern Robin – Courtesy of Betty LaRue (*B LaRue*)

In [chapter 1](#) you configured your camera for picture taking your way. This chapter, and the next several chapters, will consider the camera's menu systems. The D7000 has seven menus, with literally hundreds of configuration options. We'll examine each setting on each menu, starting now.

First is the Playback Menu, which we'll consider in detail in this chapter. Since this menu controls how the camera's Monitor displays images, you'll need to learn how to use it well. You'll be taking thousands of pictures and will view most of them on the Monitor.

By now you may have quite a few pictures on your camera's memory card. The Playback Menu has everything you need to control your camera's image playback, copying, and printing. They are as follows:

- **Delete** – Allows you to delete all or selected images from your camera's memory card(s).
- **Playback folder** – Allows you to set which image folders your camera will display if you have multiple folders on the camera's memory card(s).
- **Hide image** – Lets you conceal images so they won't display on the camera's Monitor.
- **Display mode** – Controls how many informational screens the camera will display for each image.
- **Copy image(s)** – Gives you functions to copy images between the two memory cards.
- **Image review** – Turns the camera's post-shot automatic image review on or off.
- **After delete** – Determines which image is displayed next when you delete an image from a memory card.
- **Rotate tall** – Allows you to choose whether portrait-orientation images (vertical) display in an upright position or lying on their side on the horizontal Monitor.
- **Slide show** – Allows you to display all the images on your camera's memory card(s) in a sequential display, like the slide shows of olden days (pre-2002). No projector required.
- **Print set (DPOF)** – Lets you print your images directly from a PictBridge-compatible printer without using a computer—either by using digital print order format (DPOF) directly from a memory card or by connecting a USB cable to the camera.

Now, let's examine each of these settings in detail, with full explanations on how, why, and when to configure each item.

2





Technical LCD Monitor Information

The D7000 has a Monitor with enough resolution, size, and viewing angle to really enjoy using it for previewing images. It has about VGA resolution (640 x 480), based on a 921,000-dot liquid crystal display (LCD). If anything you read says the LCD Monitor has 921,000 *pixels* of resolution—or is significantly higher than VGA—the writer is uninformed. Nikon lists the resolution as 921,000 dots, not pixels.

Don't let the numbers boggle your mind. The bottom line is that this three-inch screen has amazing clarity for your image previewing needs. You can zoom for review up to 31x for Large (L) images, 23x for Medium (M) images, and 15x for Small (S) images. That's zooming in to pixel-peeping levels.

Now, if you want to get technical—here's the extra geek stuff.

A pixel on your camera's Monitor is a combination of three color dots—red, green, and blue (RGB). The three dots, blended together to provide shades of color, are equal to one pixel. This means the Monitor is limited to one-third of 921,000 dots, or 307,000 pixels of real image resolution. The VGA standard has 307,200 pixels (640 x 480), so the resolution of the Monitor on your D7000 is close to VGA resolution.

Delete Function

(User's Manual – Page 175)

The Delete function allows you to selectively delete individual images from a group of images in a single folder or multiple folders on your camera's memory card. It also allows you to clear all images in the folders without deleting the folders. This is sort of like a card format that affects only images. However, if you have protected or hidden images, this function will not delete them.

There are three parts to the Delete menus:

- Selected
- Select date
- All

Selected

Figure 2.1 shows the menu screens you'll use to control the Delete function for selected images.

Notice in image 3 of **figure 2.1** that there is a list of images, each with a number in its lower-right corner. These numbers run in sequence from 1 to however many images you have in your current image folder, or on the entire memory card. The number of images shown will vary according to how you have the Playback folder settings configured. (See the next section of this chapter, **Playback Folder**.)

If you have Playback folder set to Current (factory default), the camera will show you only the images found in your current playback folder. If you don't have

Playback folder set to Current but are using All instead, the D7000 will display all the images it can find in all the folders on your camera's memory card.

Here are the steps to delete one or more images:

1. Select **Delete** from the **Playback Menu** and scroll to the right (**figure 2.1**, image 1).
2. Choose **Selected** and scroll to the right (**figure 2.1**, image 2).
3. Locate the images for deletion with the **Multi Selector** and then press the checkered **Thumbnail/playback zoom out button** on the rear bottom left of the camera. This button will mark or unmark images for deletion. It toggles a small trash can symbol on and off on the top right of the selected image (red arrow in **figure 2.1**, image 3).
4. Select the images you want to throw away, then press the **OK button**. A screen will appear and ask you to confirm the deletion of the images you have selected (**figure 2.1**, image 4).
5. To finish deleting the images, select **Yes** and press the **OK button**. To cancel, select **No** and press the **OK button** (**figure 2.1**, image 4).



Figure 2.1 – Delete menu screens for the Selected option

2





Note: Since the D7000 has multiple card slots, many functions can affect multiple memory cards when Playback Menu > Playback folder > All is selected. How can you tell which memory card is being affected by the current function? Notice in [figure 2.1A](#) that there are two tiny SD card symbols in the top right corner of the screen, just under the blue line (red arrow). Each card slot has a number: 1 or 2.

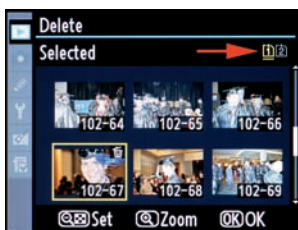


Figure 2.1A – Active memory card slot

As you use functions that affect displayed images, the memory card symbol will be underlined for the card containing the image you are modifying. In [figure 2.1A](#), it is apparent that there is only one memory card in the camera because the second card is grayed out. Only card 1 is available and underlined in yellow.

Had there been two cards in the camera, neither of the small SD card symbols (1 or 2) would have been grayed out. The card containing the currently selected image will always be underlined in yellow. As you scroll through the images, notice that the yellow underline will jump to whatever card contains the image you are highlighting at that moment.

This will apply to many functions throughout this book, so always be on the lookout for which memory card contains the picture you are working with.

Select date

Using the Select date method is simple. When you preview your images for deletion, you won't be shown a list of all the images, as with the Delete option. Instead, the Select date screen ([figure 2.2, image 3](#)) will give you a list of dates with a single representative image following each date.



Figure 2.2 – Delete menu screens for the Select date option

Here are the steps to delete images by Select date:

1. Select **Delete** from the **Playback Menu** and scroll to the right ([figure 2.2, image 1](#)).
2. Choose **Select date** and scroll to the right ([figure 2.2, image 2](#)).
3. Notice how there's a check box to the left of each date ([figure 2.2, image 3](#)). You'll

check this box by scrolling up or down to the date of your choice with the [Multi Selector](#) and then scrolling to the right where you see a tiny black arrowhead and the word Set. This checks the box and gives the camera permission to delete all images it finds with the date you've checked. If the single tiny representative image next to the date is insufficient to help you remember which images you took on that date, you can confirm the images you want to delete by viewing them. Press the checkered [Thumbnail/playback zoom out button](#) on the rear lower-left corner of the camera, and the D7000 will show you the images for that date. If you want to examine an image more closely, you can use the [Playback zoom in button](#) to temporarily zoom in on individual images. When you're satisfied that none of the images for that date are worth keeping, press the [OK button](#) (or the [Thumbnail/playback zoom out button](#)) and you will be returned to the list of dates to delete.

4. Make sure the date you want to delete is checked as described earlier, and press the [OK button](#) to start the image deletion process ([figure 2.2, image 3](#)).
5. A final screen will appear asking you to confirm your deletion for the last time ([figure 2.2, image 4](#)). This screen has a big red exclamation point and asks, *Delete all images taken on selected date?* If you scroll to Yes and press the [OK button](#), the images will be deleted. Be careful! If you decide not to delete them, press the [MENU button](#) to cancel the operation.

All

This option is like formatting a card, except that it will not delete folders, only images ([figure 2.3](#)). As mentioned previously, it will not delete protected or hidden images, either. Using this option is a quick way to format your card while maintaining your favorite folder structure.

Here are the steps to delete all images on the card (or in the current folder):

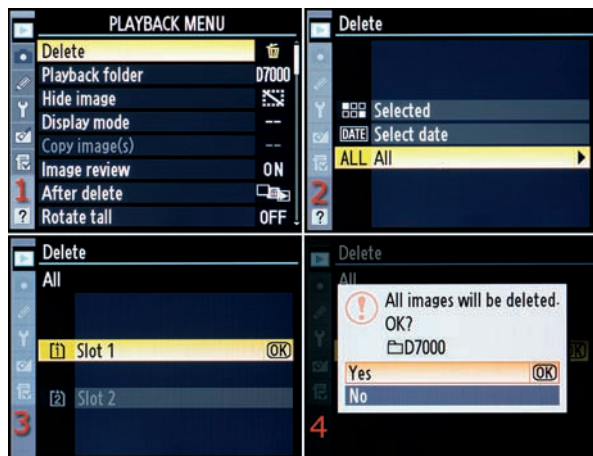


Figure 2.3 – Delete menu screens for the All option

1. Select [Delete](#) from the [Playback Menu](#) and scroll to the right ([figure 2.3, image 1](#)).
2. Choose [All](#) and scroll to the right ([figure 2.3, image 2](#)).
3. Select the slot from which to delete images ([Slot 1](#) or [Slot 2](#)). Notice that you have

2





Slot 1 and Slot 2 available (figure 2.3, image 3). If there is a memory card missing from one of the slots, it will be grayed out and unavailable. Press the **OK button** to choose the slot.

4. Choose **Yes** from the next screen with the big red exclamation point and dire warning of imminent deletion (figure 2.3, image 4). If you have **Playback folder** set to **Current**, the camera will delete only the images in the current folder, and the warning will ask, *All images will be deleted. OK?* If you have **Playback folder** set to **All**, the warning will ask, *All images in all folders will be deleted. OK?* (See the next section for information on the **Playback folder** option.) When you select **Yes** and press the **OK button**, a final screen with the word *Done* will pop up briefly, informing you that the deed has been accomplished.

Being the paranoid type, I tested this thoroughly and found that the D7000 really will not delete protected and hidden images. Plus, it will keep any folders you have created. However, if you are a worrier, maybe you should transfer the images off the card before deleting any images.

Recovering Deleted Images

If you accidentally delete an image or a group of images, or even if you format the entire memory card and then realize with great pain that you didn't really mean to, all is not lost. Simply remove the card from your camera immediately and do not use it until you can run image recovery software on the card. Deleting or formatting doesn't permanently remove the images from the card. It merely marks them as deleted and moves the references to the images to the memory card's file allocation table (FAT). The images are still there and can usually be recovered as long as you don't write any new data to the card before trying to recover them. It's wise to have a good image recovery program on your computer at all times. Sooner or later you'll have a problem with a card and will need to recover images. Many of the better brands of memory cards include recovery software either on the card itself or on a separate CD that comes with the card. Make sure you install the software on your computer before formatting the brand new memory card!

My favorite image recovery software is File Recover by PC Tools (<http://www.pctools.com/file-recover/trial/d/2/>). I've used it several times to recover lost files from damaged memory cards, and it works very well. It will also recover other standard file types, such as MP3 files, on any hard drive or memory card.

My Recommendation: I don't use the All function often since I usually don't create special folders for each type of image. If you maintain a series of folders on your memory card(s), you may enjoy using the All function. Most of the time, I just use Selected and remove particular images. Any other time I want to clear the card, I use the Format memory card function on the Setup Menu or hold down the two buttons with the red Format label next to them. We'll discuss formatting the memory card in the chapter titled **Setup Menu**, under the heading called **Format Memory Card**.

Another way I'll rid myself of images I don't want is to view them on the Monitor by pressing the Playback button and then pressing the Delete button on the top left of the camera back (marked by a trash can symbol). You have several ways to rid yourself of unwanted images with the D7000, including by individual dates with the Select date option. Choose your favorite.



Playback Folder

(User's Manual – Page 195)

The Playback folder setting allows your camera to display images during preview and slide shows. You can have the D7000 show you images only in the current image folder that was created by the D7000, in the current image folder that was created by another Nikon camera, or in all the folders on the memory card.

If you regularly use your memory card in multiple cameras, as I do, and sometimes forget to transfer images, adjusting the playback folder is a good idea. I use a D7000, D300S, and D5100 on a fairly regular basis. Often I grab an 8 GB card out of one of the cameras and stick it in another one for a few shots. If I'm not careful, I'll later transfer the images from one camera and forget that I have more folders created by the other camera on the memory card. It's usually only after I have pressed the format buttons that I remember the other camera's images on my memory card. The D7000 comes to my rescue with its Playback folder > All function.

Let's look at how the Playback folder function works by first looking at the menu screens in [figure 2.4](#). There are three selections you can choose from:

- D7000
- All
- Current

D7000

This is the most limited playback mode. The camera will display images created only by the D7000 from the current folder. If there are other folders on the camera, they will be ignored.

All

When you select All, your D7000 will obligingly show you every image it can find in all the folders on the memory card. This maximum flexibility setting has saved me several times when I remembered to check my camera for images before I formatted a card because I could see that I had other images on the card besides D7000 images. During playback, or before deletion, the D7000 will display images from other Nikon cameras you've used with the current memory card.

Each camera usually creates its own unique folders, and normally the other cameras do not report that they are there, except by showing a reduced image capacity. The D7000 intelligently displays its own images and other Nikon-created images on the card.

Current

Images in whatever playback folder your camera is currently using will be displayed during playback, whether the images were created by the D7000 or another Nikon camera. No other

images or folders will be displayed.

Use the following steps to select from which folder(s) your camera will display images:



Figure 2.4 – Selecting a Playback folder source

1. Select **Playback folder** from the **Playback Menu** and scroll to the right (figure 2.4, image 1).
2. Choose **D7000**, **All**, or **Current** and press the **OK button** (figure 2.4, image 2).

My Recommendation: Using anything except All makes it possible for you to lose images. If you don't have any other Nikon cameras, this may not be a critical issue. However, if you have a series of older Nikon cameras around, you may switch memory cards between them.

If there's an image on any of my memory cards, I want to see it and know it's there. Until I started using the All setting, I was regularly formatting cards with forgotten images on them. The images can often be recovered with file recovery software, but sometimes a few of them can't. From my pain comes a strong recommendation: use All!

Playback Folder and Hidden Images

The display of images to select for hiding (see the next section) obeys the Playback Menu > Playback folder selection that we considered in this section. You can hide only the images you can see in the Hide image selection screen. If you don't have All selected for Playback Menu > Playback folder, you may not see all of the images on the card. If you regularly hide images, you may want to leave your Playback folder set to All. That way, all the images on the card will appear on the Hide image screen and let you select any of them to hide.

2



Hide Image

(User's Manual – Page 196)

If you sometimes take images that would not be appropriate for others to view until you have a chance to transfer them to your computer, this setting is for you. You can hide one or many images, and when they are hidden, they cannot be viewed on the camera's Monitor in the normal way. After they are hidden, the only way the images can be viewed again in-camera is by using the Deselect all? function shown in [figure 2.5, image 2](#). There are three selections in this menu:

- Select/set
- Select date
- Deselect all?

Select/set

This selection allows you to hide one or many images ([figure 2.5, image 3](#)). Here's how to hide an image:

1. Select **Hide image** from the **Playback Menu** and then scroll to the right ([figure 2.5, image 1](#)).
2. Choose **Select/set** from the list and then scroll to the right ([figure 2.5, image 2](#)).
3. Scroll to the image you want to hide and press the **Thumbnail/playback zoom out button** to select the image. You'll see a little dotted rectangle with a slash symbol appear in the top right corner of the image you've selected (red arrow

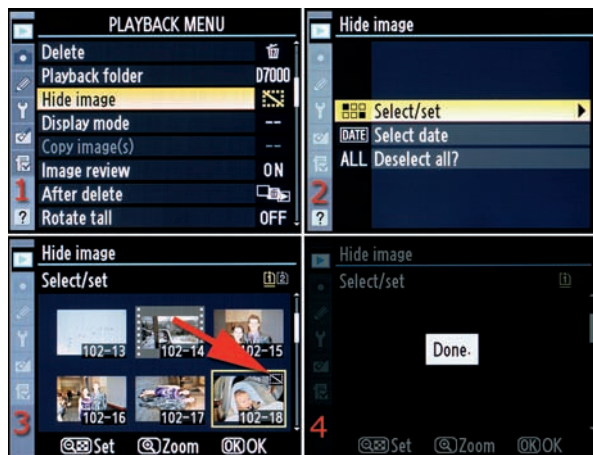


Figure 2.5 – Hide images with Select/set

in [figure 2.5, image 3](#)). You can do this multiple times to select several images.

4. Press the **OK** button to hide the image(s). *Done* will appear on the **Monitor** when the hiding process is complete.



The number of images reported does not change when you hide images. If you have 50 images on the card and you hide 10, the camera still displays 50 as the number of images on the card. A clever person could figure out that there are hidden images by watching the number of images as they scroll through the viewable ones. If you hide all the images on the card and then try to view images, the D7000 will tersely inform you, *All images are hidden*.

You can also use these steps to unhide one or many images by reversing the process described earlier. As you scroll through the images, as shown in [figure 2.5, image 3](#), you can deselect them with the Thumbnail/playback zoom out button and then press the OK button to unhide them.

While you are selecting or deselecting images to hide, you can use the Playback zoom in button to see a larger version of the image you currently have selected. This lets you examine the image in more detail to see if you really want to hide it.

Select date

This function allows you to hide a series of images by the date they were taken. You might have been shooting a nature series in the wilds of Africa one day and a glamour series for a national magazine the next day. You wouldn't mind your kids seeing the nature shots, but you might not want them to see the more glamorous ones. So you simply select the date(s) you took the glamour shots and hide them, and then they are not viewable on the camera Monitor. Use the screens shown in [figure 2.6](#) and follow these steps:

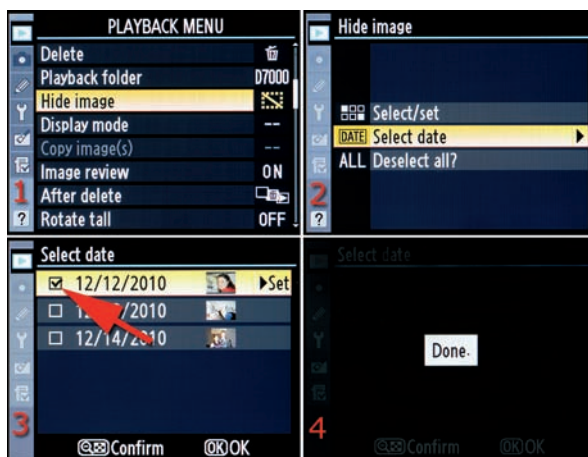


Figure 2.6 – Hide images with Select date

1. Select **Hide image** from the **Playback Menu** and then scroll to the right ([figure 2.6, image 1](#)).
2. Choose **Select date** from the list and then scroll to the right ([figure 2.6, image 2](#)).
3. Now you can select the date you took the images you want to hide from the list of

available dates by scrolling up or down with the **Multi Selector** (figure 2.6, image 3). When your chosen date is highlighted, scroll to the right where you see the arrow and the word **Set**, and a check mark will appear in the box to the left of the date (red arrow in figure 2.6, image 3). If you'd like to review the images from a certain date before hiding them, simply select the date in question and press the **Thumbnail/playback zoom out button**. This will open only the images from the selected date in the **Monitor** window. You can review individual images in detail by highlighting an image and pressing the **Playback zoom in button**.

4. The images taken on this date are now selected for hiding. If you press the **OK button**, all the images with the date selected will be hidden immediately, and the camera will return to the main **Playback Menu** after displaying **Done**.

Deselect all?

This is a much simpler way to unhide the previously hidden images on the card all at once. Here are the steps to unhide (deselect) all images marked as hidden:

1. Select **Hide image** from the **Playback Menu** and then scroll to the right (figure 2.7, image 1).
2. Choose **Deselect all?** from the list and then scroll to the right (figure 2.7, image 2).
3. At the **Reveal all hidden images?** screen, select **Yes** and press the **OK button**. All hidden images on the card will then be revealed and viewable (figure 2.7, image 3).
4. After the images are unhidden, the camera's **Monitor** will display **Marking removed from all images** (figure 2.7, image 4).



Figure 2.7 – Unhide images with Deselect all?

Unhide Images Removes Protection Too

If you have images that are both hidden and protected and then you unhide them, the delete protection is removed at the same time.

Display Mode

(User's Manual – Pages 165 and 197)

The Display mode selection allows you to customize how the D7000 displays several histogram and data screens for each image. You get to those screens by displaying an image on the camera's Monitor and scrolling up or down with the Multi Selector.

When you want to see a lot of detailed information about each image, you can select it here. Or, if you would rather take a minimalist approach to image information, simply turn off some of the screens.

If you turn off certain screens, the camera still records the information for each image, such as lens used, shutter speed, and aperture. However, with no data screens selected, you'll see only two screens when you scroll up or down. One is the main image view, and the other is a summary screen with a luminance histogram and basic shooting information. I have not found a way to turn this summary screen off. You get to the screens by using the Multi Selector to scroll vertically. I leave my camera set so I can scroll through my images by pressing left or right on the Multi Selector. Then I can scroll through the data screens by scrolling up or down with the Multi Selector.

Following are the photo info choices in the Display mode menu and descriptions of what each selection does (figures 2.8 – 2.12):

Basic photo info

- Focus point

Detailed photo info

- Highlights
- RGB histogram
- Data

When you modify these selections, be sure to scroll up to Done and press the OK button to save your setting (figure 2.8, image 3).

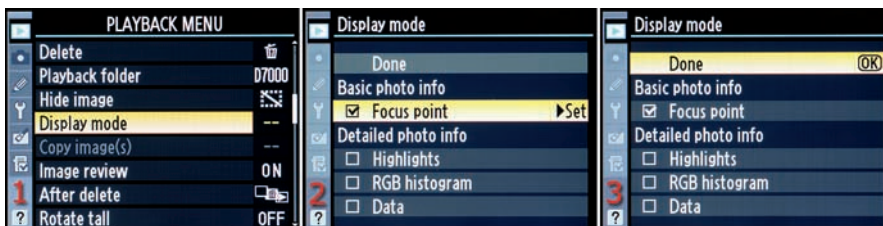


Figure 2.8 – Selecting Display mode photo info choices

Use the following steps to enable or disable any of the four Display mode screens:

1. Select **Display mode** from the **Playback Menu** and scroll to the right (figure 2.8, image 1).
2. Choose any of the four available screens by highlighting a line in yellow with the **Multi Selector** and scrolling to the right toward **Set** to put a check mark in the box for that item (figure 2.8, image 2).
3. After you have check marks in all the boxes for the screens you want to use, scroll up to **Done** and press the **OK button** (figure 2.8, image 3).

Now, let's look at what each of these selections accomplishes (figures 2.9 to 2.12).

Focus point

If you are curious about which autofocus (AF) point is focused on your subject during an exposure, use this mode to easily find out. If you are using Single-point AF or Dynamic-area AF, you'll

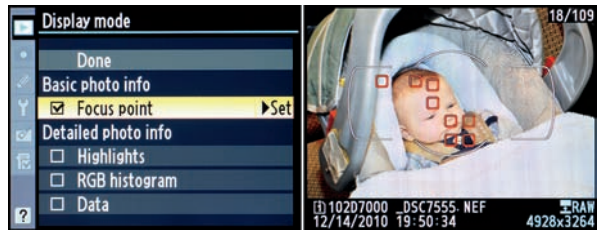


Figure 2.9 – Enabling the Focus point display

see a single red AF indicator where the camera was focused when you took the picture. If you are using Auto-area AF you'll see all the AF points that were providing autofocus in your image (figure 2.9, image 2). This is a useful function for reviewing how the camera's AF system performs in different imaging situations.

Highlights

If you put a check mark next to the Highlights selection, as shown in figure 2.10, you will turn on what I call the blink mode of the camera. You'll see the word Highlights at the bottom left of the image (red arrow in figure 2.10, image 2).



Figure 2.10 – Enabling the Highlights display (blinks white to black to white, repeating)

When an area of the image is overexposed, it will blink white and black, as shown by the blown-out face at the red arrows near the tops of figure 2.10, images 2 and 3. This is

2



a warning that certain areas of the image are overexposed and have lost detail. You will need to use exposure compensation or manually control the camera to contain the exposure within the dynamic range of the camera's sensor.

Notice the face of the young graduate in [figure 2.10, images 2 and 3](#). In image 2 the face is completely white, and in image 3 the face is black (red arrows). If you were seeing this image on your camera's Monitor, you would see the man's face repeatedly blinking white to black.

When you have Highlights enabled and you see a blinking white and black area in an image on the Monitor, it means that area of the image has turned completely white and lost all detail, or has *blown out*.

If you examine the histogram for an overexposed (blown out) image, you'll see that it's cut off, or *clipped*, on the right side. Current software cannot usually recover any image data from the blown-out sections. The exposure has exceeded the range of the sensor and has become completely overexposed in the blinking area. We'll discuss how to deal with images that have light ranges exceeding the sensor's recording capacity in the chapter called **Metering, Exposure Modes, and Histogram**.

Highlights mode conveniently warns you when you have surpassed what the sensor can capture and lets you know that portions of the image will be overexposed. When it is enabled you'll see a small Highlights word in the display ([figure 2.10, images 2 and 3](#)).

RGB histogram

A histogram is a digital readout that shows the range of light and color in an image. If there is too much contrast the histogram display will be cut off. We'll examine the histogram in great detail later. For now, let's see how to turn the display on and off.

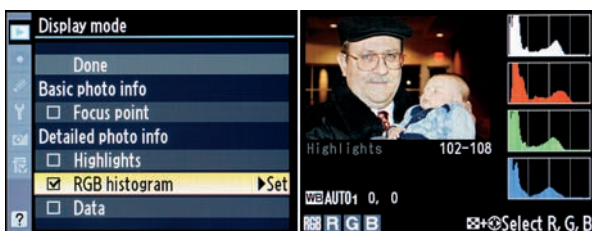


Figure 2.11 – Enabling the RGB histogram display

I like this feature since it allows me to view not just a basic luminance (brightness) histogram like some cameras, but all three color (chrominance) histograms—red, green, and blue—and a luminance histogram on one screen ([figure 2.11](#)). The D7000 stacks the four histograms on the right side of the screen, with luminance on top (white histogram) and the RGB color histograms underneath. [Figure 2.11](#) shows the D7000 RGB histogram screen.

It is quite useful to see each color channel in its own histogram since it is possible to overexpose, or blow out, only one color channel. The luminance (white) histogram

is usually very similar to the green channel histogram because green is the most common color.

Data

This setting will give you up to four additional image Data screens to scroll through. I took pictures of the screens in [figure 2.12](#) with a black background to make them legible. Normally these screens will overlay a dim version of the actual picture they represent.

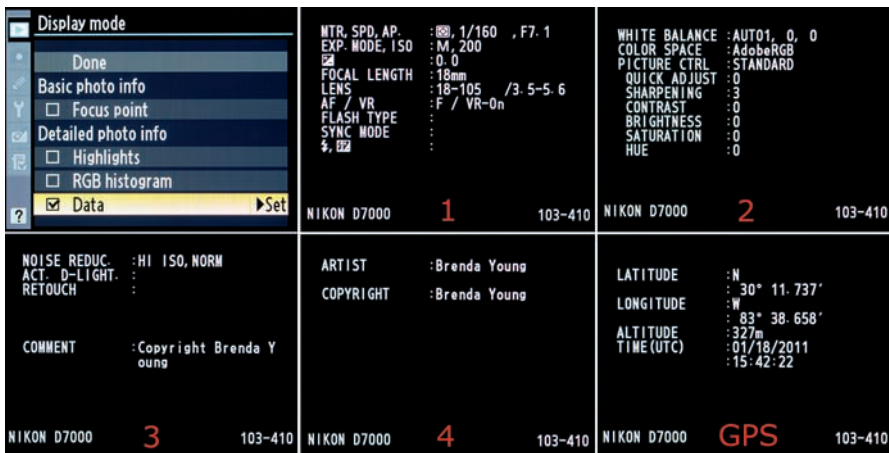


Figure 2.12 – Enabling the Data display

The data on these screens includes the following information ([figure 2.12](#)):

Image Data, Screen 1

- Light meter in use (Matrix, Spot, or Averaging), Shutter speed, and Aperture
- Exposure mode (P, S, A, M) and ISO
- Exposure compensation value
- Lens focal length
- Lens overview (e.g., 18–105 mm f/3.5–5.6)
- AF/VR
- Flash mode and Compensation
- Commander mode info (if used)

Image Data, Screen 2

- White balance
- Color space (sRGB, AdobeRGB)
- Picture control detail (e.g., Neutral, Standard, Vivid), Quick adjust, Sharpening, Contrast, Brightness, Saturation, Hue

Image Data, Screen 3

- Noise reduction
- Active D-Lighting (Off, Low, Normal, High)
- Retouch
- Comment

Image Data, Screen 4

- Artist
- Copyright

If you took a picture with a GPS unit attached and active on your D7000, you'll have an additional screen available—even if you don't have Data selected. [Figure 2.12](#) shows this screen in the last image, labeled GPS in red. The GPS data screen shows Latitude, Longitude, Altitude, and Time (UTC). The GPS screen is not controlled by the Data Display mode. I added it here to let you know it will show up after the Data screens when a GPS was mounted at the time you took a picture. It will not show up if no GPS was active.

That's a lot of screens to scroll through, but they provide a great deal of information about the image. Look how far we've come from the days when cameras wrote date information on the lower right of the image (permanently marking it) or between the frames on pro-level cameras.

Including the two standard display screens shown in [figure 2.13](#), there are eight screens just brimming with data on the D7000—plus the GPS screen. You can get by with the main image display and one summary display, which are always available. The summary display is a condensation of the most important shooting information. It even includes a small luminance histogram. [Figure 2.13](#) shows the summary display in the image on the right.



Figure 2.13 – These two display screens are always available

My Recommendation: I always leave the Highlights ([figure 2.10](#)) and RGB histogram ([figure 2.11](#)) displays turned on because I want to confirm that I'm not accidentally blowing out important sections of my image. The Highlights blink mode warns me when my images have overexposed areas, allowing me to adjust my exposure and reshoot the image.

The RGB histogram is also very important to me because it allows me to see all the color channels, just in case one of them is being clipped off on the light or dark

sides. It also allows me to see how well I am keeping my exposure balanced for light and dark.

The Data screens are not very important to me since the D7000 has a summary screen (figure 2.13, image 2) with the most important exposure information displayed.

Also, if I have the Data screens enabled, I have to scroll through three more screens to get to my RGB histogram screen.

I use only the Highlights and RGB histogram screens, but if you want to examine a large amount of extra image data, then you can enable the Data screens.

2



Copy Image(s)

(User's Manual – Page 197)

The D7000 provides a means to Copy image(s) between the camera's two card slots. I'll refer to the camera's two SD/SDHC/SDXC card slots as simply the SD cards slots. If you've been shooting and decide you want a backup on the other card or want to give images on one of your cards to someone else, you can use this function to copy images between the two cards.

This convenient function has several steps to copy images. First, select a source card—if both cards have images—and the source folder, then select the images to copy, and then select the folder on the destination card in which you want to place the images. Figure 2.14 shows the screens used to Copy image(s). First, you'll need to select an image source. If Select source is grayed out, there are two potential reasons; see them following the step-by-step method.

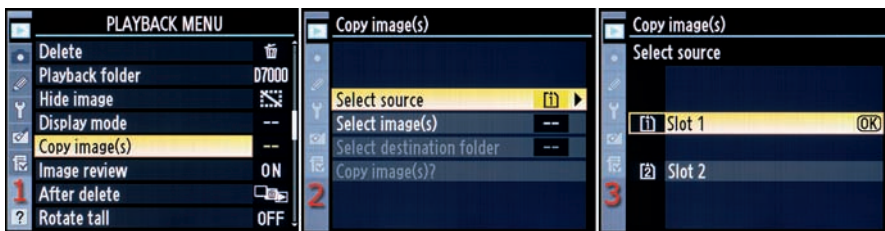


Figure 2.14 – Selecting a source for images to copy

Refer to figure 2.14 and follow these steps to select a source card:

1. Select **Copy image(s)** from the **Playback Menu** and scroll to the right (figure 2.14, image 1).
2. Choose **Select source** from the list and scroll to the right (figure 2.14, image 2).
3. Choose one of the card slots (**Slot 1** or **Slot 2**).
4. Press the **OK** button to lock in your choice.



Why is Select source grayed out? – When I first opened the menu shown in [figure 2.14](#), I found only one item available: the Select image(s) choice. The rest of the choices were grayed out. I was quite puzzled at first, but then I figured out that there are two reasons why Select image(s) may be the only option available.

First, there might be images on only one of the cards. Think about this for a moment. If only one card has images on it, you have no real reason to choose a source card. Only one card contains images, so it has to be the source. This is the most likely scenario.

Second, the SD card's write-lock switch might be in the on position. This usually happens while inserting the SD card into a card reader or a camera at a slight angle. The switch is on the side, and sometimes it accidentally gets moved from the off to the on position. Remove the card and unlock it.

See the sidebar for more information about what happens when a write-locked card is inserted into one of the camera's memory card slots.

Accidentally Inserting a Write-Locked Card

The camera cannot write to an SD card with the write lock set to on. If the locked SD card is the only one inserted into the camera, you will see the word *C*ard blinking on the Control panel (yes, for some reason it has an uppercase A). Also, a message will appear on the Monitor—if you press the Shutter-release button—saying, *Memory card is locked. Slide lock to "write" position.*

If there are two memory cards in the camera, and one of them is locked, a blinking card slot icon will appear on the Control panel and Information display screen (press Info button once for Information display screen). The blinking card symbol on the Information display screen will have a key icon in the middle, symbolizing that the card needs to be unlocked. If you don't notice the blinking card icons, it may take a while to realize that you've accidentally moved the write-lock switch to the locked position on one of the cards.

The camera is smart enough to write to the other SD card slot when it can't access one of the SD cards, so you may be happily snapping images, thinking they are being saved to the primary SD card (Slot 1) when they are actually being sent to the secondary card (Slot 2), or vice versa.

The camera will continue displaying images found on the locked SD card if it contains images and Playback folder is set to All in the Playback Menu. The D7000 can still read the card and display images from a write-locked SD card.

The following instructions assume that you have a card in each slot and images on both cards. If you have images on only one card, you can skip this process.

When you have chosen a source, it's time to select images to copy. It's a somewhat complex process to describe but fairly easy to use. First, follow these steps to choose a folder:

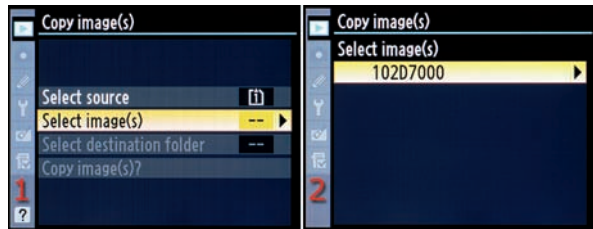


Figure 2.15 – Selecting a source folder for images to copy

1. Choose **Select image(s)** from the list and scroll to the right (figure 2.15, image 1).
2. Choose the folder that contains the images you want to copy (figure 2.15, image 2). My camera happens to be using a folder named **102D7000**. Your camera may have several folders available, or only one. After you have chosen a folder, scroll to the right.
3. There are three options for copying images: **Deselect all**, **Select all images**, and **Select protected images** (figure 2.16). Each option has a slightly different way of doing things (the description for each option is listed between steps 3 and 4). Choose only one option for your copy operation, then continue with step 4.

- **Deselect all** – Choose **Deselect all** from the **Default image selection** menu and then scroll to the right (figure 2.16). **Deselect all** opens a list of images, none

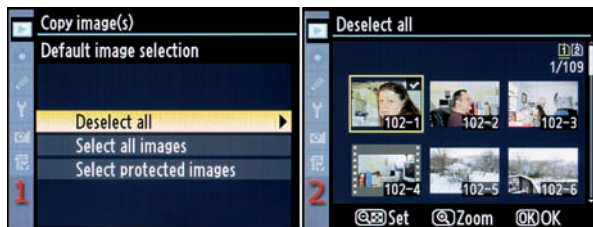


Figure 2.16 – Deselecting all images to copy

of which have been selected. It sounds a little weird to select images for copying while using a function named **Deselect all**, but this means that the camera automatically deselects all the images so you can choose which images to copy. You'll need to scroll around with the yellow rectangle and select images one at a time. Mark an image for copying by pressing the **OK** button, and you'll see a small white check mark appear in the top-right corner of the image thumbnail. Figure 2.16, image 2, shows only one picture selected, number 102-1. It's the only one with a check mark. Now move on to step 4.

• **Select all images**

– Choose **Select all images** from the **Default image selection** menu and scroll to the right (figure 2.17). The **Select all images** screen will

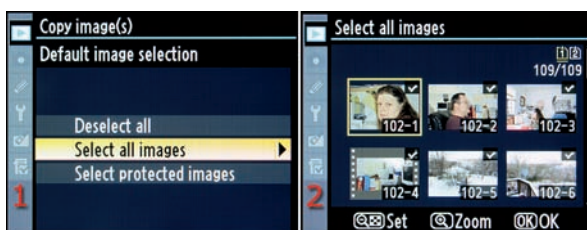


Figure 2.17 – Selecting all images to copy

appear, with all images selected. If you want to copy all of the images, move on to step 4 now. If you want to deselect a few of them before copying, scroll to an image and press the **Thumbnail/playback zoom out button**. This action will remove the check mark from the image thumbnail. After you've unchecked the images you don't want to copy, move on to step 4.

• **Select protected images**

– Choose **Select protected images** from the **Default image selection** menu and scroll to the right (figure 2.18). If you have

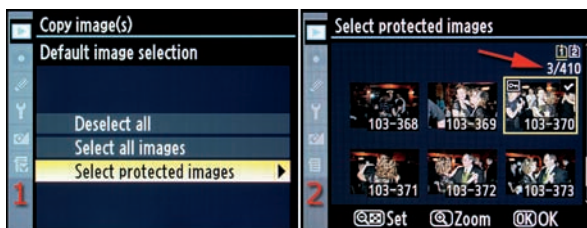


Figure 2.18 – Selecting protected images to copy

used the **Help/protect button** to mark images as protected, they will appear with a little key symbol and a check mark in the list of images, indicating that they are already checked for copying (figure 2.18, image 2, picture 103-370). If you have a lot of images on the card and only a few are protected, it may be hard to find the protected images. Rest assured that the camera knows which ones to copy. It will display all the images but only copy the protected ones. You can see the number of protected images that will be copied in the upper-right corner of the display (red arrow in figure 2.18, image 2). This figure shows that I will copy 3 protected images out of 410 images on the card in Slot 1. Now move on to step 4.

4. After you have selected all the images you want to copy, press the **OK button** and the **Monitor** will display the **Copy image(s)** menu. Now it's time to select a destination folder into which you'll copy the images (figure 2.19).

5. Choose **Select destination folder** from the **Copy image(s)** menu and scroll to the right (figure 2.19). You will have two options: **Select folder by number** or **Select folder from list** (figure 2.20 and

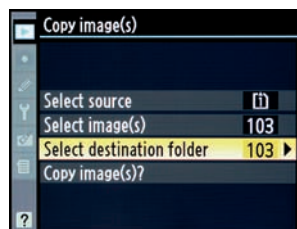


Figure 2.19 – Selecting a destination folder

figure 2.21). Before we move on to step 6, let's investigate these two options. Pick an option, follow the instructions for your option, then move on to step 6.

- **Select folder by number** – Choose

Select folder by number from the Select destination folder menu and scroll to the right (figure 2.20). The next screen

will display a folder number that can be changed to any number between 100 and 999 (figure 2.20, image 2). If you select a number for a folder that already exists on the destination card, the images will be copied into that folder. If you select a folder number that does not exist on the destination card, the folder will be created and the source images will be copied into the new folder on the destination card. Now move on to step 6.

- **Select folder from list** – If there are no

existing folders on the destination card, this option will be grayed out (figure 2.21). Obviously, you can't copy images to



Figure 2.20 – Selecting a destination folder by number

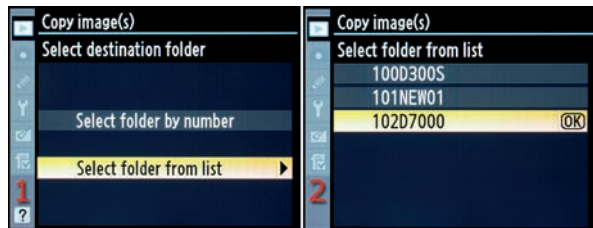


Figure 2.21 – Selecting a destination folder from a list of folders

a folder that doesn't exist, so use the Select folder by number option to create a new folder. If this option is not grayed out, choose Select folder from list and scroll to the right. The next screen will show you a list of folders. My list in figure 2.21, image 2 has three folders in it. I chose to use the folder named 102D7000. After you have selected the destination folder, move on to step 6.

6. Now it's finally time to copy some images. We've selected a source card and folder, some images, and a destination folder. Notice that you don't have to select a destination memory card. Since we've already selected a source card, the other card automatically becomes the destination. The D7000 does not support copying images to the same memory card; you can copy only to the other card. All that's left is to select Copy image(s)? and press the OK button.

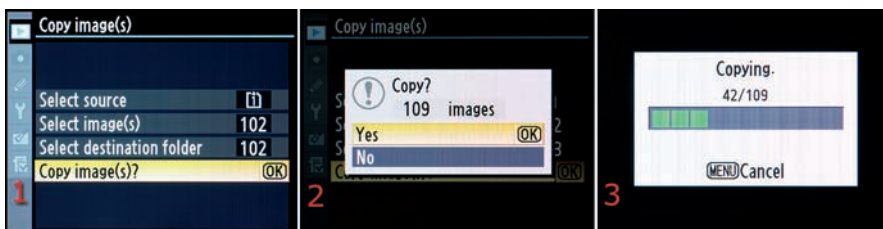


Figure 2.22 – Copying images

7. Figure 2.22 shows the screens for this step. After you have selected **Copy image(s)?**, you'll see a screen asking for verification. Mine says *Copy? 109 images* (figure 2.22, image 2). Select **Yes** and press the **OK** button. Figure 2.22, image 3 shows that the camera is copying 109 pictures from the source card to the destination card. Notice how the *Copying* screen shows the progress of the copy action with a green progress bar. This will take several minutes to complete if you are copying a large number of images.
8. When the copying is finished, you will see a small white box (not shown) that says *Copy complete*. You must press the **OK** button to return to the **Copy image(s)** screen. That completes the copying process.

There's one more screen to be aware of, in case you try to copy images into a folder where they already exist. If an identical file name already exists in the destination folder, you may or may not want to overwrite it.

The camera will warn you with the screen shown in figure 2.23, helpfully showing you thumbnails of both images. You can view the two thumbnails and choose **Replace existing image**, **Replace all**, **Skip**, or **Cancel**.

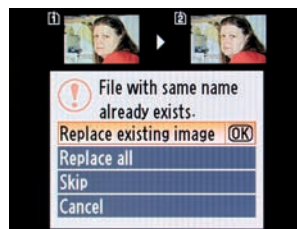


Figure 2.23 – Image overwrite warning

Image Review

(User's Manual – Page 200)

Image review does exactly what it says; it displays an image you've just taken on your camera's Monitor. With this function turned On, you'll see each picture you take just after you take it. You can review the image for quality and usefulness.

With Image review set to Off, you won't see each picture unless you press the Playback button afterward. This saves battery life. However, the camera's battery is long lived because the D7000 does not use a lot of power. If you prefer to review each image after you take it, then you'll need to set this feature to On.

You can control how long each image is displayed on the Monitor before it shuts off by adjusting Custom setting c4 Monitor off delay > Image review. This custom Image review time



Figure 2.24 – Enabling Image review

can be adjusted to display pictures from 4 seconds to 10 minutes. We'll discuss this in more detail in the chapter titled **Custom Setting Menu**.

There are two Image review settings, as shown in [figure 2.24](#):

- **On** shows a picture on the Monitor after each shutter release.
- **Off** causes the Monitor to stay off when you take pictures.

Here are the steps to choose an Image review setting ([figure 2.24](#)):

1. Choose **Image review** from the **Playback Menu** and scroll to the right.
2. Select **On** or **Off** from the **Image review** screen.
3. Press the **OK** button.

Most of us will turn this feature on right away, if it's off. Otherwise, the only way to view an image after taking it is to press the Playback button.

My Recommendation: Since the camera's battery lasts a long time, I leave Image review set to On. I am an unashamed image chimper (see sidebar, **Are You a Chimper Too?**) and always examine each image, if there's time. Photography is enjoyable, and one of the good things is the satisfaction you feel when you capture a really nice image. However, if you are shooting a sports event and blasting through hundreds of shots per hour, there's not much time to view each image. It all boils down to how you shoot. If you aren't inclined to view your images as you take them, then it may be a good idea to set Image review to Off—merely to save battery life.

Are You a Chimper Too?

Chimpering means reviewing images on the Monitor after each shot. I guess people think you look like a monkey if you review each image. Well, I do it anyway! Saying, "Oo, Oo, Oo, Ah, Ah, Ah" really fast when you're looking at an image and are happy with it may make you sound like a monkey. That's chimpering with style, and it's why the word was invented.

2



After Delete

(User's Manual – Page 200)

If you delete an image during playback, one of your other images will display on the camera's Monitor. The After delete function lets you select which image is displayed after you delete an image. The camera can display the next image or the previous image, or it can detect which direction you were scrolling—forward or backward—and let that determine which image appears after you delete another.

The three selections on the After delete menu are Show next, Show previous, and Continue as before (figure 2.25).

- **Show next** – If you delete an image and it wasn't the last image on the memory card, the camera will display the next image on the Monitor. If you

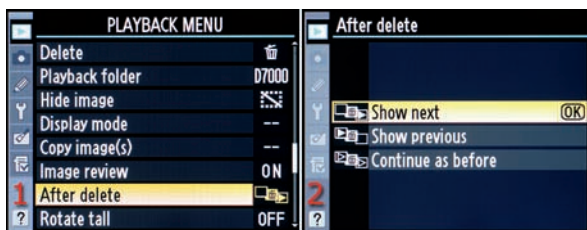


Figure 2.25 – Playback Menu – After delete

- delete the last image on the card, the previous image will be displayed. Show next is the factory default behavior of the D7000 since most people would prefer to see the next picture. However, if you feel differently, one of the next two settings may appeal to you.
- **Show previous** – If you delete the first image on the memory card, the camera will display the next image. If you delete an image somewhere in the middle or at the end of the memory card, the previous image will be displayed.
- **Continue as before** – This weird little setting shows the flexibility of computerized camera technology in all its glory. If you are scrolling to the right (the order in which the images were taken) and decide to delete an image, the camera uses the Show next method to display the next image. If you happen to be scrolling to the left (opposite from the order in which the images were taken) when you decide to delete a picture, the camera will use the Show previous method instead.

Use the following steps to choose an After delete setting (figure 2.25):

1. Choose **After delete** from the **Playback Menu** and scroll to the right (figure 2.25, image 1).
2. Select one of the three settings from the **After delete** screen (figure 2.25, image 2).
3. Press the **OK** button to lock in the setting.

My Recommendation: When I delete an image, I'm not overly concerned about which image shows next—most of the time. However, this functionality is handy in certain styles of shooting and deleting rejects.

For instance, some sports or wildlife shooters might like to move backwards through a long sequence of images, starting with the last image taken. They can then delete the images that are not usable in the sequence, and the camera will immediately show the previous image for review. When they reach the first image in the sequence, the entire series is clean and ready to use.

I leave my camera set to Continue as before because it will use the direction I was scrolling to decide which image to display after deleting one. Why not use all the neat technology built into your camera?

2



Rotate Tall

(User's Manual – Page 200)

When you shoot a portrait-oriented (vertical) image, with the camera turned sideways, the image can later be viewed as a horizontal image lying on its side or as a smaller, upright (tall) image on the camera's horizontal (wide) Monitor.

If you view the image immediately after taking it, the camera's software assumes that you are still holding the camera in the rotated position, and the image will be displayed correctly for that angle. Later, if you are reviewing the image with the camera's playback functionality and have Rotate tall set to On, the image will be displayed as an upright, vertical image that is smaller so it will fit on the horizontal Monitor. You can zoom in to see sharpness detail, if needed.

If you would rather have the camera leave the image lying on its side in a horizontal view, forcing you to turn the camera 90 degrees to view it, you'll need to choose Off.

The following two settings are available on the Rotate tall menu ([figure 2.26](#)):

- **On** – When you take a vertical image, the camera will rotate it so you don't have to turn your camera to view it naturally during playback. This resizes the view of the image so that a vertical image fits in the horizontal frame of the Monitor. The image will be a bit smaller than normal. When you first view the image after taking it, the camera does not rotate it, since it assumes you are still holding the camera in a vertical orientation. It also senses which end of the camera is up—if the Shutter-release button is up or down—and displays the image accordingly.

- **Off** – Vertical images are left in a horizontal direction, lying on their side; you'll need to turn the camera to view the images in the same orientation as when they were taken. This provides a slightly larger view of a portrait-oriented image.

Here are the three steps to choose a Rotate tall setting:



Figure 2.26 – Playback Menu – Rotate tall

1. Choose **Rotate tall** from the **Playback Menu** and scroll to the right (figure 2.26, image 1).
2. Select **On** or **Off** from the **Rotate tall** screen (figure 2.26, image 2).
3. Press the **OK** button to finish.

My Recommendation: I leave Rotate tall set to On. That way I can view a portrait-oriented image in its natural, vertical orientation without turning my camera. Be sure you understand the relationship between this function and Auto image rotation, which stores orientation data with the picture. I always set Rotate tall and Setup Menu > Auto image rotation to On. That lets me view images in the correct orientation on my camera's Monitor and my computer screen.

Rotate Tall vs. Auto Image Rotation

There is another camera function that affects how image rotation works. It's called Auto image rotation, under the Setup Menu. We'll discuss that function more deeply in the chapter titled **Setup Menu**.

Auto image rotation causes the camera to record the angle at which you are holding it as part of the image's metadata. Auto image rotation should be set to On so that an image will report how it should be displayed on the camera's Monitor and on your computer.

In other words, Rotate tall and Auto image rotation work together to display your image in the correct orientation. Rotate tall gives you the choice of how the image is viewed based on the orientation information it finds in the image's metadata.

Setup Menu > Auto image rotation causes the camera to store how the image was taken so it will know whether the image has a vertical or horizontal composition. It can then report this information to the Rotate tall function.

Slide Show

(User's Manual – Page 201)

I used to do slide shows back in the old film days. I'd set up my screen, warm up my projector, load my slides, and watch everyone fall asleep by the hundredth slide. For that reason, I hadn't been using the Slide show functionality of my camera. However, all that changed recently.

One day I was up in the Great Smoky Mountains shooting beautiful waterfalls and cascades. The day was almost over, so I headed back into town with my lovely images and a desire for supper. I stopped in at the local buffet, got some food, set up my camera on one of those silver metal napkin boxes, dialed in a nice slide show, and started watching my own little show while I ate.

Before long, I was hearing "ooohs" and "aaahs" from people at the next table. Soon, there were several people standing behind me watching the show. I became an instant celebrity. It was so popular that I think I'll go back this spring, and this time I'll be prepared to charge admission.

With the D7000's big three-inch monitor and VGA resolution, it should be a satisfying experience for any tourist. How much should I charge for the show?

All kidding aside, the camera's big Monitor does make it a lot nicer for viewing in-camera slide shows. In fact, if you wanted to you could connect the camera to your SD or HD television and do a slide show for an even larger group. You will connect to an SDTV with the included (in the box) A/V cable. Connecting to an HDTV requires the separate purchase of an HDMI (Type A) to mini-HDMI (Type C) cable.

Who needs a slide screen and projector, like in the old days, when you have a Nikon D7000 and a TV?

You can control how often each image is displayed with the Frame interval setting. First, let's see how to start a Slide show, then we'll see how to change the Frame interval.

Starting a Slide Show

As shown in [figure 2.27](#), the easy way to start a Slide show is to simply select the Playback Menu > Slide show setting, scroll right, and select Start. The slide show will commence immediately with a default display time of two seconds (2s) per image.



Figure 2.27 – Playback Menu – Slide show

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Changing a Slide Show's Frame Interval

If you want to allow a little more time for each image to display, you'll need to change the Frame interval (display time), as shown in [figure 2.28](#).

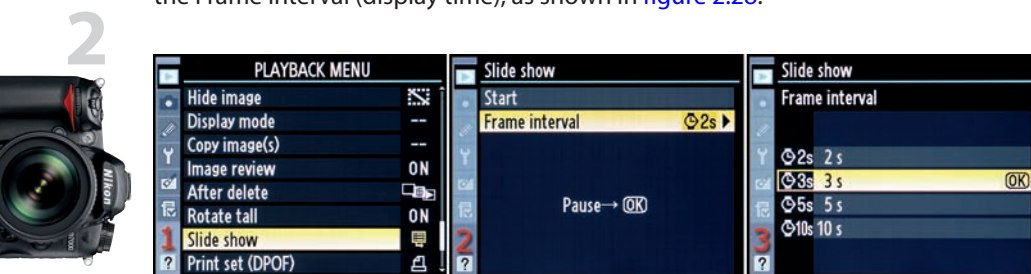


Figure 2.28 – Playback Menu – Slide show Frame interval

Your Frame interval choices are as follows ([figure 2.28](#)):

- 2s – 2 seconds
- 3s – 3 seconds
- 5s – 5 seconds
- 10s – 10 seconds

To start the slide show after you change the Frame interval, repeat the steps shown in [figure 2.27](#). The slide show will now run at the speed you chose.

My Recommendation: I usually set the Frame interval to 3s. If the images are especially beautiful, I might set it to 5s. I've found that 2s is not quite enough, and 5s or 10s may be too long. I wish there were a four-second setting, but 3s seems to work well, most of the time.

There are several options that affect how the images are displayed during the slide show. None of these options are in the camera menus; they are available through the camera's controls. Your options are as follows:

- **Skip back/Skip ahead** – During the slide show, you can go back to the previous image for another viewing by simply pressing left on the Multi Selector. You can also see the next image with no delay by pressing right on the Multi Selector. This is a quick way to skip images or review previous images without stopping the slide show.
- **View additional photo information** – While the slide show is running, you can press up or down on the Multi Selector to view the additional data screens. The screens you will see depends on how you have your camera's Display mode configured for Highlights, Focus point, RGB histogram, and Data (see the section called **Display Mode** earlier in this chapter). If any of these screens are available, they can be used during the slide show.

- **Pause slide show** – During the slide show you may want to Pause, change the Frame interval, or even Exit the show. If you press the OK button, the slide show will be suspended and you will see the Pause screen (figure 2.29).



Figure 2.29 – Playback Menu – Slide show Pause and Restart

Using the screens shown in figure 2.29, you can select any of the following:

- **Restart** – Selecting OK or scrolling to the right with the Multi Selector continues the slide show, starting with the image following the last one that was viewed.
- **Frame interval** – Scrolling to the right with the Multi Selector takes you to the screen that allows you to change the display time to one of four values. You can choose 2s, 3s, 5s, or 10s. After choosing the new Frame interval, you'll have to select Restart to continue the slide show where you left off.
- **Exit** – Selecting this option exits the slide show.

Exit to the Playback Menu – If you want to quickly exit the slide show, simply press the MENU button, and you'll jump directly back to the top of the Playback Menu, with no items selected.

Exit to playback mode – You can press the Playback button to stop the slide show and switch to a normal full-frame or thumbnail view of the last image seen in the slide show. This exits the show on the last image viewed.

Exit to shooting mode – If you press the Shutter-release button halfway down, the slide show will stop. The camera is now in shooting mode, meaning that it is ready to take some pictures.

As mentioned previously, instead of hauling out a slide projector and a box of slides, you can simply plug your D7000 into the closest high-definition (HD) device, such as an HD television, because the camera has a high-definition multimedia interface (HDMI) port. We'll talk more about HDMI in a later chapter.

You can also display a slide show on an older TV or record it on any device—such as a DVD or VHS recorder—that accepts a normal audio/video (A/V) cable input. An A/V cable is included with your camera; it's the one with the white and yellow RCA jacks on one end and the mini plug on the other.

Print Set (DPOF)

(User's Manual – Page 189)

At first I thought it was odd that Nikon chose to put image printing functions in the Playback Menu. Then I realized that printing is a permanent form of image playback. You play (print) the images to your printer and then view them without a camera or a computer. What a concept!

There are two ways to print images from your camera without using a computer. One way is to use DPOF to create a print order on a memory card. This function is called Print set (DPOF). The second way is to plug in a USB cable and print directly to a PictBridge-compatible printer. Both of these methods are generally used by nonprofessional camera users to print pictures from Joint Photographic Experts Group (JPEG) files at home or at the local lab, with no post-processing.

Most advanced amateur and professional users of the D7000 will want to post-process their images in computer software, like Nikon Capture NX2 or Adobe Photoshop, before printing, so this functionality is not used as often as other functions. However, it can be useful for someone who would rather simply take pictures and print them at home or at a store than manipulate images on their computer.

Since these seldom-used functions require multiple pages to describe and many people do not use them, I have relegated this information to a detailed document called **Print Set (DPOF)** and included it in the downloadable resources at <http://rockynook.com/NikonD7000>.

Note: Print set (DPOF) can be used only with JPEG images. It does not apply to NEF (RAW) files.

My Conclusions

Wow! The D7000 sure does have a lot of playback screens and menus. I remember the old days when if you wanted to see your images, you'd have to find the old shoebox full of pictures or open an album and flip pages. Sometimes I miss photo albums. You know what? I'm going to run down to the superstore right now and buy several albums. Then I'll have some images printed and put them into the albums. Better yet, I think I'll go buy a PictBridge-compatible printer so I can print my own images for the albums.

Now, let's move on to the next menu system in the camera, the Shooting Menu. This is one of the most important menus because it affects how the camera is configured to shoot pictures. Learn the Shooting Menu's settings well!



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Shooting Menu

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Determined Boy – Courtesy of Mikael Lorin (*mikeon*)

The Shooting Menu settings are the most-used functions in the camera. Spend time carefully learning about each of these selections because you'll use them often. They affect how your camera takes pictures in all sorts of ways.

The following is a list and overview of the 21 items found on the D7000 Shooting Menu:

- **Reset shooting menu** – Restores the factory default settings in the Shooting Menu for the currently selected User setting.
- **Storage folder** – Selects which folder subsequent images will be stored in on the camera's memory card(s).
- **File naming** – Lets you change three characters of the image's file name so it is personalized.
- **Role played by card in Slot 2** – Allows you to select how the camera divides image storage between memory card Slot 1 and Slot 2.
- **Image quality** – Select from seven image quality types, such as JPEG fine or NEF (RAW).
- **Image size** – Choose to shoot Large (4928x3264, 16.1 M), Medium (3696x2448, 9.0 M), or Small (2464x1632, 4.0 M) images.
- **JPEG compression** – Select Size priority or Optimal quality for your best JPEG images.
- **NEF (RAW) recording** – Set the compression type and bit depth for NEF (RAW) files.
- **White balance** – You can choose from nine different primary White balance types, including several subtypes and the ability to measure the color balance of the ambient light (Preset manual).
- **Set Picture Control** – Choose from several Picture Controls that modify how the pictures look.
- **Manage Picture Control** – Save, load, rename, or delete custom Picture Controls on your camera's internal memory or card slots.
- **Auto distortion control** – Causes the camera to look for barrel and pincushion distortion and attempt to automatically correct for it. Recommended for G and D lenses only.
- **Color space** – Select either the printing industry standard Adobe RGB or the Internet and home use standard sRGB color space for your camera.
- **Active D-Lighting** – Allows you to select from several levels of automatic contrast correction for your images. The camera itself will protect your images from a certain degree of under- or overexposure.
- **Long exp. NR** – Uses the black-frame subtraction method to significantly reduce noise in long exposures. This is a very powerful and useful function if you make long exposures.

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- **High ISO NR** – Uses a blurring method to remove noise from images shot with high ISO sensitivity values.
- **ISO sensitivity settings** – Allows you to set the sensitivity between ISO 100 and ISO 25,600 (Hi 2) or let the camera decide for you automatically. It even provides an Auto setting for automatic ISO adjustments while using SCENE modes.
- **Multiple exposure** – Allows you to take more than one exposure in a single frame and then combine the exposures in interesting ways.
- **Movie settings** – You can use this to set the Quality of the video stream in Movie mode. You may also select how the Microphone works and the Destination card slot for movies. Plus, there are a few manual controls called Manual movie settings that you can use while making movies.
- **Interval timer shooting** – You can set your camera on a tripod and make a time exposure with this function. Shooting things like a time exposure of a flower opening becomes easy with the D7000.
- **Remote control mode** – Gives you remote control of your camera so you can use a wireless Nikon ML-L3 remote shutter-release button to control the camera in various ways, including mirror-up shooting. This control could replace a standard release cable.

Each of these items can be configured in two ways by using the two available user settings in the D7000 (U1 and U2 on the Mode dial).

User Settings U1 and U2

(User's Manual – Page 75)

Before you configure these Shooting Menu settings, select either U1 or U2 on the Mode dial and then make the setting modifications. Afterward, go to the Setup Menu and select Save user settings > U1 (or U2) > Save settings. This will save your configuration for a specific style of shooting. This is optional, in case you don't want to use U1 and U2 on the Mode dial. However, it is a very convenient way to configure your camera for specific shooting situations and change to them quickly.

For instance, with my D7000, I set user setting U1 as my high-quality setting. I shoot in NEF (RAW) Image quality with Lossless compressed and 14-bit depth in NEF (RAW) recording, Adobe RGB Color space, 100 in ISO sensitivity settings, and Neutral Picture Control.

For the U2 selection, my party setting, I use JPEG fine Image quality with Optimal quality in JPEG compression, sRGB Color space, 400 in ISO sensitivity settings with Auto ISO sensitivity control set to On and Maximum sensitivity set to 800, and SD Picture Control.

The two user settings on the Mode dial allow you to store a lot more than just Shooting Menu items. They can also store a specific configuration for many other settings, such as the Custom settings in the Custom Setting Menu, exposure modes, flash, compensation, metering, AF-area modes, bracketing, and more. Nikon has given us a powerful and flexible way to configure our cameras for specific shooting needs.

We'll discuss the detailed configuration of these two settings in the chapter titled **Metering, Exposure Modes, and Histogram** under the subheading **U1 and U2 User Settings**. For now, just keep in mind that you can save the settings you make to the upcoming Shooting Menu items in a cumulative way within user settings U1 and U2 on the Mode dial. After you configure many aspects of your camera, you can save the changes with Setup Menu > Save user settings > U1 (or U2) > Save settings.

You can make changes to the camera's settings at any time outside of the U1 and U2 Mode dial positions with no affect on the two user settings. When you select U1 or U2 on the Mode dial, those settings outside of U1 or U2 will be overridden by your chosen user setting—but not overwritten. In other words, if your camera is configured in a certain way for general use outside of the two user settings, and then you select U1 or U2, the user settings do not overwrite the current configuration. Instead, like a light switch, they toggle the settings you've saved in U1 or U2 into the camera's operating system. When you leave U1 or U2, the camera reverts to however it was previously configured outside of the user setting.

Basically, you can configure the camera in up to three separate ways: U1 and U2, and however you have the camera configured outside of the two user settings.

There are several Shooting Menu options that cannot be stored in the user settings and saved:

- Storage folder
- File naming
- Manage Picture Control
- Multiple exposure
- Interval timer shooting

These five Shooting Menu functions are independent of the saveable user settings. If you modify one of these five, it will function the same way no matter what user setting you have selected. We will discuss how to save user settings in the chapter titled **Setup Menu**, under the subheading called **Save User Settings**.

Now, let's examine how to configure the camera's Shooting Menu settings.

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Configuring the Shooting Menu

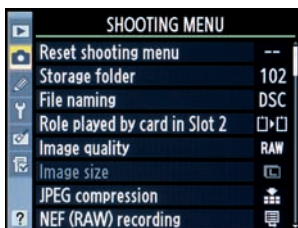


Figure 3.1 – Shooting Menu

(User's Manual – Page 202)

Press the MENU button on the back of your D7000 to locate the Shooting Menu, which looks like a small green camera in the toolbar on the left side of the Monitor (figure 3.1).

We'll now examine each of the settings on the Shooting Menu. Have your camera in hand, and maybe even the User's Manual if you are interested

in what it says about certain settings. Remember that it's *entirely optional* to use the User's Manual. This book is a comprehensive reference, but sometimes I like to get an alternate view. The User's Manual, although somewhat dense, is still a good reference.

If you take time to think about and configure each of these settings at least once, you'll learn a lot more about your new camera. There are a lot of settings to learn about, but don't feel overwhelmed. You'll get used to them pretty quickly. Some of these settings can be configured and then forgotten, and you'll use other settings more often. We'll look at each setting in detail to see which ones are most important to your style of shooting.

Reset Shooting Menu



Figure 3.2 – Reset shooting menu

(User's Manual – Page 202)

Be careful with this selection. Reset shooting menu does what it says—it resets the Shooting Menu, only for the currently selected user setting (U1, U2, or

outside the user settings), back to the factory default configuration (figure 3.2). If you have U1 selected on the Mode dial, it resets only U1, and so forth.

This is a rather simple process. Here are the steps to reset the Shooting Menu:

1. Select **Reset shooting menu** and scroll to the right (figure 3.2).
2. Choose **Yes** or **No**.
3. Press the **OK button**.

If you select Yes, the user setting you are currently using will be reset to the factory defaults (including the five nonsaveable ones).

Note: This function resets all Shooting Menu functions, including the five settings that cannot be saved in a User setting: Storage folder, File naming, Manage Picture Control, Multiple exposure, and Interval timer shooting. This may be a problem if you have carefully configured one of the five settings and then answer Yes to Reset shooting menu because your carefully adjusted settings will be reset immediately.

Interval timer shooting will warn you with a screen that says *This will end interval timer shooting. Ok?* It will allow you to select No to stop the reset action.

My Recommendation: This is an easy way to start fresh with a particular User setting since it's a full reset of all the values, including the five special settings. Please pay attention to the previous note. I use this when I've purchased a preowned camera and want to clear someone else's settings or simply want to start fresh at any time. If you use any of the five nonsaveable settings regularly, be aware that Reset shooting menu will reset them.

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Storage Folder

(User's Manual – Page 203)

Storage folder allows you to either create a new folder for storing images or select an existing folder from a list of folders. The D7000 automatically creates a folder on its primary memory card called something similar to 100D7000. The folder can hold up to 999 images. You'll see the full file name of the folder only when you examine your camera's memory card in your computer—check in the digital camera images (DCIM) folder on the memory card.

When the camera senses that the current folder contains 999 images and you take another picture, it is written to a new folder that is a seamless continuation of the previous folder. The value of the first three digits of the new folder name are increased by one. For example, if you are using a folder named 100D7000, the camera will automatically create a new folder called 101D7000 when you exceed 999 images in the original folder.

Manually Creating a New Storage Folder

If you want to store images in separate folders on the memory card, you might want to create a new folder, such as 200D7000. Each folder you create can hold 999 images, and by using Storage folder > Select folder from list (discussed in the next section), you can select any folder as the default folder. This is a nice way to isolate certain types of images on a photographic outing.

Maybe you'll put landscape shots in folder 300D7000 and people shots in 400D7000. You can develop your own numbering system and implement it with this function.

When manually creating folder names, you may want to leave room for the camera's automatic folder creation and naming. If you try to create a folder name that already exists, the camera doesn't give you a warning; it simply switches to the already existing folder. Let's look at how to create a new folder with a number of your choice, from 100 to 999 (101D7000 to 999D7000).

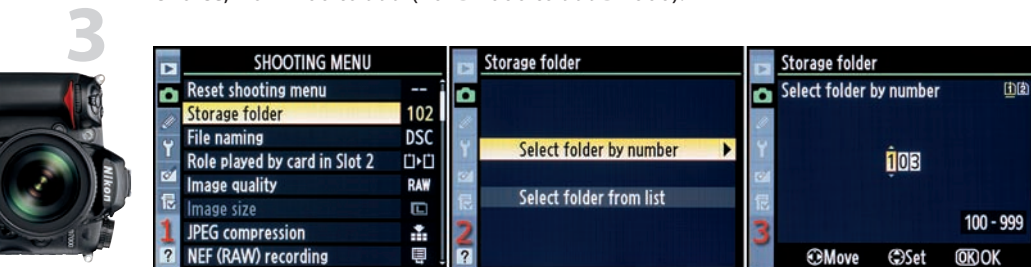


Figure 3.3 – Storage folder – Select folder by number

Here are the steps to manually create a new folder:

1. Select **Storage folder** and scroll to the right (figure 3.3, image 1).
2. Choose **Select folder by number** and scroll to the right (figure 3.3, image 2).
3. You'll now see a screen that allows you to create a new folder number from 100 and 999 (figure 3.3, image 3). Create your number using the **Multi Selector**, then press the **OK button**.

You cannot create a folder starting with 000–099; I tried! Remember that the three-digit number you select will have D7000 appended to it and will look something like 101D7000 or 301D7000 when you have finished.

After you have created a new folder, the camera will automatically switch to it.

Selecting an Existing Storage Folder

What if you want to simply start using an existing folder instead of making a new one? You may have already created a series of folders and want to switch between them to store different types of images.

The camera makes it easy to move between folders with the following screens and steps.



Figure 3.4 – Storage folder – Select folder from list

Use the following steps to select an existing folder:

1. Select **Storage folder** and scroll to the right (figure 3.4, image 1).
2. Scroll down to **Select folder from list** and scroll right (figure 3.4, image 2). If this selection is grayed out, there is only one folder on the memory card. You'll need to create a new folder with the instructions found in the previous section.
3. You'll see the available folders displayed in a list that looks like the one shown in figure 3.4, image 3. Select one of the folders from the list.
4. Press the **OK** button. The camera will now switch back to the **Shooting Menu** main screen, with the new folder number next to **Active folder**.

All images will now be saved to this folder until you exceed 999 images in the folder or manually change to another folder. One note of caution: If you are using folder 999D7000 and the camera records the 999th image, or if it records image number 9999—the Shutter-release button will be disabled until you change to a different folder. Nikon warns that the camera will be slower to start up if the memory card contains “a very large number of files or folders.”

My Recommendation: As memory cards get bigger and bigger, I can see a time when this functionality will become very important. Last year I shot around 150 GB of image files. With the newest memory cards now hitting 64–128 GB, I can foresee a time when the card(s) in my camera will become a months-long backup source.

At the present time, I do not use the Storage folder functionality very much, but I guarantee you I will in the near future. This is a good function to learn how to use!

File Naming

(User's Manual – Page 204)

File naming allows you to control the first three letters of the file name for each of your images. The default is DSC, but you can change it to any three alphanumeric characters.

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The camera defaults to the following File naming for your images:

- **sRGB** color space: DSC_1234
- **Adobe RGB** color space: _DSC1234

You can see that depending on which Color space you are using, the camera adds an underscore to the end of the three DSC characters in sRGB or to the beginning in Adobe RGB (figure 3.5, image 2).

I use this feature in a special way. Since the camera can count images in a File number sequence that continues from 0001 to 9999, I use File naming to help me personalize my images. The camera cannot count higher than 9,999. Instead, it rolls back to 0001 for the 10,000th image.

When I first got my D7000, I changed the three default characters from DSC to 1DY. The 1 tells me how many times my camera has passed 9,999 images, and DY are my initials, thereby helping me protect the copyright of my image in case it is ever stolen and misused.

Since the camera's image File number sequence counter rolls back to 0001 when you exceed 9,999 images, you need a way to keep from accidentally overwriting images from the first set of 9,999 images you took. I use this method:

- | | |
|-----------------------|---------------------------|
| • First 9,999 images | 1DY_0001 through 1DY_9999 |
| • Second 9,999 images | 2DY_0001 through 2DY_9999 |
| • Third 9,999 images | 3DY_0001 through 3DY_9999 |

See how simple it is? This naming method shows a range of 30,000 images. Since the D7000's shutter is tested to a professional level of 150,000 cycles, you will surely need to use a counting system like this one. My system works up to only 89,991 images (9,999 x 9). If you use this counting system and start your camera at 0 (0DY_0001 through 0DY_9999), you can count up to 99,990 images.

If Nikon would give us just one extra digit in our image counter, we could count in sequences of just under 100,000 images instead of 10,000 images. I suppose that many of us will have traded up to the next Nikon DSLR before we reach enough images that this really becomes a constraint. On my Nikon D2X that I've used since 2004, I've shot close to 40,000 images.

File Number Sequence Used with File Naming

Custom setting d8 File number sequence in the D7000 controls the File number sequence setting. That function works along with File naming to let you control how your image files are named. If File number sequence is set to Off, the D7000 will reset



the four-digit number—after the first three custom characters in File naming—to 0001 each time you format your camera's memory card. I set File number sequence to On as soon as I got my camera so it would remember the sequence all the way up to 9,999 images. I want to know exactly how many pictures I've taken over time. We'll talk more about File number sequence in the chapter titled **Custom Setting Menu**.

This is the way I'm using this handy feature in my D7000. If my method doesn't work for your needs, you could use the three characters to classify your image names in all sorts of creative ways.

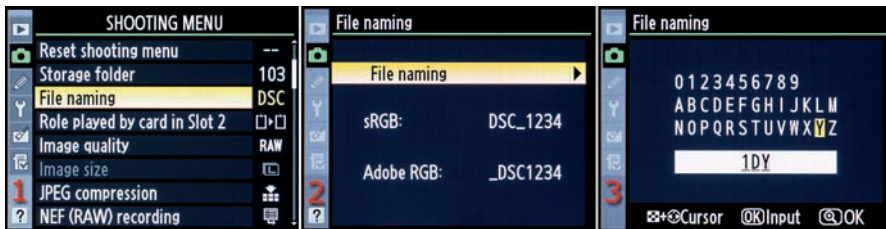


Figure 3.5 – File naming

Here are the steps to set up your custom File naming characters:

1. Select **File naming** from the **Shooting Menu** and scroll to the right (figure 3.5, image 1).
2. Select **File naming** and scroll to the right (figure 3.5, image 2).
3. Use the **Multi Selector** to scroll through the numbers and letters to find the characters you want to use. Press the **OK button** on the D7000 to select and insert a character. To correct an error, hold down the **Thumbnail/playback zoom out button** and use the **Multi Selector** to scroll to the character you want to remove. Press the **Delete button** to delete the bad character.
4. Press the **OK button** to save your three new custom characters. They will now be the first three characters of each image file name. Figure 3.5, image 2, says **1DY** to indicate that this is the first series of 9,999 images.

Now you've customized your camera so the file names it creates reflect your personal needs.

My Recommendation: I discussed how I use the three custom characters in the beginning of this section. You may want to use all three of your initials or some other numbers or letters. Some people leave these three characters at their default of DSC. I recommend using your initials, at a minimum, so you can easily identify these images as yours. With my family of Nikon shooters it sure makes it easier! If you use my method, be sure to watch for the images to reach 9999 and rename the first character for the next sequence of 9,999 images.

Role Played by Card in Slot 2

(User's Manual – Page 89)

Role played by card in Slot 2 is designed to let you control the flow of images to your memory cards. You can decide how and to which card(s) the camera writes image files. Slot 1 is the top card slot when you open the Memory card slot cover, and Slot 2 is on the bottom.

Here is a description of the three different ways you can configure the Role played by card in Slot 2 setting:



- Overflow** – Have you ever gotten the dreaded *Card full* message? If you select Overflow, it will take a lot longer to get this message. Overflow writes all images to the card you have selected under Primary slot selection. Then when the card in Slot 1 is full, the rest of the images are sent to the card in Slot 2. The image number shown on the Control panel and in the Viewfinder will count down as you take pictures and they are written to the card in Slot 1. When the image count nears zero, the camera will switch to the card in Slot 2 and the available image count number on the Control panel will increase to however many images will fit on the second card. It is not necessary to use the same size card when using this function. The camera will merely fill up all available space on both cards as you take pictures.
- Backup** – This function is a backup for critical images. Every image you take is written to the memory cards in Slot 1 and Slot 2 at the same time. You have an automatic backup system when you use the Backup function. If you are a computer geek (like me), you'll recognize this as RAID 1 or drive mirroring. Since your camera is very much a computer, a function like this is great to have. Be sure that both cards are of equal capacity or that the card in Slot 2 is larger than the card in Slot 1 when you use this function. Otherwise, the capacity shown on the Control panel and in the Viewfinder will be reduced. Since the camera will write a duplicate image to each card, the smallest card sets the camera's maximum storage capacity. When either card is full, the Shutter-release button becomes disabled.
- RAW Slot 1–JPEG Slot 2** – If you like to shoot NEF (RAW) files, this function can save you some time. You'll have a JPEG for immediate use and a RAW file for post-processing. When you take a picture, the camera will write the RAW file to the card in Slot 1 and a JPEG file to the card in Slot 2. There is no choice in this arrangement; RAW always goes to the primary card and JPEG always goes to the secondary card. This function works only when you have Shooting Menu > Image

quality set to some form of NEF (RAW) + JPEG. If you set Image quality to just NEF (RAW) or JPEG fine alone—instead of NEF (RAW) + JPEG fine—the camera will simply write a duplicate file to both cards instead of a RAW file on one card and a JPEG file on the other. In other words, if Image quality is set to NEF (RAW), the camera will write two NEF files; if it is set to JPEG, it will write two JPEG files—one on each card. Unless you set Shooting Menu > Image quality to some form of NEF (RAW) + JPEG, this function acts like the Backup function mentioned previously.

The steps to choose the Role played by card in Slot 2 are as follows:

1. Select **Role played by card in Slot 2** from the **Shooting Menu** and scroll to the right (figure 3.6, image 1).
2. Choose one of the three selections we discussed previously (figure 3.6, image 2).
3. Press the **OK button**.



Figure 3.6 – Role played by card in Slot 2

My Recommendation: When I'm out shooting for fun or for any type of photography where maximum image capacity is of primary importance, I select Overflow. This causes the camera to fill up the primary card and then automatically switch to the secondary card for increased image storage. If I'm shooting images that I cannot afford to lose, such as at a unique event like a wedding or a baptism, I'll often use the Backup function for automatic backup of every image.

If I want both a RAW and JPEG file, I use the RAW Slot 1–JPEG Slot 2 function. This lets me have the best of both worlds when card capacity is not worrisome. This also gives me redundancy, like the Backup method. In a sense, RAW Slot 1–JPEG Slot 2 backs up your images; they are just in different formats—one RAW and one JPEG. I use each of these three selections from time to time, but my favorite is Overflow.

Image Quality

(User's Manual – Page 85)

Image quality is simply the type of image your camera can create, along with the amount of image compression that modifies picture storage sizes.

You can shoot several distinct image formats with your D7000. We'll examine

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each format in detail and discuss the pros and cons for each as we go. When we're done, you'll have a better understanding of the formats, and you can choose an appropriate one for each of your styles of shooting.

The camera supports the following seven Image quality types:

- NEF (RAW) + JPEG fine
- NEF (RAW) + JPEG normal
- NEF (RAW) + JPEG basic
- NEF (RAW)
- JPEG fine
- JPEG normal
- JPEG basic

The steps to select an Image quality setting are as follows:

1. Select **Image quality** from the **Shooting Menu** and scroll to the right (figure 3.7, image 1).
2. Choose one of the seven **Image quality** types. Figure 3.7, image 2, shows **JPEG fine** as the selected format.
3. Press the **OK** button to select the format.



Figure 3.7 – Choosing an Image quality setting with menus



Figure 3.8 – Choosing an Image quality setting with external controls

You can also use the **QUAL** button on the back of the camera to set the Image quality (and size). The steps are as follows:

1. Hold down the **QUAL** button (figure 3.8, image 1).
2. Rotate the rear **Main command dial** to change the **Image quality** (bottom red arrow in figure 3.8, image 2). Also, use the front **Sub-command dial** (top red arrow in figure 3.8, image 2) to change the **Image size**.
3. Look at the **Control panel** to see the **Image quality** and **Image Size** values change. The bottom red arrow in figure 3.8, image 3 shows the quality (**RAW**, **FINE**, **RAW+FINE**, etc), and the top red arrow shows the size (**L**, **M**, **S**).
4. Release the **QUAL** button to lock in the modified settings.

Let's look at each of these formats and see which ones you might want to use regularly. We'll go beyond how to turn the different formats on and off and discuss why and when you might want to use a particular format instead of another. Even though the Image quality list shows seven different entries, the camera really only shoots in two formats: NEF (RAW) and JPEG.

The first three selections on the Image quality list (figure 3.7, image 2) allow the camera to take a NEF (RAW) file and a JPEG fine, normal, or basic file at the same time. Fine, normal, and basic indicate three levels of compression that are available for the JPEG format. When you press the Shutter-release button with one of the three NEF (RAW) + JPEG Image quality modes selected, the camera creates a RAW file and a JPEG file and then writes them to the memory card(s) as separate files. In order to understand how they work, we'll examine the NEF (RAW) and JPEG formats.

NEF (RAW) Image Quality Format

The Nikon NEF proprietary format stores raw image data directly onto the camera's memory card. Most of the time, photographers refer to a NEF file simply as a RAW file. These RAW files can easily be recognized because the file name ends with NEF. This is not an image format used in day-to-day graphics work (like the JPEG format), and it's not even an image yet. Instead, it's a base storage format used to store images for conversion to another file format ending in something like JPG, TIF, EPS, or PNG. Other than initial compression—as selected in Shooting Menu > NEF (RAW) recording—NEF stores all available image data and can be easily manipulated later.

NEF (RAW) Conversion Software

You must use conversion software, such as Nikon ViewNX 2, Nikon Capture NX2, Adobe Photoshop Lightroom, or Adobe Photoshop, to convert your NEF-formatted RAW files into other formats. You can download the latest version of the free Nikon ViewNX 2, and all sorts of Nikon imaging software from the following Nikon USA website (bookmark this website, it is a valuable resource):

http://support.nikonusa.com/app/answers/detail/a_id/61/~/_current-versions-of-nikon-software

The Nikon CD that comes free with your camera contains Nikon View NX 2, which you can use immediately for RAW conversion. However, I would use the link to Nikon USA and download the latest version. Alternately, you can install Nikon View NX 2 from the Nikon CD and then click the Help menu. Under the Help menu you'll find a link called: "Check for Updates..." This link will automatically check Nikon's website and will update Nikon View NX 2, if an update is available.

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There are also several aftermarket RAW conversion applications available, such as Bibble, RawShooter, Capture One, and ACDSee Pro. Most of these will offer both Windows and Mac versions. Here are some links to these aftermarket companies:

- Bibble Labs: <http://bibblelabs.com/>
- RawShooter: <http://rawshooter.en.softonic.com/>
- Capture One: <http://www.phaseone.com/> (click the Software link)
- ACDSee Pro: <http://www.acdsee.com/>



Before you shoot in NEF (RAW) format, it's a good idea to install your conversion software of choice so that you'll be able to view, adjust, and save the images to another format when you are done shooting. You may not be able to view NEF files directly on your computer unless you have RAW conversion software installed.

Viewing RAW Files as Thumbnails On Your Computer

Some operating systems provide a downloadable patch or *codec* that lets you see NEF files as small thumbnails in its file manager software (e.g., Windows Explorer or Mac OS X Finder). As this book is being written, I can find codecs under Google searches for 32-bit Windows 7, Vista, XP, and Mac OS X. Do a Google search on these specific words to start your search for available codecs: "download Nikon NEF RAW viewer." You can often find a free codec available for download. However, be careful that you don't go to a website promising the moon and delivering malware instead.

Nikon lists a free codec for Windows 7 (32-bit), Vista (Service Pack 2), and XP (Service Pack 3) at this website:

<http://nikonimglib.com/nefcodec/>

There are also reliable third-party companies, such as Ardfry Imaging LLC (www.ardfry.com), that offer various 32- and 64-bit codecs for a small fee. I bought the Ardfry version for my computer. If you're running 64-bit Windows Vista or 64-bit Windows 7, you may want to check out Ardfry's website or do a little Google research to see what else is currently available for viewing NEF files as thumbnails in Windows or on a Mac. Unfortunately, Windows has a greater selection of codecs than Mac. However, with so many software developers out there, things change constantly.

Nikon Software Included With Your Camera

The Nikon CD that came with your camera contains software for both Mac OS X and Windows. Nikon ViewNX 2 RAW conversion software is supplied free with the D7000, but Nikon Capture NX2 requires a separate purchase. Capture NX2 has become my favorite conversion and postprocessing software, along with Adobe Photoshop.

Transferring Images to Computer

I suggest that you download another free Nikon program called Nikon Transfer. I really like this software because it helps me transfer pictures to my computer and leave them on my memory card, too. If I take more pictures on the same memory card, Nikon Transfer will transfer only the new ones when I reconnect to the computer. Here's a link to the free Nikon Transfer software:

http://support.nikonusa.com/app/answers/detail/a_id/16694

In a sense, Nikon Transfer acts like a one-way synchronizer between a memory card and a computer. As memory cards get bigger and bigger, I can see a time when I'll keep several months worth of images on my memory card and transfer the newest images to my computer.

A RAW File Is Not an Image, Yet!

Now, let's talk about NEF, or RAW, quality. I use the NEF (RAW) format about 98 percent of the time. I think of a RAW file like I thought of my slides and negatives a few years ago. It's my original image that must be saved and protected.

It's important that you understand something very different about NEF (RAW) files. They're not really images—yet. Basically, a RAW file is composed of black-and-white sensor data and camera setting information markers. The RAW file is saved in a form that must be converted to another file type to be used in print or on the web.

When you take a picture in RAW format, the camera records the image data from the sensor and stores markers for how the camera's color, sharpening, contrast, saturation, etc. are set, but it does not apply the camera setting information to the image. In your computer post-processing software, the image will appear on-screen with the settings you initially configured in your D7000. However, these settings are applied temporarily for your computer viewing pleasure.

For example, if you don't like the white balance you selected at the time you took the picture, simply apply a new white balance and the image will appear as if you had used that setting when you took the picture. If you initially shot the image using the Standard Picture Control and now want to use the Vivid Picture Control, all you have to do is apply the Vivid Picture Control before the final conversion and it will be as if you used it when you first took the picture.

This is quite powerful! Virtually no camera settings are applied to a RAW file in a permanent way. That means you can apply completely different settings to the image in your computer software and it will appear as if you had used those settings when you first took the picture. This allows a lot of flexibility later.

NEF (RAW) is generally used by individuals who are concerned with maximum image quality and who have time to convert the images in the computer after taking

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them with the camera. A conversion to JPEG sets the image markers permanently, and a conversion to TIFF sets the markers but allows you to modify the image later. Unfortunately, the TIFF format creates very large file sizes.

Here are the pros and cons of NEF (RAW) format:

NEF (RAW) Positives

- Allows the manipulation of image data to achieve the highest-quality image available from the camera.
- All original detail stays with the image for future processing needs.
- No conversions, sharpening, sizing, or color rebalancing will be performed by the camera. Your images are untouched and pure!
- You can convert NEF files to any other image formats by using your computer's much more powerful processor instead of your camera's processor.
- You have much more control over the final look of the image since you, not the camera, make decisions about the appearance of the image.
- A 12-bit or 14-bit format provides maximum color information.

NEF (RAW) Negatives

- Not often compatible with the publishing industry, except after conversion to another format.
- Requires post-processing with proprietary Nikon software or third-party software.
- Larger file sizes are created, so you must have larger storage media.
- There is no industry-standard RAW format. Each camera manufacturer has its own proprietary format. Adobe has developed a RAW format called digital negative (DNG) that might become an industry standard. We'll see!
- The industry standard for home and commercial printing is 8 bits, not 12 bits or 14 bits.

Now, let's examine the most popular format on the planet: JPEG.

JPEG Image Quality Format

As shown in [figure 3.7, image 2](#), the D7000 has three JPEG modes. Each mode affects the final quality of the image. Let's look at each mode in detail:

- | | |
|---------------|--------------------------------|
| • JPEG fine | Compression approximately 1:4 |
| • JPEG normal | Compression approximately 1:8 |
| • JPEG basic | Compression approximately 1:16 |



Each JPEG mode provides a certain level of *lossy* image compression, which means that it permanently throws away image data as you select higher levels of compression (fine, normal, basic). The human eye compensates for small color changes quite well, so the JPEG compression algorithm works very well for viewing by humans. A useful thing about JPEG is that one can vary the file size of the image, via compression, without affecting the quality too much.

Here are details on the three JPEG modes:

- **JPEG fine** (or fine-quality JPEG) uses a 1:4 compression ratio. If you decide to shoot in JPEG, this mode will give you the best-quality JPEG your camera can produce. With a Lossless-compressed RAW setting, the camera reports that only about 230 images will fit on an 8-GB CF card, and the JPEG fine setting raises that to about 835 images.
- **JPEG normal** (or normal-quality JPEG) uses a 1:8 compression ratio. The image quality is still very acceptable in this mode. If you are shooting at a party for the 4x6-inch (10x15-cm) image size, this mode will allow you to make lots of images. The camera reports that an 8-GB card will hold about 1,600 JPEG normal image files.
- **JPEG basic** (or basic-quality JPEG) uses a 1:16 compression ratio. These are still full-size files, so you can surely take a lot of pictures. If you are shooting for the web or just want to document something well, this mode provides sufficient quality. My D7000 tells me it can store a whopping 3,200 JPEG basic files on my 8-GB CF card.

Note: It's hard to specify an exact number of images that a particular card size will hold. My D7000 reports that 230 lossless-compressed NEF (RAW) images will fit on an 8-GB memory card, yet when the shooting is finished, I often have more than 430 images. With JPEG's higher compression ratio, it is even harder to predict exactly. The complexity within a scene has a lot to do with the final compressed file size. That's why the camera underreports the number of images it can hold. You'll find that your memory cards will usually hold many more images than the estimate presented by the camera.

The JPEG format is used by individuals who want excellent image quality but have little time or interest in post-processing or converting images to another format. They want to use the image immediately when it comes out of the camera, with no major adjustments.

The JPEG format applies your chosen camera settings to the image when it is taken. The image comes out of the camera ready to use, as long as you have exposed it properly and have configured all the other settings appropriately for the image.

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Since JPEG is a lossy format, you cannot modify and save a JPEG file more than a time or two before compression losses ruin the image. However, since no post-processing is required, this format allows much quicker usage of the image. A person shooting a large quantity of images, or someone who doesn't have the time to convert RAW images, will usually use JPEG. That encompasses a lot of photographers.

Nature photographers might want to use NEF (RAW) since they have more time for processing images and wringing the last drop of quality out of them, but event or journalist photographers on a deadline may not have the time for or interest in processing images, so they often use the JPEG format.

Here are the pros and cons of capturing JPEG images:

JPEG Positives

- Allows for the maximum number of images on a memory card and computer hard drive.
- Allows for the fastest transfer from the camera memory buffer to a memory card.
- Absolute compatibility with everything and everybody in imaging.
- Uses the printing industry standard of 8 bits.
- Produces high-quality, first-use images.
- No special software is needed to use the image right out of the camera (no post-processing).
- Immediate use on websites with minimal processing.
- Easy transfer across the Internet and as e-mail attachments.

JPEG Negatives

- JPEG is a lossy format.
- You cannot manipulate a JPEG image more than once or twice before it degrades to an unusable state. Every time you modify and save a JPEG image, it loses more data and quality because of compression data losses.

Combined NEF + JPEG Shooting (Two Images at Once)

Some shooters use the three Image quality settings shown in [figure 3.7](#), [image 2](#), that save two images at the same time:

- NEF (RAW) + JPEG fine
- NEF (RAW) + JPEG normal
- NEF (RAW) + JPEG basic



These settings give you the best of both worlds because the camera saves a NEF file and a JPEG file each time you press the Shutter-release button. In NEF (RAW) + JPEG fine, my camera's 8-GB single-card storage drops to about 180 images since it stores a NEF file and a JPEG file for each picture I take.

You can set Shooting Menu > Role played by card in Slot 2 to write the NEF (RAW) file to one card and the JPEG file to the other. You can use the NEF (RAW) file to store all the image data and later process it into a masterpiece, and you can use just the JPEG file immediately with no adjustment.

The NEF (RAW) + JPEG modes have the same features as their stand-alone modes. In other words, the RAW file in NEF (RAW) + JPEG mode works like a RAW file in NEF (RAW) mode, and the JPEGs in the NEF (RAW) + JPEG modes work like JPEG fine, normal, or basic files without the NEF (RAW) file.

If you need more information on these three modes, refer to the previous sections on NEF (RAW) or JPEG Image quality formats.

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Image Compression Information

The D7000's Image quality file formats compress the image file into a smaller file size. We'll discuss several image compression types like JPEG fine/normal/basic, JPEG Size priority/Optimal quality, and NEF (RAW) Lossless/Compressed in later sections of this chapter. However, for now I want to mention where the compression functions live on the Shooting Menu system.

JPEG compression is controlled by the Shooting Menu > JPEG compression selection, along with the JPEG fine, normal, or basic compression on the Shooting Menu > Image quality screen. JPEG is always a compressed format; you'll just select how much compression is applied. NEF (RAW) compression is controlled by the Shooting Menu > NEF (RAW) recording > Type selection. These two compression selections allow you to control the size of your JPEG and RAW image files.

Pay careful attention to the various compression levels offered for the images you shoot. Once you set these compression levels, all images of that format will be affected. Also, remember that image compression is User setting specific (U1 and U2), which means that you can control it separately for each of your camera's two User settings and the third non-User setting.

Final Image Format Ramblings

Which format do I prefer? Why, RAW, of course! But it does require a bit of commitment to shoot in this format. The camera is simply an image-capturing device, and you are the image manipulator. You decide the final format, compression ratio, size, color balance, etc. In NEF (RAW) mode, you have the absolute best image your camera can produce. It is not modified by the camera's software and is ready for your personal touch. No camera processing allowed!

If you get nothing else from this section, remember this—by letting your camera process the images in *any* way, it is modifying or throwing away image data. There is only a finite amount of data for each image that can be stored on your camera, and later on your computer. With JPEG, your camera optimizes the image according to the assumptions recorded in its memory. Data is being thrown away permanently, in varying amounts.

If you want to keep *all* of the image data that was recorded with your images, you must store your originals in RAW format. Otherwise, you'll never again be able to access that original data to change how it looks. A RAW file is the closest thing to a film negative or a transparency that your digital camera can make. That's important if you would like to modify the image later. If you are concerned with maximum quality, you should probably shoot and store your images in RAW format. Later, when you have the urge to make another masterpiece out of the original RAW image file, you'll have *all* of your original data intact for the highest-quality image. (Compressed NEF loses a little data during initial compression, but Lossless compressed does not. I use Lossless compressed. These RAW compression types will be considered in an upcoming section called **NEF (RAW) Recording** under the subheading **Type**.)

If you're concerned that the RAW format may change too much over time to be readable by future generations, you might want to convert your images into TIFF or JPEG files. TIFF is best if you want to modify them later. I often save a TIFF version of my best files in case RAW changes too much in the future. Why not do a little more research on this subject and decide which you like best? Interestingly, I can still read the NEF (RAW) format from my 2002-era Nikon D100 in Nikon ViewNX 2.

My Recommendation: I shoot in NEF (RAW) format for my most important work and JPEG fine for the rest. Some people find that JPEG fine is sufficient for everything they shoot. Those individuals generally do not like working with files on a computer or do not have time for it. NEF (RAW) files are not usable images and must be converted to another format. However, RAW provides the highest possible quality your camera can create, if you have the time and inclination to post-process the images yourself. You'll use both RAW and JPEG, I'm sure. The format you use most often will be controlled by your time constraints and digital workflow.

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Image Size

(User's Manual – Page 88)

Image size lets you shoot with your camera set to various megapixel sizes. The default Image size setting for the D7000 is Large, or 16.1 M (16.1 megapixels). You can change this rating from 16.1 M to 9.0 M, or even 4.0 M (figure 3.9, image 2). Image size applies only to images captured in JPEG fine, normal, or basic modes.

If you're shooting with your camera in any of the NEF (RAW) + JPEG modes, it applies only to the JPEG image in the pair. Image size does not apply to a NEF (RAW) image. This setting is relatively simple since it affects just the megapixel (M) size of the image. Here are the three settings under Image size:

- **Large**
(4928x3264; 16.1 M)
- **Medium**
(3696x2448; 9.0 M)
- **Small**
(2464x1632; 4.0 M)



Figure 3.9 – Choosing an Image size

The steps to select an Image size are as follows:

1. Select **Image size** from the **Shooting Menu** and scroll to the right (figure 3.9, image 1).
2. Choose one of the three **Image size** settings. Figure 3.9, image 2, shows **Large** as the selected size.
3. Press the **OK** button to choose the size.



Figure 3.10 – Choosing an Image size setting with external controls

You can also use the QUAL button on the back of the camera to set the Image size (and quality):

1. Hold down the **QUAL** button (figure 3.10, image 1).
2. Rotate the front **Sub-command dial** (top red arrow in figure 3.10, image 2) to

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change the **Image size**. Also, rotate the rear **Main command dial** to change the **Image quality** (bottom red arrow in [figure 3.10, image 2](#)).

3. Look at the **Control panel** to see the **Image Size** and **Image quality** values change. The top red arrow in [figure 3.10, image 3](#) shows the size (L, M, S), and the bottom red arrow shows the quality (RAW, FINE, RAW+FINE, etc).
4. Release the **QUAL button** to lock in the modified settings.

I've been playing around with the Image size settings for the fun of it. I'm not very interested in using my 16.1 M camera to capture 9.0 M or 4.0 M images. However, there are reasons to shoot at lower megapixel sizes, such as when a smaller-resolution image is all that will ever be needed or if card space is at an absolute premium.

Setting the Image quality to JPEG basic, the Image size to Small, and the JPEG compression to Size priority allows the camera to capture 11,300 images on an 8-GB card. The images are 4.0 megapixels in size ($2,464 \times 1,632 = 4,021,248$ pixels, or 4 megapixels) and are compressed to the maximum level, but the card can hold a lot of them. If I were to walk completely around the Earth and I had only one 8-GB memory card to take with me, my camera would store more than 11,000 images on the one card—so I could at least document my trip well.

My Recommendation: You'll get the best images with the Large (16.1 M) Image size. The smaller sizes won't affect the quality of a small print, but they will seriously limit your ability to enlarge your images. I recommend leaving your camera set to Large unless you have a specific reason to shoot smaller images.

JPEG Compression

(User's Manual – Page 87)

JPEG compression allows you to further fine-tune the compression level of your JPEG images. The JPEG format is always a compressed format. The Image quality settings for JPEG images include fine, normal, and basic. Each of these settings provides a certain level of compression of the file size.

As discussed previously, a JPEG fine file has a 1:4 compression ratio, JPEG normal has a 1:8 ratio, and JPEG basic has a 1:16 ratio. A JPEG file is smaller in size than a RAW file.

JPEG files will normally vary in size when the subject of one image is more complex than another. For instance, if you take a picture of a tree with bark and lots of leaves against a bright blue sky, the JPEG compression has a lot more work to do than if you take a picture of a red balloon on a plain white background. All those little details in the picture of the tree cause lots of color contrast changes, so the JPEG

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file size will naturally be bigger for the complex image. In the balloon image, there is little detail in the balloon and the background, so the JPEG file size will normally be much smaller. The less detail in an image, the more efficient JPEG compression is.

What if you want all of your JPEG images to be the same approximate size? Or, what if file size doesn't matter to you, and quality is much more important? That's what the JPEG compression menu allows you to control. Let's discuss the two settings:

- Size priority** – This compression setting is designed to keep all of your JPEG files at a certain uniform size. This size will vary according to whether you selected JPEG fine, normal, or basic in the Image quality menu. Image quality controls the regular, everyday compression level of the JPEG file, and Size priority tweaks it even more. How does it work? With Size priority enabled, the camera software has a target file size for all the JPEGs you shoot. Let's say the target size is 4.5 MB. The D7000 will do its best to keep all JPEGs set to that particular file size by altering the level of compression according to content. If a JPEG file has lots of fine detail, it will require more compression than a file with less detail in order to maintain the same file size. By enabling this function, you are telling the camera that it has permission to throw away however much image data it needs to in order to get each file to the 4.5 MB target. This could lower the quality of a complex landscape shot much more than a shot of a person standing by a blank wall. Size priority instructs the camera to sacrifice image quality—if necessary—to keep the file size consistent. Use this function only for images that will not be used for fine art purposes. Otherwise, your image may not look as good as it could.
- Optimal quality** – This setting doesn't do anything extra to your images; the camera simply uses less compression on complex subjects. In effect, you are telling the camera to vary the file size so the image quality will be good for any subject—complex or plain. Instead of increasing compression to make an image of a complex nature scene fit a certain file size—like Size priority does—the camera compresses the image only to the standard compression level based on the Image quality you selected (JPEG fine, normal, or basic). In other words, the camera tries to preserve image quality by limiting compression of complex images. Less image data is thrown away, so the image quality is higher. However, the file sizes will vary depending on the complexity of the subject.

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The steps to choose a JPEG compression type are as follows:

1. Select **JPEG compression** from the **Shooting Menu** and scroll to the right (figure 3.11, image 1).

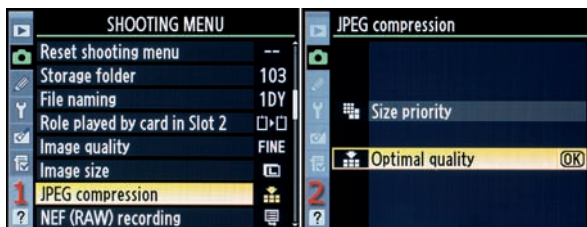


Figure 3.11 – Choosing a JPEG compression type

2. Choose **Size priority** or **Optimal quality**.

Figure 3.11, image 2, shows **Optimal quality** as the selected compression type.

3. Press the **OK** button.

My Recommendation: I normally use Optimal quality when I shoot JPEGs since the whole JPEG concept is lossy image compression, and I don't want the potentially heavier compression of Size priority to lower the image quality. Size priority just adds more potential lossiness, so I tend to avoid it. The only time I use Size priority is when I'm shooting what I call "party pics."

When I'm at a party shooting snapshots of friends having a good time, I'm not creating fine art and will never make an enlargement greater than 8x10 inches (20x25 cm), so I don't worry about extra compression. In fact, I might welcome it to avoid storing larger-than-needed images on my computer hard drive.

Using Size priority lets the camera use maximum compression to maintain the JPEG compression ratios (fine is 1:4, normal is 1:8, and basic is 1:16). Your images may not have those precise compression ratios if you use Optimal quality—especially with complex, detailed subjects.

NEF (RAW) Recording

(User's Manual – Page 87)

NEF (RAW) recording is composed of two menu choices: Type and NEF (RAW) bit depth. Type is concerned with image compression, and NEF (RAW) bit depth deals with color quality. We'll look at both of these choices and see how your photography can benefit from them.

Type

In previous sections we discussed how JPEG files have different levels of compression that vary the size of a finished image file. NEF (RAW) also has compression

choices, though not as many. The nice thing about the RAW compression methods is that they don't throw away massive amounts of image data like JPEG compression does. NEF (RAW) is not considered a lossy format because the file stays complete, with virtually all of the image data your camera captured.

One of the NEF (RAW) compression methods, called Compressed, is very slightly lossy. The other, Lossless compressed, keeps *all* the image data intact. Let's discuss how each of the available compression methods works.

There are two NEF (RAW) formats available, although you see a single NEF (RAW) selection on the Image quality menu. After you select NEF (RAW), you'll need to use Shooting Menu > NEF (RAW) recording > Type to select one of the two NEF (RAW) compression types:

- **NEF (RAW) Lossless Compressed** (20–40 percent file size reduction) – The factory default for the NEF (RAW) format is Lossless compressed. According to Nikon, this compression will not affect image quality because it's a reversible compression algorithm. Since Lossless compressed shrinks the stored file size by 20 to 40 percent—with no image data loss—it's my favorite compression method. It works somewhat like a ZIP file on your computer; it compresses the file but allows you to use it later with all the data still available.
- **NEF (RAW) Compressed** (40–55 percent file size reduction) – Before the newest generation of cameras, including the D7000, the Compressed mode was known as visually lossless. The image is compressed and the file size is reduced by 40 to 55 percent, depending on the amount of detail in the image. There is a small amount of data loss involved in this compression method. Most people won't be able to see the loss since it doesn't affect the image visually. I've never seen any loss in my images with the Compressed mode. However, I've read that some people notice slightly less highlight detail. Nikon says the Compressed mode uses nonreversible compression, so after you've taken an image using this mode, any small amount of data loss is permanent. If this concerns you, then use the Lossless compressed method. It won't compress the image quite as much (20 to 40 percent instead of 40 to 55 percent), but it is guaranteed by Nikon to be a reversible compression that does not affect the image.

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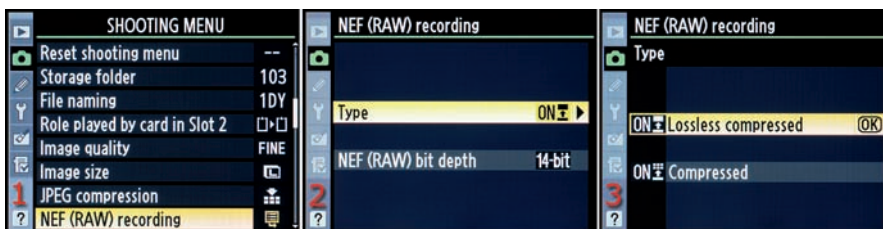


Figure 3.12 – Choosing a NEF (RAW) recording compression type

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The steps to select a NEF (RAW) recording compression Type are as follows:

1. Select **NEF (RAW) recording** from the **Shooting Menu** and scroll to the right (figure 3.12, image 1).
2. Select **Type** and scroll to the right (figure 3.12, image 2).
3. Select a compression method from the **Type** menu (figure 3.12, image 3).
4. Press the **OK** button to save your selection.



An image with a large area of blank space, such as an expanse of sky, will compress a lot more efficiently than an image of a forest with lots of detail. The camera displays a certain amount of image storage capacity in NEF (RAW) modes—around 230 images with an 8-GB card.

In the two NEF (RAW) compressed modes, the D7000 does not decrease the image capacity by one for each picture taken. Instead, the camera will decrease the image capacity counter approximately every two shots, depending on how well it compressed the images. When the card is full, it might contain more than twice as many images as the camera initially reported it could hold. Your D7000 deliberately underreports storage capacity when you are shooting in either of the NEF (RAW) compressed modes.

My Recommendation: I'm concerned about maximum quality along with good storage capacity, so I shoot in Lossless compressed mode most of the time. It makes the most sense to me since it produces a file size close to half of what an uncompressed RAW file would normally be, if you could create one with the D7000, which you can't. More expensive Nikon cameras can create uncompressed RAW files, although there's no point when a Lossless compressed file retains all data and is stored on your computer hard drive at close to half the size.

I haven't used Compressed mode much since Lossless compressed became available in Nikon cameras a few years ago. Even though I can't see any image quality loss, it bothers me that it is there, if only slightly. The extra 10 or 15 percent of extra compression is not worth the potential small data loss to me. If I were running out of card space but wanted to keep shooting RAW, I might consider changing to Compressed temporarily. Otherwise, it's Lossless compressed for me!

NEF (RAW) Bit Depth

NEF (RAW) bit depth is a special feature for those of us concerned with capturing the best color in our images. The D7000 has three color channels, one for red, another for green, and the last one for blue (RGB). It combines those color channels to form all the colors you see in your images. Let's talk about how bit depth, or the number of colors per channel, can make your pictures even better.

With the D7000, you can select the bit depth stored in an image. More bit depth equals better color gradations. An image with 12-bits contains 4,096 colors per RGB channel, and an image with 14-bits contains 16,385 colors per RGB channel. In lesser DSLR cameras, the color information is limited to 12-bits. If you do not fully understand what this means, take a look at the **Channel and Bit Depth Tutorial** following this section.

The D7000 has the following two bit depths available: 12-bit (4,096 colors per channel) and 14-bit (16,385 colors per channel).

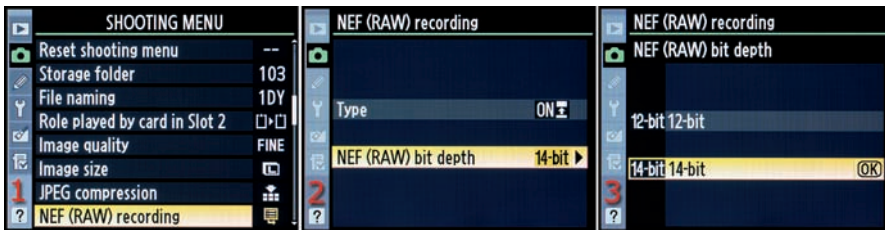


Figure 3.13 – Choosing a NEF (RAW) bit depth

The steps to choose a NEF (RAW) bit depth are as follows:

1. Select **NEF (RAW) recording** from the **Shooting Menu** and scroll to the right (figure 3.13, image 1).
2. Select **NEF (RAW) bit depth** and scroll to the right (figure 3.13, image 2).
3. Select **12-bit** or **14-bit** from the **NEF (RAW) bit depth** menu (figure 3.13, image 3).
4. Press the **OK button** to save your selection.

My Recommendation: Which bit depth setting is best? I always use 14-bit because I want all the color my camera can capture for the best possible pictures. If you read my bit depth tutorial in the next section, you'll understand why I feel that way. My style of shooting is nature oriented, so I am concerned with capturing every last drop of color I can.

There is one small disadvantage to using the 14-bit mode. Your file sizes will be 1.3 times larger than they would have been in 12-bit mode. There is a lot more color information being stored, after all.

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Channel and Bit Depth Tutorial

What does all this talk about bits mean? Why would I set my camera to use to 14-bit depth instead of 12-bit depth? Here is a short tutorial on bit depth and how it affects color storage in an image.

An image from your camera is an RGB image, where each of the three colors—red, green, and blue—have separate channels. If you're shooting in 12-bit mode, your camera will record up to 4,096 colors for each channel, so there will be up to 4,096 different reds, 4,096 different greens, and 4,096 different blues. Lots of color! In fact, almost 69 billion colors. If you set your camera to 14-bit mode, the camera can store 16,384 different colors in each channel. Wow! That's quite a lot more color—almost 4.4 trillion shades.

Is that important? Well, it can be, since the more color information you have, the better the color in the image—if it has a lot of color. I always use the 14-bit mode. That allows for smoother color changes when a large range of color is in the image. I like that!

Of course, if you save your image as an 8-bit JPEG or TIFF, most of those colors are compressed, or thrown away. Shooting a JPEG image in-camera (as opposed to a RAW image) means that the camera converts the image in a 12- or 14-bit RGB file to an 8-bit file. An 8-bit image file can hold 256 different colors per RGB channel—more than 16 million colors.

There's a big difference between the number of colors a camera captures in a RAW file and the number captured in a JPEG. That's why I always shoot in RAW; later I can make full use of all those potential extra colors to create a different look for the same image.

If you shoot in RAW and later save your image as a 16-bit TIFF file, you can store all the colors you originally captured. A 16-bit file can contain 65,536 different colors in each of the RGB channels. Lots of people save their files as 16-bit TIFFs when post-processing RAW files, especially if they are worried about the long-term viability of the NEF (RAW) format. TIFF gives us a known and safe industry-standard format that will fully contain all image color information from a RAW file.

It's important that you learn to use your camera's histogram so you can visually examine the various RGB channels at a glance.

We'll discuss the histogram in an upcoming chapter titled **Metering, Exposure Modes, and Histogram**. In the meantime, please look at [figure 3.14](#), which shows the histogram screen on your camera and its RGB channels.

We talked about this screen in the chapter titled **Playback Menu**. However, I wanted to tie this in here



Fig. 3.14 – RGB histogram screen

to help you understand channels better. The histogram displays the amount and brightness of color for each of the RGB channels.

In [figure 3.14](#) you can see four small colored histogram readings on the right side of the screen. The bottom three histograms represent the red, green, and blue color channels, as can easily be seen. The white histogram on top is not an additional channel. This is called a luminance histogram, and it represents an average histogram for the three color channels. It is also known as a brightness histogram. In reality, even though all the color channels may influence the luminance histogram, most of its information comes from the green channel. Notice that they are almost identical.

In digital photography we must use new technology and learn lots of new terms and acronyms. However, by investing a little time to understand these tools, we'll become better digital photographers.

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White Balance

(User's Manual – Page 117)

White balance is designed to let you capture accurate colors in each of your camera's RGB color channels. Your images can reflect realistic colors if you understand how to use the White balance settings.

This may be one of the most important things to learn about digital photography. If you don't understand how white balance works, you'll have a hard time when you want consistent color across a number of images.

In this chapter we will look at white balance briefly and learn only how to select the various White balance settings. This is such an important concept to understand that an entire chapter—titled **White Balance**—is devoted to this subject. Please read that chapter very carefully. It is important that you thoroughly learn to control the White balance settings. A lot of what you'll do in computer post-processing requires a good understanding of white balance control.

Many people leave their cameras set to Auto White balance. This works fine most of the time because the camera is quite capable of rendering accurate color. However, it's hard to get exactly the same white balance in each consecutive picture when you are using Auto mode. The camera has to make a new white balance decision for each picture in Auto. This can cause the white balance to vary from picture to picture.

For many of us this isn't a problem. However, if you are shooting in a studio for a product shot, I'm sure your client will want the pictures to be the same color as the product. White balance lets you control that carefully, when needed.

The steps to select a White balance setting are as follows:

1. Select **White balance** from the **Shooting Menu** and scroll to the right (figure 3.15, image 1).
2. Choose a **White balance** type, such as **Auto** or **Flash**, from the menu and scroll to the right (figure 3.15, image 2).



Figure 3.15 – Setting White balance to Auto1 – Normal

3. If you choose **Auto**, **Fluorescent**, **Choose color temp.**, or **Preset manual** you will need to select from an intermediate screen, shown in figure 3.15, image 3. **Auto** presents two settings: **Auto1 – Normal** and **Auto2 – Keep warm lighting colors**. **Fluorescent** presents seven different types of fluorescent lighting. **Choose color temp.** lets you select a color temperature manually from a range of 2500 K (cool) to 10000 K (warm). **Preset manual (PRE)** shows the stored white balance memory locations d-0 through d-4 and allows you to use one of them. If this seems a bit overwhelming, just choose **Auto1 – Normal** for now. The chapter titled **White Balance** will explain how to use all these settings.
4. As shown in figure 3.15, image 4, you'll now arrive at the **White balance** fine-tuning screen. At this time, you can make an adjustment to how you want this **White balance** to record color by introducing a color bias toward green, yellow, blue, or magenta. You do this by moving the little black square in the middle of the color box toward the edges of the box in any direction. If you make a mistake, simply move the black square to the middle of the color box. Most people do not change this setting.
5. After you have finished adjusting (or not) the colors, press the **OK button** to save your setting. Most people press the **OK button** as soon as they see the fine-tuning screen so they don't change the default settings for this particular **White balance**.



Figure 3.16 – Setting White balance with external controls

You'll also find it convenient to change the White balance settings by using external camera controls. The three steps are as follows:

1. Hold down the **WB button**, which shares functionality with the **Help/protect button** (figure 3.16, image 1).
2. Turn the **Main command dial** as you watch the **WB icons** change on the **Control panel** (figure 3.16, image 2).
3. Release the **WB button** to lock in your choice.

My Recommendation: Until you've read the chapter titled **White Balance**, I suggest that you leave the camera's White balance set to Auto1 – Normal. However, please do take the time to understand this setting by reading the dedicated chapter carefully. Understanding white balance is especially important if you plan to shoot JPEGs regularly.

Set Picture Control

(User's Manual – Page 131)

Set Picture Control allows you to choose a Picture Control for a shooting session. Nikon's Picture Control system lets you control how your image appears in several ways. Each control has a specific affect on the image's appearance. If you ever shoot film, you know that there are distinct looks to each film type. No two films produce color that looks the same.

In today's digital photography world, Picture Controls give you the ability to impart a specific look to your images. You can use Picture Controls as they are provided from the factory, or you can fine tune Sharpening, Contrast, Brightness, Saturation, and Hue.

We'll discuss how to fine tune a Nikon Picture Control later in this section. In the next section we'll discuss how to save a modified Picture Control under your own Custom Picture Control name. You can create up to nine Custom Picture Controls.

I'll refer to Picture Controls included in the camera as Nikon Picture Controls,

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since Nikon does too. You may also hear them called Original Picture Controls in some Nikon literature. If you modify and save a Nikon Picture Control under a new name, it becomes a Custom Picture Control. I'll also use the generic name of Picture Control when referring to any of them.

The cool thing about Picture Controls is that they are shareable. If you tweak a Nikon Picture Control and save it under a name of your choice, you can then share your control with others. Compatible cameras, software, and other devices can use these controls to maintain the look you want from the time you press the Shutter-release button until you print the picture with a program like Nikon Capture NX2.



Figure 3.17 – Choosing a Picture Control

The steps to choose a Picture Control are as follows:

1. Select **Set Picture Control** from the **Shooting Menu** and scroll to the right (figure 3.17, image 1).
2. Choose one of the Nikon Picture Controls from the **Set Picture Control** screen (figure 3.17, image 2).
3. At this point, you can simply press the **OK button** and the control you've chosen will be available for immediate use. It will show up as a two-letter name in the **Shooting Menu** next to **Set Picture Control**. You can see this in figure 3.17, image 1, where **SD** is displayed to the right of **Set Picture Control**.
4. You can also modify the currently highlighted control by scrolling to the right before you press the **OK button** (figure 3.17, image 3). This will bring you to the fine-tuning screen. You can adjust the **Sharpening**, **Contrast**, **Brightness**, **Saturation**, and **Hue** settings by scrolling up or down to select a line and then scrolling right or left (+/-) to change the value of that line item. This is entirely optional.

If you do choose to modify a control, it is *not yet* a Custom Picture Control because you haven't saved it under a new name. Instead, it's merely a modified Nikon Picture Control. We'll discuss how to name and save your own Custom Picture Controls in the upcoming section called **Manage Picture Control**.

Figure 3.18, images 1 and 2, shows an asterisk after the Vivid Picture Control (VI* – Vivid*). This asterisk appears after you have made a modification to any of the Picture Control's inner settings, such as Sharpening or Contrast. The asterisk will go away if you set the control back to its factory default configuration.



Figure 3.18 – The Vivid Picture Control has been modified

Now, let's look closer at the Picture Control system. As shown in figure 3.17, image 2, there is a series of Picture Control selections that modify how your D7000 captures an image:

- SD – Standard
- NL – Neutral
- VI – Vivid
- MC – Monochrome
- PT – Portrait
- LS – Landscape

Each of these settings has a different and variable combination of the following settings:

- Sharpening
- Contrast
- Brightness
- Saturation
- Hue
- Filter effects (MC only)
- Toning (MC only)

You can select one of the controls and leave the settings at the factory defaults, or you can modify the settings and completely change how the D7000 captures the image (figure 3.17, image 3). If you shoot in one of the NEF (RAW) modes, the D7000 does not apply these settings to the image permanently; it stores them with the image so you can change them during post-processing in your computer. If you shoot JPEG, the camera applies the settings you've chosen immediately and permanently. Let's examine each of the Picture Controls.

Examining Picture Controls

Figure 3.19 provides a look at the differences in color saturation and shadow with the various controls. Due to limitations in printing, it may be hard to see the variations. Saturation and Contrast depth increases within these Picture Control choices, in this order: NL (low) > SD (medium) > VI (high).

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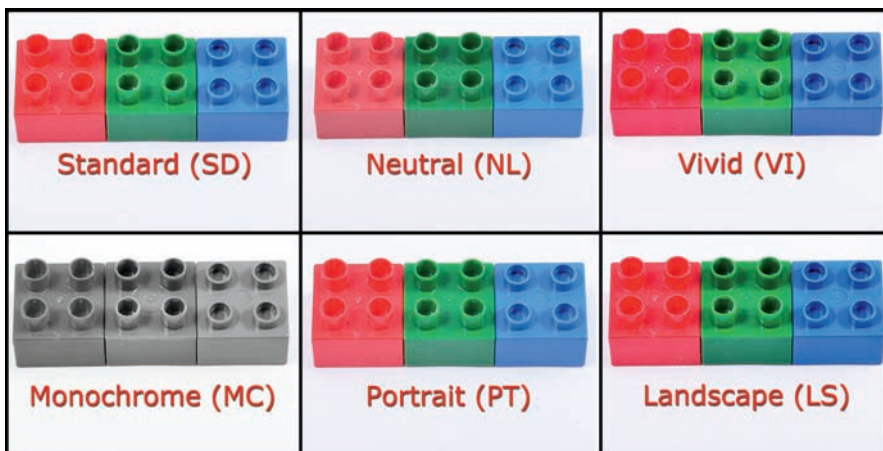


Figure 3.19 – Red, green, and blue (RGB) with all six Picture Controls

The following is an overview of what Nikon says about Picture Controls and what I see in my sample image taken with the various controls.

- SD, or *Standard***, is Nikon's recommendation for getting "balanced" results. They recommend SD for most general situations. Use this if you want a balanced image and don't want to post-process it. It has what Nikon calls "standard image processing." The SD control provides what I would call medium saturation, with darker shadows to add contrast. If I were shooting JPEG images in a studio or during an event, I would seriously consider using the SD control. I would compare this setting to Fuji Provia or Kodak Kodachrome 64 slide films.
- NL, or *Neutral***, is best for an image that will be extensively post-processed in a computer. It, too, is a balanced image setting, but it applies minimal camera processing so you'll have room to do more with the image during post-processing. The NL has less saturation and weaker shadows, so the image will be less contrasty. The effects of the NL and SD controls are harder to see in [figure 3.19](#) since there's not a marked difference. However, the NL control will give you a little extra dynamic range in each image due to more open shadows and slightly less saturated colors. If you've ever shot with Fuji NPS film or Kodak Portra negative films and liked them, you'll like this control.
- VI, or *Vivid***, is for those of us who love Fuji Velvia slide film! This setting places emphasis on saturating primary colors for intense imagery. The contrast is higher for striking shadow contrast, and the sharpness is higher, too. If you are shooting JPEGs and want to imitate a saturated transparency film like Velvia, this mode is for you! If you look at the red block under the VI control in figure

3.19, you'll see that it's pushed into deep saturation, almost to the point of oversaturation. Plus, the greens and blues are extra strong. That means your nature shots will look saturated and contrasty. Be careful when you are shooting on a high-contrast day, such as in direct sunshine in the summer. If you use the VI control under these conditions, you may find that your images are too high in contrast. It may be better to back off to the SD or NL control when shooting in bright sunshine. You'll need to experiment with this to see what I mean. On a cloudy or foggy low-contrast day, when the shadows are weak, you may find that the VI control adds a pleasing saturation and contrast to the image.

- **MC, or Monochrome**, allows the black-and-white lovers among us to shoot in toned black-and-white. The MC control basically removes the color by desaturation. It's still an RGB color image, but the colors have become levels of gray. It does not look the same as black-and-white film, in my opinion. The blacks are not as deep, and the whites are a little muddy. To me, it seems that the MC control is fairly low contrast, and that's where the problem lies. Good black-and-white images should have bright whites and deep blacks. To get images like that from a digital camera, you'll have to manually work with the image in a graphics program like Photoshop. However, if you want to experiment with black-and-white photography, this gives you a good starting point. There are two extra settings in the MC control that allow you to experiment with Filter effects and Toning. We'll look at these settings in the upcoming section called **MC Picture Control Filter Effects and Toning**. The MC control creates a look that is somewhat like Kodak Plus-X Pan negative film, with blacks that are not as deep.
- **PT, or Portrait**, is a control that "lends a natural texture and rounded feel to the skin of portrait subjects" (Nikon's description). I've taken numerous images with the PT control and shot the same images with the NL control. The results are very similar. I'm sure that Nikon has included some software enhancements specifically for skin tones in this control, so I'd use this control for portraits of people. The results from the PT control look a bit like smooth Kodak Portra or Fuji NPS negative film.
- **LS, or Landscape**, is a control that "produces vibrant landscape and cityscapes," according to Nikon. That sounds like the VI control to me. I shot a series of images using both the LS and VI controls and got similar results. Compared to the VI control, the LS control seemed to have slightly less saturation in the reds and a tiny bit more saturation in the greens. The blues stayed about the same. It seems that Nikon has created the LS control to be similar to, but not quite as drastic as, the VI control. In my test images, the LS control created smoother transitions in color. However, there was so little difference between the two controls that you'd

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have to compare the images side by side to notice. Maybe this control is meant to be more natural than the super-saturated VI control. It will certainly improve the look of your landscape images. The look of this control is somewhere between Fuji Provia and Velvia. You get great saturation and contrast, with emphasis on the greens in natural settings.

MC Picture Control Filter Effects and Toning



Figure 3.20 – Filter effects screen

The Monochrome, or MC, Picture Control has some added features that are enjoyable for those who love black-and-white photography. As shown in [figure 3.20](#), there are Filter effects that simulate the effect of Y (yellow), O (orange), R (red), and G (green) filters on a monochrome image. Yellow, orange, and red (Y, O, R) change the contrast of the sky in black-and-white images. Green (G) is often used in black-and-white portrait work to change the appearance of skin tones. You don't have to go buy filters for your lenses; they're included free in your D7000.

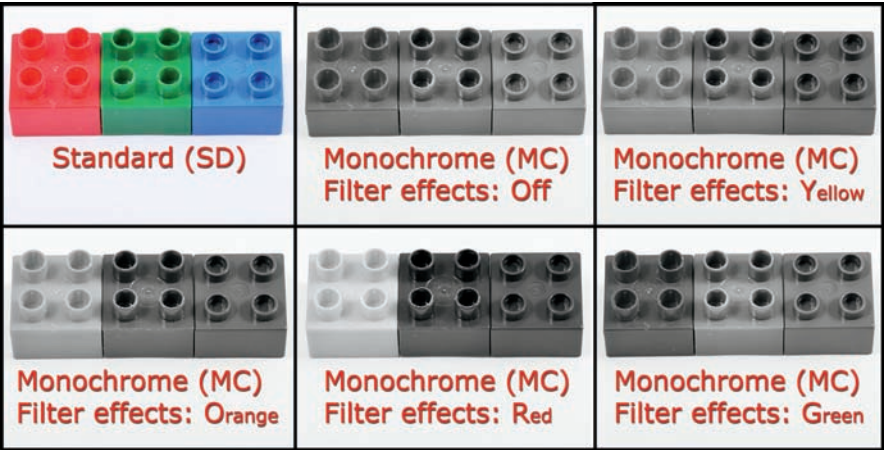


Figure 3.21 – Filter effects: SD, off, yellow, orange, red, and green

Filter Effects

[Figure 3.21](#) is a comparison of a color SD Picture Control and the five MC Filter effects (including off). In real-life use, the R (red) effect seems to darken the sky and emphasize clouds a bit better if you are shooting Nature images. Notice how dark the blue is with the MC Red Filter effect. The sky will do that too! The Filter effects can be more pronounced than if you used a glass filter attached to your lens.



Figure 3.22 – Filter effects – Toning filters

Toning

As displayed in [figure 3.22](#), there are 10 variable Toning effects: B&W (none, or standard black-and-white), Sepia, Cyanotype, Red, Yellow, Green, Blue Green, Blue, Purple Blue, and Red Purple. Each of the Toning effects is variable within itself—you can adjust the saturation of the individual tones. In [figure 3.22](#), I cranked them all the way up to the maximum setting, which tends to oversaturate the toning color. I wanted you to clearly see the maximum potential in the Toning settings.

You can shoot a basic black-and-white image, use filters to change how colors appear, or tone the image in experimental ways. Can you see the potential for a lot of fun with these tones?

In the first image of [figure 3.22](#), notice that to the right of Toning there is a row of 10 tiny rectangles and arrows on each end. The first rectangle is half black and half white. That is the normal black-and-white (B&W) selection, and it has no extra toning. Next to that you'll see a golden-brown rectangle. That is the Sepia toning effect. To the right of that is the bluish Cyanotype effect. The smaller rectangles that follow are the other available colors for toning. Each color has seven saturation settings in the green bar below the Toning rectangles (next to Blue Green, 4 in [figure 3.22](#)). This bar allows you to select the depth of saturation for each of the colors. Blue Green is set to the fourth saturation position in [figure 3.22](#).

Use the Multi Selector to move around in the Filter effects and Toning settings. Press the OK button to select one of them.

Picture Control Grid Screen

Each Picture Control has a Picture Control Grid that allows you to compare the selected control to the other Nikon Picture Controls ([figure 3.23](#)). You access the Grid by scrolling to the screen shown in [figure 3.18](#), [image 2](#), and then pressing the Thumbnail/playback zoom out button.

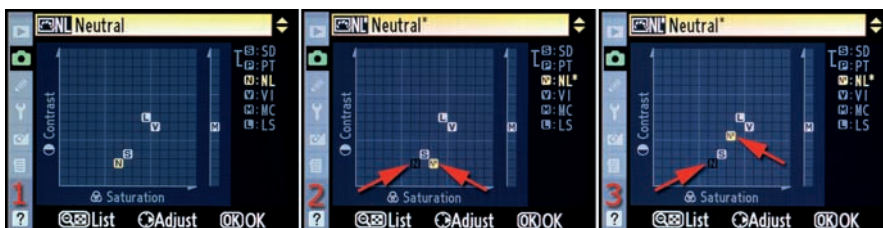


Figure 3.23 – Picture Control Grid screen

When you make a modification to the Saturation or Contrast of a particular control, you'll see the position of that control change on the Picture Control Grid. [Figure 3.23, image 1](#), shows a Neutral Picture Control Grid in its unchanged condition, with all controls set to factory default.

In [figure 3.23, image 2](#), I changed the Saturation. You can see that the N*—representing the modified Neutral setting—has moved from its starting location (red arrow on left) to its new location (red arrow on right). In [figure 3.23, image 3](#), I changed the Contrast. The N* moved from the location at the bottom red arrow to its new location at the top red arrow.

The Picture Control Grid allows you to see how each control compares to the others, both before and after you make a change. When a change has been made, you'll see a black square that marks the original location of the control and a yellow square that marks its new location. The new location will have the same name as the previous location, except you'll see an asterisk after it.

Resetting a Nikon Picture Control

If you modify the Nikon Picture Controls, you may do what I did and forget what the original settings were when you want to change them back.

Worry not! Nikon has given us an easy way to reset a control. Any time you've modified a control, you can reset it by pressing the Delete button while you have the Set Picture Control screen open (figure 3.18, image 2 and figure 3.25, image 2).

You'll see the screen in figure 3.24 with the warning, *Selected Picture Control will be reset to default settings. OK?* Select Yes from the menu and press the OK button to reset the control.

As shown in figure 3.25, there is an alternate way to access the Set Picture Control menu screens in the D7000. You can use the Information display edit screen

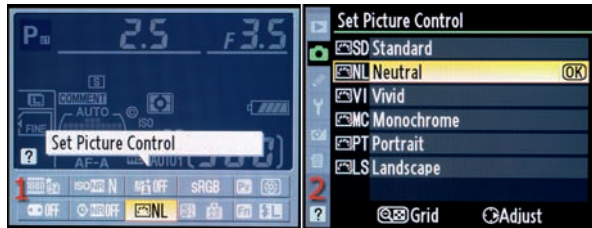


Figure 3.25 – Alternate Picture Control access

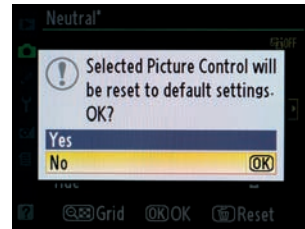


Fig. 3.24 – Reset a Picture Control

by pressing the Info button twice then scrolling to the Set Picture Control position and pressing the OK button. This will directly open the Set Picture Control screen for your convenience.

Notes on Photoshop for Black-and-White Images

The RGB color channels are intact when the D7000 captures a black-and-white image, so you can use Photoshop's Channel Mixer (Image Menu > Adjustments > Channel Mixer) to manipulate the color channels and improve the blacks and whites. If you use Photoshop to play with the channels, be sure to check the Monochrome box on the Channel Mixer window. If you don't, you'll simply add color back into your black-and-white image. This proves that a D7000's black-and-white image is really just a color image with the colors desaturated to levels of gray. The good thing about this is you now have room to play with the three color channels, similar to how you use color filters when shooting black-and-white film. You can add or subtract contrast by moving the channel sliders until you are happy with the results. There is a lot of discussion about these techniques on the Internet. Why not join the **Nikonians.org** forum to discuss how to best achieve beautiful black-and-white images? Look for the Nikonians Gold Membership 50 percent discount coupon in the front of this book.

Manage Picture Control

(User's Manual – Page 136)

The Manage Picture Control section of your camera's Shooting Menu is designed to allow you to create and store Custom Picture Control settings for future use. If you modified them when you read the Set Picture Control section just before this one, you simply create a one-off setting. If you'd like to go further and create your own named Custom Picture Controls, the D7000 is happy to oblige.

There are four choices on the Manage Picture Control screen:

- Save/edit
- Delete
- Rename
- Load/save

Let's look at each of these four Picture Control management settings.

Save/Edit a Custom Picture Control

There are six screens used to Save/edit a Nikon Picture Control (figure 3.26) and store the results for later use as a Custom Picture Control under a new name.



Figure 3.26 – Save/edit a Picture Control

Use the following the steps to edit, name, and save a Custom Picture Control:

1. Select **Manage Picture Control** from the **Shooting Menu** and scroll to the right (figure 3.26, image 1).
2. Highlight **Save/edit** and scroll to the right (figure 3.26, image 2).
3. Choose a **Picture Control** that you want to use as a base for your new settings,

and then scroll to the right (figure 3.26, image 3). I am modifying the **Standard Picture Control** and will save it under a different name.

4. Make your adjustments to **Sharpening**, **Contrast**, etc. When you are done, press the **OK button** (figure 3.26, image 4).
5. Select one of the nine storage areas named **C-1** to **C-9** and scroll to the right (figure 3.26, image 5). They are all currently marked as **Unused**. I can save up to nine different Custom Picture Controls for later selection (**Set Picture Control**).
6. You now see the **Rename** screen, which works just like the other screens you've used to rename things. Type in a new name by selecting characters from the list at the top of the screen and pressing the **OK button** to choose the highlighted character (figure 3.26, image 6). To correct an error, hold down the **Thumbnail/playback zoom out button** and use the **Multi Selector** to move back and forth along the field that contains the new name.
7. Press the **Playback zoom in button** when you have entered the name of your Custom Picture Control. This will save the custom control to the storage location you selected.

Your camera is now set to your Custom Picture Control. You can switch between your Custom Picture Controls and the Nikon Picture Controls by using **Set Picture Control** (see the previous section, **Set Picture Control**). In other words, each of your newly named Custom Picture Controls will appear in the **Set Picture Control** menu.

Now, let's look at how to rename an existing Custom Picture Control.

Rename a Custom Picture Control

If you decide to rename an existing Custom Picture Control, you can do so with the following steps:

1. Select **Manage Picture Control** from the **Shooting Menu** and scroll to the right (figure 3.27, image 1).
2. Select **Rename** from the **Manage Picture Control** screen and scroll to the right (figure 3.27, image 2).
3. Select one of your Custom Picture Controls from the list (**C-1** to **C-9**) and scroll



Figure 3.27 – Renaming a Picture Control

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to the right (figure 3.27, image 3). I will rename it **STANDARD-02**. This is the Custom Picture Control I created in the previous section.

4. Now you'll see the **Rename** screen (figure 3.27, image 4). To create a different name, hold down the **Thumbnail/playback zoom out button** and use the **Multi Selector** to scroll back and forth within the old name. When you have the small gray cursor positioned over a character, you can delete that character with the **Delete button**. To insert a new character, position the yellow cursor in the character list and press the **OK button**. The character that is highlighted in yellow will appear on the name line below, at the position of the gray cursor. If a character is already highlighted with the gray cursor, it will be pushed to the right. The name of your Custom Picture Control is limited to 19 characters.
5. Press the **Playback zoom in button** when you have completed the new name. I renamed my Custom Picture Control from **STANDARD-02** (figure 3.27, image 3) to **STANDARD-03** (figure 3.27, image 4).

Note: You can have more than one control with exactly the same name in your list of Custom Picture Controls. The camera does not get confused because each control has a different location (C-1 to C-9).

When you no longer need a Custom Picture Control, you can easily delete it.

Delete a Custom Picture Control

You cannot delete a Nikon Picture Control (SD, NL, VI, MC, PT, or LS). They don't even appear in the Manage Picture Control Delete menu.

However, you can delete one or more of your Custom Picture Controls by following these steps:

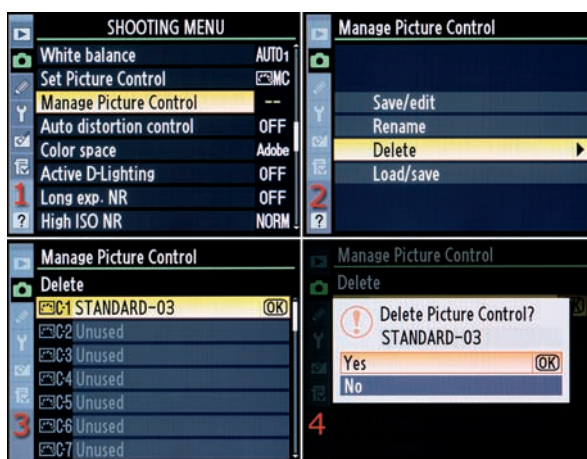


Figure 3.28 – Renaming a Picture Control

1. Select **Manage Picture Control** from the **Shooting Menu** and scroll to the right (figure 3.28, image 1).
2. Select **Delete** from the **Manage Picture Control** screen and scroll to the right (figure 3.28, image 2). You'll find up to nine controls listed in **C-1** to **C-9**.
3. Select one of the nine available Custom Picture Controls and press the **OK**

button (figure 3.28, image 3). I selected **STANDARD-03** for deletion.

4. Choose **Yes** from the **Delete** menu (figure 3.28, image 4).
5. Press the **OK** button to delete the Custom Picture Control from your camera.

Now, let's move to our last menu selection from the Manage Picture Control screen, Load/save.

Load/Save a Custom Picture Control

There are three parts to the Load/save function. They allow you to copy Custom Picture Controls to and from the memory card or delete them from the card.



Figure 3.29 – Load/save a Picture Control

When I mention copying or deleting controls from the memory card, I'm speaking of the primary card slot on the D7000. You cannot copy or delete controls from the secondary card slot. There are three selections in the Load/save menu, as shown in figure 3.29, image 3.

- **Copy to camera** – Loads Custom Picture Controls from the memory card into your camera. You can store up to nine controls in your camera's nine available memory locations (C1–C9).
- **Delete from card** – Displays a list of any Custom Picture Controls found on the memory card. You can selectively delete them.
- **Copy to card** – Allows you to copy your carefully crafted Custom Picture Controls from your camera to a memory card. You can then share them with others. The camera will display up to 99 control locations on any single memory card.

Let's examine each of these selections and see how to best use them.

Copy to Camera

After you've transferred a Custom Picture Control from your memory card to your camera, it will show up in the Shooting Menu > Set Picture Control screen.

3



Use the following steps to copy a saved Custom Picture Control from the memory card to the camera's memory:

1. **Figure 3.30**, image 1, continues from **figure 3.29**, image 2 (Load/save on the Manage Picture Control menu). Choose **Copy to camera** and scroll to the right.



Figure 3.30 – Copy to camera

2. You'll see the list of controls that are currently on the memory card (**figure 3.30**, **image 2**). If there are no controls on the memory card, the camera will display a screen that says, *No Picture Control file found on memory card*. **Figure 3.30**, **image 2**, shows two controls: **NEUTRAL-02** and **STANDARD-02**. Select a control from the list and press the **OK** button. (If you scroll to the right instead, you will be able to examine and adjust the control's settings before saving it to your camera. If you don't want to modify it, simply press the **OK** button.)
3. You will now see the **Manage Picture Control > Save as** menu, which lists any Custom Picture Controls already in your camera (**figure 3.30**, **image 3**). Select one of the **Unused** memory locations and press the **OK** button.
4. You'll now see the **Rename** screen, in case you want to change the name of the Custom Picture Control. If you don't want to change the name, simply press the **Playback zoom in** button, and the custom control will be added to your camera's **Set Picture Control** menu. It's okay to have multiple controls with exactly the same name. The camera keeps each control separate. However, I always rename them to prevent confusion, which is what we'll do next.

Copy to Camera – Renaming a Custom Picture Control

To create a different name for a Custom Picture Control, refer to **figures 3.30** and **3.31**. Hold down the Thumbnail/playback zoom out button and use the Multi Selector to scroll back and forth within the old name. When the small gray cursor highlights a character, you can delete it with the Delete button. To insert a new character, position the yellow cursor in the character list and press the OK button. The character that is highlighted with the yellow cursor will appear on the name line below, at the position of the gray cursor. If there is already a character highlighted by the gray cursor, it will be pushed to the right. Custom Control Picture names are limited to 19

characters. Press the Playback zoom in button when you've completed the new name.

You can also create Custom Picture Controls in computer programs such as Nikon Capture NX2, which uses its Picture Control Utility, and load them into your camera using the preceding steps.

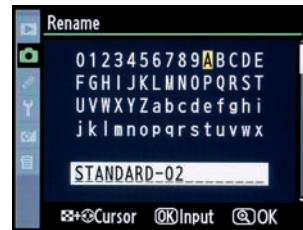


Figure 3.31 – Rename a Custom Picture Control

Delete from Card

After you've finished loading Custom Picture Controls on your camera, you may be ready to delete a control or two from the memory card. You could format the memory card, but that will delete all the images and Picture Controls on the card. A less drastic method that allows you to be more selective is the Delete from card function.



Figure 3.32 – Delete from card

Here are the steps to remove Picture Controls from your camera's memory card:

1. [Figure 3.32](#) continues from [figure 3.29, image 2](#). Choose **Delete from card** from the **Load/save** menu and scroll to the right ([figure 3.32, image 1](#)).
2. Choose one of the Custom Picture Controls that you want to delete ([figure 3.32, image 2](#)). I chose the only one I had on the card at that time, **STANDARD-02**. You can confirm that you are deleting the correct control by scrolling to the right, which gives you the fine-tuning screen with current adjustments for that control. If you are sure that this is the control you want to delete, move on to the next step by pressing the **OK** button.
3. You will be shown the deletion screen, which asks, *Delete Picture Control?* Choose either **Yes** or **No** ([figure 3.32, image 3](#)). If you choose **Yes**, the Picture Control will be deleted from the memory card. If you choose **No**, you will return to the previous screen.
4. Press the **OK** button to execute your choice.

3



Copy to Card

After you create up to nine Custom Picture Controls using the instructions in the last few sections, you can use the Copy to card function to save them to a memory card. When they are on a memory card, you can share your Custom Picture Controls with friends who have compatible Nikon cameras.



Figure 3.33 – Copy to card

Use the following steps to copy your Custom Picture Controls to a memory card:

1. Figure 3.33 continues where figure 3.29, image 2, left off. Choose **Copy to card** from the **Load/save** menu and scroll to the right (figure 3.33, image 1).
2. Select one of your current Custom Picture Controls from the **Copy to card** menu and scroll to the right (figure 3.33, image 2).
3. Now you'll use the **Choose destination** menu to select where you want to save the custom control (figure 3.33, image 3). You have 99 choices for where to place the control on the card. Select any **Unused** location.
4. Press the **OK** button, then you'll briefly see a screen that says, *Data saved to memory card*. Your Custom Picture Control is now ready to distribute to the world or load onto another one of your compatible Nikon cameras.

My Recommendation: To help you understand Nikon Picture Controls even better, please download and read the following 13-page PDF (4.5 MB) document from Nikon:

<http://imaging.nikon.com/products/imaging/lineup/picturecontrol/catalog/PicCon.pdf>

To open the file, you'll need Adobe Reader, which you can download for free from www.Adobe.com.

This document describes Picture Controls—with lots of pictures—to help you see the range of control you can achieve. I really enjoyed reading it because it explains Nikon Picture Controls well and even mentions software that will work with them.

Memory Cards and Custom Picture Controls

If you look at the contents of your memory card with your computer after you've created and saved a new Custom Picture Control to it, you'll find a new folder called NIKON with a subfolder called CUSTOMPC. This folder contains any Custom Picture Controls you might have saved. Each control has a file name that ends with NCP.

Auto Distortion Control

(User's Manual – Page 205)

Auto distortion control is a function designed to automatically detect and remove certain lens aberrations in Nikkor type G and D lenses. Basically, if you leave this setting turned On, the camera will try to remove barrel distortion when you use a wide-angle lens and pincushion distortion when you use a telephoto lens.

Barrel distortion is where straight lines in your images bow outward like a barrel. Imagine a door frame with the middle bowed outward. It looks strange! Also, when you are close to an object, things centered directly in front of the lens can seem closer to the camera than things on the edges of the picture. Shooting against a flat wall can make it bulge toward the camera in an odd way. Pincushion distortion is just the opposite; the edges of things bow inward. If you see this problem in your images, this function may help you automatically overcome the distortion.

Unfortunately, this can cause the edges of your image to be removed (cropped) as the camera adjusts the distorted areas of the image. It may also slow the camera's image processing time a bit as adjustments are made before the camera writes the image to the memory card.

Use the following steps to enable or disable Auto distortion control:

1. Select **Auto distortion control** from the **Shooting Menu** and scroll to the right (figure 3.34, image 1).
2. Choose **On** or **Off** from the menu (figure 3.34, image 2).
3. Press the **OK** button to lock in the setting.

My Recommendation: I tend to shoot in RAW and want to adjust my images later in Photoshop so I can use its very powerful distortion tools. I therefore rarely

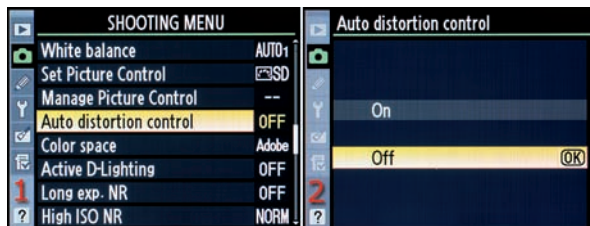


Figure 3.34 – Using Auto distortion control

3



leave this function enabled. However, If you are a JPEG shooter who is allergic to post-processing images, this function gives you another automatic choice to keep you from having to take time to adjust images after you shoot them. If you have no time to adjust the images and know your lens tends to have barrel or pincushion distortion, maybe you'll want to use this function.

Nikon recommends that you limit this function to Nikkor G or D lenses. However, it certainly won't hurt to try it out on non-Nikkor lenses, or even on older lenses. If it doesn't work or causes a problem, you'll can always turn it Off.

3



Color Space

(User's Manual – Page 141)

Using a Color space is an interesting and important part of digital photography. It helps your images fit into a much broader range of imaging devices. Software, printers, monitors, and other devices recognize which Color space is attached to your image and use it, along with other color profiles, to help balance the image to the correct output colors for the device in use.

The two Color spaces available on the Nikon D7000 have different gamuts, or ranges of color. They are called sRGB and Adobe RGB. Here's how to select your favorite Color space:



Figure 3.35 – Selecting a color space

1. Choose **Color space** from the **Shooting Menu** and scroll to the right (figure 3.35, image 1).
2. Select the **Color space** that you want to use, keeping in mind that **Adobe RGB** has a larger color gamut (figure 3.35, image 2). We'll learn more about that in the next section.
3. Press the **OK button** to lock in your choice.

The D7000 also allows you to access the Color space settings via the shortcut Information display edit screen. You simply press the Info



Figure 3.36 – Choosing a Color space (alternate screens)

button twice and select the Color space icon, then press the OK button (figure 3.36, image 1). The Color space screen in figure 3.36, image 2, is the same as the one in figure 3.35, image 2. You adjust it in the same way as described in the preceding steps.

Which Color Space Should I Choose?

Adobe RGB uses colors from a broader selection of the total color range, so it has a wider gamut. If you are taking images that might be printed, Adobe RGB is often the best color space to use (see sidebar, **Which Color Space Is Best—Technically?**).

After a JPEG file is created, either in a camera or on a computer, both Adobe RGB and sRGB's color gamut are compressed into the same number of color levels. A JPEG has only 256 levels for each of its red, green, and blue (RGB) channels. However, since the Adobe RGB color space takes its colors from a wider spectrum, you will have a better representation of reality when there are lots of colors in your image.

If you shoot in RAW format a lot, you may want to consider using Adobe RGB to store the maximum number of colors in your image files for later use. Remember that a NEF (RAW) image file can contain 4,096 levels of color per RGB channel in 12-bit mode and 16,385 levels in 14-bit mode—instead of the limited 256 levels in an 8-bit JPEG. Using Adobe RGB makes a lot of sense in NEF (RAW) mode because of its capacity to contain more colors as a base storage medium.

There are some drawbacks to using Adobe RGB, though. The sRGB color space is widely used in printing and display devices. Many local labs print with sRGB because so many point-and-shoot digital cameras use that format. If you try to print directly to some inkjet printers using the Adobe RGB color space, the colors may not be as brilliant as with sRGB. If you aren't going to modify your images in post-processing and plan to print them directly from your camera, you may want to use sRGB. If you shoot only JPEGs for computer display or Internet usage, it might be better to stay with sRGB for everyday shooting.

If you are a RAW shooter and regularly post-process your images, you should consider using Adobe RGB. You will have a wider gamut of colors to work with and can make your images the best they can be. Later, you can convert your carefully crafted Adobe RGB RAW images to JPEG and sRGB and get great results from inkjet printers and other printing devices. Here's a rough way to look at it:

- Many JPEG shooters use sRGB
- Many RAW shooters use Adobe RGB

This is not a hard and fast rule, but many people use these settings according to their style of shooting.

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My Recommendation: I use Adobe RGB most of the time since I shoot a lot of nature pictures with a wide range of color. I want the most accurate color my camera can give me. Adobe RGB has a wider range of colors, so it can be more accurate when my subject has a wide range of colors. However, if you are shooting JPEG snapshots, there's no need to worry about this. Leave the camera set to sRGB and have fun.

Which Color Space Is Best—Technically?

There is a large color space used by the graphics industry called CIE LAB. This color space is designed to approximate human vision. Adobe RGB covers about 50 percent of the CIE LAB color space, and sRGB covers only 35 percent. In other words, Adobe RGB has a wider gamut. That means Adobe RGB gives your images access to significantly higher levels of color, especially cyans (bluish tones) and greens. Another important consideration if you'll send your work to companies that use offset printing—such as book and magazine publishers—is that Adobe RGB maps very well to the four-color cyan, magenta, yellow, black (CMYK) printing process. If you are shooting commercial work, you may want to seriously consider Adobe RGB. Stock photo shooters are nearly always required to shoot in Adobe RGB.

Active D-Lighting

(User's Manual – Page 139)

Active D-Lighting (ADL) is used to help control contrast in your images. Often, the range of light around a subject is broader than our camera's sensor can capture. The D7000 is able to capture six to nine exposure value (EV) steps of light, but the brightness outside on a sunny day might equal 12 stops in range. The contrast is too high!

Since the camera often cannot grab the full range of light—and most people use the histogram to expose for the highlights (we'll discuss how in a later chapter)—some of the image detail will be lost in the shadows. The D7000 allows you to "D-Light" the image—bringing out additional shadow detail—while protecting the highlights; in other words, you can lower the contrast. Active D-Lighting has these settings:

- Auto
- Extra high
- High
- Normal
- Low
- Off

If you are familiar with Nikon Capture NX2, you may know how Active D-Lighting works. You can use it to bring up lost shadow detail at the expense of adding noise in those darker areas.

We'll talk about noise in an upcoming section called **Long Exp. NR**.

Use the following steps to choose an Active D-Lighting level (figures 3.37 and 3.38):

1. Choose **Active D-Lighting** from the **Shooting Menu** and scroll to the right (figure 3.37, image 1).
2. Select one of the **Active D-Lighting** levels (figure 3.37, image 2). Refer to figure 3.39 to see how the levels affect an image.
3. Press the **OK** button to save your setting.

As with some other important functions, the D7000 adds access to the Active D-Lighting setting through the Information display edit screen (figure 3.38, image 1). Simply press the Info button twice, select the Active D-Lighting icon, press the OK button, and then follow steps 2 and 3, described previously (image 3.38, image 2).

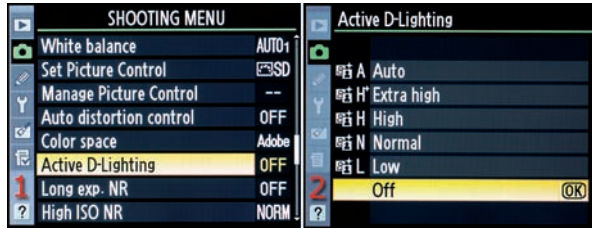


Figure 3.37 – Choosing an Active D-Lighting level



Figure 3.38 – Choosing an Active D-Lighting level (alternate screens)

Basically, Active D-Lighting will bring out detail in areas of your image that are hidden in shadow due to excessive image contrast. It also tends to protect the highlights from blowing out, or becoming pure white with no detail.

Figure 3.39 shows a series of six images with Active D-Lighting set to its various levels, including Off. I took six pictures of a still life of my favorite RGB blocks, a Nikon lens cap, and a Nikon body cap. The six images start with Active D-Lighting set to Off, and then progress through Low, Normal, High, Extra high, and Auto. I used the Vivid picture control to maximize contrast.

The images in figure 3.39 were taken with a point source light and deep shadows (high contrast) to let you see how Active D-Lighting tries to pull detail out of the shadows and protect the highlights. Notice the silver Nikon logo on the lens cap.

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You can begin to see detail in the last few letters as the Active D-Lighting level increases. In the first image, with ADL set to Off, you can see no detail past the K in Nikon. Gradually, over the next few ADL levels the final three letters begin to show.



Figure 3.39 – Active D-Lighting at all five levels and off

The detail shown by the Auto setting looks very similar to the High setting, which tells me that the camera chose a setting close to High ADL because of the excessive contrast. Also, notice that no highlights are blown out from overexposure. ADL tends to protect highlights.

My Recommendation: You'll need to experiment with the Active D-Lighting settings to see which ones you like best. It has the effect of lowering contrast, and some people do not like low-contrast images. Also, anytime you recover lost detail from shadows, there will be extra noise in the recovered areas. So watch the noise!

This function can be useful for JPEG shooters, in particular. Since you really shouldn't modify a JPEG file after shooting it, it's important that the image is created exactly right in the first place. When you are shooting in a contrasty setting, such as direct sunlight, some degree of ADL may help reign in the contrast.

If you set ADL much above Normal, the image will start to have an artificial look, in my opinion. Light skin tones can develop a pinkish look that seems unnatural to me. You can't tell from my sample image (figure 3.39) because there are no skin tones. Shoot some pictures of people with higher levels of ADL and you'll see what I mean.

Remember, your camera has multiple user settings, and you can set Active D-Lighting for each setting (U1 and U2) in a different way and then select the most appropriate setting for a particular job. I leave it set to Off for the user setting that uses NEF (RAW) mode and On for the user setting that uses JPEG. Normally, I don't go much above the Low setting, except for party JPEGs, which I set to Normal.

My best JPEGs are set to Low because I worry about adding noise to the image from higher ADL levels.

Use Auto mode when you're shooting JPEGs and don't have time to fool with camera settings but you must get the shot, no matter what. Auto lets the camera decide the appropriate level of Active D-Lighting according to the ambient light and contrast in the image.

Experiment with this by shooting images in a high-contrast and a low-contrast setting at all the various levels of Active D-Lighting. You'll see how the camera reacts and then decide how you'll use this functionality.

Long Exp. NR

(User's Manual – Page 205)

Long exp. NR (Long Exposure Noise Reduction) is designed to combat visual noise in long exposures. Noise is that ugly, grainy look in images when they are under-exposed and then brightened, or when a really high ISO sensitivity setting is used. If you ever shoot film, you know how faster films have lots more grain. Noise is like that, except uglier. It's the digital equivalent of static in music. Who wants static in their images?

Nikon knows that their sensors might exhibit more noise than is acceptable in exposures longer than 8 seconds. The sensor can start to warm up a little when longer exposures are used. This causes a condition called *amp noise*, in which warmer sections of the sensor start to create more noise than cooler sections.

There are two settings for Long exp. NR ([figure 3.41](#)):

- **On** – When you select On and an exposure is longer than 8 seconds, the camera will take two exposures with approximately the same time for each. Nikon says that the D7000 can sometimes take the second exposure in as little as half the time as the first one. The first exposure is the normal picture-taking exposure. The second one is a black-frame subtraction exposure, which is a second image that is exposed for about the same duration as the first image, but the shutter is closed. The noise in the black-frame exposure is examined and then subtracted from the original image. It's really quite effective and beats having to blur the image to get rid of noise. I've taken exposures of around 30 seconds and had perfectly usable results. The only drawback is that the total exposure time can be as much as doubled because two exposures are made. The black-frame exposure is not written to the memory card, so you'll have only one image, with much less noise, in the end. While the black-frame exposure is being processed, a message of *Job nr* will blink in any active displays.

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When *Job nr* is flashing, you cannot use the camera. If you turn it off while *Job nr* is flashing, the camera will keep the first image, but it won't do any noise reduction on it. If Long exp. NR is set to On, the frame advance rate may slow down a little in Continuous release mode and the capacity of the in-camera memory buffer will drop, usually by one image. (We'll discuss Continuous release mode in the chapter titled: **Autofocus, AF-Area, and Release Modes.**)

- **Off** – If you select Off, Long Exposure Noise Reduction will be disabled in exposures longer than 8 seconds.



Figure 3.40 – A 30-second exposure with Long exp. NR turned On

Figure 3.40 is an image I took with a 30-second exposure and Long exp. NR set to On. I left the shutter open for 30 seconds in several exposures, hoping to catch a lightning strike in a storm near my home. The camera used black-frame subtraction with the Long exp. NR setting to remove noise from my lightning strike image, without seriously blurring the image in the process. I can't see any noise, can you?

Disclaimer: It can be a lot of fun to capture lightning images, but be sure you have a safe place to shoot from so you won't attract the lightning. I was shooting from my upstairs bedroom window. The camera was on a tripod with a wide-angle lens looking out the open window. I got four or five nice lightning shots for my efforts— such as the one shown.

Here are the steps to choose a Long exp. NR setting:

1. Choose **Long exp. NR** from the **Shooting Menu** and scroll to the right ([figure 3.41, image 1](#)).
2. Select either **On** or **Off** ([figure 3.41, image 2](#)).
3. Press the **OK** button to save your setting.

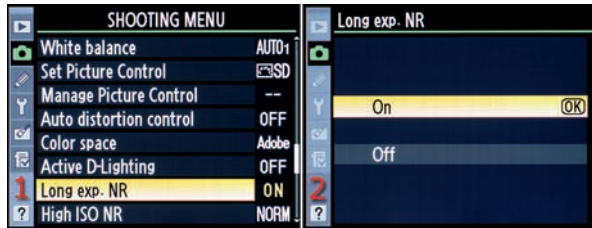


Figure 3.41 – Using Long exp. NR

The D7000 allows you to access the Long exp. NR setting quickly by using the Information display edit screen. Press the Info button twice, select the Long exp. NR icon, and press the OK



Figure 3.42 – Using Long exp. NR (alternate screens)

button ([figure 3.42, image 1](#)). Then follow steps 2 and 3, as discussed previously ([figure 3.42, image 2](#)). [Figure 3.41, image 2](#), is the same as [figure 3.42, image 2](#).

My Recommendation: I like the benefits of Long exp. NR. I shoot a lot of waterfall and stream shots where I want exposures longer than 8 seconds to really blur the water. Also, I like to take midnight shots of the sky and shots of city scenes at night. Even though it may slow down the frame rate slightly and give me one less image in the in-camera memory buffer, I still use it most of the time.

If I were a sports or action shooter using Continuous release mode, I may leave Long exp. NR set to Off. It's unlikely I would be using exposures longer than 8 seconds, and I would want the maximum frames per second and the ability to cram as many images into the camera buffer as possible. I wouldn't want my camera to slow down while writing black-frame subtraction exposures to the memory card.

Your style of shooting will govern whether this function is useful to you. Ask yourself one simple question, "Do I often shoot exposures longer than 8 seconds?" If so, you may want to keep Long exp. NR set to On. Compare how your images look with and without it. I think you'll like Long exp. NR.

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High ISO NR

(User's Manual – Page 205)

High ISO NR (High ISO Noise Reduction) lessens the effects of visual digital noise in your images when you use high ISO sensitivity (exposure gain) settings. Nikon doesn't specify the exact ISO level at which High ISO NR kicks in. I suspect that a small amount of noise reduction occurs at around ISO 400–800 and gradually increases as the ISO gets higher.

The D7000 has better noise control than most cameras, so it can shoot up to ISO 800 with little noise. However, no digital camera (that I know of) is completely without noise, so it's a good idea to use some noise reduction above a certain level of ISO sensitivity.

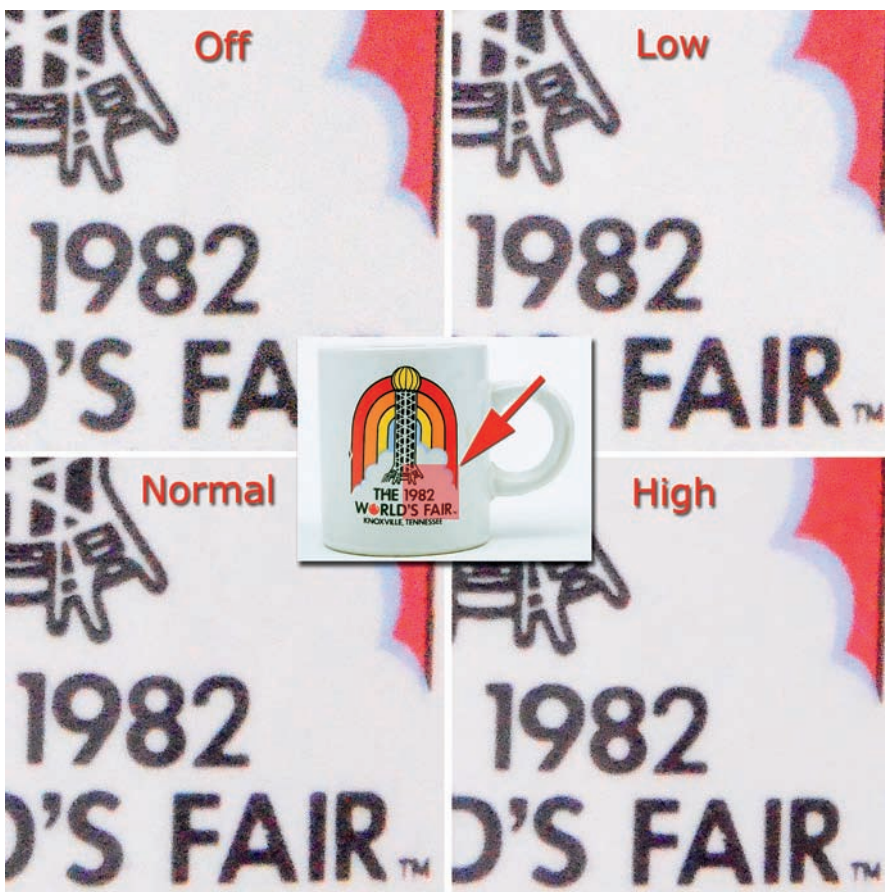


Figure 3.43 – High ISO NR – Off to High NR correction levels

If High ISO NR is turned Off, the camera does not reduce noise until the ISO reaches 1600. At that point a small amount of noise reduction—less than the Low setting—kicks in, even if the setting is turned Off. So above ISO 1600 you will always have some noise reduction taking place. You can control the amount by choosing one of the four High ISO NR settings. Here are the selections:

- High
- Normal
- Low
- Off

You'll need to shoot some high-ISO exposures and decide for yourself which settings you are comfortable with.

Figure 3.43 shows a sample image of my invaluable 1982 World's Fair mug taken at ISO 25,600 (Hi 2) with High ISO NR set to Off. I then took the same image at the Low, Normal, and High settings. The red arrow in the little picture of the mug points to the area in red represented by the four larger images.

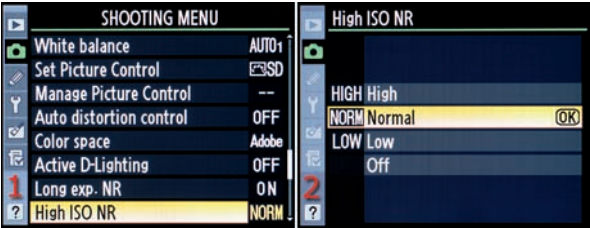


Figure 3.44 – Setting High ISO NR

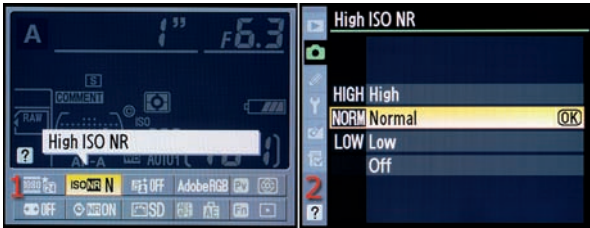


Figure 3.45 – Setting High ISO NR (Alternate screens)

High ISO NR works by blurring the image more and more as you increase the setting from Low to High. By blurring the image, the grainy noise is blended into its surroundings and reduces the appearance of noise in the image. Some mild sharpening is applied to restore image sharpness. This whole process tends to make the image lose detail as noise reduction is turned to higher levels.

High ISO NR works by blurring the image more and more as you increase the setting from Low to High. By blurring the image, the grainy noise is blended into its surroundings and reduces the appearance of noise in the image. Some mild sharpening is applied to restore image sharpness. This whole process tends to make the image lose detail as noise reduction is turned to higher levels.

Use the following steps to choose a High ISO NR setting:

1. Choose **High ISO NR** from the **Shooting Menu** and scroll to the right (figure 3.44, image 1).
2. Select one of the noise reduction levels: **High**, **Normal**, **Low**, or **Off** (figure 3.44, image 2).
3. Press the **OK button** to save your setting.

The D7000 allows you to control the High ISO NR function by using the Informa-

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tion display edit screen. Press the Info button twice, select the High ISO NR icon, and press the OK button (figure 3.45, image 1). Then follow steps 2 and 3, as described previously (figure 3.45, image 2). Figure 3.44, image 2, is the same as figure 3.45, image 2.

My Recommendation: I leave High ISO NR set to Low. I do want some noise reduction at levels above ISO 800. However, since any form of noise reduction blurs the image, I don't go too far with it. I shoot RAW, so it really makes no difference because I can change everything later in the computer. If I were shooting JPEG, it would make a serious difference.

Why not test a few images at high ISO sensitivity settings with High ISO NR turned On? You may like the output of High, or you may prefer Normal or Low. Remember that you can set this differently for each User setting so that your camera can be configured for different shooting styles.

Note: If you have High ISO NR turned On, your in-camera memory buffer for images shot in Continuous release mode will decrease by at least one image.



What Is Noise?

Have you ever tried to watch TV while children are playing in the same room? The louder you turn the TV, the louder the kids get, it seems. However loud the volume of the TV, the children laughing and running around degrades the pure sound you desire. There is a high child-to-TV noise ratio that interferes with your enjoyment of the program you are watching. After a while, there is a point when you simply have to ask the kids to leave the room. Turning up the TV just makes them get louder and louder to overcome the sound.

Noise in a digital image is somewhat similar. You want pure, clean images when you take pictures, but instead digital noise interferes with the clarity. The higher you turn the camera's ISO sensitivity, the more digital noise degrades your image. The noise-to-signal ratio can damage the picture. How can you make the visual noise go away? Use High ISO NR, that's how!

ISO Sensitivity Settings

(User's Manual – Page 101)

ISO sensitivity settings are provided to give you control over the light sensitivity of the imaging sensor, including whether you manually control it or if the camera sets it automatically.

In the D7000, the ISO numbers are sensitivity equivalents. To make it very simple, ISO sensitivity is the digital equivalent of film speed. The higher the ISO sensitivity, the less light is needed for the exposure. A high ISO setting allows higher shutter speeds and smaller apertures.

In [figure 3.46](#) you can see the external camera controls used to change the ISO sensitivity on the D7000. This is a good way to adjust ISO sensitivity quickly. This is also the easiest method to change the camera's ISO sensitivity setting, although it doesn't involve the Shooting Menu.



Figure 3.46 – Setting ISO sensitivity with external camera controls

Here are the steps you'll use to manually adjust the camera's ISO sensitivity:

1. Hold down the [ISO button](#) ([figure 3.46, image 1](#)).
2. Rotate the rear [Main command dial](#) counterclockwise to increase the [ISO sensitivity](#), or turn it clockwise to decrease the [ISO sensitivity](#) ([figure 3.46, image 2](#)).
3. The [ISO sensitivity](#) number will show on the [Control panel](#) ([figure 3.46, image 3](#)) and in the [Viewfinder](#).

Configuring the ISO Sensitivity Settings

You can also use Shooting Menu > ISO sensitivity settings to change the camera's ISO sensitivity. [Figure 3.47](#) shows the three screens used select your favorite ISO sensitivity for the circumstances in which you are shooting.

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Notice in [figure 3.47, image 3](#), that there is a list of ISO sensitivity settings, from ISO 100 to Hi 2 (ISO 25,600). The normal ISO range for the D7000 is 100 to 6400. Select your desired ISO sensitivity from the list of available ISO sensitivity settings.

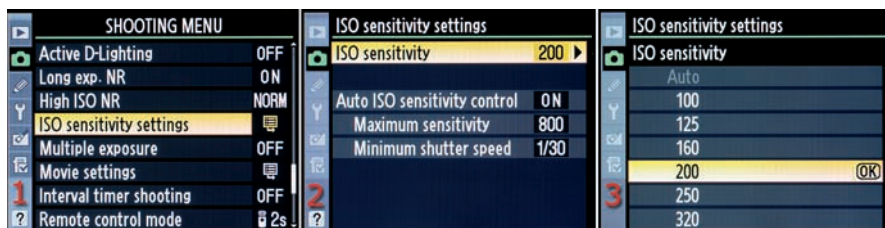


Figure 3.47 – Setting ISO sensitivity

Here are the steps to select an ISO sensitivity setting:

1. Choose **ISO sensitivity settings** from the **Shooting Menu** and scroll to the right ([figure 3.47, image 1](#)).
2. Select **ISO sensitivity** from the menu and scroll to the right ([figure 3.47, image 2](#)).
3. Scroll up or down in the **ISO sensitivity** menu until you highlight the ISO value you want to use.
4. Press the **OK** button to save the setting ([figure 3.47, image 3](#)).

The standard minimum ISO sensitivity for the D7000 is ISO 100. You can adjust the camera in a range from ISO 100–6400, in one-third steps, except for the increase from Hi 1 to Hi 2. The increment value is controlled by Custom setting b1 ISO sensitivity step value, which can be set to 1/3 or 1/2 step. We'll look at this more carefully in the upcoming chapter titled **Custom Setting Menu**.

Select your favorite ISO sensitivity setting, using either the external camera controls or the ISO sensitivity settings from the Shooting Menu. If you'd like, you can simply let your camera decide which ISO to use. This brings us to two often-misunderstood features.

ISO Sensitivity Auto Setting

You may have noticed in [figure 3.47, image 3](#), that there's a grayed out Auto setting at the top of the ISO sensitivity list. This Auto setting is the default when you have the camera set to one of the automatic SCENE modes or the AUTO mode—found on the Mode dial—and allows the camera to take full control of adjusting the ISO sensitivity to help you get the picture under difficult lighting.

Don't confuse the ISO sensitivity Auto setting with the AUTO mode (it looks like a green camera on the Mode dial) or the Auto ISO sensitivity control we'll discuss in the next section.

A nice feature on the D7000 is the ability to use the fully automatic AUTO or SCENE modes and still adjust the ISO sensitivity manually by taking it out of Auto mode and selecting a manual ISO instead (figure 3.47, image 3). Auto will stay grayed out until you enter one of the SCENE or AUTO modes.

This is a fine degree of control that allows a new user to gradually learn how to take more and more control of the camera's settings.

Auto ISO Sensitivity Control

There's another, more controllable, automatic setting available: the Auto ISO sensitivity control. This was known on earlier Nikon cameras as ISO-AUTO.

This setting allows the camera to control the ISO sensitivity and shutter speed according to the light levels sensed by the camera.

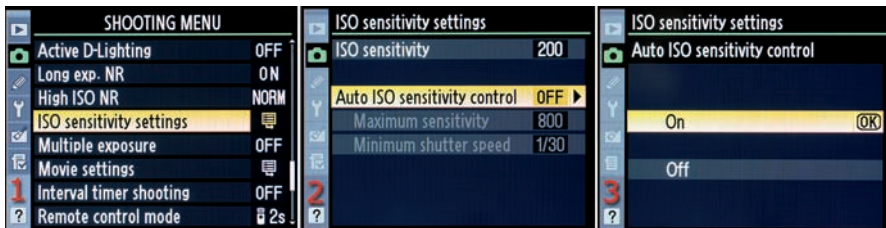


Figure 3.48 – Using the Auto ISO sensitivity control

Use the following steps to enable the Auto ISO sensitivity control:

1. Choose **ISO sensitivity settings** from the **Shooting Menu** and scroll to the right (figure 3.48, image 1).
2. Select **Auto ISO sensitivity control** from the menu and scroll to the right (figure 3.48, image 2).
3. Choose **On** or **Off** from the menu (figure 3.48, image 3).
4. Press the **OK button** to select the setting.

After you set the Auto ISO sensitivity control to On, you should immediately set two values, depending on how you shoot: Maximum sensitivity and Minimum shutter speed.

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Maximum Sensitivity

The Maximum sensitivity setting is a safeguard. It allows the camera to adjust its own ISO sensitivity from the minimum value of ISO 100 to the value set in Maximum sensitivity according to the light conditions. The camera will try to maintain the lowest ISO sensitivity it can to get the picture. However, it can rapidly rise to the Maximum sensitivity level, if needed.



Figure 3.49 – Auto ISO sensitivity control – Maximum sensitivity

This setting overrides the normal ISO sensitivity settings. If you don't want the Maximum sensitivity to exceed a certain ISO value, simply select from the list shown in [figure 3.49, image 2](#), where I selected ISO 1600. The Maximum sensitivity default is ISO 6400. That's too high for my taste, since it will let the camera take the ISO sensitivity all the way up to ISO 6400 in a low-light situation. That introduces too much noise potential for me! Maybe not for you? In any case, I set my camera's Maximum sensitivity to ISO 1600, as shown in [figure 3.49, image 2](#).

Note: It's a little-known fact that you can also set a minimum sensitivity, of sorts. The User's Manual describes how to set Maximum sensitivity, but it does not mention (that I've found) that you can use the normal ISO sensitivity setting to control the lowest ISO you want the camera to use. If you set the ISO sensitivity to ISO 400 and the Auto ISO sensitivity control > Maximum sensitivity to ISO 1600, then the camera will use the ISO range of 400 to 1600. It will not go below ISO 400, nor will it exceed ISO 1600.

The Maximum sensitivity setting you choose is the maximum ISO value the camera will use to get a good exposure when the light dims.

Interestingly, Custom setting b1 ISO sensitivity step value does not control the incremental ISO numbers between these primary values. I carefully set up my D7000 to test this and found that it would often use an intermediate value like ISO 640, 1100, 1250, 2000, or 2200 as the light dimmed. It did this whether I set Custom setting b1 to 1/3 or 1/2 EV step.

What happens when the camera reaches its Maximum sensitivity and there still isn't enough light for a good exposure? Let's find out.

Minimum Shutter Speed

Since shutter speed helps control how sharp an image can be, depending on camera shake and subject movement, you'll need some control over the minimum shutter speed while the Auto ISO sensitivity control is set to On ([figure 3.50, image 1](#)).

You can select the Minimum shutter speed that the camera will allow when the light diminishes. In Programmed auto (P) (camera controls shutter and aperture) and Aperture priority auto (A) (camera controls shutter and you control aperture) exposure modes, the camera will not go below the Minimum shutter speed unless the Maximum sensitivity setting still won't give you a good exposure.

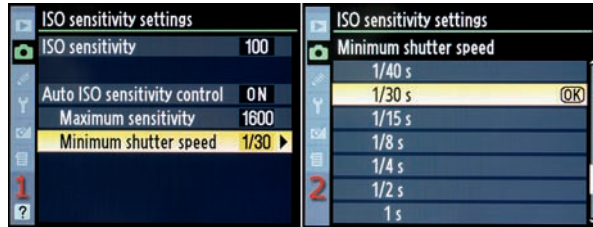


Fig. 3.50 – Auto ISO sensitivity control – Minimum shutter speed

This is the answer to our question in the last section about what happens when there is not enough light and the camera has maxed out the Maximum sensitivity level. Even though you've selected a Minimum shutter speed, the camera will go below the Minimum shutter speed when the Maximum sensitivity ISO number has been reached and the light is still too low for a good exposure.

In other words, in Programmed auto (P) or Aperture priority auto (A) exposure modes, if you try to take pictures in low light, the camera will try to keep the ISO sensitivity as low as possible until the shutter speed drops to your selected Minimum shutter speed. When it hits the selected Minimum shutter speed value—like 1/30s shown in [figure 3.50, image 2](#)—the ISO sensitivity will begin to rise up to your selected Maximum sensitivity value, such as ISO 1600 as shown in [figure 3.49, image 2](#).

If there still isn't enough light for a good exposure after the camera hits the Maximum sensitivity value, it won't keep raising the ISO sensitivity. Instead, the camera will now go below your selected Minimum shutter speed, dropping below 1/30s as shown in [figure 3.50, image 2](#). Be careful because if the light gets that low, your camera can go all the way down to a shutter speed of 30 seconds to get a good exposure. You better have the camera on a tripod and a static subject with a shutter speed that low.

Consider the Minimum shutter speed value to be the lowest handheld speed, after which you'll put your camera on a tripod. Most people can handhold a camera down to about 1/60s if they are careful, and maybe as low as 1/30s if they're extra careful and brace themselves. At shutter speeds slower than that, it's blur city for your images. It's even worse with telephoto lenses because camera movement is greatly magnified with a long lens, and a Minimum shutter speed of 1/250s to 1/500s or more may be required (the maximum is 1/4000s).

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Auto ISO Sensitivity Control from the Camera's Perspective

For fun, let's listen to the camera talk to itself while you take pictures in low light with Auto ISO sensitivity control enabled. As we listen in on the D7000 thinking—in the next paragraph—we need to know that the current Maximum sensitivity setting is ISO 1600 and the Minimum shutter speed setting is 1/30s:

Nikon D7000 thinking: *Okay, the Auto ISO sensitivity control is on! The light is dropping and my current 1/60s shutter speed at ISO 200 won't let me make a good exposure. I'll slow the shutter speed to the minimum of 1/30s, as my owner specified in my Minimum shutter speed setting. More pictures are incoming, and the light is still dropping! I can't go any lower on the shutter speed for now, since my owner has instructed me to keep the Minimum shutter speed at 1/30s unless I can't get a good picture. I'll have to start raising the ISO sensitivity. Here comes more pictures, and whew, it's getting dark! I've now raised the ISO sensitivity to my Maximum sensitivity level of ISO 1600, which is as high as I am allowed to go. I have no choice now but to go below the 1/30s Minimum shutter speed my owner has specified. I hope I'm on a tripod!*

Note: The other exposure modes, Shutter priority auto (S) and Manual (M), allow you to control the camera in a way that overrides certain parts of the Auto ISO sensitivity control.

In Manual (M) mode the camera completely relinquishes all control of the shutter and aperture. It can adjust only the ISO sensitivity by itself, so it can obey the Maximum sensitivity, but the Minimum shutter speed is overridden and does not apply.

In Shutter priority auto (S) mode the camera can control the aperture, but the shutter speed is controlled only by the camera user. So Auto ISO sensitivity control can still control the Maximum sensitivity, but the camera cannot control the Minimum shutter speed.

It may be a good idea to enable High ISO NR—as discussed a few pages back—when you turn on the Auto ISO sensitivity control. This is especially true if you leave the camera set to the default Maximum sensitivity value of 6400. Otherwise, you may have excessive noise when the light drops.

When and Why Should I Use Auto ISO Sensitivity Control?

How much automation do you need to produce consistently excellent images? Let's explore how and when automatic, self-adjusting ISO might improve or degrade your images. What is this feature all about? When and why should you use it? Are there any compromises in image quality when using this mode?

Normally, you will set your camera to a particular ISO number, such as 200 or 400, and shoot your images. As the light dims or as the shade deepens, you might



increase ISO sensitivity to continue taking handheld images. If you absolutely must get the shot, Auto ISO sensitivity control will work nicely. Here are a few scenarios:

- **Scenario 1** – Let's say you're a photojournalist and you're shooting flash pictures of the president as he disembarks from his airplane, walks into the terminal, and drives away in his limousine. Under these circumstances, you will have little time to check your ISO settings or shutter speeds and will be shooting in widely varying light conditions.
- **Scenario 2** – You're a wedding photographer in a church that doesn't allow the use of flash. As you follow the bride and groom from the dark inner rooms of the church into the lobby, and finally up to the altar, the light conditions will vary constantly. You have no time to deal with the fluctuations in light by changing your ISO.
- **Scenario 3** – You're at a party, and you want some great pictures. You want to use flash, but the pop-up Speedlight may not be powerful enough to reach across the room at low ISO settings. You really don't want to be bothered with camera configuration at this time but still want some well-exposed images. The light will vary as you move around the room talking and laughing and snapping pictures.

These scenarios present excellent environments for the Auto ISO sensitivity control. The camera will use your normal settings, such as your ISO, shutter speed, and aperture, until the light will not allow those settings to provide an accurate exposure. Only then will the camera raise the ISO or lower the shutter speed to keep functioning within the shutter/aperture parameters you have set.

Look at the Auto ISO sensitivity control as a fail-safe for times when you must get the shot but have little time to deal with camera settings or when you don't want to vary the shutter/aperture settings but still want to be assured of a well-exposed image.

Unless you're a private detective shooting handheld telephoto images from your car or a photojournalist or sports photographer who must get the shot every time regardless of maximum quality, I would not recommend leaving Auto ISO sensitivity control set to On. Use it only when you really need to get the shot under any circumstances!

Of course, if you are unsure of how to use the correct ISO for the light level due to lack of experience, don't be afraid to experiment with this mode. At the very worst, your images might be noisier than usual. However, it may not be a good idea to depend on this mode over the long term because noisy images are not very nice.

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Are There Any Drawbacks to Using Auto ISO Sensitivity Control?

Maybe! It really depends on how widely the light conditions vary when you are shooting. Most of the time your camera will maintain the normal range of ISO settings in Auto ISO sensitivity control, so your images will be their normal low-noise, sharp masterpieces. However, at times the light may be so low that the ISO will exceed the normal range of 100–800 and will start getting into the noisier ranges above ISO 800.

Be aware that Auto ISO sensitivity control can and will push your camera's ISO sensitivity into a range that causes noisier images when light levels drop, if you've allowed it by setting the Maximum sensitivity to a high level. Use it with this understanding and you'll do fine. ISO 6400 is the default maximum. Make sure you understand this or you might get some noisy images.

The Auto ISO sensitivity control is yet another great feature of your powerful Nikon D7000. Maybe not everyone needs this fail-safe feature, but some people rely on it. I use it in circumstances where getting the shot is the most important thing and where the light levels may get too low for normal ISO settings.

Even if you think you might use it only from time to time, do learn how to use it for those times. Experiment a bit with Auto ISO sensitivity control. It's fun and can be useful!



What Is ISO?

An ISO sensitivity number, such as 200 or 3200, is an agreed-upon sensitivity for the image-capturing sensor. Virtually everywhere you go in the world, all camera ISO numbers mean the same thing. With that fact being established, camera bodies and lenses can be designed to take advantage of the ISO sensitivity ranges they will have to deal with. Standards are good! ISO is an abbreviation for the International Organization for Standardization, a standard-setting group with representatives from several national standards organizations.

Multiple Exposure

(User's Manual – Page 152)

Multiple exposure is the process you use to take more than one exposure on a single frame, or picture. Most people do only double exposures, which is two exposures on one frame.

Multiple exposure requires you to figure the exposure values carefully for each exposure segment so that in the final picture all the combined exposures equal

one normal exposure. In other words, if you are going to do a nonmasked double exposure, your background will need two exposures at half the normal exposure value to equal one normal exposure.

The D7000 allows you to calculate your own exposure settings and do them manually, and it provides Auto gain to help you with exposure calculations.

There are really only three steps to setting up a Multiple exposure session, but there are six Shooting Menu screens we'll use to do the three steps. The three basic steps are as follows:

- Select the Number of shots you want to take.
- Set Auto gain to either On or Off depending on how you want to control the exposure.
- Take the picture.

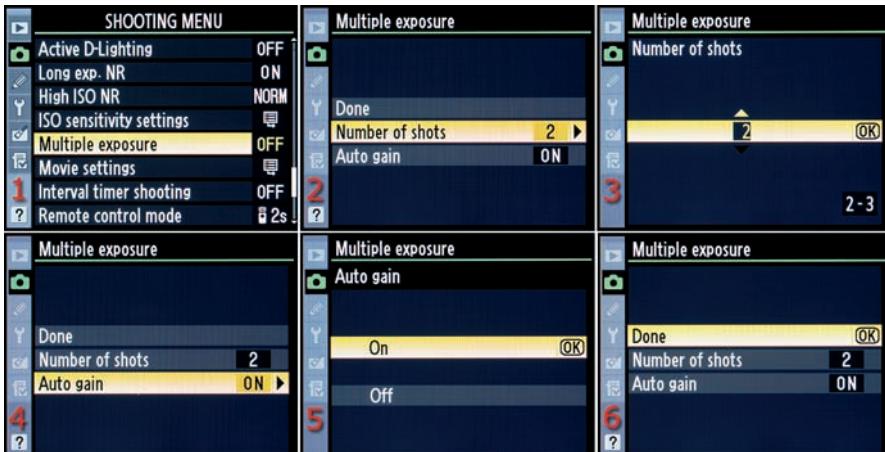


Figure 3.51 – Configuring the camera for Multiple exposures

The following instructions describe the six screens you will use to execute the three Multiple exposure steps:

1. Select **Multiple exposure** from the **Shooting Menu** and scroll to the right (figure 3.51, image 1).
2. Select **Number of shots** and scroll to the right (figure 3.51, image 2).
3. Enter the number of shots you wish to take—any number between 2 and 10—and press the **OK** button (figure 3.51, image 3).
4. Select **Auto gain** and scroll to the right (figure 3.51, image 4).
5. Select **On** and press the **OK** button (figure 3.51, image 5).
6. Select **Done** and press the **OK** button (figure 3.51, image 6).
7. Shoot your images from a tripod.

To repeat another Multiple exposure series with the same settings, use the screen in [figure 3.51, image 2](#), again, then select Done and press the OK button. That prepares the camera to do the Multiple exposure series in the same way as last time. The camera remembers the previous Number of shots and other settings until you reset them.

Understanding Auto Gain

Auto gain defaults to On, so you need to understand it if you use Multiple exposure frequently. Auto gain applies only if you want to make a number of exposure segments with the exact same exposure value for each frame. If you want to make two exposures, the camera will meter for a normal exposure and then divide the exposure in half for the two shots. For three shots, it will divide the exposure by one-third, four shots by one-quarter, eight shots by one-eighth, and so forth.

When you are done making the Multiple exposures, you have the equivalent of a single good exposure. Auto gain is like an automatic normal-exposure divider for Multiple exposures. It divides the exposure into appropriate sections so you won't have to.

If I want a two-shot Multiple exposure—a double exposure—I normally want the background to get half of a normal exposure in each shot so that it will appear normal when combined in the final image. Auto gain does that automatically. If I need four shots, I want the background to get only one-fourth of a normal exposure for each shot so that I'll have a normally exposed background when the four shots are taken.

I am repeating myself a little bit because it took me a little while to wrap my brain around the confusing presentation of this concept in the User's Manual. Whoever heard of gain meaning dividing something into parts? I think the manual is trying to say that each shot gains a portion of the normal exposure so that in the end the exposure is complete and correct. I hope this makes sense to you.

You should use Auto gain only when you have no need for controlling the exposure differently for each frame. Use it when you need an exact division of similar exposures.

Auto gain works fine if you're not using masks. When you use a mask, you want a full normal exposure for each of the uncovered (nonmasked) sections of the image, so Auto gain will not work. In this case, you should use manual exposure, with Auto gain turned Off.

My Recommendation: Multiple exposure images can be a lot of fun to create ([figure 3.52](#)). I often shoot Multiple exposure images with two people in the frame. One person leaves after the first half of the exposure is taken, and the other person stays carefully still. When you are finished, you will have a normal picture of one person and the background, but the person that left halfway through the Multiple expo-

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sure will be ghosted. That means you'll be able to see the background right through the ghosted person. If the person who stayed for the entire exposure was very careful not to move at all, the image will remain sharp. It will certainly raise eyebrows later.



Figure 3.52 – Example Multiple exposures

It's even more fun if you have the person that leaves touch the stationary person in some way during the first half of the Multiple exposure.

You can also do a Multiple exposure with just one person, as the second picture in [figure 3.52](#) shows. Just make sure the person leaves halfway through the Multiple exposure.

Finally, be sure to use a tripod when you create a Multiple exposure image, unless you mask part of the frame. Otherwise, the background will be completely blurred from camera movement.

Movie Settings

(User's Manual – Page 60)

Movie settings are a set of functions that allow you to adjust four specific things about how the Movie mode works:

- **Movie quality** – Select from six high-definition (HD) modes and two standard-definition (SD) modes.
- **Microphone** – Change the sensitivity of the internal or external microphone to four separate levels, or turn it off.
- **Destination** – Select which memory card (Slot 1 or Slot 2) will store all movies you create.
- **Manual movie settings** – Manually control shutter speed and ISO sensitivity when in Manual (M) mode. You can change the ISO and shutter speed during the video! Fast shutter speeds help prevent subject blurring in action sequences. (The aperture should be set just before starting Live view mode and remains constant throughout the video; it cannot be changed during the movie.)

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Movie Quality

The Movie quality setting allows you to control several aspects of a movie created with your camera. I count 12 Movie quality formats between the NTSC and PAL Video mode selections. Not all choices are available under each Video mode setting. Following are all available choices ([table 3.1](#)):

Frame Size	Resolution	Quality	FPS	Ratio	Video Mode
1920 x 1080	1080p HD	high	24	16:9	NTSC/PAL
1920 x 1080	1080p HD	normal	24	16:9	NTSC/PAL
1280 x 720	720p HD	high	24	16:9	NTSC/PAL
1280 x 720	720p HD	normal	24	16:9	NTSC/PAL
1280 x 720	720p HD	high	25	16:9	PAL
1280 x 720	720p HD	normal	25	16:9	PAL
1280 x 720	720p HD	high	30	16:9	NTSC
1280 x 720	720p HD	normal	30	16:9	NTSC
640 x 424	424p SD	high	25	3:2	PAL
640 x 424	424p SD	normal	25	3:2	PAL
640 x 424	424p SD	high	30	3:2	NTSC
640 x 424	424p SD	normal	30	3:2	NTSC

Table 3.1 – All available Movie quality settings

Note: When you change between NTSC and PAL in Setup Menu > Video mode, the camera changes the available selections under Shooting Menu > Movie settings > Movie quality. The D7000 will warn you of this fact when you select one of the two Video modes. [Table 3.1](#) shows all available settings; however, you'll never see all of them at the same time in a camera menu since some are specific to one of the two Video modes—NTSC or PAL.

The ratios (16:9 and 3:2) are format sizes. The HD format has a ratio of 16:9, and will display on a standard-definition television (SDTV) in the wide-screen format. The 3:2 ratio more closely matches the SDTV format we've been using for years, but it is rapidly becoming obsolete. A 3:2 movie will display full screen on a SDTV. All movie formats are limited to 20 minutes of recording time for each segment. In [table 3.2](#) is a list of approximate file sizes for 20-minute recording sequences.

There is an entire chapter of this book devoted to movies. It is called **Live View and Movie Modes**. Read that chapter for much more detail on shooting and displaying movies.

Frame Size	Quality	FPS	Length	Size
1920 x 1080	high	24	20 minutes	2.9 GB
1920 x 1080	normal	24	20 minutes	1.7 GB
1280 x 720	high	30	20 minutes	1.7 GB
1280 x 720	normal	30	20 minutes	1.1 GB
1280 x 720	high	25	20 minutes	1.7 GB
1280 x 720	normal	25	20 minutes	1.1 GB
1280 x 720	high	24	20 minutes	1.4 GB
1280 x 720	normal	24	20 minutes	1.0 GB
640 x 424	high	30	20 minutes	800 MB
640 x 424	normal	30	20 minutes	510 MB
640 x 424	high	25	20 minutes	800 MB
640 x 424	normal	25	20 minutes	510 MB

Table 3.2 – Approximate file sizes for the various quality ratings

Now, let’s examine how to select a Movie quality. Remember that the values shown in the following Shooting Menu screen (figure 3.53, image 3) are based on how Setup Menu > Video mode is configured (NTSC or PAL). Since I am shooting in North America and devices here generally use NTSC, the screen images in figure 3.53 show values based on NTSC. If you are using PAL you will see some additional choices (mostly 25 fps). Refer to table 3.1 for all the Movie quality values.



Figure 3.53 – Choosing a Movie quality

- Use the following steps to choose a Movie quality setting:
1. Select **Movie settings** from the **Shooting Menu** and scroll to the right (figure 3.53, image 1).
 2. Choose **Movie quality** from the **Movie settings** menu and scroll to the right (figure 3.53, image 2).
 3. Select one of the eight formats for **Movie quality** (figure 3.53, image 3).
 4. Press the **OK button** to choose the format.

Microphone

Now, let's look into the Microphone settings. The D7000 has a built-in Microphone, which consists of the three small holes just below the D7000 logo on the front of the camera. Be careful not to block them when you're recording.

You can also buy a plug-in stereo mic that uses the stereo plug under the rubber flap on the side of the camera. We'll look into this a little deeper when we get to the chapter called **Live View and Movie Modes**.

You can select from four sound-level settings—Auto, High, Medium, and Low—or set the Microphone to Off.



Figure 3.54 – Choosing a Microphone sensitivity

Use the following steps to select a sound-level setting:

1. Choose **Movie settings** from the **Shooting Menu** and scroll to the right (figure 3.54, image 1).
2. Select **Microphone** from the **Movie settings** menu and scroll to the right (figure 3.54, image 2).
3. Select one of the five choices. There are four choices, from **Low** to **Auto**, for sound-level sensitivity, or you can select **Microphone Off** (figure 3.54, image 3).
4. Press the **OK** button to lock in your choice.

Destination

Next, we'll examine the final Movie setting called Destination. This setting lets you choose which memory card will store your camera's video recordings. Just below the card slot selections you will see something like 00h 31m 44s on a card with other videos and images, or 00h 46m 15s on an empty 8-GB card. This is the total recording time a particular card will hold.

As mentioned in the previous table, movie files can be quite large when shot in full 1080p mode. An 8-GB memory card can probably hold a little under an hour of video since its file size is approximately 2.9 GB per 20-minute segment.

As usual, Nikon chooses to be conservative on memory card space estimates. An 8-GB memory card generally reports that it can hold about 46 minutes of 1080p video. You may or may not be able to store more than that, so use it as a guideline for your shooting times. If you are serious about shooting video with your camera, you should buy some high-capacity cards—you'll need them!

Of course, the problem is somewhat alleviated by the fact that the D7000 has multiple card slots available (Slot 1 and Slot 2), so you can load up with some big cards on days you go out shooting movies.



Figure 3.55 – Choosing a memory card Destination slot

Use the following steps to select a Destination slot for your movies:

1. Select **Movie settings** from the **Shooting Menu** and scroll to the right (figure 3.55, image 1).
2. Choose **Destination** from the **Movie settings** menu and scroll to the right (figure 3.55, image 2).
3. Select one of the two cards slots: **Slot 1** or **Slot 2** (figure 3.55, image 3).
4. Press the **OK button** to lock in your choice.

Manual Movie Settings

Nikon has given us much greater manual control over movie exposure with the D7000. Most of us will use the normal, convenient automatic modes. However, some people buy the D7000 to outfit it as a real movie maker, with all the cool attachments like stabilization, bigger external video monitors, and an external stereo mic. For those individuals, manual recording modes are often needed.

By setting the Mode dial to Manual (M), you can use the shutter speed control (Main command dial) to control subject movement, just like when you take still pictures. In addition, you can change the ISO sensitivity when needed. You can change both the shutter speed and ISO during video recording.

You can also control the aperture to use depth of field selectively; however, there is a serious limitation. You must set the aperture before you enter Live View mode and start the movie. After the aperture is set, it cannot be changed without stopping

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the video recording.

The Nikon D7000 is much closer to a professional video camera than previous Nikon DSLRs. You still can't control the aperture during video recording, but you can control the shutter speed and ISO sensitivity. This makes the D7000 so much more flexible and usable as a video recorder, especially with the more effective rolling shutter compensation and longer 20-minute recording segments.

Note: We'll discuss the rolling shutter effect and why it needs compensation, along with how to manually control shutter speed and ISO sensitivity, in the chapter titled **Live View and Movie Modes**.

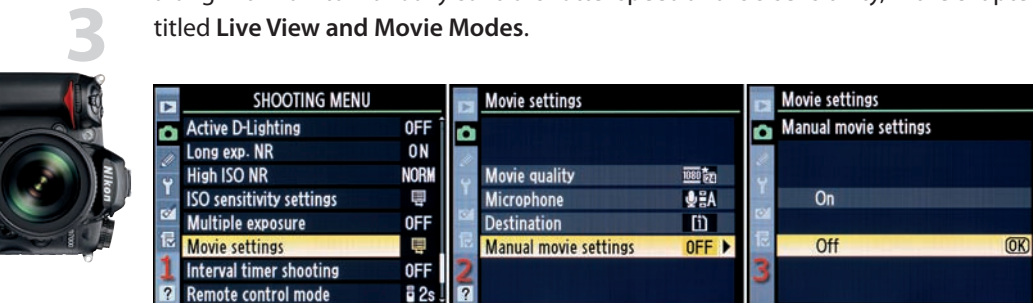


Figure 3.56 – Choosing Manual movie settings

Use the following steps used to enable or disable the Manual movie settings:

1. Select **Movie settings** from the **Shooting Menu** and scroll to the right (figure 3.56, image 1).
2. Choose **Manual movie settings** from the **Movie settings** menu and scroll to the right (figure 3.56, image 2).
3. Select either **On** or **Off** from the **Manual movie settings** menu (figure 3.56, image 3).
4. Press the **OK** button.

My Recommendation: When you shoot a movie, have a specific display type in mind. If you have an SDTV, the 640 x 424 format fits the screen well, but it seriously limits the quality and size of the movies for high-resolution display devices. An HDTV requires the 1920 x 1080 or 1280 x 720 format so you can display HD video. I shoot mostly in 1080p HD mode (high quality).

However, if you are shooting some fun videos of family gatherings, the normal quality video mode will save memory card space. Video recording is a highly personal thing. It really varies according to what you are going to do with the video. If you want to make money on one of the many stock imaging sites that now accept video clips, by all means use the highest-quality mode. If you are shooting for personal use, test the normal modes for quality, especially if you have small memory cards.

Video Compression Type and Audio

For the technically inclined individuals among us, the D7000 uses the following type of video compression and audio formatting: H.264/MPEG-4 Advanced Video Coding, with MOV (Apple QuickTime) file format; audio recording format is Linear PCM.

Interval Timer Shooting

(User's Manual – Page 155)

Interval timer shooting allows you to set your camera up to shoot a series of images over time. Make sure you have a full battery or are connected to a full-time power source, such as the Nikon EH-5a AC adapter, for images taken over long periods of time.

The first step in using Interval timer shooting is to make sure that your Time zone and Date and time are set correctly in the Setup Menu (see the subheadings called **Time Zone** and **Date and Time** in the chapter titled **Setup Menu**). If you don't have the Date and time set, the Interval timer shooting menu selection will be grayed out, and you won't be able to use it.

The screens shown in [figure 3.57](#) look a little daunting, but it might help you to realize that the bottom half of screens 2–6 is informational in nature. They show the settings you create in the top half of each screen.

There are four basic steps involved in configuring Interval timer shooting (we will go through the steps in a more detailed way momentarily):

- Choose a Start Time.
- Choose an Interval.
- Choose the number of intervals (Select intervals).
- Choose the number of shots per interval (no. of shots).

If you want to take a series of images starting Now (Start time) and shoot every 10 seconds (Interval) over a period of 30 seconds, or 3 intervals (number of intervals), making 2 images per interval (no. of shots), you'll need to follow the upcoming step-by-step method.

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Get your camera and try these steps yourself so they will make sense to you. This is one of the more difficult functions to understand, for most people, so it is important that you use your camera and step through the process.



Figure 3.57 – Setting up Interval timer shooting

1. Under **Choose start time** (figure 3.57, image 2), select **Now**, and the timer will start 3 seconds after you've completed steps 3–5 (skipping step 2). If you select **Now**, the camera will skip step 2 since it selects a start time. If you'd rather start at a future time—instead of now—simply select **Start time** (figure 3.57, image 2) and scroll right, then move on to step 2. You will now see a **Start time** menu (figure 3.57, image 3), with the time in 24-hour (military) format:

00:00

Enter the time at which you want the intervals to begin. If you want to start at 3:30 p.m., insert the following:

15:30

After you've entered the time, scroll to the right.

2. You will now see the **Interval** screen with hours, minutes, and seconds in the following format (figure 3.57, image 4):

00:00'00"

The first two zeros represent the hour, the second set represents minutes, and

the third set represents seconds. Since we want to start out with an **Interval** of 10 seconds, let's set the screen to look like this:

00 : 00' 10"

Scroll to the right to get to the next screen.

- Now we'll select the number of intervals (figure 3.57, image 5). This screen says **Select intervals X no. of shots** in the following format. The number of intervals x the number of shots = total shots.

000 x 0 = 0000

Set your camera so it looks like this (figure 3.57, image 5):

003 x 2 = 0006

This means that there will be 003 intervals of 10 seconds each (set in step 3), and the camera will take 2 pictures in each interval for a total of 0006 pictures. In other words, 2 pictures will be taken every 10 seconds over a period of 30 seconds, for a total of 6 images. Now scroll to the right to get to the next screen.

- Select **On** from the final screen (figure 3.57, image 6) and press the **OK button**. A *Timer active* message will appear on your camera's **Monitor** (figure 3.58). If you look at the top **Control panel** you will see the word *INTVL* flashing. This will keep flashing as long as **Interval timer shooting** is in operation.



Fig. 3.58 – Interval timer active

If you are shooting a timed interval during daylight hours, be sure to use the little black eyepiece cap (DK-5) supplied with your camera. Otherwise, changes in the light from behind the camera could cause the exposure to be inaccurate.

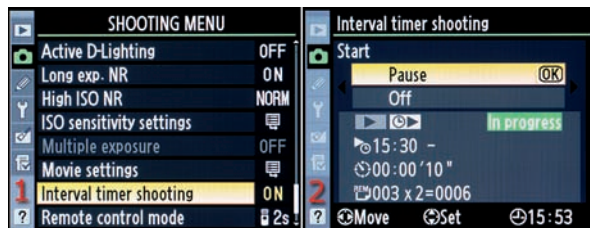


Figure 3.59 – Pause Interval timer shooting

As shown in figure 3.59, to pause or stop an interval and cease timer operations, simply select **Interval timer shooting** from the **Shooting Menu** and scroll to the right.

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This won't work if your intervals are very close together.

Notice that [figure 3.59, image 1](#), shows the Interval timer shooting is On, proving that an interval is in progress.

After scrolling to the right, you can select Pause or Off from the screen with the bright green In progress bar ([figure 3.59, image 2](#)). You will also see the Start time (currently 15:30; if Now was selected, a series of dashes would be shown), current interval delay, and number of intervals and shots remaining, in case you don't want to pause or stop it but just want to see how things are going.

The number of intervals remaining will be displayed on the Control panel, in the same spot the shutter speed is normally displayed. The place that normally displays the aperture will instead display the number of shots remaining in the current interval setup.

Note: Be sure to adjust any bracketing for the exposure or flash (AE & flash or Flash only), or Active D-Lighting (ADL bracketing), before you start the Interval timer shooting. Bracketing overrides no. of shots, so you may not get what you expected if any kind of bracketing is active. We will discuss more about bracketing in the chapter titled **Custom Setting Menu**, under Custom setting e5 (Auto bracketing set).

My Recommendation: Interval timer shooting is somewhat complicated, but if you read this section carefully and practice using it as you read, you'll learn quickly. This type of photography allows you to shoot things like flowers gradually opening or the Sun moving across the sky. Have some fun with it!

Remote Control Mode

(User's Manual – Pages 80, 281)

Remote control mode operates with your camera's Self-timer and the Nikon ML-L3 wireless remote control. Its primary purpose is to give you a way to take hands-off images while the camera is on a tripod. This reduces camera shake and allows you to release the shutter either remotely or up close without touching the camera.

To use the Remote control mode you'll need to select one of the modes; mount your camera on a tripod, bean bag, or other support device; set the Release mode dial to Self-timer (it looks like a clock with a single hand at 11 o'clock); and use the button on the ML-L3 remote control to fire the shutter.

There are three Remote control modes available:

- **Delayed remote** – When you press the ML-L3 shutter-release button, the camera waits two seconds and then fires the shutter.
- **Quick-response remote** – When you press the ML-L3 shutter-release button, the camera fires the shutter immediately.



- **Remote mirror-up** – The first press of the ML-L3 shutter-release button raises the reflex mirror. Wait for camera and tripod vibrations to subside, and press the ML-L3 shutter-release button again to fire the shutter. This is a two-step operation that can help you create sharper images by allowing vibrations to cease before taking the picture.

You will use the screens shown in [figure 3.60](#) to select one of the modes. Use the following steps to prepare the camera for shooting in Remote control mode:

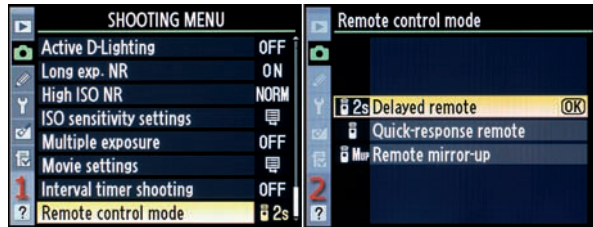


Figure 3.60 – Selecting a Remote control mode

1. Set your camera up on a tripod or other stationary device.
2. Remove the rubber viewfinder eyepiece (Rubber eyecup) by sliding it upward.
3. Install the plastic DK-5 eyepiece cover where the Rubber eyecup was. This prevents improper exposures by preventing light from entering the viewfinder eyepiece. The DK-5 eyepiece cover should be in the box that the camera came in, or you can buy one from a camera store.
4. Set the camera to [Self-timer](#) mode by choosing the self-timer symbol from the [Release mode dial](#). Hold down the [Release mode dial lock release button](#) ([figure 3.61](#), red arrow on left), and turn the dial until you have selected [Self-timer](#) (red arrow on right).
5. Select [Remote control mode](#) from the [Shooting Menu](#) and scroll to the right.
6. Choose your favorite [Remote control mode](#) from the three choices. I chose [Delayed remote](#) in [figure 3.60, image 2](#).
7. Press the [OK button](#) to select the mode you want to use.
8. Take some pictures.



Fig. 3.61 – Self-timer mode

My Recommendation: I am pleased to see the Remote mirror-up mode on the D7000. This is considered a professional feature by most people. It allows you to take very sharp images by removing the chance of camera shake from the movement of the reflex mirror. I recommend that you learn to use this mode anytime you are shooting for maximum quality. All three of the Remote control modes have their place. Learn to use them all for maximum flexibility.

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My Conclusions

Congratulations! You've fully configured one of the camera's user settings. Now, set up another one. Using the camera's two user settings (U1 and U2) allows you a great deal of flexibility in how your camera operates. You can switch between two different camera configurations very quickly.

The upcoming information about the Custom Setting Menu will round out the major configuration of your camera for daily shooting. So, let's move on to the Custom Setting Menu.

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Custom Setting Menu

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Hanging Out – Courtesy of Dean Andersen (*DeanAZ*)

Back in the early days of photography, such as pre-1999, cameras were relatively simple affairs. They were either manual or had a few semiautomatic modes. The professional Nikon cameras had a few tricks up their sleeves with features controlled by what were called the CSM settings. The menu used a system of hard-to-remember CS numbers. Few people could easily remember what CS 3 or CS 7 meant, so they used the small, thin manuals for initial configuration or simply ignored the settings.

How things have changed! The camera you hold in your hand has a CSM menu too. It turns out that the early seed planted by Nikon software engineers has grown from a few sparse CSM settings to a full-blown dictionary of Custom Setting Menu settings. It turns out that CSM stood for Custom Setting Menu and CS stood for Custom setting. Little did we know that our basic cameras would turn into computerized machines of photographic automation. Where the 50-page manuals of yesterday fully sufficed, today's cameras come with manuals more like an encyclopedia volume.

Fortunately, that massive amount of computer automation and inherent complexity provides a camera that—even in inexperienced hands—can produce excellent pictures consistently. When an advanced photographer wants to learn how to use the various features provided on and in the camera, it can take weeks of study to fully master. But then you can do things with the camera that less-experienced users can't. A book, like this one, can compress the time it takes to complete that study, by providing the real-life experience of a person who has already taken time to fully research and explain each part of your camera.

Your Nikon D7000 is a truly powerful camera. It can be used as a fully automated point-and-shoot or as a master's brush for creative photography. As we progress through the literally hundreds of choices in the Custom Setting Menu, you may discover things that you never knew a camera could do. With a little effort, you can come away with a much greater understanding of how to use your new photographic tool.

The Custom Setting Menu is the core of the camera's configurability. Combined with the Shooting Menu ([chapter 3](#)) and the Setup Menu ([chapter 5](#)), you have complete control over how the D7000 functions. Without further ado, let's look deeply into the 48 settings found in the Custom Setting Menu and continue our journey to mastering the Nikon D7000.

Using the Camera's Help System

The D7000 is complex enough that it needs a help system. Fortunately for us, Nikon gave us one. Whenever you have a function selected in one of the menus, you can press and hold the Help/protect button and a help screen will appear for that function. When you are trying to use help in the Custom Setting Menu, be sure that

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you are not looking at the top of the menu but are inside of it. In other words, help won't work for menu selections such as a Autofocus or b Metering/exposure. It will work in the level underneath those menus, such as a1 AF-C priority selection or b1 ISO sensitivity step value. Check out the useful help screens. They are excellent for when you have forgotten exactly what a function does and could use a reminder.

The User Settings and the Custom Setting Menu

Like the Shooting Menu we studied in the last chapter, the Custom Setting Menu options are also stored within the user settings (U1 and U2) found on the Mode dial. Although there is no direct connection between the Shooting Menu and the Custom Setting Menu, you can make a connection by configuring both menus under one user setting.

Maybe user setting U1 will be a repository for a certain style-paired Shooting Menu and Custom Setting Menu configuration; and user setting U2 will be for menus configured in a completely different style-based way. I do this with my D7000 by configuring the Shooting Menu and Custom Settings Menu for nature photography in U1 and storing events photography settings in U2.

When you think of the Shooting Menu and Custom Setting Menu as a paired group of settings controlled by one of the user settings, you begin to see how powerful the Nikon D7000 can be.

Be absolutely sure that you save your settings in U1 before going to U2 to make changes. Otherwise, you'll lose your carefully configured settings in either the Shooting Menu or Custom Setting Menu for that particular user setting. Save the user settings in the Setup Menu with the following function:

Setup Menu > Save user settings > U1 (or U2) > Save settings

Note: Remember that the Shooting Menu and Custom Setting Menu configurations outside of U1 and U2—or what I call non-user settings—are completely different camera configurations than the configurations in U1 and U2. As a result, there are three ways to configure your camera's Shooting Menu and Custom Setting Menu: by using U1, U2, or non-user settings.

Now, let's see how to use and configure the 48 functions of the Custom Setting Menu. You should repeat the configuration of all these functions for each user setting. This allows you to configure the camera in two completely different ways, one for U1 and another for U2. The non-user settings outside of U1 and U2 can simply be used for general everyday shooting.

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Using the Custom Setting Menu

(User's Manual – Page 206)

Figure 4.1 shows the location of the Custom Setting Menu. It's the third menu down on the left-side icon bar, and its symbol looks like a small pencil.



Fig. 4.1 – Custom Setting Menu

There are six Custom Setting Menu headings in the D7000 (a–f). Each menu heading has several items underneath it (totaling 48 subitems). We have a lot of ground to cover, and we will do so in great detail. But first, there is an initial item on the menu that we'll need to consider before we get into the main Custom settings.

Reset Custom Settings

If you ever want to start fresh with the Custom settings under a particular user setting, you can return the camera to the factory default configuration with Reset custom settings. Maybe

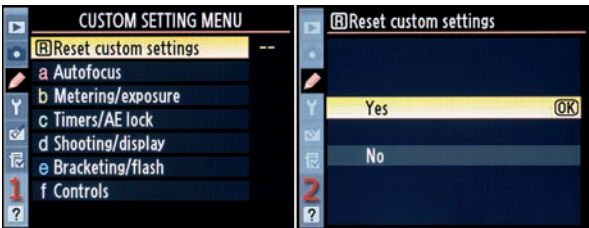


Figure 4.2 – Reset custom settings

you no longer like how you have the Custom settings configured in U1, for instance. You can use the screens in figure 4.2 to reset U1. Make sure you have the Mode dial set to the correct user setting (U1, U2, or the non-user setting outside U1 and U2) before you use the Reset custom settings function.

Here are the steps to Reset custom settings that are currently active:

1. Select **Reset custom settings** from the **Custom Setting Menu** and scroll to the right (figure 4.2, image 1).
2. Choose **Yes** from the menu (figure 4.2, image 2).
3. Press the **OK button** to **Reset custom settings** under the current user setting to factory default settings.

This chapter is divided into six distinct sections. There is a section for each major division of the Custom settings, such as a Autofocus, b Metering/exposure, or d Shooting/display. The clear divisions will make it easy to find a particular setting in the large number of available choices.

Now, let's look at each setting, starting with those found under Custom setting a Autofocus.



a Autofocus

Custom Settings a1–a8

You'll find eight Custom settings within the a Autofocus menu:

- a1 AF-C priority selection
- a2 AF-S priority selection
- a3 Focus tracking with lock-on
- a4 AF point illumination
- a5 Focus point wrap-around
- a6 Number of focus points
- a7 Built-in AF-assist illuminator
- a8 Live view/movie AF

This section is about how to configure the autofocus system in various ways. The whole process is rather complex, yet it is important for good photography. Autofocus and related functions are important enough that I've included an entire chapter titled **Autofocus, AF-Area, and Release Modes**. It covers autofocus and related functions in much deeper detail. Please be sure to read that chapter thoroughly.

a1 AF-C Priority Selection

(User's Manual – Page 208)

The a1 AF-C priority selection setting is designed to let you choose how your autofocus works when using Continuous-servo autofocus mode (AF-C). If you configure this setting incorrectly for your style of shooting, it's entirely possible that a number of your pictures will be out of focus. Why?

Notice in [figure 4.3, image 3](#), that there are two specific selections:

- **Release (default)** – If the image must be taken no matter what, you'll need to set AF-C priority selection to Release. This allows the shutter to fire every time you press the Shutter-release button, even if the image is not in focus. Releasing the shutter has priority over autofocus. If you are well aware of the consequences of shooting without a focus guarantee, then use this setting to make your camera take a picture every time you press the Shutter-release button. Your camera will shoot at its maximum frames per second (fps) rate since it is not hampered by the time it takes to validate that each picture is in correct focus. You'll need to decide whether taking the image is more important than having it in focus.



- **Focus** – This setting is designed to prevent your camera from taking a picture when the Focus indicator in the Viewfinder is off. In other words, if the picture is not in focus, the shutter will not release. It does not mean that the camera will always focus on the correct subject. It simply means that your camera must focus on something before it will allow the shutter to release. Nikon cameras do a very good job with autofocus, so you can usually depend on the AF module to perform well. The Focus setting will drastically increase the chances that your image is in correct focus.

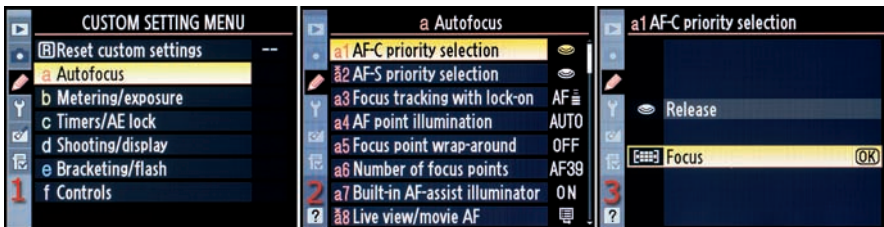


Figure 4.3 – The a1 AF-C priority selection setting

Use the following steps to select a shutter-release priority when using a1 AF-C priority selection:

1. Select **a Autofocus** from the **Custom Setting Menu** and scroll to the right (figure 4.3, image 1).
2. Highlight **a1 AF-C priority selection** and scroll to the right (figure 4.3, image 2).
3. Choose **Release** or **Focus** from the menu, with full understanding of what may happen if you don't choose **Focus** (out-of-focus pictures).
4. Press the **OK** button to select your shutter-release priority.

My Recommendation: Since I'm not a sports or action shooter, I choose Focus. Even if I were an action shooter, I would choose Focus. Read the section called **Using Custom Settings a1 and a2** before you make your final choice. The safe choice is Focus.

a2 AF-S Priority Selection

(User's Manual – Page 208)

The a2 AF-S priority selection setting is very similar to a1 AF-C priority selection. It also allows you to choose whether the camera will take a picture with something out of focus. With this setting, you set the shutter-release priority for Single-servo autofocus mode (AF-S). If you set it incorrectly for your style of shooting, many of your pictures may be out of focus. There are two modes to choose from:



- **Release** – A photo can be taken at any time. This can lead to images that are out of focus unless you manually focus each time you take a picture. The camera's priority is releasing the shutter when you press the Shutter-release button, and it will do so even if nothing is in focus.
- **Focus** (default) – The image must be in focus or the shutter will not release. This means that the shutter won't release unless the Focus indicator in the Viewfinder is on. This is the closest thing to a guarantee that your image will be in focus when you press the Shutter-release button. However, if you are focused on the wrong part of your subject, the camera will still fire.

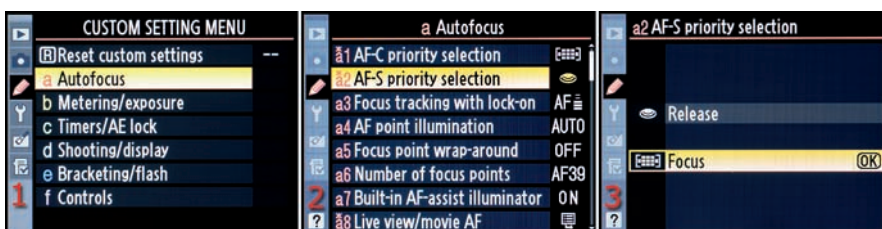


Figure 4.4 – The a2 AF-S priority selection setting

Use the following steps to select a shutter-release priority when using a2 AF-S priority selection:

1. Select **a Autofocus** from the **Custom Setting Menu** and scroll to the right (figure 4.4, image 1).
2. Highlight **a2 AF-S priority selection** and scroll to the right (figure 4.4, image 2).
3. Choose one of the two settings from the menu, with full understanding of what may happen if you don't choose **Focus** (figure 4.4, image 3).
4. Press the **OK button** to select your shutter-release priority.

My Recommendation: I choose Focus priority when using AF-S. I love pictures that are in focus, don't you? When I want to manually control focus, I'll just flip the switch to manual on the camera or lens and focus where I want. Please read the next section very thoroughly!

Using Custom Settings a1 and a2

Two of the more important settings are a1 AF-C priority selection and a2 AF-S priority selection. I added this special section so you'll understand why you must pay very close attention to these two settings.

Focus priority simply means that your camera will refuse to take a picture until it can reasonably focus on something. Release priority means that the camera will take a picture when you decide to take it, whether anything is in focus or not!

Now, you might ask yourself why there is such a setting as Release priority. Many professional photographers shoot high-speed events at high frame rates—taking hundreds of images—and use depth of field (or experience and luck) to compensate for less than accurate focus. They are in complete control of their camera's systems since they have a huge amount of practice in getting the focus right where they want it to be. There are valid reasons for these photographers not to use Focus priority.

You need to ask yourself what type of photographer you are. If you are a pro shooting hundreds of pictures of fast race cars, Focus priority may not be for you. However, for average photographers taking pictures of their kids running around the yard, deer jumping a fence, beautiful landscapes, flying birds, or a bride tossing a bouquet, Focus priority is usually the best choice. For most of us, it's better to have the camera refuse to take the picture unless it's able to focus on our subject.

When you're shooting at a high frame rate, Focus priority may cause your camera to skip a series of out-of-focus images. It will slow your camera's frame rate so that it will not reach the maximum six frames per second, in some cases. But, I have to ask, what is the point of several out-of-focus images among the in-focus pictures? Why waste the card space and then have to weed through the slightly out-of-focus images?

Pay special attention to these two settings. You will need to decide—based on your style of shooting—whether you want your camera to refuse to take an out-of-focus image. If you set a1 and a2 to Focus priority and you try to take an out-of-focus image, the Shutter-release button will simply not release the shutter. The Focus indicator in the Viewfinder will have to be on before the shutter will release.

My Recommendation: I set both a1 and a2 to Focus priority. I'm not a high-speed shooter, so I don't need my camera to take a picture no matter what if that includes a series of out-of-focus images. What good are out-of-focus images? We'll discuss this even more in the chapter titled Autofocus, AF-Area, and Release Modes.

a3 Focus Tracking with Lock-On

(User's Manual – Page 209)

The a3 Focus tracking with lock-on setting allows you to select the length of time that your camera will ignore an intruding object that blocks your subject.

In other words, let's say you are focused on a bird flying past you. As you pan the camera with the bird's movement, the autofocus system tracks it and keeps it in good focus. As the bird flies by, a road sign briefly interrupts the focus tracking as the bird moves behind it and then reemerges. It would be quite aggravating if the bright, high-contrast road sign grabbed the camera's attention and you lost tracking on the bird.

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The D7000 provides Focus tracking with lock-on to prevent this from happening. The lock-on portion of this function helps your camera keep its focus on your subject, even if something briefly comes between the camera and the subject. Without Focus tracking with lock-on, any bright object that gets between you and your subject may draw the camera's attention and cause you to lose focus on the subject.

The camera provides a variable time-out period for the lock-on functionality. The lock-on time-out function allows an object that stays between the camera and your subject for a predetermined length of time to attract the camera's attention. You can adjust the length of this time-out from 1 (Short) to 5 (Long).

You'll need to test the time-out length to see which setting works best for you. You might start with the factory default, 3 (Normal), and let something get between you and your subject. If you'd like the camera to ignore an intruding subject for a longer time, move the setting toward 5 (Long), or for less time, move it toward 1 (Short). I don't suggest turning it Off unless you fully understand how it works and do not need focus tracking to lock on to your subject.

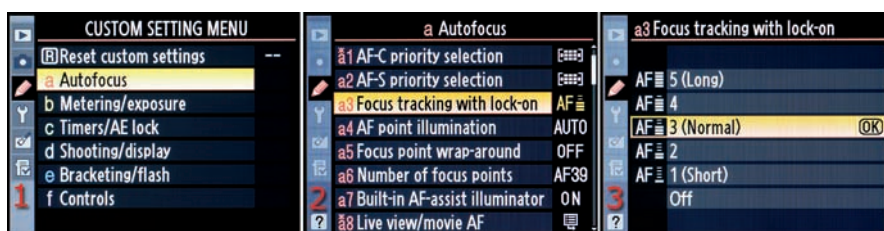


Figure 4.5 – The a3 Focus tracking with lock-on setting

Use the following steps to configure a3 Focus tracking with lock-on:

1. Select **a Autofocus** from the **Custom Setting Menu** and scroll to the right (figure 4.5, image 1).
2. Highlight **a3 Focus tracking with lock-on** and scroll to the right (figure 4.5, image 2).
3. Choose one of the five options (5–1), or **Off**, from the menu (figure 4.5, image 3).
4. Press the **OK** button to select the time-out period.

With Single-point AF, the camera will start the lock-on time-out as soon as the single AF point is unable to detect the subject. With Dynamic-area AF or Auto-area AF and Focus tracking with lock-on enabled, I was amused at how adamant the camera was about staying with the current subject. I focused on a map on the wall and then covered most of the focusing points with the User's Manual. As long as I allowed at least one or two AF points to remain uncovered so it could see the map, the focus did not switch to the User's Manual. I could imagine the D7000 muttering,

Hah, you can't fool me. I can still see a little edge of the map, so I'm not changing focus!

Only when I placed the User's Manual completely in front of the lens, covering all the AF points, did the camera decide to start timing the Focus tracking with lock-on time-out. After a few seconds, the camera gave up on the map and focused on the manual instead.

Try this yourself! It's quite fun and will teach you something about the power of your camera's AF system. You will also see how long each setting causes the time-out to last so you can choose your favorite setting.

Does Lock-On Cause Autofocus to Slow Down?

Focus tracking with lock-on is an autofocus algorithm that allows your camera to maintain focus on a subject and ignore anything that comes between it and the subject for a specific period of time. It will lock-on to that subject and track where the subject is on the array of AF points in the Viewfinder. Focus tracking with lock-on is controlled by configuring Custom setting a3 to a specific duration or to Off.

Some misunderstanding surrounds this technology. Since it is designed to cause autofocus to hesitate for a variable time period before seeking a new subject, it may make the camera seem sluggish. This sluggishness is really a feature designed to keep you from losing your subject's tracked focus. Once the camera locks on to a subject's area of focus, it tries its best to stay with that subject even if it briefly loses the subject. This keeps the lens from racking in and out and searching for a new subject as soon as the previous subject is no longer under an AF point.

It also causes the camera to ignore other higher contrast or closer subjects while it follows your original subject. You will have to judge the usefulness of this technology for yourself. I suggest that you go to some event, or maybe to a lake, and track moving objects with and without lock-on enabled. Your style of photography has a strong bearing on how you'll use—or whether you'll use—Focus tracking with lock-on.

This feature has little to do with how well the camera focuses. Instead, it is concerned with what the camera is focused on. There are several good reasons to leave Focus tracking with lock-on enabled in your camera.

If Focus tracking with lock-on is set to Off, Dynamic-area AF and Auto-area AF will instantly react to something that comes between your subject and the camera. When you enable Focus tracking with lock-on, the camera will ignore anything that briefly gets between you and your subject. If you turn it off, your camera will happily switch focus to a closer subject even if it only appears in the frame for a moment. A good example of this is when you are tracking a moving subject and just as you are about to snap the picture, a closer or brighter object enters the edge of the frame and is picked up by an outside sensor. The camera may instantly switch focus

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to the intruding subject. If you turn off Focus tracking with lock-on, your camera won't know how to keep its attention on the subject you are trying to photograph if something interferes. When using Dynamic-area AF or Auto-area AF modes, I refer to turning off Focus tracking with lock-on as focus roulette!

Configuring Custom setting a3 is not difficult. However, you'll need to decide how long you want your camera to lock on to a subject before it decides that the subject is no longer available.

My Recommendation: I leave Focus tracking with lock-on enabled at all times. When I'm tracking a moving subject, I don't want my camera to be distracted by every bright object that gets between me and the subject. Nikon gives us variable lock-on time-outs so we can change how long the camera will keep seeking the original subject before it switches to a new subject. Play around with this setting until you fully understand how it works. Watch how long the camera stays locked on one subject before an intruding subject grabs its attention. This is one of those settings that people either love or hate. I find it quite useful for my type of photography. Try it and see what it does for you.

a4 AF Point Illumination

(User's Manual – Page 209)

The a4 AF point illumination setting helps you see the currently active AF points when you first start autofocus. You've seen the little squares that represent the AF points in the Viewfinder when they briefly appear in red and then turn black. Sometimes the Viewfinder is dark, and it might be difficult to see a black square.

If AF point illumination is turned Off, you'll still have the black square that represents your selected AF point, but you may not be able to see it. If you set AF point illumination to Auto or On, the point will flash red when you first start autofocus or select a different AF point with the Multi Selector.

There are three selections on the AF point illumination screen. These selections affect how the AF points are displayed when they are active:

- **Auto** – If the background of the Viewfinder is dark, the selected AF point(s) will briefly flash red when you press the Shutter-release button to start autofocus. If the background is bright, you'll have no trouble seeing the black AF points, so they don't flash red when you start autofocus.
- **On** – The selected AF point is highlighted in red when you start autofocus, regardless of the light level of the background.
- **Off** – The selected AF point does not light up in red when you start autofocus. It always stays black.

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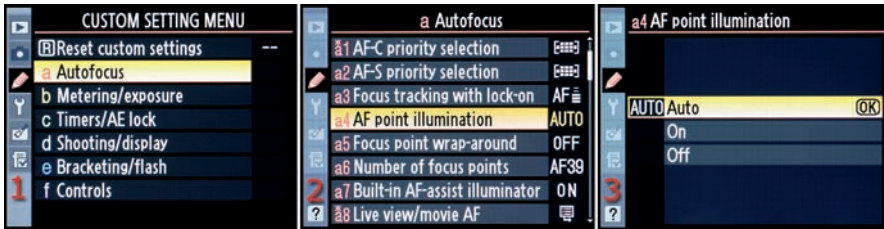


Figure 4.6 – The a4 AF point illumination setting

Use the following steps to configure a4 AF point illumination:

1. Select **a Autofocus** from the **Custom Setting Menu** and scroll to the right (figure 4.6, image 1).
2. Highlight **a4 AF point illumination** and scroll to the right (figure 4.6, image 2).
3. Choose one of the three options from the menu. In figure 4.6, image 3, I selected **Auto**.
4. Press the **OK button** to lock in the setting.

My Recommendation: The simplest setting to use is Auto, since that lets the camera determine if there is enough light coming through the Viewfinder for you to see the AF points at the start of autofocus. If you want to force the AF points to flash each time you start autofocus or select different points with the Multi Selector, you can set AF point illumination to On. I wouldn't leave this set to Off unless I was in a consistently lighted studio where the Viewfinder has good contrast.

a5 Focus Point Wrap-Around

(User's Manual – Page 209)

The a5 Focus point wrap-around setting allows you to control how AF point scrolling on the Viewfinder works. When you are scrolling horizontally or vertically to select an AF point in the array of 51 points, you will eventually come to the edge of the Viewfinder area.

The Focus point wrap-around setting allows you to set whether the AF point selector simply stops when it gets to the edge of the array or scrolls to the opposite side. If you turn on Wrap and scroll toward the left side of the AF point array, you can continue scrolling to the right side of the screen.

This setting works the same vertically. If you scroll off the top of the sensor area, the AF point selector will reappear on the bottom.

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Here is a description of the two choices:

- **Wrap** – This setting allows the AF point selector to scroll off the Viewfinder screen and reappear on the other side.
- **No wrap** (default) – If you scroll across the array of AF points and come to the edge of the screen, the AF point selector stops there. You have to use the Multi Selector to move the selector in the opposite direction, back toward the middle.

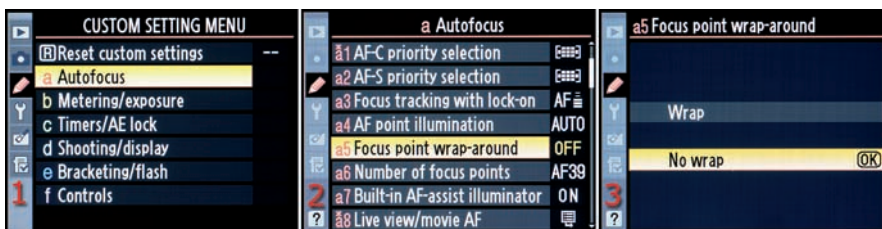


Figure 4.7 – The a5 Focus point wrap-around setting

Use the following steps to configure a5 Focus point wrap-around:

1. Select **a Autofocus** from the Custom Setting Menu and scroll to the right (figure 4.7, image 1).
2. Highlight **a5 Focus point wrap-around** and scroll to the right (figure 4.7, image 2).
3. Choose **Wrap** or **No wrap** from the menu. In figure 4.7, image 3, I selected **No wrap**.
4. Press the **OK** button to lock in the setting.

My Recommendation: Wrapping the AF point selector from one side to the other drives me bonkers. I don't like it on my computer screen or in my camera's Viewfinder. When I reach the edge of the array, I want the selector to stop so I can scroll back the other way with the Multi Selector. However, I humbly submit that some people will simply adore having their AF point selector wrap to the other side of the Viewfinder. If that describes you, simply set it to Wrap. It's always No wrap for me!

a6 Number of Focus Points

(User's Manual – Page 210)

The a6 Number of focus points setting lets you choose how many AF points you want to use when you scroll manually with the Multi Selector. There are two selections available: AF39 and AF11.

If you are using any of the AF-area modes besides Auto-area AF, you can unlock the Multi Selector with the small switch directly below it. If the switch is pointing at L, the Multi Selector is locked; if it is pointing at the white dot, it is unlocked.

When it is unlocked, you can use the Multi Selector to move the AF point selector around the Viewfinder so you can select particular areas of your subject to focus on.

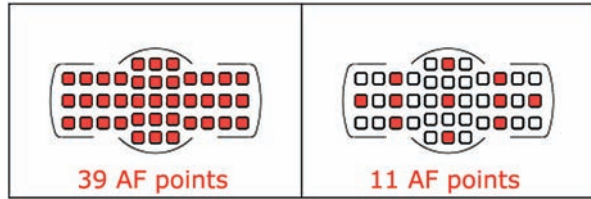


Figure 4.8 – All 39 AF points versus 11 AF points

Since the D7000 has 39 focus points (figure 4.8), it can take a little time to scroll to the AF point you want to use. To make it a little easier to scroll from one side to another quickly, you can select 11 points (AF11), which will cause the AF point selector to jump over several points at a time. It uses the pattern seen in figure 4.8 for 11 points.

If you are using an autofocus mode that makes use of multiple focus points, they continue being active when you have selected AF11. The only thing Number of focus points affects is the manual scrolling of the AF point selector when you look into the camera's Viewfinder. It is merely for your convenience.

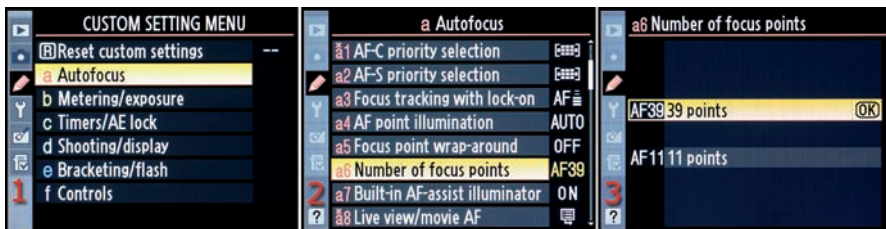


Figure 4.9 – Selecting the number of focus points (39 or 11 AF points)

Use the following steps to change from 39 points to 11 points:

1. Select **a Autofocus** from the **Custom Setting Menu** and scroll to the right (figure 4.9, image 1).
2. Highlight **a6 Number of focus points** and scroll to the right (figure 4.9, image 2).
3. Choose one of the two options from the menu. In figure 4.9, image 3, I selected **39 points (AF39)**.
4. Press the **OK** button to lock in the setting.

My Recommendation: I don't find it to be much trouble to scroll through 39 focus points. I'm glad to have all those luxurious AF points so I can select my focus point accurately. However, there are times when it may be aggravating to use the 39 points setting, such as when I'm shooting a fast-moving event. It may take longer than I'd like to reselect an AF point, so I might use 11 points to speed things up. Remember, it affects nothing except how the AF point selector scrolls around the



Viewfinder. However, if I have the AF-area mode configured (Single-point, 9-point dynamic, 21-point dynamic, or 39-point dynamic), it is not affected by the Number of focus points setting. All focus points are active, depending on your configuration with the AF-mode button. We'll discuss this further in the chapter titled **Autofocus, AF-Area, and Release Modes**.

a7 Built-in AF-Assist Illuminator

(User's Manual – Page 210)

You've seen the little AF-assist illuminator light on the front of the D7000, near the grip. This setting allows you to control when that little light comes on. Nikon calls this setting the Built-in AF-assist illuminator, and it lights up when low-light conditions are sensed and when using certain AF-area modes (not all) to help with autofocus.

There are two choices on the Built-in AF-assist illuminator menu: On and Off. The following are descriptions of how the choices affect the AF-assist illuminator:

- **On** (default) – If the light level is low, the AF-assist illuminator comes on to help light the subject enough for autofocus. This works only in certain modes:
 - a. Single-servo AF as a Focus mode at any time it's needed.
 - b. Auto-area AF as an AF-area mode at any time it's needed.
 - c. Single-point AF and Dynamic-area AF as an AF-area mode if you are using only the center AF point as the selected sensor.
- **Off** – The AF-assist illuminator does not come on to help you in low-light autofocus situations. The camera may not be able to autofocus in very low light.

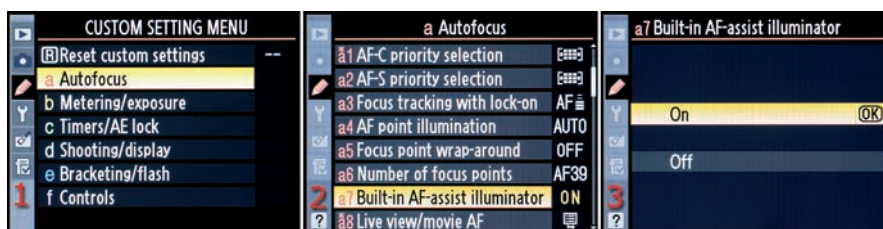


Figure 4.10 – The a7 Built-in AF-assist illuminator setting

Use the following steps to set the Built-in AF-assist illuminator to On or Off:

1. Select **a Autofocus** from the menu and scroll to the right (figure 4.10, image 1).
2. Highlight **a7 Built-in AF-assist illuminator** and scroll to the right (figure 4.10, image 2).

3. Choose **On** or **Off** from the menu. In [figure 4.10, image 3](#), I selected **On**.
4. Press the **OK button** to lock in the setting.

My Recommendation: I leave Built-in AF-assist illuminator set to On most of the time. It is activated only when the light is low enough to need it. However, there are exceptions for specific circumstances.

If you are trying to take pictures without being noticed, such as from across the room with a zoom lens or while doing street photography, you certainly don't want this extremely bright little light drawing attention when you start autofocus. Or you may be shooting wildlife, such as a giant grizzly bear, and you surely don't want to call attention to yourself by shining a bright light into the bear's eyes.

Don't use this feature if you don't want others to notice you—especially if they are 8-feet tall with claws and fangs—because it will draw attention immediately.

a8 Live View/Movie AF

(User's Manual – Pages 211, 50)

The a8 Live view/movie AF setting is a multilevel setting that lets you control how the autofocus (AF) system works while you are using Live View mode or Movie modes. We'll look into this setting in even greater detail in the chapter titled **Autofocus, AF-Area, and Release Modes**.

For now, let's examine some basics on how Live view/movie AF works so you can select the Live view/movie AF Autofocus mode or AF-area mode. To simplify things, the Autofocus mode is how the camera focuses during Live view mode and Movie mode, and the AF-area mode selects where it focuses.

Autofocus Mode

Autofocus mode gives you a choice of whether the AF system finds your subject and locks focus on it (the focus does not update if the subject moves) or continuously tracks the subject while it moves around in the Viewfinder. Most of us would rather have our camera track our selected subject if there is potential for it to move while we are taking pictures.

The following are descriptions of the two selections under Autofocus mode:

- **Single-servo AF** – A big red AF point square will appear in the middle of the camera's Monitor. It turns green when autofocus is locked on your subject. You can move the square around the Monitor screen to select the area of your subject that the camera will focus on. If your subject doesn't move or moves very slowly, use the Single-servo AF mode. You control the focus by pressing the Shutter-release

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button down half way. If your subject moves, you'll need to release pressure from the Shutter-release button and then reapply pressure to refocus. After focus is acquired, autofocus locks and does not update unless you release pressure and reapply it again. In Movie mode, you'll have to refocus if you or your subject moves.

- Full-time-servo AF** – The red AF point square appears in the middle of the camera's Monitor, like in Single-servo AF mode. It will turn green when it finds your subject and focuses on it. You can move it around to select a focus area. This mode provides constantly updating autofocus that tracks your subject, tempered by the AF-area mode (discussed in the next section) you have selected. The focus doesn't lock on the subject, which simply means it updates continuously until you press the Shutter-release button halfway. Generally, you won't press the Shutter-release button until you are ready to take a picture in Live view mode. In Movie mode you won't press the Shutter-release button at all. The camera will maintain focus on your subject automatically.

Use the following steps to change the Autofocus mode:

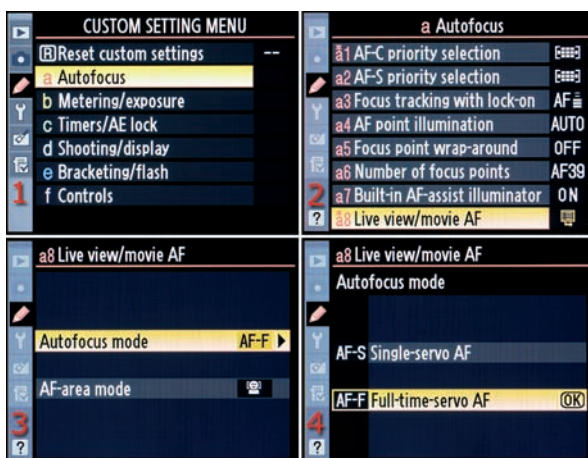


Figure 4.11 – Choosing an Autofocus mode in the Live view/movie AF setting

1. Select **a Autofocus** from the Custom Setting Menu and scroll to the right (figure 4.11, image 1).
2. Highlight **a8 Live view/movie AF** and scroll to the right (figure 4.11, image 2).
3. Choose **Autofocus mode** and scroll to the right (figure 4.11, image 3).
4. Select either **Single-servo AF (AF-S)** or **Full-time-servo AF (AF-F)** from the menu (figure 4.11, image 4).
5. Press the **OK button** to lock in the **Autofocus mode**.

AF-Area Mode

AF-area mode lets you choose how the camera senses your subject. Autofocus works differently for each of the four AF-area modes. You can instruct the camera to look for people's faces, widen out for landscapes, pinpoint the focus on a small

area of the frame, or track a moving subject. Let's examine the four modes and how to select one of them:

- **Face-priority AF** – When you are taking portraits in Live view mode or shooting movies with people in Movie mode, use Face-priority AF. The camera can track focus on the faces of several people at the same time. It is quite fun to watch as the little green and yellow AF point squares find faces and stay with them as they move—green squares are for focused faces and yellow squares are for those being tracked but not in the best focus. Nikon claims the D7000 can detect up to 35 faces at the same time. That's a lot of people! Here is a quote from a Nikon website: "When multiple faces are detected, the camera will focus on the subject recognized to be the closest. Alternatively, you can also choose a different subject with the Multi Selector."
- **Wide-area AF** – For the landscape shooters among us that like to use Live view mode or shoot movies of beautiful scenic areas, this is your mode. The camera will display a big green AF point square on the Monitor. You can move this big AF point around until it rests exactly where you want the best focus to be. The camera will sense a wide area and determine the best focus, with priority on the area within the green square. Nikon says, "Suitable for hand-held shooting such as landscape. AF area can be moved to the desired position within a frame."
- **Normal-area AF** – This mode is primarily for shooters who need to get very accurate focus on a small area of the frame. If you were shooting a butterfly closeup and wanted to focus on one of the antennae, you would use Normal-area AF. This is a great mode to use with a macro lens because it gives you a much smaller green AF point square that you can move around the Monitor. You can pinpoint the exact area of the subject that you want to have the sharpest focus. Nikon comments, "Suitable for tripod shooting with pin-point focus such as close up. AF area can be moved to the desired position within a frame."
- **Subject-tracking AF** – This mode lets you start autofocus with the OK button. When the subject is selected, the camera locks its attention on the point you selected and tracks it, regardless of whether the subject or the camera moves. If you were making a movie of a black bear in the Great Smoky Mountains, you would move the focus point to the bear and press the OK button, and the focus would stay with the bear. It is amazing to watch the camera do this. Try it and see! Nikon says, "Suitable for a moving subject. After focusing is achieved with the OK button, AF area tracks the subject's movement."

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Use the following steps to change the AF-area mode:

1. Select **a Autofocus** from the **Custom Setting Menu** and scroll to the right (figure 4.12, image 1).
2. Highlight **a8 Live view/movie AF** and scroll to the right (figure 4.12, image 2).
3. Choose **AF-area mode** and scroll to the right (figure 4.12, image 3).
4. Select one of the four **AF-area modes** from the menu (figure 4.12, image 4).
5. Press the **OK** button to lock in the **AF-area mode**.

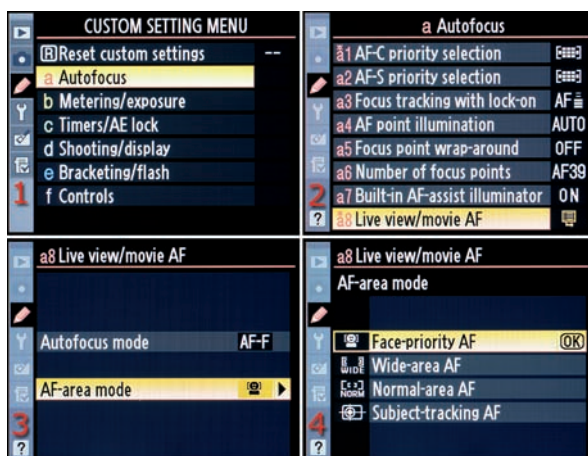


Figure 4.12 – Choosing an AF-area mode under Live view/movie AF

My Recommendation: Autofocus mode and AF-area mode work together within the Live view/movie AF setting. I like to use Single-servo AF (AF-S) when I am shooting in Live view mode. It gives me control over where I want to place the autofocus as I am taking pictures. When I shoot movies, though, I like to use Full-time-servo AF (AF-F). This mode takes away the aggravation of having to continually deal with autofocus as I walk around taking movies of friends. If I were a video fanatic, I would probably use pure old manual focus when shooting movies.

The AF-area modes affect how the camera performs after autofocus begins. I use Face-priority AF when I am shooting pictures or movies of people. If I am outside enjoying nature, I generally use Normal-area AF so I can focus on specific areas of a landscape. If I am shooting a picture or movie of an animal, I use Subject-tracking AF. Animals tend to move around so I need to track their movement.

You'll need to experiment with each of these modes to see how they work for your styles of shooting. We'll look more deeply at the Live view mode and Movie mode screens in the chapter titled **Autofocus, AF-Area, and Release Modes**.

Note: The D7000 will allow you to select an Autofocus mode and an AF-area mode by pressing the AF-mode button while you turn either the main or subcommand dials. We won't cover it in this chapter since we are discussing the Custom Setting Menu. However, the chapter titled **Autofocus, AF-Area, and Release Modes** will consider the alternate method in detail.

b Metering/Exposure

Custom Settings b1–b5

You'll find five custom settings within the b Metering/exposure menu:

- b1 ISO sensitivity step value
- b2 EV steps for exposure cntrl.
- b3 Easy exposure compensation
- b4 Center-weighted area
- b5 Fine tune optimal exposure

The first two custom settings in the Metering/exposure menu (b1 and b2) affect how your camera views exposure steps in its exposure value (EV) range. Most people like to have their camera work very precisely, so they'll use the 1/3 step EV selection of b1 and b2. Others might not be as selective and would prefer to change the sensitivity in 1/2 step EV.

b1 ISO Sensitivity Step Value

(User's Manual – Page 211)

The b1 ISO sensitivity step value setting allows you to change the way the camera handles its progression of EVs for ISO sensitivity. In other words, the camera's ISO sensitivity increment is set with Custom setting – b1 ISO sensitivity step value. You can control the exposure steps with either 1/3 step EV or 1/2 step EV increments.

If you are concerned with maximum ISO control, then use the 1/3 step setting. It takes a little longer to scroll through the ISO selections if you manually set your ISO value in 1/3 steps because there are more of them to choose from, but the extra fineness of the ISO increments allows you to control exposure better. The 1/3 step setting is the factory default value for b1.

With ISO sensitivity step value set to 1/3 step, hold down your camera's ISO button on the top left of the camera and turn the rear Main command dial to the right.

If your camera is set to ISO 100 initially, you will see the ISO sensitivity number in the Control panel, Information display, or Viewfinder change in increments as you hold down the ISO button and turn the rear Main command dial. Here are the beginning steps in the pattern. The steps range from ISO 100 to Hi 2, or ISO 25,600:

- 1/3 step: 100, 125, 160, 200, 250, 320, 400, 500, 640, 800, etc.
- 1/2 step: 100, 140, 200, 280, 400, 560, 800, 1100, 1600, 2200, etc.

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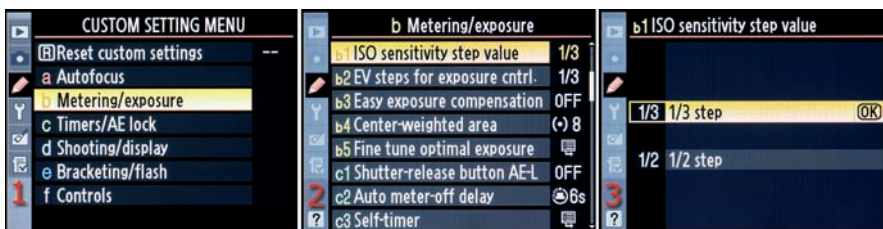


Figure 4.13 – Choosing an ISO sensitivity step value

Use the following steps to change the b1 ISO sensitivity step value:

1. Select **b Metering/exposure** from the Custom Setting Menu and scroll to the right (figure 4.13, image 1).
2. Highlight **b1 ISO sensitivity step value** and scroll to the right (figure 4.13, image 2).
3. Choose **1/3 step** or **1/2 step**. In figure 4.13, image 3, I selected **1/3 step**.
4. Press the **OK button** to lock in the setting.

My Recommendation: I like having the finest control possible of ISO sensitivity step values. I normally leave this set to the factory default of 1/3 step. This allows me to carefully fine-tune the ISO sensitivity value for precise exposures.

b2 EV Steps for Exposure Cntrl.

(User's Manual – Page 211)

The b2 EV steps for exposure cntrl. setting refers to the number of steps in the shutter speed and aperture. It also encompasses the exposure bracketing system. Just as with ISO sensitivity step value, covered in the previous section, you can control the number of steps in 1/3 step or 1/2 step EVs. This applies to shutter speed, aperture, exposure and flash compensation, and bracketing. The factory default value for EV steps for exposure cntrl. is 1/3 step.

EV steps for exposure cntrl. means that when you manually adjust shutter speed, aperture, exposure and flash compensation (referred to as Comp), and bracketing, they work incrementally in the following steps (starting at a random point):

1/3 step EV:

- Shutter – 1/100, 1/125, 1/160, 1/200, 1/250, 1/320, etc.
- Aperture – f/5.6, f/6.3, f/7.1, f/8, f/9, f/10, etc.
- Comp/bracketing – 0.0, 0.3, 0.7, 1.0, 1.3, 1.7, 2.0, 2.3, 2.7, 3.0, etc.

1/2 step EV:

- Shutter – 1/90, 1/125, 1/180, 1/250, 1/350, 1/500, etc.
- Aperture – f/5.6, f/6.7, f/8, f/9.5, f/11, f/13, etc.
- Comp/bracketing – 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, etc.

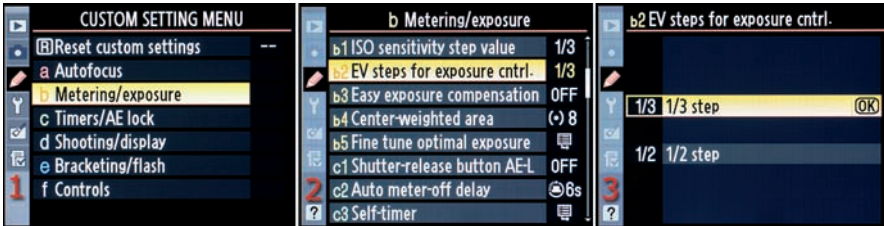


Figure 4.14 – Choosing EV steps for exposure cntrl.

Use the following steps used to adjust b2 EV steps for exposure cntrl.:

1. Select **b Metering/exposure** from the **Custom Setting Menu** and scroll to the right (figure 4.14, image 1).
2. Highlight **b2 EV steps for exposure cntrl.** and scroll to the right (figure 4.14, image 2).
3. Choose **1/3 step** or **1/2 step** from the menu (figure 4.14, image 3).
4. Press the **OK** button to lock in the setting.

My Recommendation: Similar to ISO sensitivity step value, I keep EV steps for exposure cntrl. set to 1/3 step. It's critical to control the EV steps with granularity for exposure and compensation. It's best to increment the EV in small steps for use with the histogram.

b3 Easy Exposure Compensation

(User's Manual – Page 212)

The b3 Easy exposure compensation setting took awhile for me to understand. The bottom line is that you can set the camera exposure compensation without using the +/- Exposure compensation button.

If you set the camera to Reset On (Auto reset) or simply to On, you can use the Command dials to set exposure compensation instead of the +/- Exposure compensation button. Off means what it says. If you use the +/- Exposure compensation button, it overrides the Easy exposure compensation settings. Each exposure mode (P, S, A, M) reacts somewhat differently to Easy exposure compensation.

In the upcoming list we'll consider how the Programmed auto (P), Shutter priority auto (S), and Aperture-priority auto (A) exposure modes act when you use the three

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available settings (figure 4.15). The Manual (M) mode does not seem to be affected by Custom setting – b3 Easy exposure compensation, although it does work with the +/- Exposure compensation button. The Control panel, Information display, and Viewfinder will display a +/- icon to show that compensation value has been dialed into the camera. The three settings in Easy exposure compensation are as follows:

- **Reset On (Auto reset)** – By using the Sub-command dial in Programmed auto (P) or Shutter priority auto (S) modes, or the Main command dial in Aperture priority auto (A) mode, you can dial in exposure compensation without using the +/- Exposure compensation button. If you allow the meter to reset, or if you turn the camera off, the compensation value you dialed in is reset back to 0. That's why it's called Auto reset. If you have already set a compensation value using the +/- Exposure compensation button, then the process of dialing in exposure compensation with the Sub-command dial simply adds more compensation to what you originally put in with the +/- Exposure compensation button. When the meter resets, it returns to the compensation value you added with the +/- Exposure compensation button, not to 0.
- **On** – This works the same way as Reset On (Auto reset), except that the compensation you've dialed in does not reset. It stays in place, even if the meter or camera is turned off.
- **Off** – Exposure compensation can be applied only with the +/- Exposure compensation button.

Use the following steps to configure b3 Easy exposure compensation:

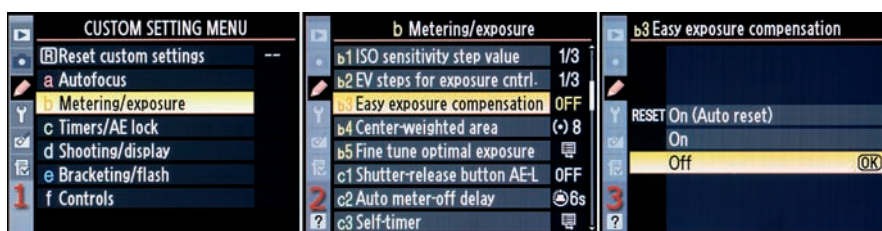


Figure 4.15 – Using Easy exposure compensation

1. Select **b Metering/exposure** from the Custom Setting Menu and scroll to the right (figure 4.15, image 1).
2. Highlight **b3 Easy exposure compensation** and scroll to the right (figure 4.15, image 2).

3. Choose one of the three items from the menu. In [figure 4.15, image 3](#), I selected **Off**.
4. Press the **OK button** to lock in the setting.

Note: The granularity of the Easy exposure compensation EV is affected by whether Custom setting b2 EV steps for exposure cntrl. is set to 1/3 step or 1/2 step. Also, the Command dials used to set compensation can be swapped in Custom setting – f6 Customize command dials, which we will consider later in this chapter.

My Recommendation: I've never used this setting, having used the +/- Exposure compensation button for too many years to change now. I'm sure many people requested this feature since Nikon added it to the camera. However, for my style of photography it is unnecessary. If you need to change compensation with the Command dials, then you have a way to do it. Give it a try, you may like it!

b4 Center-Weighted Area

(User's Manual – Page 213)

The b4 Center-weighted area setting allows you to control the area on the Viewfinder that has the greatest weight in metering a subject when you use Center-weighted area metering mode. Years ago cameras didn't have Matrix metering. Back in the good old days, we all had averaging or partially averaging meters, or none at all.

If you prefer not to use the D7000's built-in database of image scenes, otherwise known as Matrix metering, and you use only Spot metering as needed, you are most likely using the Center-weighted area meter. It's cool that Nikon gives us a choice.

You have three types of meters in your camera. You change it with the Metering button just behind and to the left of the Shutter-release button. We'll consider each of the metering modes in greater detail in the chapter titled **Metering, Exposure Modes, and Histogram**.

When you hold down the Metering button and turn the rear Main command dial, you'll scroll through three symbols on the Control panel on top of the camera. The symbol that represents the Center-weighted area meter looks like this: (·). The Center-weighted area meter can be configured to use a central area of the Viewfinder to do most of its metering, with less attention paid to subjects outside of this area, or it can be set up to simply average the entire frame.

The four size settings for the most sensitive area of the Center-weighted area meter are 6 mm, 8 mm, 10 mm, and 13 mm—or the meter can simply Average the entire frame, as shown in [figure 4.16](#).

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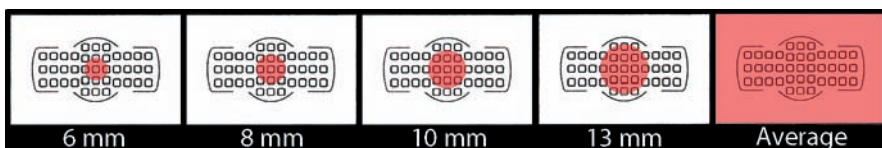


Figure 4.16 – Approximate Center-weighted area meter sensitivity

Figure 4.16 shows the approximate size of the most sensitive area in the Viewfinder for each step of the Center-weighted area meter. The pink circle is the most sensitive area for metering, and it gets larger for each setting. In the final image of figure 4.16, the entire frame is equally sensitive and averages everything seen in the Viewfinder.

When using the Center-weighted area metering mode, the metering system uses an invisible circle in the center of the Viewfinder to meter the subject. Reducing it to 6 mm makes it almost small enough to be a spot meter because the real Spot metering mode of the camera uses a 3 mm circle surrounding the currently selected AF point.

The Center-weighted area meter does not move around with the currently selected AF point as the Spot meter does. Instead, it assigns the greatest weight to the center of the Viewfinder frame, and everything outside the center circle is not as important.

Each size increase from 6 mm to 13 mm will increase the sensitivity of the center of the Viewfinder so that more emphasis is given to a larger area in the middle.

If you select the Average (Avg) setting, the entire Viewfinder frame is used to meter the scene. The camera takes an average of the entire frame by including all light and dark areas mixed together for an averaged exposure.

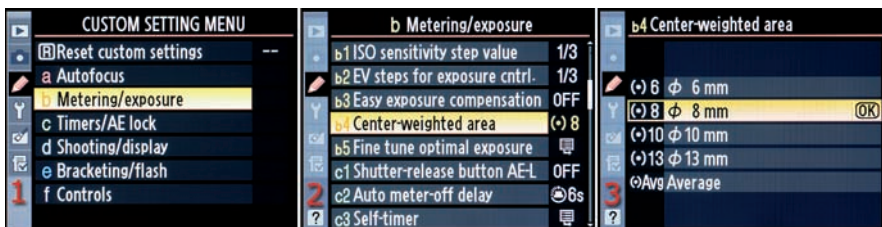


Figure 4.17 – Choosing a Center-weighted area

Use the following steps to set the b4 Center-weighted area:

1. Select **b Metering/exposure** from the **Custom Setting Menu** and scroll to the right (figure 4.17, image 1).
2. Highlight **b4 Center-weighted area** and scroll to the right (figure 4.17, image 2).

3. Choose one of the five items from the menu. In [figure 4.17, image 3](#), I selected 8 mm.
4. Press the [OK button](#) to lock in the setting.

My Recommendation: When I use the Center-weighted area meter, I generally use the 13 mm setting to make the largest area of the center of the Viewfinder be the most sensitive section. I use 3D Matrix metering most of the time and have my camera's Fn button set up to switch to the Spot meter temporarily. That way, I can use Nikon's incredible 3D Color Matrix system, with its ability to consider brightness, color, distance, and composition. Matrix metering gives me the best metering I've had with any camera! The Center-weighted area meter is still included in modern cameras for people who are used to this older-style meter. Most people use Matrix metering these days.

b5 Fine Tune Optimal Exposure

(User's Manual – Page 213)

The b5 Fine tune optimal exposure setting allows you to fine-tune the Matrix metering, Center-weighted area metering, and Spot metering systems by +1/-1 EV in 1/6 EV steps. Nikon has taken the stance that most major camera systems should allow the user to fine-tune them. The exposure system is no exception.

You can force each of the three metering systems to add or subtract exposure from what it normally would use to expose your subject. This stays in effect until you set it back to zero. It is indeed fine-tuning, since the maximum 1 EV step up or down is divided into six parts (1/6 EV). If you think your camera mildly underexposes highlights and you want it to add 1/2 step of exposure, you simply add 3/6 EV to the metering system. (Remember basic fractions: 1/2 equals 3/6.)

Fine tune optimal exposure works like the normal compensation system, but it allows only one EV of compensation. As shown in [figure 4.18, screen 3](#), an ominous-looking warning appears when you use Fine tune optimal exposure. It lets you know that your camera will not display a compensation icon, as it does with the +/- Exposure compensation button, when you use the metering fine-tuning system. This simply means that while you have fine-tuning dialed in for your light meter, the camera will not remind you that it is fine-tuned by showing you a compensation icon. If it did turn on the compensation icon (+/- on the Control panel and in the Viewfinder), it couldn't use that same icon when you use normal compensation.

Fine tune optimal exposure applies only to the user setting (U1, U2, or non-user setting) you are currently working with. If you are working with U1, then U2 and

4



non-user settings are not changed. Be sure to save the user setting in the Setup Menu if you change one of them.

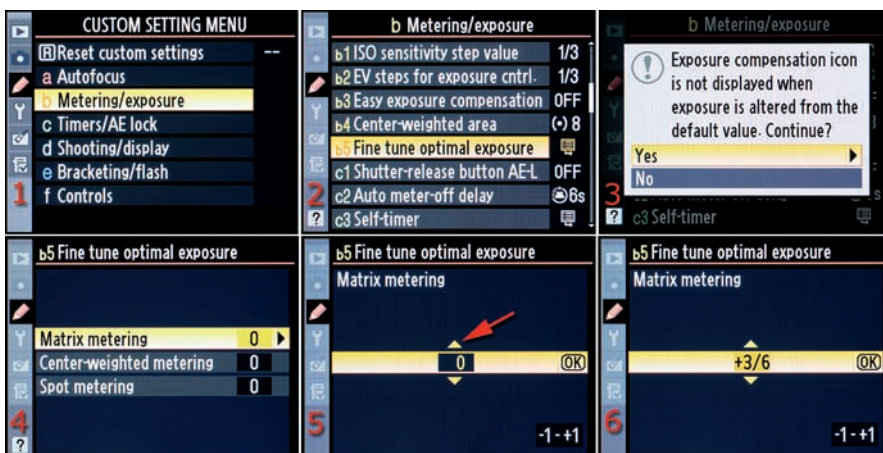


Figure 4.18 – Choosing b5 Fine tune optimal exposure settings

Use the following steps to choose b5 Fine tune optimal exposure settings:

1. Select **b Metering/exposure** from the Custom Setting Menu and scroll to the right (figure 4.18, image 1).
2. Select **b5 Fine tune optimal exposure** and scroll to the right (figure 4.18, image 2).
3. Select **Yes** from the warning screen and scroll to the right (figure 4.18, image 3).
4. Select the metering system you want to adjust. In figure 4.18, image 4, I selected **Matrix metering**. Scroll to the right.
5. Scroll up or down in 1/6 EV steps until you reach the fine-tuning value you would like to use (figure 4.18, image 5, red arrow).
6. In figure 4.18, image 6, I selected **+3/6** (1/2 step EV). Press the **OK** button to lock in the fine-tuning value for the metering system you selected in step 4.

That's all there is to it! Remember that you have Fine tune optimal exposure turned on because the camera will not remind you. Watch your histogram to make sure you're not regularly underexposing or overexposing images when you have the fine-tuning adjustment in place. If needed, adjust the fine-tuning up or down, or turn it off. You must fine-tune each metering system separately.

My Recommendation: Fine tune optimal exposure is a rather controversial setting. On my older Nikon D300, I found that I took better pictures when I ran the Matrix meter 3/6 (1/2 EV step) over the normal setting. The D300's Matrix metering seemed a bit conservative to me and it worked a little too hard to keep from blowing out the highlights in my images. It seemed to underexpose them by about 1/3 EV

step most of the time. I could see this underexposure because on most of my Matrix meter exposed images, the histogram didn't quite make it to the right edge (lighter values) of the histogram window, which I prefer. I like to expose for the highlights, yet my older D300 seemed to slightly underexpose.

I have *not* needed to change the default on my D7000. If anything, it tends to expose a little on the bright side. If I were to make an exposure adjustment on this camera, I would try $-1/6$ as a test. However, I doubt that I will make this adjustment.

Remember that adjusting an exposure is always an experiment. If you choose to fine-tune any of the three metering systems, you should thoroughly test it before you do an important shoot. The way I fine-tune my camera is based on my own photographic style, and my results can't guarantee that you would get the same results. It certainly won't hurt to play with these settings—as long as you remember to set them back to 0 when you're done if they don't perform the way you expect.

c Timers/AE Lock

Custom Settings c1–c5

You'll find five Custom settings within the c Timers/AE lock menu:

- c1 Shutter-release button AE-L
- c2 Auto meter-off delay
- c3 Self-timer
- c4 Monitor off delay
- c5 Remote on duration

c1 Shutter-Release Button AE-L

(User's Manual – Page 213)

The Shutter-release button AE-L setting allows you to lock your camera's exposure when you press the Shutter-release button halfway down. Normally that type of exposure lock happens only when you press and hold the AE-L/AF-L button. However, when you have Shutter-release button AE-L set to On, your camera will act like you've pressed the AE-L/AF-L button every time you start autofocus and take a picture.

This setting allows you to meter from one area of the scene and then recompose to another area without losing the meter reading from the first area—as long as you hold the Shutter-release button halfway down.

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Looking at this from another direction, when you have Shutter-release button AE-L set to Off, the exposure will lock only when you have the AE-L/AF-L button held down.

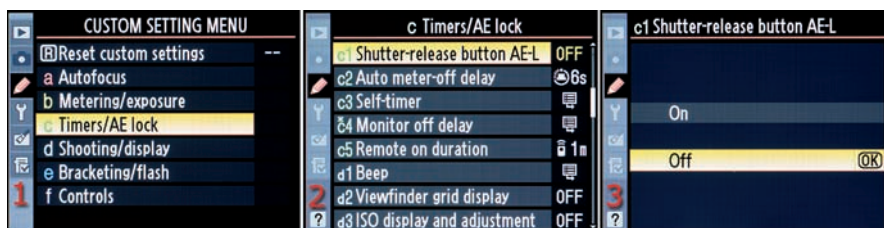


Figure 4.19 – Using Shutter-release button AE-L

Use the following steps to configure c1 Shutter-release button AE-L:

1. Select **c Timers/AE lock** from the **Custom Setting Menu** and scroll to the right (figure 4.19, image 1).
2. Highlight **c1 Shutter-release button AE-L** and scroll to the right (figure 4.19, image 2).
3. Choose either **On** or **Off** from the menu. In figure 4.19, image 3, I selected **On**.
4. Press the **OK button** to lock in the setting.

My Recommendation: I use this feature only when I really need it. The rest of the time I use the AE-L/AF-L button to lock my exposure. I don't think I'd leave Shutter-release button AE-L turned on all the time since I might be holding the Shutter-release button halfway down to track a moving subject through light and dark areas.

For people who shoot sunsets or similar scenes where the sun is included in the image, this is a nice function. You can meter from an area of the sky that has the best color and then swing the camera around to include the sun in the shot. The camera will expose for the originally metered area as long as you hold the Shutter-release button halfway down. Normally, you'd do this with the AE-L/AF-L button.

c2 Auto Meter-Off Delay

(User's Manual – Page 214)

The c2 Auto meter-off delay controls the amount of time that your camera's light meter stays on after you press the Shutter-release button halfway and then release it. The default value is 6 seconds.

When the light meter goes off, the various displays—like shutter speed and aperture—in the Control panel and Viewfinder do, too. If you want your light

meter to stay on longer for whatever reason, such as multiple exposures, you can adjust it to the following settings:

- 4 s – 4 seconds
- 6 s – 6 seconds (default)
- 8 s – 8 seconds
- 16 s – 16 seconds
- 30 s – 30 seconds
- 1 min – 1 minute
- 5 min – 5 minutes
- 10 min – 10 minutes
- 30 min – 30 minutes
- ∞ – No limit (meter stays on)

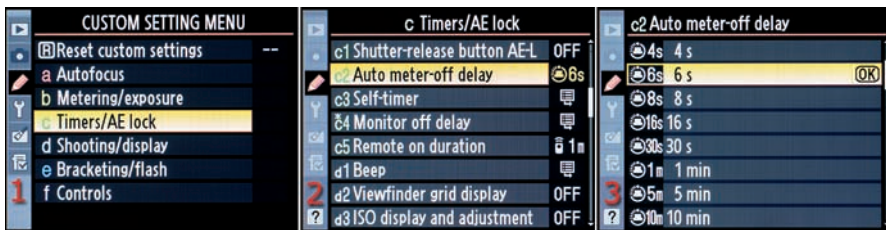


Figure 4.20 – Using Auto meter-off delay

Use the following steps to use the c2 Auto meter-off delay setting:

1. Select **c Timers/AE lock** from the **Custom Setting Menu** and scroll to the right (figure 4.20, image 1).
2. Highlight **c2 Auto meter-off delay** and scroll to the right (figure 4.20, image 2).
3. Choose one of the 10 options from the menu. In figure 4.20, image 3, I selected **6 s**. You can't see all the available menu selections in image 3. Scroll down on the menu to find two more settings, **30 min** and **∞** (No limit).
4. Press the **OK button** to lock in the setting.

My Recommendation: There are times when you want the light meter to stay on for a longer or shorter time than normal. When I'm shooting multiple exposures, I set Auto meter-off delay to ∞ (No limit). However, when I'm shooting normally, it stays at either 6 s or 8 s. The longer the meter stays on, the shorter the battery life, so extend the meter time only if you really need it. You can adjust it from 4 s to No limit (∞). Easy enough!

c3 Self-Timer

(User's Manual – Page 214)

The c3 Self-timer setting is used to take pictures remotely or without touching the camera. Hands-off shooting can reduce vibrations so that you have sharper pictures.

4



There are three choices when you use the Self-timer:

- **Self-timer delay** – This setting allows you to specify a delay before the camera's shutter fires so you have time to position yourself for the shot or allow vibrations to settle down. The time delays range from 2 to 20 seconds. This setting can be used instead of a remote release, and you won't have cables to trip over.
- **Number of shots** – Use this setting to choose how many shots will be taken for each cycle of the Self-timer. You can choose 1 to 9 shots in a row.
- **Interval between shots** – If you are taking more than one shot during a Self-timer cycle, this setting allows you to choose a time interval between each shot ranging from 1/2 second to 3 seconds. This lets you to select a time that allows vibrations from the previous shot to settle down.

4



Now let's look at the screens and steps used to adjust each of these settings. First, we'll look at the Self-timer delay. Here is a list of the four available Self-timer delay settings:

- 2 s – 2 seconds
- 5 s – 5 seconds
- 10 s – 10 seconds
- 20 s – 20 seconds

Use the following steps to configure the Self-timer delay:

1. Select **c Timers/AE lock** from the Custom Setting Menu and scroll to the right (figure 4.21, image 1).
2. Highlight **c3 Self-timer** and scroll to the right (figure 4.21, image 2).
3. Select **Self-timer delay** from the menu and scroll to the right (figure 4.21, image 3).
4. Choose one of the four options from the menu (2 s to 20 s). In figure 4.21, image 4, I selected 10 s.
5. Press the **OK button** to lock in the setting.

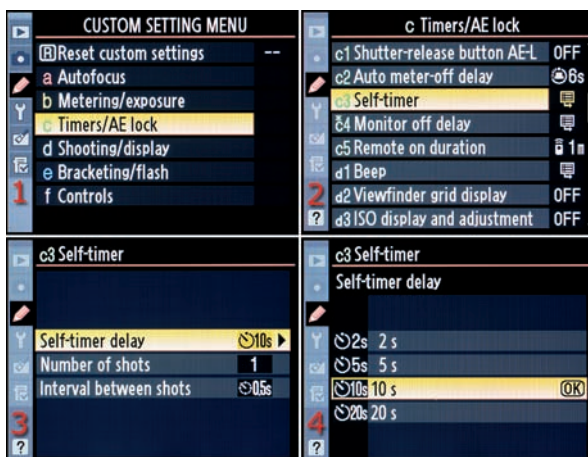


Figure 4.21 – Setting a Self-timer delay

Next, let's look at how to configure the Number of shots for each Self-timer cycle.

Use the following steps to configure the Number of shots:

1. Select **c Timers/AE lock** from the Custom Setting Menu and scroll to the right (figure 4.22, image 1).
2. Highlight **c3 Self-timer** and scroll to the right (figure 4.22, image 2).
3. Select **Number of shots** from the menu and scroll to the right (figure 4.22, image 3).
4. Choose the **Number of shots**, from 1 to 9, by scrolling up or down with the Multi Selector. In figure 4.22, image 4, I selected 1 shot.
5. Press the **OK button** to choose the setting.

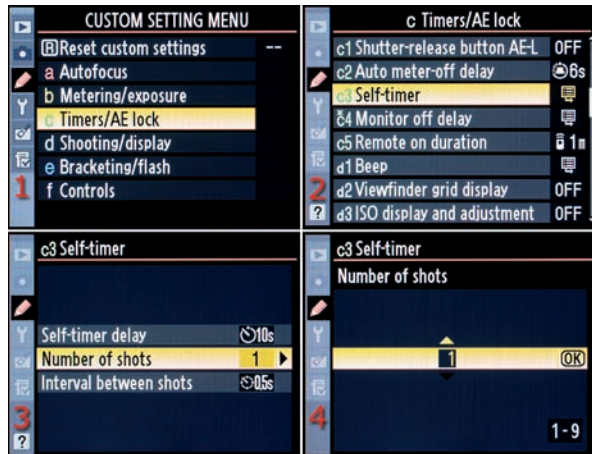


Figure 4.22 – Setting the Number of shots

Finally, let's look at how to configure the Interval between shots for each Self-timer cycle. Here is a list of the four available Interval between shots settings:

- 0.5 s – 1/2 second
- 1 s – 1 second
- 2 s – 2 seconds
- 3 s – 3 seconds

Use the following steps to configure the Interval between shots:

1. Select **c Timers/AE lock** from the Custom Setting Menu and scroll to the right (figure 4.23, image 1).
2. Highlight **c3 Self-timer** and scroll to the right (figure 4.23, image 2).

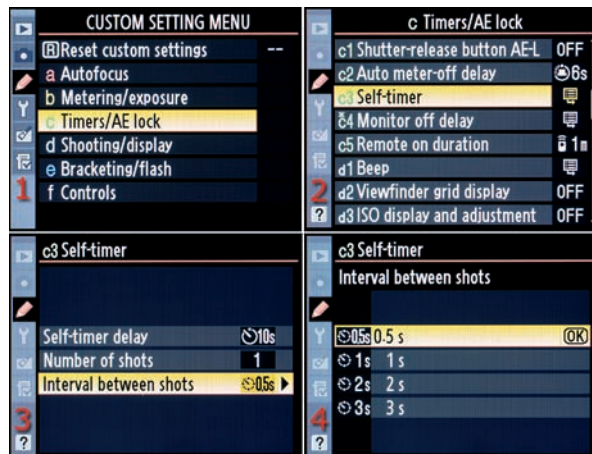


Figure 4.23 – Setting the Interval between shots

4



3. Select **Interval between shots** from the menu and scroll to the right (figure 4.23, image 3).
4. Choose the **Interval between shots**, from 0.5 s to 3 s, by scrolling up or down with the **Multi Selector**. In figure 4.23, image 4, I selected 0.5 s (1/2 second).
5. Press the **OK button** to choose the setting.

My Recommendation: Often, if I don't want to take the time to plug in a remote release cable, I just put my camera on a tripod and set the Self-timer delay to 2 or 5 seconds. This lets the D7000 make a hands-off exposure so I don't shake the camera or the tripod. If I must run to get into position for a group shot, I often increase the delay to at least 10 s (10 seconds) to keep from looking like an idiot as I trip while running for position.

I can also control how many shots to take each time I use the Self-timer and how long to delay between those shots to allow vibrations to go away. I'm sure you'll agree that the Self-timer in your D7000 is one of the most flexible timers in a DSLR camera.

c4 Monitor Off Delay

(User's Manual – Page 215)

The c4 Monitor off delay setting lets you specify a time-out for the LCD Monitor on the back of your camera. You can select intervals from 4 seconds to 10 minutes for most functions and 5 minutes to 30 minutes for one function. The Monitor will stay on until the time-out period expires.

The D7000 allows you to select individual display time-outs for each of the following functions:

- **Playback** – You can manually view pictures on the camera's Monitor with the Playback button. Select a 4-second to 10-minute Monitor off delay.
- **Menus** – Use the seven in-camera menus. Select a 4-second to 10-minute Monitor off delay.
- **Information display** – Press the Info button once or twice to see the Information display on the Monitor. Select a 4-second to 10-minute Monitor off delay.
- **Image review** – You can see a picture on the Monitor immediately after you take it. Select a 4-second to 10-minute Monitor off delay.
- **Live view** – Use the camera's Monitor to view your subject, instead of the Viewfinder. Select a 5-minute to 30-minute Monitor off delay.



Here are the available Monitor off delay values:

- 4 s – 4 seconds (all five functions)
- 10 s – 10 seconds (all five functions)
- 20 s – 20 seconds (all five functions)
- 1 min – 1 minute (all five functions)
- 5 min – 5 minutes (all five functions)
- 10 min – 10 minutes (all five functions)
- 15 min – 15 minutes (Live view only)
- 20 min – 20 minutes (Live view only)
- 30 min – 30 minutes (Live view only)

There is no need to provide figures and step-by-step instructions for each of the time-out types. Figure 4.24 shows a sample of how to select the Monitor off delay > Playback time-out. Use the following steps for each of the five delay types, with the understanding that Live view has longer delays than the other four time-outs:



Figure 4.24 – Choosing a timeout (sample for all five delay types)

1. Select **c Timers/AE lock** from the **Custom Setting Menu** and scroll to the right (figure 4.24, image 1).
2. Highlight **c4 Monitor off delay** and scroll to the right (figure 4.24, image 2).
3. Choose one of the five display types (figure 4.24, image 3). You can set the **Monitor off delay** for each type. They all have the same delay time-outs available—except for **Live view**, which has longer delays—and they are all selected in the same way. Now, scroll to the right.
4. Figure 4.24, image 4, shows the delay times for the **Playback** display, which I selected in image 3. Choose a delay time from **4 s** to **10 min**, or you can choose **5 min** to **30 min** for **Live view**.
5. Press the **OK button** to lock in the setting.

My Recommendation: I set Monitor off delay to 1 min for Playback, Information display, and Image review on my D7000. I set the Menus time-out to 5 min because I like to scroll around for longer time periods as I configure various settings in the menus. I leave Live view at the default of 5 min.

If you want to conserve battery power, leave the Monitor off delay set to a low value, like 4 s to 20 s. The longer the monitor stays on, the shorter the battery life, so extend the monitor time only if you really need it. Like a small notebook computer screen, that big, luxurious VGA-resolution LCD pulls a lot of power. The Monitor and Control panel backlights are probably the biggest power drains in the entire camera. However, you don't need to be overly concerned about this. For as much image review (chimping) as I do, I can still usually shoot all day on one full battery charge.

c5 Remote on Duration

(User's Manual – Page 215)

The c5 Remote on duration setting is an interesting setting that controls how long the camera will wait for you to press the shutter-release button on your Nikon ML-L3 infrared remote. It works in partnership with the Shooting Menu > Remote control mode we explored in the last chapter. Recall that Remote control mode gives you three settings to choose from:

- **Delayed remote** – Two-second delay after the shutter-release button on the ML-L3 wireless remote is pressed.
- **Quick-response remote** – Instant release when you press the shutter-release button on the ML-L3 wireless remote.
- **Remote mirror-up** – First press of the the shutter-release button on the ML-L3 wireless remote raises the mirror, second press fires the shutter.

If you set Remote control mode to any of these three settings, the camera will stay in a ready state—looking for the remote signal from the ML-L3—for the time delay you set in Remote on duration. This means that the camera stays prepared for taking a picture and leaves the exposure meter active until Remote on duration times out.

The following delay times are available for Remote on duration:

- 1 min – 1 minute (default)
- 5 min – 5 minutes
- 10 min – 10 minutes
- 15 min – 15 minutes



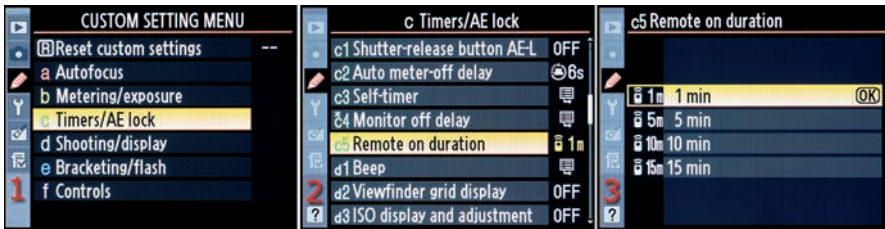


Figure 4.25 – Choosing a Remote on duration for Self-timer Remote control mode

Use the following steps to configure c5 Remote on duration:

1. Choose **c Timers/AE lock** from the **Custom Setting Menu** (figure 4.25, image 1).
2. Select **c5 Remote on duration** from the menu and scroll to the right (figure 4.25, image 2).
3. Select a time-out delay period from **1 min** to **15 min** (figure 4.25, image 3).
4. Press the **OK button**.

My Recommendation: I used to leave my Remote on duration delay time set to 1 min (factory default). However, I have recently been leaving it set to 5 min. I wish there were a two-minute setting because 1 min is not quite enough time in some instances, especially where there is a large group portrait involved, and 5 min is often too long (battery wasting). If you need this function, you'll have to decide how long is long enough.

4



d Shooting/Display

Custom Settings d1–d14

Within the d Shooting/display menu, you'll find 14 Custom settings:

- d1 Beep
- d2 Viewfinder grid display
- d3 ISO display and adjustment
- d4 Viewfinder warning display
- d5 Screen tips
- d6 CL mode shooting speed
- d7 Max. continuous release
- d8 File number sequence
- d9 Information display
- d10 LCD illumination
- d11 Exposure delay mode
- d12 Flash warning
- d13 MB-D11 battery type
- d14 Battery order

d1 Beep

(User's Manual – Page 215)

The d1 Beep setting allows your camera to make a beeping sound to alert you during the following functions:

- Focus lock while in Single-servo AF (AF-S) mode
- Focus lock while in Live view mode
- Countdown in Self-timer and Delayed release mode operations
- Taking a picture in Quick-response remote or Remote mirror-up modes
- Trying to take a picture with the memory card locked

You can set the camera to beep with a high- or low-pitched tone, and you can adjust the volume at which that tone sounds—or you can turn the Beep sound Off. When Beep is active, you'll see a little musical note displayed in the top Control panel and also in the Information display.

First let's examine how to set the Volume or disable the Beep. The Volume settings



under Beep in the Custom Setting Menu are 3, 2, 1, and Off (figure 4.26). Use the following steps to select one of the d1 Beep volume choices:

1. Select **d Shooting/display** from the **Custom Setting Menu** and scroll to the right (figure 4.26, image 1).
2. Highlight **d1 Beep** and scroll to the right (figure 4.26, image 2).
3. Select **Volume** from the menu and scroll to the right (figure 4.26, image 3).
4. Choose one of the four options from the list (3–1 or Off). In figure 4.26, image 4, I selected **Off**. You will hear a sample beep in each volume level as you choose it. The level 1 beep is rather quiet, so you may not hear it unless you hold your ear closer to the camera.
5. Press the **OK button** to lock in the setting.

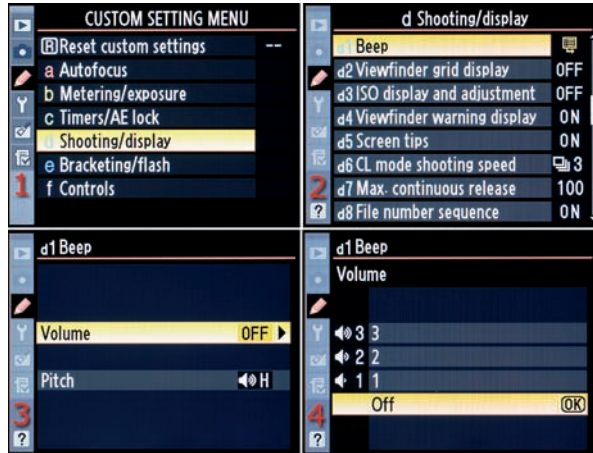


Figure 4.26 – Choosing a Volume level for the camera's Beep

Next, let's consider how to change the pitch of the Beep. You have two pitch levels available: High (H) and Low (L). I compared them to my piano, and the Low (L) sound is F# just above middle C. The High (H) sound is almost three octaves higher. It is the B just before three octaves above middle C.

(You probably don't need that much information; however my somewhat compulsive personality requires that I give it to you. Notice that I didn't give you the decibel level of the three Beep volume levels. Wouldn't that be excessively excessive? Of course, with my trusty Radio Shack digital sound level meter, I do have that information. If you really want it, send me an e-mail.)

4



Getting back on track, here are the screens and steps to select a pitch for the beep:

1. Select **d Shooting/display** from the Custom Setting Menu and scroll to the right (figure 4.27, image 1).
2. Highlight **d1 Beep** and scroll to the right (figure 4.27, image 2).
3. Select **Pitch** from the menu and scroll to the right (figure 4.26, image 3).
4. Choose one of the two options from the list (**High** or **Low**). In figure 4.26, image 4, I selected **High** (default). You will hear a sample beep in each pitch (B or F#) as you choose it.
5. Press the **OK button** to lock in the setting.

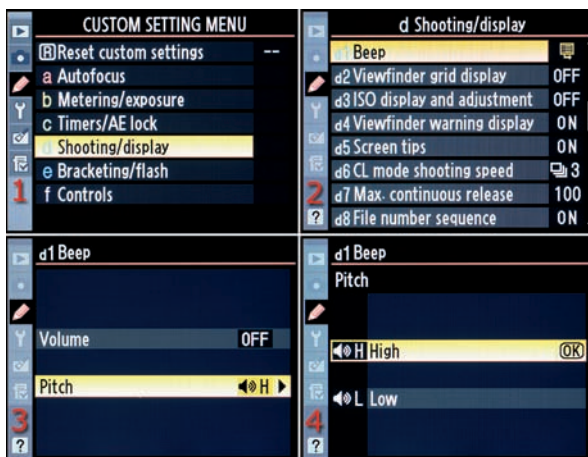


Figure 4.27 – Choosing a Pitch for the camera's Beep



My Recommendation: I don't use the Beep; it's turned Off on my D7000. If I were using my camera in a quiet area, why would I want it beeping and disturbing those around me? I can just imagine me zooming in on that big grizzly bear, pressing the Shutter-release button, and listening to the grizzly roar his displeasure at my camera's beep. I want to live, so I turn off Beep.

You might want the reassurance of hearing a beep when AF has been confirmed or when the Self-timer is counting down. If so, turn it on. The AF-assist illuminator flashes during Self-timer operations, so I generally use that instead of Beep.

This is another function that you either love or hate. You can have it either way, but be careful around big wild animals when Beep is enabled. They might think you're calling them to supper, and you may be the main course.

By the way, Beep is automatically disabled when you're using the new Q or Quiet shutter-release mode on the Release mode dial, regardless of how this Custom setting is configured.

d2 Viewfinder Grid Display

(User's Manual – Page 216)

A few years ago, the 35mm film Nikon N80/F80 was released with a Viewfinder grid display, and I was hooked. Later, as I bought more professional cameras, I was chagrined to find that they did not have the on-demand gridlines that I had grown to love.

With the D7000, you have not only a Viewfinder grid display, but also Live View (Lv) gridlines. The best of both worlds! There are only two selections in Viewfinder grid display: On and Off.

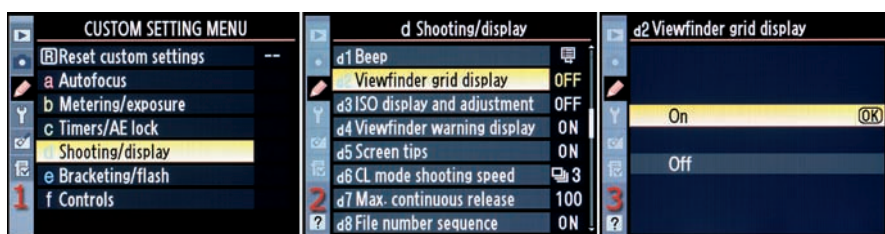


Figure 4.28 – Enabling the Viewfinder grid display

Use the following steps to enable/disable the d2 Viewfinder grid display setting:

1. Select **d Shooting/display** from the **Custom Setting Menu** and scroll to the right (figure 4.28, image 1).
2. Highlight **d2 Viewfinder grid display** and scroll to the right (figure 4.28, image 2).
3. Choose either **On** or **Off** from the menu. In figure 4.28, image 3, I selected **On**.
4. Press the **OK** button to lock in the setting.

My Recommendation: I use these gridlines to line up things as I shoot so that I won't have tilted horizons and such. Many of us tend to tilt the camera one way or another, and gridlines help us see that we've tilted the frame.

I especially enjoy shooting with gridlines enabled when I'm at the beach. Who needs tilted ocean views? When shooting architecture, the gridlines are invaluable for making sure buildings, walls, and doors are correctly oriented. There are lots of ways to use the Viewfinder grid display.

If you set the Viewfinder grid display to On, I doubt that you'll turn it back Off. The nice thing is that you can turn the gridlines On and Off at will. You don't have to buy an expensive viewfinder replacement screen for those times you need gridlines.



Using a Grid Display on the Live View Screen

This section pertains only to the Viewfinder grid display in the Viewfinder. However, you can also turn on gridlines when the Live View screen is active by pressing the Info button multiple times to scroll through the various display overlays. One of them is a grid display.

d3 ISO Display and Adjustment

(User's Manual – Page 216)

The d3 ISO display and adjustment setting modifies how the D7000 shows you the ISO sensitivity in the Control panel and Viewfinder, where you can normally see the frame count, or how many images you have left to take before the memory card is full. However, you can use ISO display and adjustment to modify the readout so the ISO sensitivity is shown instead of the frame count. There are three settings:

- **Show ISO sensitivity** – This setting displays the ISO sensitivity, instead of the frame count, in the Control panel and Viewfinder.
- **Show ISO/Easy ISO** – This setting affects how you adjust the ISO sensitivity, as well as how it displays. It works like Show ISO sensitivity, in that it replaces the frame count with the ISO sensitivity value. It also adds a way to change the ISO sensitivity while taking pictures. Normally you would use Shooting Menu > ISO sensitivity settings or press the ISO button and turn the rear Main command dial to change the ISO sensitivity. However, when you enable Show ISO/Easy ISO, the camera lets you adjust the ISO sensitivity with either the rear Main command dial or front Sub-command dial alone, without using the ISO button. This applies only when you use the P, S, or A modes on the Mode dial.
 Normally, when you have the camera in P or S modes, you control the aperture (P mode) or shutter speed (S mode) with the rear Main command dial. The front Sub-command dial does nothing. When you set the camera to Show ISO/Easy ISO, the normally unused front Sub-command dial now sets the ISO sensitivity when the P or S modes are set. Likewise, when the camera is set to A mode, you normally control the aperture with the front Sub-command dial, and the rear Main command dial does nothing. When you enable Show ISO/Easy ISO in A mode, the camera lets you adjust ISO sensitivity with the unused rear Main command dial, and you continue to control the aperture with the front Sub-command dial.



Basically, for people who need to adjust ISO sensitivity quickly while shooting, this can be very convenient. M mode on the Mode dial is not affected by this setting.

- **Show frame count** – This is the default setting and leaves the camera functioning as normal, with the frame count showing in the Control panel and Viewfinder.

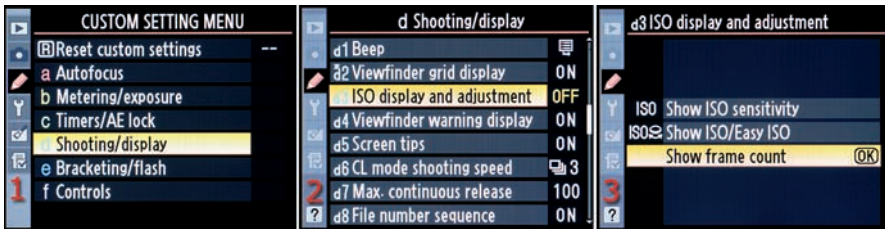


Figure 4.29 – Using ISO display and adjustment settings

Use the following steps to select a d3 ISO display and adjustment setting:

1. Select **d Shooting/display** from the **Custom Setting Menu** and scroll to the right (figure 4.29, image 1).
2. Highlight **d3 ISO display and adjustment** and scroll to the right (figure 4.29, image 2).
3. Choose one of the three settings from the menu. In figure 4.29, image 3, I selected **Show frame count**.
4. Press the **OK button** to lock in the setting.

My Recommendation: I find little use for this setting. My slow and deliberate tripod-based style of nature shooting rarely requires changing ISO sensitivity from its lowest setting (ISO 100). However, I recognize that many people need to change ISO sensitivity on the fly and may not trust the Auto ISO sensitivity control, which adjusts ISO sensitivity automatically, within bounds, to get the shot.

This feature shows how interested Nikon is in giving us very fine control over our cameras. You can use automatic methods or control everything manually. ISO display and adjustment basically gives you manual control over a feature that most people would manage with Auto ISO sensitivity control.

If you are an action shooter and find yourself in varying light levels where you want to maintain fast manual control over ISO sensitivity, maybe you should learn to use this feature.

4



d4 Viewfinder Warning Display

(User's Manual – Page 216)

The d4 Viewfinder warning display setting flashes three types of warnings in the Viewfinder. It warns when no memory card is inserted in the camera, when you have the camera set to MC – Monochrome Picture Control, and when the battery is getting low. It can display all three warnings at the same time, if necessary (figure 4.30, red arrow).

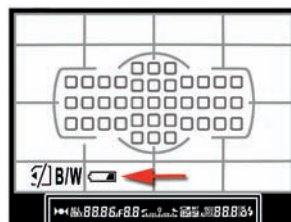


Figure 4.30 – Viewfinder warning display

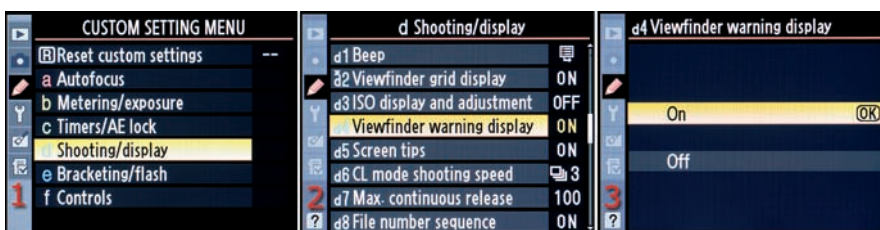


Figure 4.31 – Enabling Viewfinder warning display settings

Use the following steps to set d4 Viewfinder warning display:

1. Select **d Shooting/display** from the **Custom Setting Menu** and scroll to the right (figure 4.31, image 1).
2. Highlight **d4 Viewfinder warning display** and scroll to the right (figure 4.31, image 2).
3. Choose either **On** or **Off** from the menu. In figure 4.30, image 3, I selected **On**.
4. Press the **OK button** to lock in the setting.

You won't see any of the warnings appear in the Viewfinder until the camera actually has a low battery, no memory card, or is using the MC – Monochrome Picture Control (B/W warning). Then it will merrily flash on the lower left-hand corner of the Viewfinder until you fix the condition.

My Recommendation: I leave Viewfinder warning display set to On. I think it's a great idea to have the Viewfinder warn me when my battery is getting low, if I forgot to insert a memory card, or when I'm using the MC – Monochrome Picture Control.

d5 Screen Tips

(User's Manual – Page 216)

The d5 Screen tips setting allows you to enable small helpful tips on the second screen of the camera's Information display. This display is accessed by pressing the Info button twice. Pressing the Info button only once brings up a summary display—you can't edit anything. Pressing it twice shows a similar screen that allows you to change several settings. It's a shortcut screen with settings that are accessed frequently, such as changing the Shooting menu bank or Custom setting bank.

Figure 4.32, image 1, shows the screen that appears when you press the Info button once. Image 2 shows the screen that appears when you press the Info button twice. The first screen is called the Information display, and I'll call the second screen the Information display edit screen to prevent confusion.

You may download additional information about these two screens from this book's downloadable resources website at <http://rockynook.com/NikonD7000>. Look for material called **Information Display**.

Since I have Screen tips enabled on my camera, you can see the tip for changing the Custom setting bank (figure 4.32, image 2, red arrow). If you press the OK button when you have one of the settings highlighted on the Information display edit screen (figure 4.32, image 2), the camera will switch to a normal text menu and allow you to modify the setting.



Figure 4.32 – Screen tips

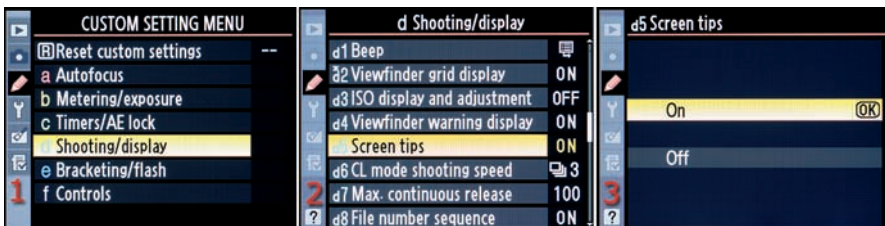


Figure 4.33 – Enabling Information display edit screen tips

Use the following steps to configure d5 Screen tips:

1. Select **d Shooting/display** from the **Custom Setting Menu** and scroll to the right (figure 4.33, image 1).

2. Highlight **d5 Screen tips** and scroll to the right (figure 4.33, image 2).
3. Choose either **On** or **Off** from the menu. In figure 4.33, image 3, I selected **On**.
4. Press the **OK button** to lock in the setting.

My Recommendation: This helpful setting gives you tool tips for using the Information display edit screen. I leave this set to the factory default of On. These little tips don't get in the way and may be helpful to remind you which setting you're looking at on the Information display edit screen.

d6 CL Mode Shooting Speed

(User's Manual – Page 217)

The d6 CL mode shooting speed setting controls how many frames per second (fps) the camera's shutter can fire (maximum)—or how many pictures per second you can take—while in Continuous-low speed release mode (CL on the Release mode dial).

The CL mode is for those who would like to use a conservative fps rate. With the proper power and settings, the camera can record 6 fps in Continuous-high speed release mode (CH on the Release mode dial). However, unless you are shooting race cars going 200 miles per hour and have large memory cards, you may not want a lot of pictures of the same subject a few milliseconds apart.

In that case, just use the CL mode and select fewer fps than CH mode provides. You can choose from 1 to 5 fps as shown in figure 4.34.

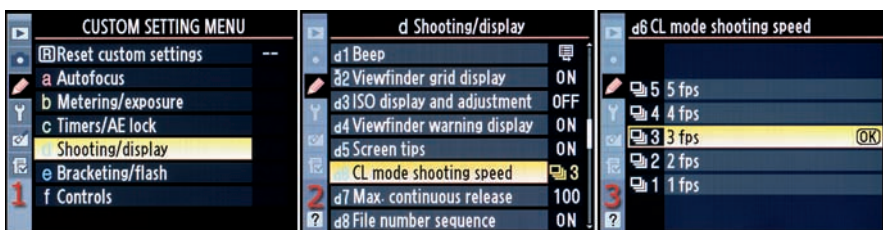


Figure 4.34 – Setting CL mode shooting speed

Use the following steps to configure d6 CL mode shooting speed:

1. Select **d Shooting/display** from the **Custom Setting Menu** and scroll to the right (figure 4.34, image 1).
2. Highlight **d6 CL mode shooting speed** and scroll to the right (figure 4.34, image 2).
3. Choose one of the five options from the list (from 1 to 5 fps). In figure 4.34, image 3, I selected 3 fps.
4. Press the **OK button** to lock in the setting.

As the [figure 4.34, image 3](#), shows, you can adjust the CL mode shooting speed so your camera shoots at any frame rate from 1 to 5 fps. The default is 3 fps. Remember, you always have CH mode for when you want to blast off images like there's no end to your memory card or when you want to impress bystanders with that extra cool Nikon shutter clicking sound.

My Recommendation: Use your favorite CL mode shooting speed, and grab a few, or many, frames in each press and hold of the Shutter-release button. I've always left mine set at the default of 3 fps since that is reasonably fast yet not wasteful of card space. If you'd like, you can slow it all the way down to 1 fps and take only one picture each second that you hold the Shutter-release button down. You'll need to play around with this setting and decide for yourself what speed you like. Again, remember that you have both low (CL) and high (CH) speeds for the camera's shooting rate. This function is for the low speed setting (CL) found on the Release mode dial.

d7 Max. Continuous Release

(User's Manual – Page 217, 320)

The d7 Max. continuous release setting adjusts the maximum number of images you can shoot in a single burst. You can start blasting away with your camera—shooting in a single burst until you have reached the number of exposures specified in [figure 4.35, image 3](#), which is up to 100 images.

Although it is possible that you could reach 100 images in a single burst, it is improbable. Your camera is limited by the size of its buffer and the types of images you are shooting. Plus, during a burst it is actively writing images from the buffer to one or both memory cards.

There's a list in your User's Manual (page 320) that specifies how large the camera's buffer is for each image type. Here's a summary of what the User's Manual says:

- **NEF (RAW) files** – The D7000's in-camera image buffer can hold up to 11 Loss-less compressed RAW images and up to 15 standard Compressed RAW images, depending on whether you are shooting in 12- or 14-bit color depth (Shooting Menu > NEF (RAW) recording).
- **JPEG files** – The D7000's in-camera image buffer can hold from 31 to 100 images, depending on whether you are shooting L, M, or S image sizes; whether you are shooting fine, normal, or basic; and whether you have selected Optimal quality or Size priority compression (Shooting Menu > Image quality, Image size, and JPEG compression).

4



Unless you are shooting the smaller JPEG basic files, you'll fill up your camera buffer before you reach the maximum of 100 shots specified by Max. continuous release. If Shooting Menu > Long exp. NR is on, it further reduces the buffer capacity.

However, the D7000 has a respectable-sized buffer, especially in JPEG mode. If you are shooting in RAW mode, it will not handle nearly the number of images as JPEG mode before running out of buffer space. High-speed event shooting may require that you shoot in JPEG mode to keep from running out of buffer space. Using fast memory cards (for fast image writing) can help, too.

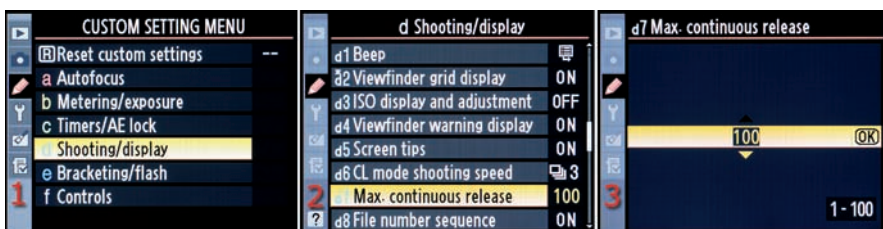


Figure 4.35 – How many images do you want to take in succession?

Use the following steps to configure d7 Max. continuous release:

1. Select **d Shooting/display** from the **Custom Setting Menu** and scroll to the right (figure 4.35, image 1).
2. Highlight **d7 Max. continuous release** and scroll to the right (figure 4.35, image 2).
3. Use the **Multi Selector** to scroll up or down and set the number of images you want in each burst. In figure 4.35, image 3, I selected **100** (the maximum).
4. Press the **OK button** to lock in the setting.

My Recommendation: If you have a need to limit your camera to a maximum number of images in each shooting burst, simply change this number from its default of 100 images to whatever works best for you. I want the buffer to hold as many images as it possibly can when I am blasting away in high-speed shooting modes, so I leave Max. continuous release set to 100.

However, you may want to limit the camera to a maximum burst of 10 or 20 images so the buffer will not fill up and slow the camera down. This also lets you maintain some control over your enthusiastic high-speed shooting. Do you really want dozens and dozens (and dozens) of pictures of those flying seagulls?

What Is the Memory Buffer?

Your D7000 has internal memory that will hold a limited number of images (up to 15 RAW and 31 Large Fine JPEG). This memory buffer allows you to shoot several images in quick succession while the camera writes them one at a time to the memory card(s). The buffer holds the last few pictures you have taken in temporary buffer memory until the camera can store them on the more permanent flash memory in a memory card. If the camera had no internal memory buffer, it would be nearly impossible to shoot several images quickly.

d8 File Number Sequence

(User's Manual – Page 218)

The d8 File number sequence setting allows your camera to count the image file numbers for each picture you take, in a running sequence from 0001 to 9999. After 9999 pictures, it rolls back over to 0001. Or, you can cause it to reset the image number to 0001 when you format or insert a new memory card.

Here are the settings and an explanation of how they work:

- **On** – Image file numbers start at 0001 and continue running in a series until you exceed 9999, at which time the image numbers roll over to 0001 again. The File number sequence continues even if a new folder is created, a new memory card is inserted, or the current memory card is formatted. If the file number exceeds 9999 during a shoot, the camera will create a new folder on the same memory card and start writing the new images, in numbered order from 0001, into the new folder. Similarly, if you accumulate 999 images in the current folder, the next image capture will result in the camera creating a new folder, but the file numbering will not be reset to 0001 unless that 999th image has a file number of 9999. In other words, no matter what you do with your memory cards, or how many folders you or the camera create, the File number sequence will continue incrementing until 9999 images have been taken. Only then will the File number sequence reset to 0001.
- **Off** – Whenever you format or insert a new a memory card or create a new folder, the number sequence starts over at 0001. If you exceed 999 images in a single folder, the camera creates a new folder and starts counting images at 0001 again.

4



- **Reset** – This works in a similar way to the On setting. However, it is not a true running total to 9999 because the image number is dependent on the folder in use. The camera simply takes the last number it finds in the current folder and adds 1 to it, up to 999. If you switch to an empty folder, the numbering starts over at 0001. Since a folder cannot hold more than 999 pictures, you will not exceed 999 as a running sequence of images in any one folder. Each folder has its own number series and causes the File number sequence to Reset.

Use the following steps to configure the d8 File number sequence:

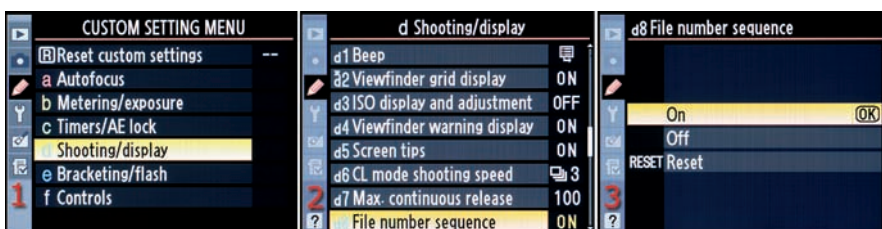


Figure 4.36 – Enabling File number sequence

1. Select **d Shooting/display** from the Custom Setting Menu and scroll to the right (figure 4.36, image 1).
2. Highlight **d8 File number sequence** and scroll to the right (figure 4.36, image 2).
3. Choose one of the three options from the list. In figure 4.36, image 3, I selected **On**.
4. Press the **OK** button to lock in the setting.

My Recommendation: I heartily recommend that you set File number sequence to On. After much experience with Nikon DSLR cameras and many years of storing thousands of files, I've found that the fewer number of files with similar image numbers, the better. Why take a chance on accidentally overwriting the last shooting session when transferring files onto your computer just because they have the same image numbers?

Plus, I like to know how many pictures I've taken with each camera. Since I use the Shooting Menu > File naming function to add three letters reflecting the current number of times my camera has rolled over 9999 images (e.g., _1DY9999.NEF, _2DY9999.NEF, or _3DY9999.NEF), I am better able to determine how many images I've taken with the camera. I just have to be careful to change the 1DY to 2DY when the image File number sequence rolls over from 9999 to 0001.

d9 Information Display

(User's Manual – Page 219)

The d9 Information display setting allows your camera to automatically sense how much ambient light is in the area where you are shooting. If the ambient light is bright, the color of the physical Information display screen will also be bright so it can overcome the ambient light.

To open the Information display screen, press the stand-alone Info button. The Information display screen shows the current shooting information. As I mentioned in the beginning of this section, the extremely cool thing about this Information display screen is that it can adjust its color and brightness according to the ambient light the camera senses through its lens.

Figure 4.37 shows the difference between the light and dark screens, which you can select by using one of the two Manual settings or allowing Auto to select a screen automatically. Figure 4.37, image 1, is the dark on light screen, and Figure 4.37, image 2, is the light on dark screen.



Figure 4.37 – Dark on light and Light on dark display screens

Try this: With your lens cap off, your camera turned on, and nothing displayed on the rear Monitor, press the Info button. If there's dim to bright ambient light, you'll see a light blue information screen with black characters. Now, go into a dark area or put your lens cap on and cover the eyepiece with your hand. You'll see that anytime there is very little ambient light, the camera changes the Information display screen to light gray characters on a dark blue background. This assures that you won't be blinded when you need to see the shooting information while you're in a dark area. This may not impress you much, but I'm easily entertained!

As shown in figure 4.38, image 3, there are two available selections for the Information display setting:

- **Auto** – The D7000 decides through its capless lens or uncovered Viewfinder eyepiece how much ambient light there is and changes the color and contrast of the Information display screen accordingly.
- **Manual** – The Manual setting allows you to select the light or dark version of the Information display screen manually. If you choose Manual, you can see in figure 4.39, image 4, that you have two options: B Dark on light (light blue screen) and W Light on dark (dark blue screen).

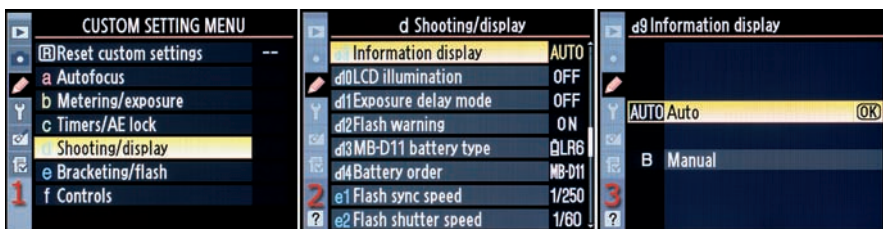


Figure 4.38 – Auto Information display

Use the following steps to configure the d9 Information display setting for Auto:

1. Select **d Shooting/display** from the Custom Setting Menu and scroll to the right (figure 4.38, image 1).
2. Highlight **d9 Information display** and scroll to the right (figure 4.38, image 2).
3. In figure 4.38, image 3, I selected **Auto**. The camera will choose the light blue or dark blue screen depending on the ambient light level.
4. Press the **OK** button to lock in the setting.

If you want to manually select the screen color for your camera's Information display screen, use the following steps:

1. Select **d Shooting/display** from the Custom Setting Menu and scroll to the right (figure 4.39, image 1).
2. Highlight **d9 Information display** and scroll to the right (figure 4.39, image 2).
3. Choose **B Manual** and scroll to the right (figure 4.39, image 3).
4. The next screen shows the **B Dark on light** or **W Light on dark** choices. In figure 4.39, image 4, I chose **B Dark on light** so the light blue screen will display when I press the **Info** button.
5. Press the **OK** button to lock in the setting.



Figure 4.39 – Manual Information display

If you want to impress your friends and make your enemies envious, just show them how cool your camera is when it's smart enough to adjust its screen color to the current light conditions. I warned you that I'm easily entertained, didn't I?

My Recommendation: I leave my camera set to Auto because it seems to work very well at automatically selecting the proper screen for current light conditions. If you prefer the lighter screen, you can select B Dark on light for the normal light blue screen with dark characters, and it will stay that way all the time. Or you could select W Light on dark for the dark blue screen with light characters.

d10 LCD Illumination

(User's Manual – Page 219)

The d10 LCD illumination setting gives you a simple way to set how the illumination of the Control panel LCD backlight works. When it's on, the Control panel lights up in yellowish green. Here are the two choices and how they work:

- **Off (default)** – If you leave LCD illumination set to Off, the Control panel will not turn on its backlight unless you tell it to with the “backlight on” setting on the ring surrounding the Shutter-release button. If you move the Power switch all the way to the right, the Control panel will light up.
- **On** – This setting makes the Control panel illumination come on anytime the exposure meter is active. If you shoot in the dark a lot and need to refer to the Control panel often, then switch this setting to On.

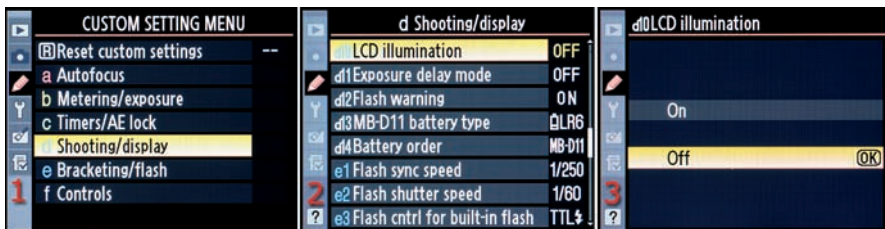


Figure 4.40 – LCD illumination

Use the following steps to configure the d10 LCD illumination setting:

1. Select **d Shooting/display** from the **Custom Setting Menu** and scroll to the right (figure 4.40, image 1).
2. Highlight **d10 LCD illumination** and scroll to the right (figure 4.40, image 2).
3. Choose either **On** or **Off** from the menu. In figure 4.40, image 3, I selected **Off**.
4. Press the **OK button** to lock in the setting.



My Recommendation: This setting will affect the battery life since backlights pull a lot of power, so I don't suggest using the On setting unless you really need it. You have the Power switch (On/Off/Backlight)—surrounding the Shutter-release button—to manually turn on the Control panel light when needed.

d11 Exposure Delay Mode

(User's Manual – Page 219)

The d11 Exposure delay mode setting introduces a delay of about one second after the Shutter-release button is pressed—and the reflex mirror is raised—before the shutter is actually released. Hopefully, during the one-second delay, the camera vibrations will die down and the image will be sharper.

There are two settings available in Exposure delay mode:

- **On** – The camera first raises the reflex mirror and then waits about one second before firing the shutter. This allows the vibrations from the mirror movement to dissipate before the shutter fires. Of course, this won't be useful at all for shooting anything that moves or for any type of action shots. But for slow shooting of static scenes, this is great and keeps you from having to use Mirror-up (MUP), which requires two Shutter-release button presses to take a picture. It has the same effect as MUP but requires only one Shutter-release button press and a one-second delay.
- **Off** – The shutter has no delay when this setting is turned off.

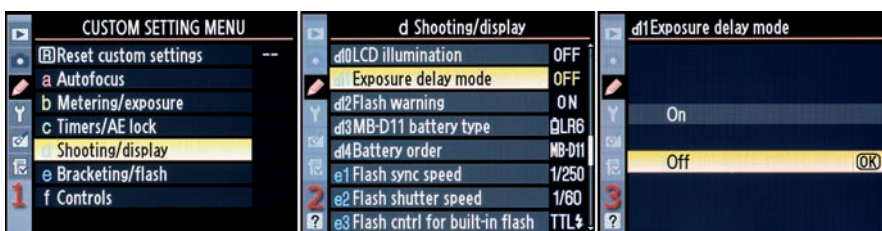


Figure 4.41 – Exposure delay mode

Use the following steps to configure d11 Exposure delay mode:

1. Select **d Shooting/display** from the **Custom Setting Menu** and scroll to the right (figure 4.41, image 1).
2. Highlight **d11 Exposure delay mode** and scroll to the right (figure 4.41, image 2).
3. Choose either **On** or **Off** from the menu. In figure 4.41, image 3, I selected **Off**.
4. Press the **OK button** to lock in the setting.

My Recommendation: Exposure delay mode is very important to me. As a nature shooter, I use it frequently for single shots. When I'm shooting handheld—or on a tripod—and want a really sharp image, I often use this mode to prevent the camera's internal reflex mirror movement from vibrating my camera and blurring my pictures. If you handhold your camera, shoot mostly static subjects, and want sharper pictures, this setting will help. On a tripod, this is a time saver compared to Mirror-up (MUP) mode, which requires two Shutter-release button presses or a 30-second time-out delay.

d12 Flash Warning

(User's Manual – Page 219)

The d12 Flash warning setting enables a blinking lightning bolt warning in the Viewfinder when the camera detects that the ambient light is too low to take a sharp picture. You should raise the camera's pop-up flash manually when you see the Flash warning. You won't see the warning when you use one of the camera's automatic modes because the camera will pop up the flash as needed. However, in release modes like P, S, A, or M you will see this warning often. Figure 4.42 (red arrow) shows the location of the small lightning bolt symbol in the lower right of the Viewfinder. It may be hard to see in the figure, so go into a low-light area and press the Shutter-release button halfway while holding the camera to your eye. If the flash is not raised, the lightning bolt symbol will flash, symbolically asking you to invoke the flash unit.

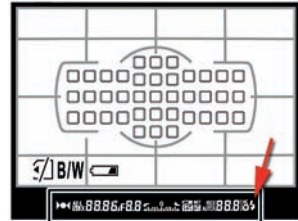


Figure 4.42 – Flash warning

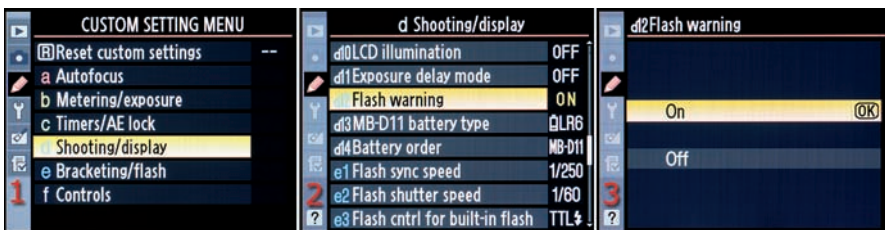


Figure 4.43 – Flash warning settings

Use the following steps to configure the d12 Flash warning setting:

1. Select **d Shooting/display** from the **Custom Setting Menu** and scroll to the right (figure 4.43, image 1).
2. Highlight **d12 Flash warning** and scroll to the right (figure 4.43, image 2).
3. Choose either **On** or **Off** from the menu. In figure 4.43, image 3, I selected **On** (factory default).
4. Press the **OK button** to lock in the setting.

My Recommendation: Flash warning defaults to On, which I use all the time. That way, if it's too dark to make a normal exposure the camera warns me that I need to use flash. Of course, the long shutter time and blurry picture from camera shake warn me as well, when the light is too low. Especially for a new photographer, this function is helpful. There's no point in turning it Off, unless you don't like it flashing just before you take a blurry picture.

d13 MB-D11 Battery Type

(User's Manual – Page 220)

The d13 MB-D11 battery type setting applies only when you use AA-sized batteries in your optional MB-D10 battery pack. It does not apply when you are using normal Nikon EN-EL15 lithium ion battery packs because they communicate with the camera.

If you have an MB-D11 and plan to use AA batteries, you'll need to tell the camera what type of AA batteries you're using for this session. It certainly is not a good idea to mix AA battery types.

The MB-D11 can hold one EN-EL15 battery or six AA batteries. Nikon suggests that AA batteries only be used in emergencies and only in warm temperatures. The performance characteristics of AA batteries is significantly lower than the Nikon EN-EL15 lithium ion battery pack.

The camera will accept the following battery types:

- LR6 (AA alkaline)
- HR6 (AA Ni-MH) (nickel metal hydride)
- FR6 (AA lithium)

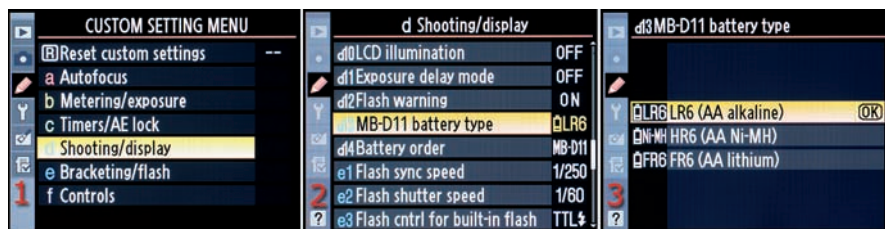


Figure 4.44 – MB-D11 battery type choices

Use the following steps to configure the d13 MB-D11 battery type setting:

1. Select **d Shooting/display** from the **Custom Setting Menu** and scroll to the right (figure 4.44, image 1).
2. Highlight **d13 MB-D11 battery type** and scroll to the right (figure 4.44, image 2).

3. Choose one of the three options from the list. In [figure 4.44, image 3](#), I selected **LR6 (AA alkaline)**.
4. Press the **OK button** to lock in the setting.

My Recommendation: Nikon does not recommend using certain AA batteries, such as LR6 (AA alkaline) and HR6 (AA Ni-MH). Its primary objection to these two types of batteries is that they do not work well at lower temperatures. In fact, once you go below 68 degrees F (20 degrees C), an Alkaline battery starts losing its ability to deliver power and will die rather quickly. You may not get as many shots out of a set of AA batteries, so your cost of shooting may rise.

However, AA batteries are readily available and relatively low cost, so some people like to use them, especially in an emergency. If you do choose to use AA batteries, stick with FR6 (AA lithium) since that is the same type of cell used in the normal Nikon EN-EL batteries, and they are not affected as much by low ambient temperatures. You can also use HR6 (AA Ni-MH) batteries safely since they are not as temperature sensitive, and they provide consistent power.

d14 Battery Order

(User's Manual – Page 221)

The d14 Battery order setting lets you choose the order in which you want the available batteries to be used: camera's battery first or those in the MB-D11 battery pack first:

- **Use MB-D11 batteries first (default)** – When the camera is turned on it starts drawing its power from the MB-D11 battery pack first. After the battery pack is exhausted, the camera automatically switches to the EN-EL15 battery inside the camera.
- **Use camera battery first** – When you turn on the camera it uses the internal EN-EL15 battery to exhaustion before using the battery or batteries in the MB-D11 battery pack. If you select this option and remove the MB-D11 while the battery is dead in the camera, you'll have to remove and recharge the camera's internal battery before use.

4



e Bracketing/Flash

Custom Settings e1–e6

Within the e Bracketing/flash menu, you'll find six settings:

- e1 Flash sync speed
- e2 Flash shutter speed
- e3 Flash cntrl for built-in flash
- e4 Modeling flash
- e5 Auto bracketing set
- e6 Bracketing order

e1 Flash Sync Speed

(User's Manual – Page 222)

The e1 Flash sync speed setting lets you select a basic synchronization speed from 1/60 s to 1/250 s. The D7000 has a more flexible Flash sync speed than many cameras.

Or, if you prefer, you can use the two Auto FP high-speed sync modes on your camera—1/250 s (Auto FP) or 1/320 s (Auto FP). These Auto FP high-speed sync modes are available only with certain external Speedlights, not with the built-in pop-up Speedlight.

At the time of writing this book, the five Nikon Speedlights that can be used with the D7000 in Auto FP high-speed sync modes are as follows:

- SB-900
- SB-800
- SB-700
- SB-600
- SB-R200

Auto FP high-speed sync enables the use of fill flash even in bright daylight with wide aperture settings. It allows you to set your camera to the highest shutter speed, up to 1/8000 second, and still use the external flash unit to fill in shadows. There are two upcoming subsections in this chapter, **Auto FP High-Speed Sync Review** and **Special Shutter Speed Setting X + Flash Sync Speed**, that provide a detailed discussion on how the Auto FP high-speed sync system works.

4



The following are your Flash sync speed choices (figure 4.46):

- 1/320 s (Auto FP)
- 1/250 s (Auto FP)
- 1/250 s
- 1/200 s
- 1/160 s
- 1/125 s
- 1/100 s
- 1/80 s
- 1/60 s

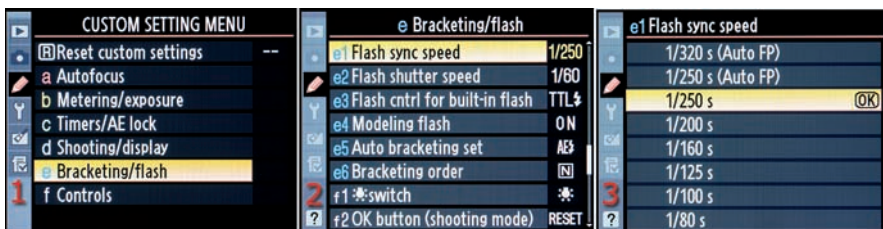


Figure 4.46 – Flash sync speed choices

Use the following steps to adjust the e1 Flash sync speed setting:

1. Select **e Bracketing/flash** from the **Custom Setting Menu** and scroll to the right (figure 4.46, image 1).
2. Highlight **e1 Flash sync speed** and scroll to the right (figure 4.46, image 2).
3. Choose one of the nine options from the list—1/60 s to 1/320 s (Auto FP). In figure 4.46, image 3, I selected 1/320 s (Auto FP).
4. Press the **OK button** to lock in the setting.

When you're using Auto FP high-speed sync mode, the output of your flash is reduced, but it doesn't cut off the frame for exposures using a shutter speed higher than the normal flash sync speed (X-sync). Why? Let's review.

Auto FP High-Speed Sync Review

In a normal flash situation, with shutter speeds of 1/250 of a second and slower, the entire shutter is fully open and the flash can fire a single burst of light to expose the subject. It works like this: There are two shutter curtains in your camera. The first shutter curtain opens to expose the sensor to your subject, the flash fires to provide light for the correct exposure, then the second shutter curtain closes. For a very brief period of time, the entire sensor is uncovered. The flash fires during the time when the sensor is fully uncovered.

However, when your camera's shutter speed is faster than 1/250 of a second, the shutter curtains are never fully open for the flash to expose the entire subject in one burst of light. This is because at fast shutter speeds the first shutter curtain starts

opening and the second shutter curtain quickly follows. In effect, a slit of light scans across the surface of your sensor, exposing the subject. If the flash fired normally, the width of that slit between the shutter curtains would get a flash of light, but the rest of the sensor would be blocked by the curtains. A band of the image would be correctly exposed, and everything else would be underexposed.

What happens to your external Nikon Speedlight to allow it to follow that slit of light moving across the sensor? It changes into a pulsing strobe unit instead of a normal flash unit. Have you ever danced under a strobe light? A strobe works by firing a series of light pulses. Similarly, when your camera's shutter speed is so high that the Speedlight cannot fire a single burst of light for a correct exposure, it can use its Auto FP high-speed sync mode and fire a series of light bursts as the slit between the shutter curtains travels in front of the image sensor. The Speedlight can fire thousands of bursts per second. To a photographer or subject it looks like one flash of light, even though it is hundreds or thousands of bursts of light, one right after the other.

When the camera is in Auto FP high-speed sync mode, you'll see something like this on your Speedlight's LCD monitor: TTL FP or TTL BL FP. The FP designation tells you that the camera and Speedlight are ready for you to use any shutter speed you'd like and still get a good exposure, even with wide-open apertures!

You can safely leave your camera set to 1/320 s (Auto FP) or 1/250 s (Auto FP) all the time since the Auto FP high-speed sync mode does not kick in until you raise the shutter speed above the maximum setting of 1/250 s. With slower shutter speeds, the flash works in normal mode and does not waste any power by pulsing the output. This pulsing of light reduces the maximum output of your flash significantly but allows you to use any shutter speed while still firing your external Speedlight. The higher the shutter speed, the lower the flash output. In effect, your camera is depending on you to have enough ambient light to offset the loss in power. I've found that even my powerful SB-900 Speedlight can provide only enough power to light a subject to about 8 feet (2.4 m) when I use a 1/8000 second shutter speed. With shutter speeds that fast, there needs to be enough ambient light to help the flash light the subject, unless you are very close to the subject.

However, now you can use wide apertures to isolate your subject in direct sunlight—which requires fast shutter speeds. The flash will adjust and provide great fill light if you use Auto FP high-speed sync mode.

Note: If your flash fires at full power in normal modes, the flash indicator will blink in the Viewfinder to let you know that all available flash power has been expended, and you need to check to see if the image is underexposed. When the camera is firing in Auto FP high-speed sync mode, that doesn't happen. You won't get a warning in the Viewfinder if the image does not have enough light. Check the histogram often when using Auto FP high-speed sync mode.

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Special Shutter Speed Setting X + Flash Sync Speed

When using exposure modes Manual (M) or Shutter priority auto (S), you can turn the shutter speed all the way down to 30 seconds, then to bulb. There is one more setting below bulb, named X + Flash sync speed. This special setting allows you to set the camera to a known shutter speed and shoot away. You will see X 250 if Custom Setting e1 Flash sync speed is set to 1/250 s. Whatever Flash sync speed you select will show up after the X. If you selected a Flash sync speed of 1/125 s, then X 125 will show up as the next setting below bulb. Selecting a Flash sync speed of 1/60 s means that X 60 will show up below bulb, etc.

The shutter speed will not vary from your chosen setting. The camera will adjust the aperture and flash when in Shutter priority auto (S) mode, or you can adjust the aperture while the flash controls exposure in Manual (M) mode.

This special X-Sync mode is not available in Aperture priority auto (A) or Programmed auto (P) modes since the camera controls the shutter speed in those two settings. You'll use this setting primarily when you are shooting in Manual (M) or Shutter priority auto (S) mode and want to use a known X-Sync speed.

My Recommendation: I leave my camera set to 1/320 s (Auto FP) (as shown in [figure 4.46, image 3](#)) all the time. The camera works just like it normally would until one of my settings increases the shutter speed to faster than 1/250 second, at which time it starts pulsing the light to match the travel of the shutter curtains. Once again, you won't be able to detect this high-frequency strobe effect since it happens so fast it seems like a single burst of light.

Remember that the flash loses significant power (or reach) at faster shutter speeds since it is forced to work so hard. Be sure you experiment with this setting to get the best results. You can use a big aperture, like f/1.8, to create a very shallow depth of field in direct bright sunlight since you can use very fast shutter speeds. This will allow you to make images that many other cameras simply cannot create. Learn to balance the flash and ambient light in Auto FP high-speed sync mode. All this technical talk will make sense when you see the results. Pretty cool stuff!

e2 Flash Shutter Speed

(User's Manual – Page 223)

The e2 Flash shutter speed setting controls the minimum shutter speed your camera can use in various flash modes. You can select shutter speeds between 30 s and 1/60 s.

Let's consider each of the modes and their minimum shutter speeds.

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- **Front-curtain sync, Rear-curtain sync, or Red-eye reduction** – In Programmed auto (P) mode or Aperture priority auto (A) mode, you can select the slowest shutter speed from the range of 1/60 s to 30 s (figure 4.47). Shutter priority auto (S) mode and Manual (M) mode cause the camera to ignore Flash shutter speed, and the slowest shutter speed is 30 s.
- **Slow sync, Red-eye reduction with slow sync, or Slow rear-curtain sync** – These three modes ignore Flash shutter speed, and the slowest shutter speed is 30 s.

The User's Manual is a bit confusing on this subject, but the mode and minimum shutter speed information in the previous list is evident after study and testing. Therefore, Custom setting e2 Flash shutter speed is only partially used by the flash modes, because the default is preset to 30 seconds in Shutter priority auto (S) and Manual (M) modes.

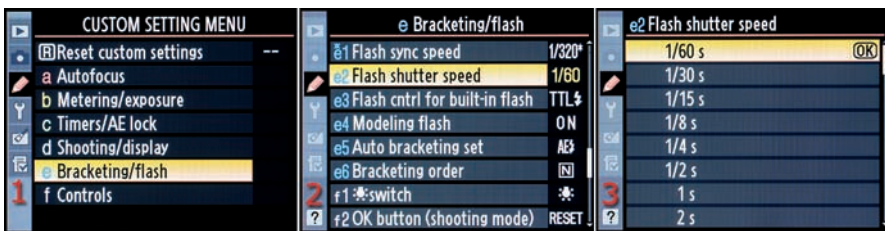


Figure 4.47 – Flash shutter speed choices

Use the following steps to set the e2 Flash shutter speed minimum:

1. Select **e Bracketing/flash** from the **Custom Setting Menu** and scroll to the right (figure 4.47, image 1).
2. Highlight **e2 Flash shutter speed** and scroll to the right (figure 4.47, image 2).
3. Choose one of the options from the list: 1/60 s to 30 s. In figure 4.47, image 3, I selected 1/60 s (default).
4. Press the **OK button** to lock in the setting.

My Recommendation: I normally use 1/60 s. Shutter speeds slower than 1/60s can cause ghosting if the ambient light is too bright. The subject can move after the flash fires, but the open shutter and ambient light can record a blurred ghost effect. You'll have a well-exposed picture of the subject plus a ghost of the subject in the image. Use slower shutter speeds only when you are sure that you'll be in dark conditions and the flash will provide the only lighting—unless you're shooting special effects, like a blurred aftereffect following your subject to imply movement.



e3 Flash Cntrl for Built-in Flash

(User's Manual – Page 223)

The e3 Flash cntrl for built-in flash setting provides four distinct ways to control the output of the pop-up Speedlight flash. This Custom setting does not apply to flash units you attach via the Accessory shoe (hot-shoe) on top of the camera. It is only for the built-in flash. The four modes are as follows:

- TTL – TTL
- M – Manual
- RPT – Repeating flash
- CMD – Commander mode

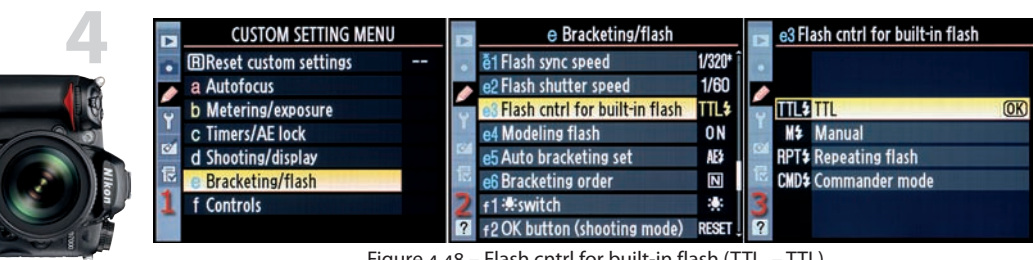


Figure 4.48 – Flash cntrl for built-in flash (TTL – TTL)

Use the following steps to choose one of the e3 Flash cntrl for built-in flash settings:

1. Select **e Bracketing/flash** from the **Custom Setting Menu** and scroll to the right (figure 4.48, image 1).
2. Highlight **e3 Flash cntrl for built-in flash** and scroll to the right (figure 4.48, image 2).
3. Choose one of the four options from the list. In figure 4.48, image 3, I selected **TTL – TTL**. The other choices will be detailed in figures 4.49 to 4.51, which begin where figure 4.48 leaves off.
4. Press the **OK button** to lock in the setting.

Let's consider each of the four Flash cntrl for built-in flash modes.

TTL

Also known as i-TTL, this mode is the standard way to use the camera for flash pictures. TTL stands for through the lens, and it creates a very accurate and balanced flash output using a preflash method to determine the correct exposure before the main flash burst fires. This is a completely automatic mode and will

adjust to various distances, along with the different shutter speeds and apertures your camera can use. The TTL – TTL setting was illustrated in [figure 4.48](#).

M – Manual

This mode, shown in [figure 4.49](#), allows you to manually control the output of your flash. The settings range from Full power to 1/128th power. If you’ve been shooting in a studio for a long time, this setting will be quite familiar to you.



Figure 4.49 – Flash cntrl for built-in flash (M – Manual)

RPT – Repeating flash

This setting turns your flash into a strobe unit where you can see the pulse (unlike Auto FP high-speed sync mode), allowing you to get creative with stroboscopic multiple flashes. Using the screen shown in [figure 4.50, image 2](#), you use the Multi Selector to scroll up and down to set the values, and you scroll left and right to move between Output, Times, and Frequency. Press the OK button when you have the settings configured. Descriptions of the settings are as follows:



Figure 4.50 – Flash cntrl for built-in flash (RPT – Repeating flash)

- Output** – You can vary the power of the flash from 1/4 to 1/128 of full power. The more power the flash uses, the fewer times it can fire. The following table indicates how many times the built-in pop-up flash can fire using the various Output levels:

1/4	2 times
1/8	2–5 times
1/16	2–10 times
1/32	2–10 or 15 times
1/64	2–10, 15, 20, or 25 times
1/128	2–10, 15, 20, 25, 30, or 35 times

- Times** – This setting controls the number of times the strobe will flash per second. The range is from 2 to 10 flashes in one-step increments and then from 10 to 35

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(at 1/128) in five-step increments (the number of times shown in Output). Refer to the previous table to see the number of times the flash can fire. Raising the power output (going toward 1/4) will decrease the number of times the flash can fire, and lowering the power (going toward 1/128) will increase the number of times the flash can fire. As you change the Output, you'll see the maximum Times change.

- **Frequency** – This sets the flash to fire a series of pulses for each of the Times it fires, from 1 pulse to 50 pulses. You could also call this the Hz, or Hertz setting. The frequency range is from 1 to 50 Hz.

CMD – Commander Mode

This mode allows your camera to become a commander, or controller, of an unlimited number of external Speedlight flash units

that are compatible with the Nikon Creative Lighting System (CLS). It can control up to two groups, or banks, with four available communication Channels (1-4). In [figure 4.51, image 2](#), you can see the Built-in flash, Group A, Group B, and Channel settings. The two columns have headers called Mode and Comp. (compensation). Use the Multi Selector to move around and modify the settings. Descriptions of the four settings are as follows:



Fig. 4.51 – Flash cntrl for built-in flash (CMD – Commander mode)

- **Built-in flash** – This option lets you set the built-in pop-up flash to one of three settings. These settings do not affect any of the flash units in Group A or Group B because they are external flash units being controlled wirelessly by the Commander mode:
 - TTL** – Otherwise known as i-TTL mode, this is a completely automatic mode that monitors preflashes to determine the duration of the built-in flash for correct exposure. You can set Comp. to between +3.0 and -3.0 EV in 1/3 EV steps.
 - M** – This Mode allows you to choose a manual flash level between 1/1 (full power) to 1/128 (1/128 of full power).
 - – I call this the double-dash Mode. This disables the built-in flash so it won't add light to the image. The primary light burst from the built-in flash will not fire. However, the built-in flash must fire preflashes to determine the correct exposure and to communicate with any external flash units in Group A or Group B, which are being commanded.

- **Group A** and **Group B** – These are groups of an unlimited number of remote slaved Speedlights that your camera can control and fire using the Nikon CLS. Each group has four Modes that can be applied to each flash unit in the group. The Modes are as follows:
 - a. **TTL** – This Mode works like Built-in flash except that it causes all flash units being controlled in each Group to use TTL (i-TTL). You can also set Comp. between +3.0 and -3.0 EV in 1/3 EV steps. Comp. will affect all flash units in that group.
 - b. **AA** – This stands for auto aperture, and it is available only when your D7000 is controlling an SB-900 or SB-800 Speedlight flash unit in slave mode on a bank. This is an older technology that does not use the newer i-TTL exposure technology. It is included for people who are used to the older style of exposure. You can safely ignore this mode and use TTL instead, and you'll get better exposures. If you really want to use AA Mode, that's fine. It works like TTL Mode but with less accurate exposures. You can set Comp. between +3.0 and -3.0 EV in 1/3 EV steps. Comp. will affect all flash units in that group.
 - c. **M** – This Mode allows you to choose a manual flash level between 1/1 (full power) and 1/128 (1/128 of full power) for each of the flash units being controlled in a group. If you like to shoot manually for ultimate control, the camera gives you a way to control multiple groups of flash units manually.
 - d. **--** – The flash units in the group do not fire. Double-dash Mode disables an entire group so you can concentrate on configuring the other group. Then you can turn the disabled group back on and configure it, too. Or you can use just one group of slaved Speedlights (Group A or Group B) and disable the other.
- **Channel** – The Channel is a communications channel on which your camera communicates with all grouped remote flashes. You choose one Channel to control all of your slaved flash units. You must match the Channel number for the camera to each flash unit. You have a choice of four Channel numbers: 1–4. This allows you to use your flash units near another photographer who is also controlling groups without accidentally firing the flash units on the other camera. Each photographer chooses a different channel to avoid communication conflicts.

An upcoming chapter of this book, **Speedlight Flash**, is devoted to Nikon flash usage. It covers each of the flash and Commander modes in more detail.



Commander Mode Notes

When your camera controls multiple flash units in Commander mode, it is important that you understand a few points.

First, the camera communicates with the remote slaved flash groups (Group A and Group B) during the monitor preflash cycle, so the pop-up flash must be raised so it can communicate with the remote flash units.

Second, each remote flash unit has a little round photocell sensor on its side that picks up the monitor preflashes from your camera's pop-up flash. Make sure those sensors are not blocked or exposed to direct, very bright light while in use or they may not be able to see the monitor preflashes.

Third, if you want to prevent the monitor preflashes from appearing in your photographs or causing people to squint, you need to purchase the optional SG-3IR infrared panel for the pop-up flash. This infrared panel makes the monitor preflashes mostly invisible to humans and imaging sensors, yet the remote flash units can still see them and react properly.

Fourth, don't position any of the remote flash units more than 33 feet (10.05 m) from the camera. That's the maximum distance for which you can use the D7000's pop-up flash in Commander mode.

If these issues bother you, invest in the Nikon SU-800 wireless Speedlight commander that replaces the pop-up flash/Commander mode combo. Mount it onto the Accessory shoe and let it control the remote slaves up to 66 feet (20.10 m) away.

My Recommendation: Learn to use the Commander mode on your D7000. It opens up the Nikon CLS to you. You can then use your D7000 to control multiple Nikon Speedlight flash units and really get creative with your lighting arrangements for portrait work and product shots. When I'm not using Commander mode, I leave Flash cntrl for built-in flash set to TTL for fully automatic flash pictures.

e4 Modeling Flash

(User's Manual – Page 228)

The e4 Modeling flash setting lets you fire a pulse of flashes to help you see how the light wraps around your subject. It works like modeling lights on studio flash units, except it pulses instead of shines. You can press the Depth-of-field preview button to see the effect if you set Modeling flash to On.

This function works with Nikon's main Speedlight flash unit group: SB-900, SB-800, SB-700, SB-600, and SB-R200. It also works with the pop-up flash for limited periods. My SB-400 flash unit does not work with Modeling flash.

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Here's what each of the settings for Modeling flash accomplishes:

- **On** – This setting allows you to see (somewhat) how your flash will light the subject. If you have this setting turned On, you can press the Depth-of-field preview button to strobe the pop-up flash, or any attached/controlled external Speedlight unit, in a series of rapid pulses. These pulses are continuous and simulate the lighting that the primary flash burst will emit. The Modeling flash can be used only for a few seconds at a time to prevent the flash unit from overheating, so look quickly.
- **Off** – This means that no Modeling flash will fire when you press the Depth-of-field preview button.

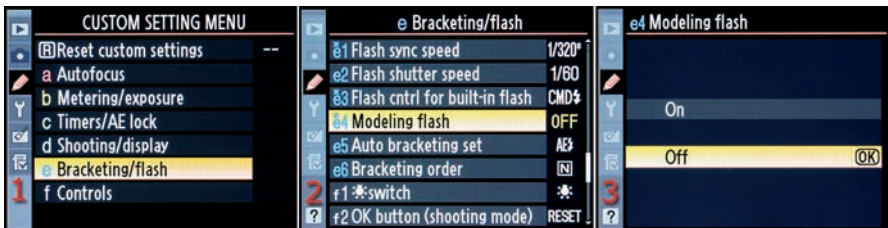


Figure 4.52 – Modeling flash settings

Use the following steps to configure the e4 Modeling flash settings:

1. Select **e Bracketing/flash** from the **Custom Setting Menu** and scroll to the right (figure 4.52, image 1).
2. Highlight **e4 Modeling flash** and scroll to the right (figure 4.52, image 2).
3. Choose either **On** or **Off** from the menu. In figure 4.52, image 3, I selected **Off**.
4. Press the **OK button** to lock in the setting.

My Recommendation: I often forget that I have this setting turned on and want to check my actual depth of field on a product shot. When I press the Depth-of-field preview button, I get the modeling light instead of depth of field. I don't find this feature to be particularly useful, and it often startles me. One of these days, I'll get around to turning it off. You might like it if you do a lot of studio-style flash photography. Give it a try, but be prepared—the pulsing of the flash sounds like an angry group of hornets about to attack your face.

4



e5 Auto Bracketing Set

(User's Manual – Pages 229, 109)

The e5 Auto bracketing set function lets you choose how bracketing works. You can set up bracketing for the exposure system (AE), flash, White balance, and Active D-Lighting.

The basic idea behind bracketing is to take the same picture multiple times with a different exposure, White balance, or Active D-Lighting level. It's a way to play it safe so you get at least one excellent picture.

Let's start by reviewing the five types of bracketing:

- **AE & flash** – When you set up a session for bracketing, the camera will cause any type of normal picture you take to be bracketed, whether it is a standard exposure or taken with the flash.
- **AE only** – Your bracketing settings will affect only the exposure system and not the flash.
- **Flash only** – Your bracketing settings will affect only the flash system and not the exposure.
- **WB bracketing** – White balance bracketing works the same as exposure and flash bracketing, except it is designed for bracketing color in mired values, in which color temperatures are adjusted, instead of bracketing light in EV step values. This can be used only when you are shooting in JPEG mode.
- **ADL bracketing** – In this case you are bracketing Active D-Lighting (ADL) in up to five separate exposures. Each consecutive exposure uses the next higher level of Active D-Lighting.

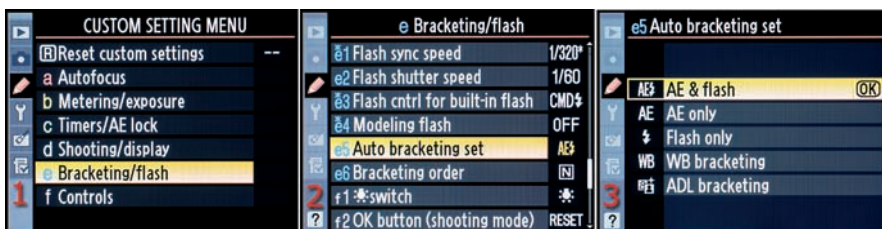


Figure 4.53A – Auto bracketing set choices

Use the following steps to select an e5 Auto bracketing set type:

1. Select **e Bracketing/flash** from the Custom Setting Menu and scroll to the right (figure 4.53A, image 1).
2. Highlight **Auto bracketing set** and scroll to the right (figure 4.53A, image 2).

3. Choose one of the five options from the list. In [figure 4.53A, image 3](#), I selected **AE & flash**.
4. Press the **OK button** to lock in the setting.

Now let's consider how to use the bracketing system.

Steps to Use AE and/or Flash Bracketing

The primary type of bracketing for most photographers is generally AE bracketing, which simply means auto-exposure bracketing. Since AE and Flash bracketing work in the same way, this section explains how to bracket your images when you have selected AE & flash, AE only, or Flash only bracketing.



Figure 4.53B – BKT button, Main and Sub-command dials, and Control panel with AE/flash bracketing symbols

Use the following steps to shoot an exposure-bracketed series of images ([figure 4.53B](#)):

1. Select **AE & flash**, **AE only**, or **Flash only** in **Custom Setting Menu > e Bracketing/flash > e5 Auto bracketing set** ([figure 4.53A, image 3](#)).
2. Press and hold the **BKT button** on the front of the camera ([figure 4.53B, image 1](#)). **BKT** will appear on the **Control panel**, along with a series of characters (see A, B, and C in [image 3](#)). Do not release the **BKT button**.
3. Turn the rear **Main command dial** ([figure 4.53B, image 2](#), bottom arrow) to select the number of shots in the bracket. The number of shots you select will appear on the **Control panel**. In [figure 4.53B, image 3](#), I selected **3F** (red letter A). You can choose from the following options:
 - **0F** = Bracket not set
 - **3F** = Three-shot bracket (with exposure order set in Custom setting e6)
 - **-2F** = Two-shot bracket, normal and underexposed
 - **+2F** = Two-shot bracket, normal and overexposed
4. Continue holding down the **BKT button** and turn the front **Sub-command dial**

(figure 4.53B, image 2, top arrow) to select the bracketed exposure increment. The EV step value will appear on the **Control panel**. In figure 4.53B, image 3, I selected 1.0 (red letter B). You can choose from the following increments, which are affected by the setting in Custom setting b2:

- 0.3, 0.7, 1.0, 1.3, 1.7, or 2.0 EV (with 1/3 step set in Custom setting b2)
- 0.5, 1.0, 1.5, or 2.0 (with 1/2 step set in Custom setting b2)

5. Release the **BKT button** and press the **Shutter-release button** to shoot your bracketed pictures. If you are using **Single frame (S) release mode**, you will have to press the **Shutter-release button** two or three times (depending on the number of shots selected in step 3). If you are using one of the **Continuous (CL or CH) release modes**, you can simply hold down the **Shutter-release button** and the camera will fire the number of shots selected in step 3. Figure 4.53B, image 3 shows the Bracketing progress indicator (red letter C). Each time the shutter fires, a part of the indicator will disappear. If you are using **Single frame (S) release mode**, you must be sure that you have taken all shots in the bracketed series. If part of the progress indicator remains, you have *not* taken all the shots in the series. In a **Continuous (CL or CH) release mode** all shots will fire in quick succession when you hold down the **Shutter-release button**.

My Recommendation: I normally bracket with a 1 EV or 2 EV step value (1 or 2 stops) so that I can get a good spread of light values for creating High Dynamic Range (HDR) images. In most cases, I will shoot a three-image bracket, with one image overexposed and one image underexposed by 1 or 2 stops. This allows me to combine detail in the highlight and shadow areas during HDR processing.

Using Bracketing Burst

Custom settings f3 and f4 allow you to assign Bracketing burst to either the Fn button (f3) or the Preview button (f4). When the camera is in Single frame (S) or Quiet (Q) release modes, Bracketing burst lets the camera fire the entire bracketed series when you hold down one of the assigned buttons (Fn or Preview) and the Shutter-release button. It lets the camera override the fact that you normally have it set to shoot one frame at a time. In addition, if you have the camera set to one of the Continuous (CL or CH) release modes, it will fire the entire bracketed series over and over as long as you hold down the Shutter-release button and Fn or Preview button, instead of stopping after one bracket series.



Steps to Use WB Bracketing

WB bracketing allows you to shoot a bracketed series of images with various White balance (WB) color temperatures applied. With WB bracketing you can add amber and/or blue to the bracketed images to make them warmer or cooler with lighter or darker tint levels.

WB bracketing does not work when your camera is in RAW mode. If you press the BKT button and turn the Command dials and nothing happens, the camera's Image quality is probably set to a mode that provides NEF (RAW) images.



Figure 4.53C – BKT button, Main and Sub-command dials, and Control panel with WB bracketing symbols

Use the following steps to shoot a WB-bracketed series of images (figure 4.53C):

1. Select **WB bracketing** from **Custom Setting Menu > e Bracketing/flash > e5 Auto bracketing set** (figure 4.53A, image 3).
2. Press and hold the **BKT button** on the front of the camera (figure 4.53C, image 1). **WB-BKT** will appear on the **Control panel**, along with a series of characters (see A and B in image 3). Do not release the **BKT button**.
3. Turn the rear **Main command dial** (figure 4.53C, image 2, bottom arrow) to select the number of shots in the bracket. The number of shots you select will appear on the **Control panel**. In figure 4.53B, image 3, I selected **A2F** (red letter A). You can choose from the following options:
 - **0F** = Bracket not set
 - **A2F** = Two-shot bracket, one normal, one adding amber
 - **b2F** = Two-shot bracket, one normal, one adding blue
 - **3F** = Three-shot bracket, one normal, one adding amber, and one adding blue
4. Now we'll set the tint level of the amber or blue color by adding more or less color depth in mired amounts (see sidebar, **What is Mired?**). Continue holding down the **BKT button** and change the mired number by turning the **Sub-command dial** left or right, up to three maximum. The mired number will appear on the **Control panel**. In figure 4.53C, image 3, I selected **3** (red letter B). Choose **1, 2, or 3**,



where 1=5 mired, 2=10 mired, and 3=15 mired. If you chose a three-shot bracket (3F), the direction of the color bracketing toward amber or blue is controlled by Custom setting e6 Bracketing order. If you selected MTR > under > over in Custom setting e6, the color change direction is normal > amber > blue. If you selected Under > MTR > over in Custom setting e6, the color change direction is amber > normal > blue.

5. Press the Shutter-release button to take the bracketed picture series. The camera will take only **one** picture. Then it reapplies the color filtration for each image in the bracket, and saves each image as a separate image file with a new consecutive file number and bracketed color value. This is different from AE or Flash bracketing, where you have to fire off each individual frame of the bracket. All images in the bracket (up to 3) simply appear on your memory card.

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Note: White balance bracketing works differently when it comes to shooting the bracket. All you have to do is press the Shutter-release button **once** and the camera takes one image, makes copies, and applies the different WB bracketing values to each image. It then saves the two or three images, with their WB settings, under different file names. *You do not take multiple images in WB bracketing.*

My Recommendation: I prefer to use RAW mode and make minor or major color adjustments in the post-processing stage. However, you may want to use WB bracketing when shooting JPEGs because each time you modify and resave a JPEG, the file is degraded. Only people with extreme concern over color balance will find WB bracketing useful. Most of us don't need it.

What is Mired?

Mired changes simply modify the color of your image, in this case toward amber (reddish) or blue. In effect, it warms or cools the image. It's applied directly to the image by the camera when shooting JPEGs, or is saved as a marker when shooting RAW images. You don't have to worry about mired values unless you are a color scientist. You can just determine whether you like the image the way it is or would prefer that it be warmer or cooler, and bracket accordingly. In WB bracketing the A direction warms and the b direction cools. Technically, mired is calculated by multiplying the inverse of the color temperature by 106. I'd rather let my camera calculate mired values and then judge them with my eye; wouldn't you? Remember, if you shoot in RAW, you can modify color values during post-processing. Otherwise, they are applied permanently to JPEG files.

Steps to Use ADL Bracketing

ADL bracketing allows you to shoot a bracketed series of images with various levels of Active D-Lighting (ADL) applied. There are two types of ADL bracketing: two and three frame—represented as 2F or 3F on the camera's Control panel—plus off (0F).

- **Two-frame bracket (2F)** – This type of ADL bracketing fires two shots. The first is taken with no ADL at all, and the second is taken with whatever level of ADL you selected in Shooting Menu > Active D-Lighting (Low, Normal, High, Extra high, or Auto). If ADL is set to Off in the Shooting Menu, the camera will take one image with no ADL and the second with ADL set to Auto, which means it adjusts according to what the camera feels is the best ADL level.
- **Three-frame bracket (3F)** – This version of ADL bracketing ignores the setting in Shooting Menu > Active D-Lighting. It captures three images—the first with no ADL (Off), the second with Normal ADL, and the third with High ADL (Off > Normal > High).
- **No bracketing (0F)** – If you have not selected a bracketing mode, you will see 0F on the Control panel when you press the BKT button. Bracketing is currently off.



Figure 4.53D – BKT button, Main command dial, and Control panel with ADL bracketing symbols

Use the following steps to shoot an ADL-bracketed series of images (figure 4.53D):

1. Select **ADL bracketing** from Custom Setting Menu > e Bracketing/flash > e5 Auto bracketing set (figure 4.53A, image 3).
2. If you selected a two-frame (2F) bracket, set Shooting menu > Active D-Lighting to one of its ADL selections, such as **Low**, **Normal**, or **High**. For a three-frame (3F) bracket, the camera will automatically use Off > Normal > High **ADL bracketing**.
3. Press and hold the **BKT button** while turning the rear **Main command dial** and verify that **ADL- BKT** appears on the upper **Control Panel**. Continue rotating the rear **Main command dial** to choose one of the three settings (4.53D, image 3, red letter A):

- 0F – No bracketing selected
- 2F – Two-frame bracketing (Off > Shooting Menu's Active D-Lighting level)
- 3F – Three-frame bracketing (Off > Normal > High)

4. Release the **BKT button** and press the **Shutter-release button** to take your bracketed pictures. **Figure 4.53D, image 3**, shows the Bracketing progress indicator (red letter B). It will have two parts for a two-frame bracket and three parts for a three-frame bracket. Each time the shutter fires, a part of the indicator will disappear. If you are using **Single frame (S) release mode**, you must be sure that you have taken all the shots in the bracketed series. If part of the progress indicator remains, you have *not* taken all the shots in the series. In a **Continuous (CL or CH) release mode**, all shots will fire in quick succession when you hold down the **Shutter-release button**.

Note: See the sidebar called **Using Bracketing Burst** for instructions on how to override the way the camera captures the bracketed image series in step 4.

My Recommendation: You might use each of the bracketing types for different reasons as you shoot. Many landscape or scenic shooters use AE only (exposure) bracketing quite frequently, with the express purpose of having several images of the same scene shot at different exposures, which they can combine later using high dynamic range imaging (HDR or HDRI) software. If you haven't used bracketing before, I urge you to learn how. It is a powerful capability that seriously extends the camera's facility for capturing a greater range of light and variety of color.

e6 Bracketing Order

(User's Manual – Page 229)

The e6 Bracketing order setting allows you to choose the order of your exposure settings (normal, overexposed, and underexposed) during an exposure bracketing operation.

There are two bracketing orders available in the D7000. These allow you to control which images are taken first, second, and third in the bracketing series:

- MTR – Metered value (normal exposure)
- Under – Underexposed
- Over – Overexposed



Next, let's see how these settings are used during bracketing:

- **MTR > under > over** – With this setting, the normal exposure (MTR) is taken first, followed by the underexposed image (Under), then the overexposed image (Over). For WB bracketing the pattern is normal > amber > blue. This setting does not apply to ADL bracketing.
- **Under > MTR > over** – Using this order for bracketing means that a three-image bracket will be exposed in the following manner: underexposed (Under) > normal exposure (MTR) > overexposed (Over). For WB bracketing the pattern is amber > normal > blue. This does not apply to ADL bracketing.

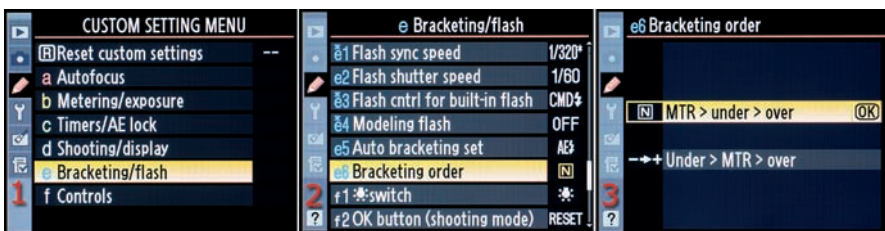


Figure 4.54 – Bracketing order choices

Finally, let's look at the steps to configure the e6 Bracketing order setting:

1. Select **e Bracketing/flash** from the **Custom Setting Menu** and scroll to the right (figure 4.54, image 1).
2. Highlight **e6 Bracketing order** and scroll to the right (figure 4.54, image 2).
3. Choose one of the bracketing orders from the list. In figure 4.54, image 3, I selected **MTR > under > over**.
4. Press the **OK button** to lock in the setting.

My Recommendation: I leave Bracketing order set to MTR > under > over so that when the images are displayed in series by the camera I can see the normal exposure (MTR) first and then watch how it varies as I scroll through the bracketed images. If that doesn't suit you, change it to the other direction, Under > MTR > over. The normal exposure will be in the middle of the bracket instead of at the beginning. Some people prefer the more natural flow of that bracketing order (underexposed to overexposed).

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f Controls

Custom Settings f1–f10

Within the Controls menu you'll find 10 settings:

- f1 switch (backlight)
- f2 OK button (shooting mode)
- f3 Assign Fn button
- f4 Assign preview button
- f5 Assign AE-L/AF-L button
- f6 Customize command dials
- f7 Release button to use dial
- f8 Slot empty release lock
- f9 Reverse indicators
- f10 Assign MB-D11 AE-L/AF-L button

f1 Switch (Backlight)

(User's Manual – Page 229)

The  Backlight switch controls the backlights for the Control panel and rear Monitor. To turn on the backlights, turn the Power switch all the way to the right.

The Power switch—with its Off, On, and  (backlight) positions—surrounds the Shutter-release button, as shown in [figure 4.55](#).

When you move the switch past On, you'll turn on the backlight for just the Control panel or both it and the Information display, according to how you have the Backlight switch setting configured.

There are two choices under the Backlight switch setting ([figure 4.56](#)):

- LCD backlight ()
-  and information display

The Control panel and Information display have different backlight time-outs controlled by separate functions. The Control panel backlight time-out is controlled by Custom setting c2 Auto meter-off delay.



Figure 4.55 – Backlight position

The Information display backlight time-out is controlled by Custom setting c4 Monitor off delay.

You can set these two time-outs first, and when you activate Backlight switch, both timers will start counting down separately.

Use the following steps to configure the f1 Backlight switch settings:

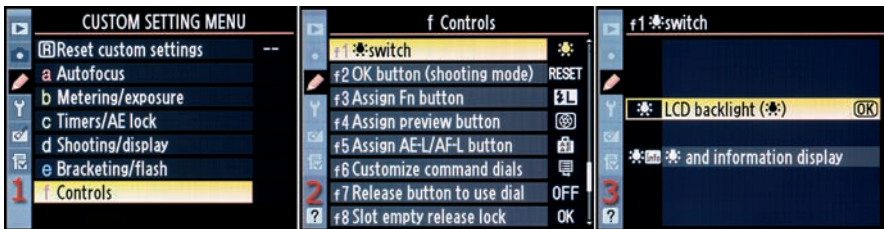


Figure 4.56 – Backlight switch choices

1. Select **f Controls** from the **Custom Setting Menu** and scroll to the right (figure 4.56, image 1).
2. Highlight **f1 :switch** and scroll to the right (figure 4.56, image 2).
3. Choose one of the settings from the menu. In figure 4.56, image 3, I selected **LCD backlight (Control panel only)**.
4. Press the **OK button** to lock in the setting.

My Recommendation: Although this function could be useful if you use the Information display screen frequently, I suspect that many D7000 users do not depend on the Information display screen as often as those who own lower-cost Nikon cameras. As new models are released, the lower-end cameras are increasingly geared toward the Information display screen because many people who use those cameras are accustomed to point-and-shoot cameras, where that configuration is more common.

Nikon has recently added more functionality to the Information display edit screen on advanced-level cameras, such as the Nikon D7000, which sets a pattern that will surely continue in future cameras. How long will it be before we have touch-screen technology?

In any case, I still mostly use the Backlight switch setting to turn on the backlight for the Control panel only. I would rather simply press the Info button when I want access to the Information display screen on the rear Monitor.

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f2 OK Button (Shooting Mode)

(User's Manual – Page 229)

The f2 OK button (shooting mode) setting determines how the OK button in the center of the Multi Selector works. All three of the available settings affect the currently active AF point seen in the Viewfinder whenever the camera is not in Auto-area AF mode and is in shooting mode (versus playback).

When you use Auto-area AF the camera controls the AF points as it sees fit, so this function has no effect. When you use Playback mode (viewing a picture), pressing the OK button opens the Retouch Menu. Shooting mode simply means you are not viewing anything on the Monitor and are ready to take a picture.

There are three selections in OK button (shooting mode):

- Select center focus point** – When you are shooting, you'll often use the Multi Selector with your thumb to navigate to a focus point (AF point) in the Viewfinder. When you are done, unless you want to leave the AF point where it happens to be, you will have to scroll it back to the center of the Viewfinder. Not anymore! If Select center focus point is chosen, the selected focus point resets to the center point when you press the OK button. This is the default action of the button.
- Highlight active focus point** – Sometimes, when you are looking at a confusing subject through the Viewfinder, it may be hard to see the small black AF point. When Highlight active focus point is selected and you press the OK button, the selected AF point lights up in red for easy viewing.
- Not used** – This does what it says: nothing happens when you press the OK button while in Shooting mode.

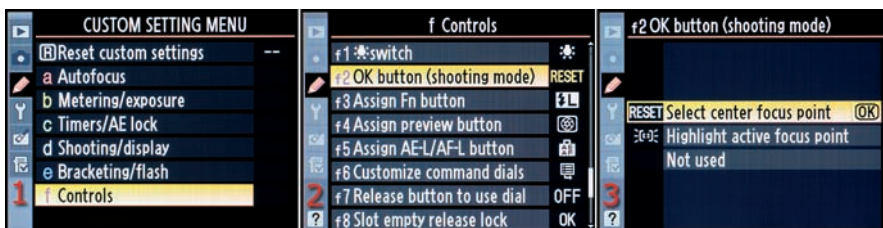


Figure 4.57 – OK button (shooting mode) choices

Use the following steps to choose one of the f2 OK button (shooting mode) settings:

1. Select **f Controls** from the **Custom Setting Menu** and scroll to the right (figure 4.57, image 1).
2. Highlight **f2 OK button (shooting mode)** and scroll to the right (figure 4.57, image 2).

3. Choose one of the options from the menu. In [figure 4.57, image 3](#), I chose [Select center focus point](#).
4. Press the [OK button](#) to lock in the setting.

Note: When you have the camera set to Live view mode, pressing the OK Button returns the larger AF point square back to the center, like the previously discussed Select center focus point setting. The Highlight active focus point setting has no effect in Live View. In fact, if you press the MENU button and open Custom Setting f2 OK button (shooting mode) while you're in Live View, you'll find that it is grayed out. Live view mode defaults to Select center focus point.

My Recommendation: I have my camera set to Select center focus point so that when I press the OK button in Shooting mode, the center AF point is selected. It saves time because I don't have to manually scroll. I don't find the Highlight active focus point setting all that useful since I can press the Shutter-release button halfway and the camera will highlight the active focus point. It seems like duplicate functionality to me.

If you would rather highlight the active focus point with the OK button, simply choose the Highlight active focus point setting; then you can highlight the active AF point with both the OK button and the Shutter-release button.

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f3 Assign Fn Button, f4 Assign Preview Button, f5 Assign AE-L/AF-L Button

(User's Manual – Page 230–232)

The f3 Assign Fn button, f4 Assign preview button, and f5 Assign AE-L/AF-L button settings are all discussed in this section. These three Custom settings work the same way, so I will explain them once.

When I refer to **Selected button**, I am talking about the camera button you want to configure—Fn button, Preview button, or AE-L/AF-L button. When you see **Selected button**, please mentally replace it with the name of the button you want to configure. You can assign various camera functions to any of these three buttons.

After we consider each of the screens used to assign the various functions, we'll look at each function in detail in the section titled **Assignable Function List**. There are a lot of different functions from which to select. The screens, steps, and settings we are about to review are designed to let you customize the function of the **Selected button**.

The following figures show the *Selected buttons*:

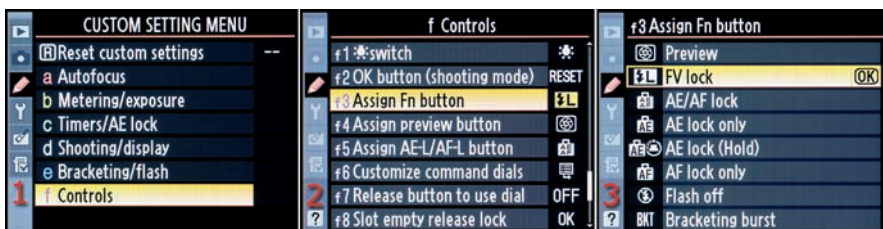


Figure 4.58 – Assign Fn button

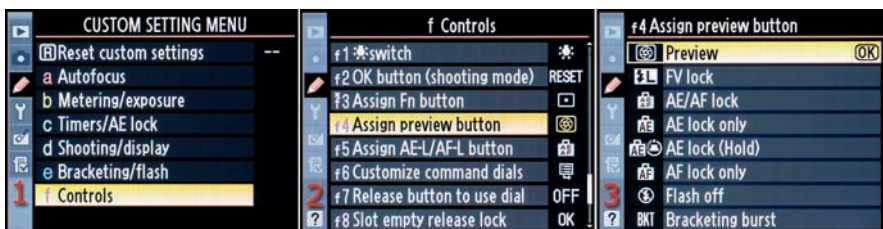


Figure 4.59 – Assign preview button

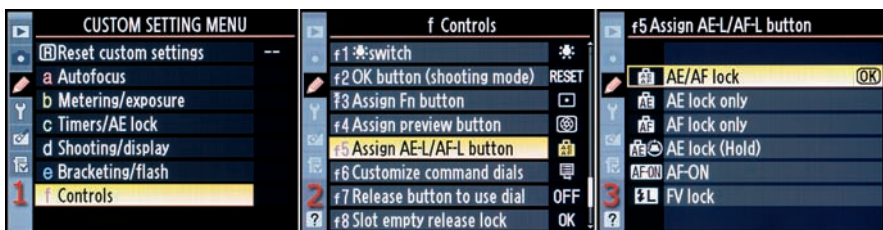


Figure 4.60 – Assign AE-L/AF-L button

Remember that the following steps are designed to explain any of the three *Selected buttons*. Refer to the previous figures as you work through the following steps for each *Selected button*:

1. Select **f Controls** from the **Custom Setting Menu** and scroll to the right (figures 4.58, 4.59, or 4.60, image 1).
2. Highlight **Assign Selected button** and scroll to the right (figures 4.58, 4.59, or 4.60, image 2).
3. Select one of the functions from the list. The function you choose will be assigned to a single button press of the **Selected button** (figures 4.58, 4.59, or 4.60, image 3). See the upcoming section titled **Assignable Function List** for an explanation of each function.
4. Press the **OK button** to lock in your selection.

Now, let's look at the **Assignable Function List** to see what amazing powers we can give each of the assignable buttons on our cameras. The f5 Assign AE-L/AF-L button setting uses a subset of the functions that are available to the other two buttons. In other words, not all the upcoming functions are available for assignment to all three of the buttons.

The following list will not match the order shown on the menu screens for the various buttons. Instead, they are presented alphabetically to make it easier for reference:

Assignable Function List

- **1 step spd/aperture** – Normally the exposure value (EV) steps (1/3 step or 1/2 step) for the shutter speed and aperture are controlled by Custom setting b2 EV steps for exposure cntrl. However, if you select 1 step spd/aperture you can hold down the **Selected button** while rotating the rear **Main command dial** to change the shutter speed in 1 EV steps, overriding the 1/3 step or 1/2 step values set in Custom setting b2 EV steps for exposure cntrl. You can also do the same for the aperture by holding down the **Selected button** and rotating the front **Sub-command dial**. This function is not available for Assign AE-L/AF-L button assignment.
- **Access top item in My Menu** – You can press the **Selected button** to jump directly to the top item in **My Menu**. This allows you to quickly modify a favorite menu item. This function is not available for Assign AE-L/AF-L button assignment.
- **Active D-Lighting** – You can hold down the **Selected button** while turning the rear **Main command dial** to select an **Active D-Lighting** level. The **Control panel** on top of the camera will show these levels in its bottom-right corner: Off, L for Low, n for Normal, H for High, HP for Extra high, and Auto (Shooting Menu > Active D-Lighting). This function is not available for Assign AE-L/AF-L button assignment.
- **AE/AF lock** – Enabling this function causes AE (exposure) and AF (focus) to lock on the last meter and autofocus system reading while the **Selected button** is held down.
- **AE lock only** – This function allows you to lock AE (exposure) on the last meter reading when you hold down the **Selected button**.
- **AE lock (Hold)** – Enabling this function causes AE (exposure) to lock on the last meter reading when the **Selected button** is pressed once. It stays locked until you press the **Selected button** again. In other words, the **Selected button** toggles AE lock.

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- **AF-ON** – **AF-ON** applies to **Assign AE-L/AF-L button only!** This causes the camera to initiate autofocus when you press the AE-L/AF-L button. Most of the more expensive Nikon DSLRs have a dedicated **AF-ON button** in addition to the **AE-L/AF-L button**. Not to be left out, the D7000 gives you a similar assignable functionality. When **AF-ON** is active the **Shutter-release button** cannot be used to focus. This function is not available for **Assign Fn button** or **Assign preview button** assignment.
- **AF lock only** – When set, this function locks the **AF** (focus) system on the last autofocus reading while you hold down the **Selected button**.
- **Bracketing burst** – Normally, during a bracketing sequence with the shutter release set to **Single frame Release mode** (the **S** on the **Release mode dial**) or **Quiet shutter-release mode** (the **Q** on the **Release mode dial**), you have to press the **Shutter-release button** once for each of the images in the bracket. The only way to shoot all the images in the bracketed series without letting up the **Shutter-release button** is to set the Release mode dial to **CL** or **CH**. If you select **Bracketing burst**, you can hold down the **Selected button** while also holding down the **Shutter-release button**, and the camera will take all the images in the bracket. In addition, any time you are using one of the **Continuous Release modes** (**CL** or **CH**), the camera will fire the bracketed image series over and over—instead of stopping at the end of the series—when you hold down the **Selected button**. This applies to **AE**, **Flash**, and **ADL bracketing**, which take one image for each shutter release. **WB bracketing** is mentioned in the User's Manual too, but since it takes the entire bracket in one shutter release, what's the point? **WB bracketing** takes the entire bracket in one shutter press by creating three images with varying white balances. Multiple shutter releases will capture numerous multi-image **WB brackets**. If you use this function for **WB bracketing** and hold down the **Shutter-release button**, you'll create multiple groups of bracketed images on your memory card. Be careful with this function when using **WB bracketing** or you may end up with a lot of unnecessary images. This function is not available for **Assign AE-L/AF-L button** assignment.
- **Center-weighted** – If you normally use **Matrix metering** or **Spot metering** as your primary metering system, you can temporarily use **Center-weighted area metering** by holding down the **Selected button**. When you release the button, the camera returns to your customary meter type, such as **Spot metering** or **Matrix metering**. This function is not available for **Assign AE-L/AF-L button** assignment.
- **Choose non-CPU lens number** – This function allows you to shoot with some older AI or AI-S Nikkor lenses that do not have a CPU chip in them. You must first register the lens in the **Setup Menu > Non-CPU lens data** function. After you have registered one or more lenses, you can select them by assigning

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Choose **non-CPU lens number** to the **Selected button**. Simply hold down the **Selected button** while rotating the rear **Main command dial** to scroll through up to nine registered non-CPU lenses. You'll see **n-1** to **n-9** appear on the lower right corner of the **Control panel** on top of the camera as you scroll. Above that you'll see the current focal length and aperture. This function is not available for **Assign AE-L/AF-L button** assignment.

- **FV lock** – If you set **Selected button** to **FV lock**, the button will cause the built-in Speedlight or the external Speedlight to emit a monitor preflash and then lock the flash output to the level determined by the preflash until you press the **Selected button** a second time.
- **Flash off** – This is a temporary way to disable the flash for when you want to leave your flash turned on and still be able to take a picture without flash. While you hold down the **Selected button**, the flash is disabled. This function is not available for **Assign AE-L/AF-L button** assignment.
- **Framing grid** – If you don't have the gridlines enabled under **Custom setting d2 Viewfinder grid display**, you can temporarily enable the gridlines by pressing the **Selected button**, turning the rear **Main command dial** one click, and releasing the **Selected button**. This function is not available for **Assign AE-L/AF-L button** assignment.
- **Matrix metering** – If you do not use **Matrix metering** as your primary metering system but want to use it occasionally, this setting allows you to turn it on while you hold down the **Selected button**. When you release the **Selected button**, the camera returns to your customary meter type, such as **Spot metering** or **Center-weighted area metering**. This function is not available for **Assign AE-L/AF-L button** assignment.
- **+NEF (RAW)** – When you are using one of the **JPEG** modes (**JPEG Fine**, **JPEG Normal**, or **JPEG Basic**), you can also get an additional **NEF (RAW)** image by pressing the **Selected button** before you press the **Shutter-release button**. The **Selected button** works like a toggle. The **Selected button** toggles **+NEF (RAW)**. If you keep the **Shutter-release button** pressed halfway between shots, the camera will take a series of RAW and JPEG images. When **+NEF (RAW)** is active, **RAW+** will display above the other image format setting on the **Control panel**. This function is not available for **Assign AE-L/AF-L button** assignment.
- **Playback** – This function causes the **Selected button** to act as if you had pressed the **Playback button**. Nikon included this so you can play back images when you use a big telephoto lens that requires two hands to use. This function is not available for **Assign AE-L/AF-L button** assignment.
- **Preview** – This function shows you an actual view of what the camera sees with the aperture closed down to the selected aperture setting. Although it darkens the **Viewfinder** when you press the **Selected button**, you can see the depth

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of field (zone of sharp focus) that will be captured in the image. Normally, viewing the depth of field is controlled by the [Depth-of-field preview button](#). Some people may not like the location of the [Depth-of-field preview button](#) and may decide to switch the [Fn button](#) (for instance) with the [Depth-of-field preview button](#). This function is not available for the [Assign AE-L/AF-L button](#) assignment.

- **Spot metering** – If you normally use a metering system other than [Spot metering](#), you can temporarily switch to [Spot metering](#) by holding down the **Selected button**. When you release the button, the camera returns to your customary meter type, such as [Center-weighted area metering](#) or [Matrix metering](#). This function is not available for [Assign AE-L/AF-L button](#) assignment.
- **Start movie recording** – If you don't like to use the Live View controls to start recording a movie, you can assign this setting to the **Selected button** and use it to start recording movies instead. Live View must already be active for this to work. This function is not available for [Assign AE-L/AF-L button](#) assignment.
- **Viewfinder virtual horizon** – If you are concerned about keeping the camera level and the gridline display is insufficient for you, Nikon offers the [Viewfinder virtual horizon](#). Press the **Selected button** once and the [Viewfinder](#) will display an indicator at the bottom. When you tilt the camera left or right, you'll see a series of dots moving to the left or right. When the dots disappear, the camera is level. When you press the **Selected button** this function remains active until you take a picture or until the meter goes off. Be careful about tilting the camera forward or backward too much or it may skew the results of the left to right leveling action. This function is not available for [Assign AE-L/AF-L button](#) assignment.

My Recommendation: There are so many functions here that I'm loathe to recommend anything. People shoot in many different ways, and there are so many choices in this list that it's hard to pin down just a few. However, you can experiment with the settings I use and see if they suit your style. If not, you have a lot of choices! Here are my favorite button assignments:

- **Assign Fn button** – [Spot metering](#) (my normal meter is Matrix metering)
- **Assign preview button** – [Preview](#) (depth-of-field preview)
- **Assign AE-L/AF-L button** – [AE lock only](#)

4



f6 Customize Command Dials

(User's Manual – Page 233)

The f6 Customize command dials setting lets you change how the two Command dials operate. There are several operations you can modify:

- Reverse rotation
- Change main/sub
- Aperture setting
- Menus and playback

Reverse Rotation

This setting allows you to change which direction things increment when you rotate the Command dials. There are two selections:

- **Yes** – Both Command dials increment their settings in the opposite direction; they are reversed. For example, when the D7000 is set to Aperture priority auto (A) and you rotate the Sub-command dial to the right, the aperture normally decreases, like this: f/5.6 to f/6.3 to f/7.1, etc. If you select Yes under Reverse rotation, then the direction of the aperture changes will be reversed when you turn the Sub-command dial to the right, like this: f/5.6 to f/5 to f/4.5, etc. Instead of getting smaller, the aperture gets larger. This applies to the front and rear Command dials.
- **No** – The directions of the Command dials are set to the factory default.

Use the following steps to reverse the rotation of the Command dials:

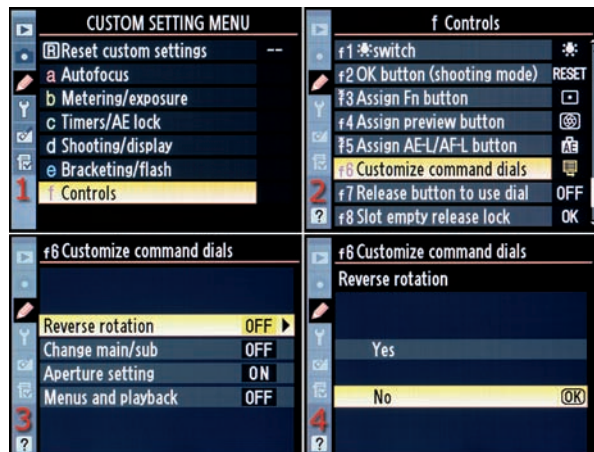


Figure 4.61 – Reverse rotation

1. Select **f Controls** from the **Custom Setting Menu** and scroll to the right (figure 4.61, image 1).
2. Highlight **f6 Customize command dials** and scroll to the right (figure 4.61, image 2).

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3. Choose **Reverse rotation** and scroll to the right (figure 4.61, image 3).
4. Select **Yes** or **No** from the menu (figure 4.61, image 4).
5. Press the **OK** button to lock in the setting.

My Recommendation: I leave the Command dials rotation set to the factory default. I find life confusing enough without my camera working backwards! Of course, you may have previously used a different brand of camera that worked in the opposite direction, so you might prefer to use this setting.

Change Main/Sub

This setting allows you to swap the functionality of the two Command dials. The Main command dial will take on the functions of the Sub-command dial and vice versa. Here are the three settings:

- **On** – The rear Main command dial controls the aperture in shooting modes A and M (on the Mode dial). The front Sub-command dial controls the shutter speed in shooting modes S and M.
- **On (Mode A)** – The rear Main command dial controls the aperture in shooting mode A. The rest of the modes work like Off (the next setting).
- **Off** – The rear Main command dial controls the shutter speed, and the front Sub-command dial controls the aperture (factory default).

Shooting mode P on the Mode dial is unaffected by Change main/sub. Use the following steps to swap the functionality of the Command dials:

1. Select **f Controls** from the **Custom Setting Menu** and scroll to the right (figure 4.62, image 1).
2. Highlight **f6 Customize command dials** and scroll to the right (figure 4.62, image 2).
3. Choose **Change main/sub** from the menu and scroll to the right (figure 4.62, image 3).

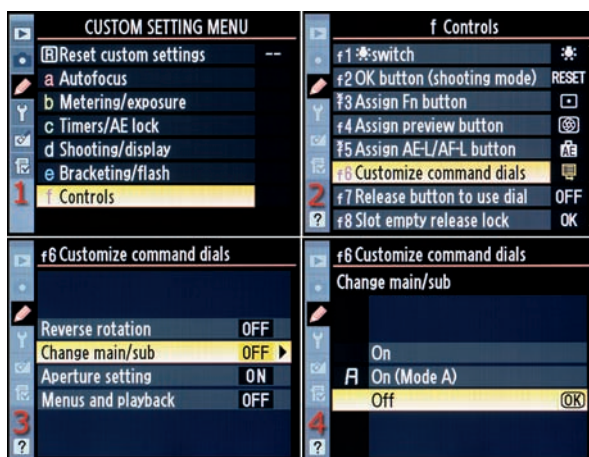


Figure 4.62 – Change main/sub

4. Select **On**, **On (Mode A)**, or **Off** from the menu (figure 4.62, image 4).
5. Press the **OK button** to lock in the setting.

My Recommendation: I leave the Command dials set to the factory default (Off). I've been using Nikon cameras for too many years to change the Command dial functionality now!

Aperture Setting

There are two selections that allow you to modify how the camera treats CPU lenses that have aperture rings (non-G lenses). There are many excellent older, preowned AF Nikkor D lenses out there in eBay land, and your D7000 can use them, in addition to the newer AF-S style G lenses. The two settings are as follows:

- **Sub-command dial** – This is the factory default setting. The aperture is set using the Sub-command dial.
- **Aperture ring** – This setting allows you to use the aperture ring of non-G lenses with a CPU to adjust the aperture instead of using the Sub-command dial. The EV increments will display only in 1 EV steps when this is active.

Use the following steps to change the style of Aperture setting:

1. Select **f Controls** from the **Custom Setting Menu** and scroll to the right (figure 4.63, image 1).
2. Highlight **f6 Customize command dials** and scroll to the right (figure 4.63, image 2).
3. Choose **Aperture setting** from the menu and scroll to the right (figure 4.63, image 3).
4. Select **Sub-command dial** or **Aperture ring** from the list (figure 4.63, image 4).
5. Press the **OK button** to lock in the setting.



Figure 4.63 – Aperture setting (Sub-command dial vs. Aperture ring)

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Note: When a non-CPU lens is used, the aperture ring must always be used to set the aperture instead of the Sub-command dial. If you are using a G lens with no aperture ring, you clearly can't set the aperture with a nonexistent aperture ring, so the camera ignores this setting. You can even use older non-CPU lenses and adjust the aperture with the lens aperture ring when you have the camera in Live View mode. I used a 1970s AI Nikkor 35mm f/2 (non-CPU) lens to test this. It worked great!

My Recommendation: I leave Aperture setting set to Sub-command dial. I have some older AF Nikkor lenses that I like to use, so I keep them locked at their smallest aperture settings and use the Sub-command dial to change their apertures. I usually don't adjust apertures with the old aperture ring on the lens unless I'm using older non-CPU, manual-focus AI or AI-S lenses.

Of course, with the D7000's capability for adjusting the aperture manually with the aperture ring in Live view mode and Video mode, I just may start using the Aperture ring setting a bit more. This is intriguing and opens up some possibilities for depth-of-field control during a video with any Nikkor lens that has an aperture ring, whether it is CPU or non-CPU. Videographers take note!

Menus and Playback

This setting is designed for people who do not like to use the Multi Selector for viewing image Playback or Info screens. It also allows you to use the Command dials for scrolling through menus.

The following selections change how the menus and image playback displays when you would rather not use the Multi Selector:

- **On** – While viewing images during playback, turning the Main command dial to the left or right scrolls through the displayed images. Turning the Sub-command dial left or right scrolls through the data and histogram screens for each image. While viewing menus, turning the Main command dial left or right scrolls up or down in the screens. Turning the Sub-command dial left or right scrolls left or right in the menus. This setting simply gives you two ways to view your images and menus.
- **On (image review excluded)** – The Command dials will scroll around in the camera menus as described in the On setting. However, you must use only the Multi Selector to scroll through your pictures.
- **Off** – This is the default action. The Multi Selector is used to scroll through images and menus.



Use the following steps to configure Menus and playback:

1. Select **f Controls** from the **Custom Setting Menu** and scroll to the right (figure 4.64, image 1).
2. Highlight **f6 Customize command dials** and scroll to the right (figure 4.64, image 2).
3. Choose **Menus and playback** from the menu and scroll to the right (figure 4.64, image 3).
4. Select one of the settings from the menu (figure 4.64, image 4).
5. Press the **OK button** to lock in the setting.

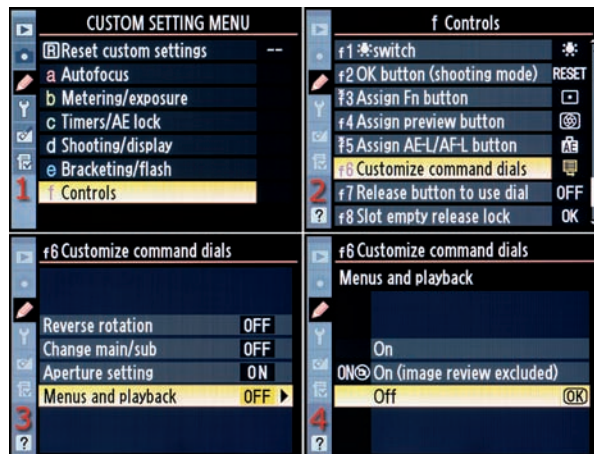


Figure 4.64 – Menus and playback setting

My Recommendation: I leave Menus and playback set to On. I've heard others say how much they like this function, and I've recently been using it myself. I like the fact that I can use either the Multi Selector or the Command dials to move around in my camera's menus and images. Try this one out; you may like it too!

f7 Release Button to Use Dial

(User's Manual – Page 234)

The f7 Release button to use dial setting allows people who hate holding down various buttons and turning Command dials at the same time to change the settings. It could be very useful to a person with limited hand strength because the camera would be easier to operate.

There are two settings under Release button to use dial:

- **Yes** – This setting changes a two-step operation into a three-step operation. Normally, you would press and hold down a button while rotating a Command dial. When you select Yes under Release button to use dial, the camera allows you to press and release a button, rotate the Command dial, then press and release the button again. In other words, the normal (No) actions are to press and hold a button and then turn a Command dial. The Yes actions are to press and release a button, turn a Command dial, and press and release the button again. The initial

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button press locks the button so you do not have to hold your finger on it while turning the Command dial. After you have changed whatever you are adjusting, you must press the button a second time to unlock it. If the exposure meter turns off while the Yes operation is active, you must press it again to lock the action.

- **No** – This is the default setting. You must press and hold a button while rotating the Command dials in order to change the camera function.

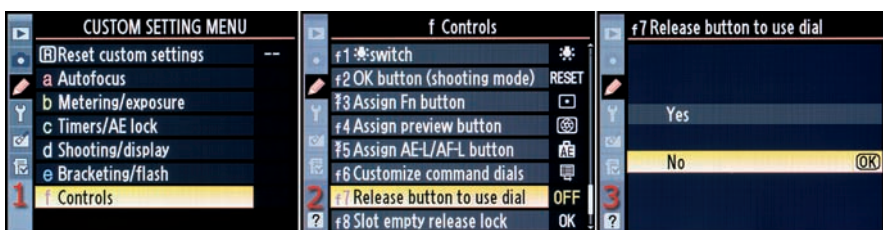


Figure 4.65 – Release button to use dial

Use the following steps to configure f7 Release button to use dial:

1. Select **f Controls** from the **Custom Setting Menu** and scroll to the right (figure 4.65, image 1).
2. Highlight **f7 Release button to use dial** and scroll to the right (figure 4.65, image 2).
3. Choose **Yes** or **No** from the list. In figure 4.65, image 3, I selected **No**.
4. Press the **OK** button to lock in the setting.

My Recommendation: I haven't found this function to be useful. However, a person with limited dexterity may find this to be a very useful function.

f8 Slot Empty Release Lock

(User's Manual – Page 234)

The f8 Slot empty release lock setting is primarily designed for people who work with their camera tethered to a computer. If a memory card is not present, the camera will not normally let you take a picture. However, when you enable Slot empty release lock, the camera will let you take quite a few pictures as it fills up the internal buffer memory. If the camera is not attached to a computer—with software designed to intercept the images—the pictures have nowhere to go, so you'll lose them. You can't insert a memory card after the fact and save them.

There are two settings available under Slot empty release lock:

- **Release locked** – The camera simply refuses to take a picture unless a memory card with available storage space is inserted in the camera.

- **Enable release** – If your D7000 is tethered to a computer and you know how to use the software, this setting is a great choice. Anytime you want to take pictures without a memory card, you'll need to select this setting. Be careful, though; if the camera is not hooked up to a computer and you don't have a memory card in the camera and then accidentally take an important picture, you can't save it.

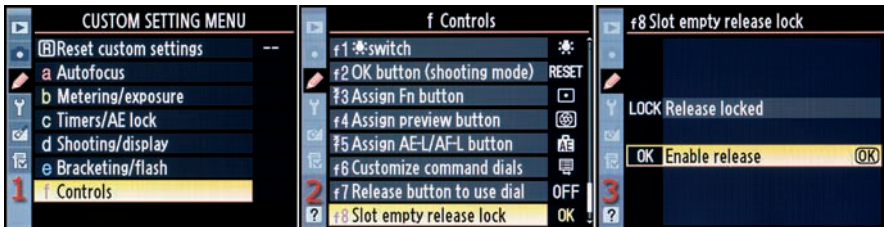


Figure 4.66 – Slot empty release lock

Use the following steps to choose one of the f8 Slot empty release lock settings:

1. Select **f Controls** from the **Custom Setting Menu** and scroll to the right (figure 4.66, image 1).
2. Highlight **f8 Slot empty release lock** and scroll to the right (figure 4.66, image 2).
3. Choose **Release locked** or **Enable release** from the list. In figure 4.66, image 3, I selected **Enable release**.
4. Press the **OK button** to lock in the setting.

My Recommendation: I don't often shoot in-studio with my camera tethered to a computer. I'm glad the D7000 provides the ability to do that, though. I don't suggest changing this setting to Enable release unless you know exactly why you are doing it. Otherwise you will lose your images. I'd much rather have the camera refuse to take a picture if I've inadvertently left out a memory card. Don't you agree?

f9 Reverse Indicators

(User's Manual – Page 234)

The f9 Reverse indicators setting lets you change the direction of your camera's exposure displays. Normally, anytime you see the exposure indicators in your camera's Viewfinder or Information display, the + is on the left and the – is on the right.

In figure 4.67, image 3, you can see both directions displayed. Notice how +/- becomes -/+ when they are reversed. You'll see the same thing in any exposure indicators. Choose the style that makes you most comfortable. Most people leave this setting alone.



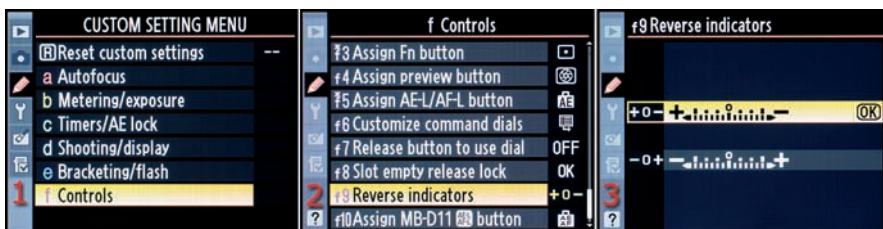


Figure 4.67 – Reverse indicators

Use the following steps to set the f9 Reverse indicators:

1. Select **f Controls** from the **Custom Setting Menu** and scroll to the right (figure 4.67, image 1).
2. Highlight **f9 Reverse indicators** and scroll to the right (figure 4.67, image 2).
3. Choose one of the selections from the list. In figure 4.67, image 3, I selected the normal exposure indicator direction.
4. Press the **OK button** to lock in the setting.

My Recommendation: I like the exposure indicators with + on the left and – on the right. However, if you are from a part of the world where these things normally run the other direction, or you would just prefer it the other way, it's easy to change. Select your favorite indicator direction for maximum ease!

f10 Assign MB-D11 AE-L/AF-L Button

(User's Manual – Page 235)

The f10 Assign MB-D11 AE-L/AF-L button setting lets you use the AE-L/AF-L button built into the optional MB-D11 battery pack in the same manner as the one on the camera's body. There are seven distinct functions, similar to the ones used by Custom setting f5 Assign AE-L/AF-L button:

- **AE/AF lock** – Enabling this function causes AE (exposure) and AF (focus) to lock on the last meter and autofocus system reading while the AE-L/AF-L button on the MB-D11 is held down.
- **AE lock only** – This allows you to lock AE (exposure) on the last meter reading when you hold down the AE-L/AF-L button on the MB-D11.
- **AF lock only** – This function locks the AF (focus) system on the last autofocus reading while you hold down the AE-L/AF-L button on the MB-D11.
- **AE lock (Hold)** – Enabling this function causes AE (exposure) to lock on the last meter reading when the AE-L/AF-L button on the MB-D11 is pressed once. It stays locked until you press the AE-L/AF-L button again. In other words, the AE-L/AF-L

button on the MB-D11 toggles AE lock.

- **AF-ON** – This causes the camera to initiate autofocus when you press the AE-L/AF-L button on the MB-D11. The Shutter-release button cannot be used to focus.
- **FV lock** – If you set the AE-L/AF-L button on the MB-D11 to FV lock, the button will cause the built-in Speedlight or an external Speedlight to emit a monitor preflash. It will lock the flash output to the level determined by the preflash until you press the AE-L/AF-L button on the MB-D11 a second time.
- **Same as Fn button** – This cool setting allows you to set the AE-L/AF-L button on the MB-D11 so it executes whatever function you assigned to the camera's Fn button in Custom setting f3 Assign Fn button.

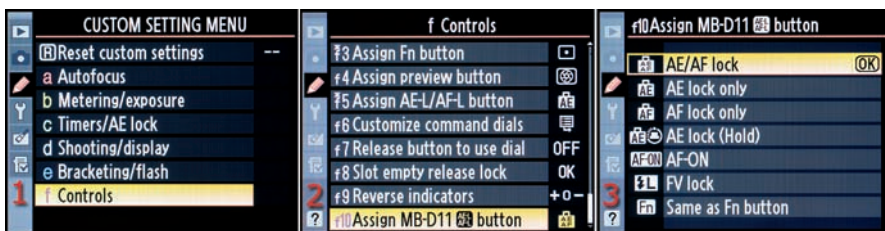


Figure 4.68 – Assign MB-D11 AE-L/AF-L button

Use the following steps to select an f10 Assign MB-D11 AE-L/AF-L button setting:

1. Select **f Controls** from the **Custom Setting Menu** and scroll to the right (figure 4.68, image 1).
2. Highlight **f10 Assign MB-D11 AE-L/AF-L button** and scroll to the right (figure 4.68, image 2).
3. Choose one of the selections from the list. In figure 4.68, image 3, I selected **AE/AF lock**.
4. Press the **OK button** to lock in the setting.

Note: Nikon says that you cannot use the AE-L/AF-L button on the MB-D11 to activate VR (vibration reduction).

My Recommendation: I generally use AE lock only for this button. You can assign one of the seven functions to this button as a separate assignment from any other button. If you don't like AE lock only, then assign your favorite instead.

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Modified Custom Setting Notice

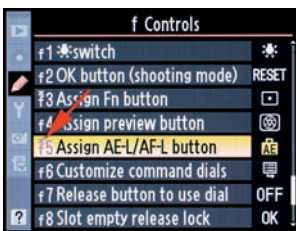


Figure 4.69 – Custom setting with modification

One thing to note is that whenever you have modified one of the Custom settings so it is no longer set to its factory default, a small asterisk will appear above the letter in the Custom setting name.

If you look carefully at Custom setting f3 Assign Fn button and f5 Assign AE-L/AF-L button ([figure 4.69](#), red arrow), you can see the small asterisk above the f that shows it's a modified function.

My Conclusions

We've reached the end of the biggest chapter in the book. I'm glad you stayed with me all the way through this incredibly dense series of 48 functions.

Keep in mind that all of these settings can be modified in three different ways with user settings U1 and U2 and the non-user setting (any other Mode dial position). Your Nikon D7000, like a chameleon, can change to a different style of shooting with a mere turn of the Mode dial.

We will now move on into the camera's Setup Menu and learn about the camera's most basic settings. You won't change these settings often, but they are very important, especially for initial camera configuration. The Setup Menu configuration is not stored in the user settings like the Shooting Menu and Custom Settings Menu. Whatever you change in the Setup Menus affects the camera at all times. Let's see what more we can learn!



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Setup Menu



Bison in Winter – Courtesy of Richard Sandor (*rbsandor*)

The Setup Menu on the Nikon D7000 is a series of settings for basic camera configuration not directly related to taking pictures. They cover things like how bright you'd like the Monitor, battery information, firmware version, the default language, image sensor cleaning, and many other basic settings.

These menus are most likely the first you'll use when you prepare your new D7000. You'll have to set the time and date right away, format a memory card, and set the Monitor brightness.

The Setup Menu is selected with a symbol that looks like a wrench. It is about midway down the menu tree on the left. See [figure 5.1](#) for a look at the Setup Menu location.

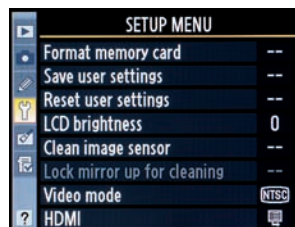


Figure 5.1 – Setup Menu

The following is a list of the 24 functions available in the Setup Menu of the D7000:

- **Format memory card** – This function allows you to delete all images from your camera's memory card(s).
- **Save user settings** – You can configure the camera under the individual user settings U1 and U2 on the camera's Mode dial and save the settings to internal memory. When they are saved, the D7000 will remember the settings and return to them when you select U1 or U2.
- **Reset user settings** – If you decide to return one of your user settings (U1 or U2) back to factory default configuration, this function will do it for you.
- **LCD brightness** – Choose the brightness level for the Monitor on the back of your camera.
- **Clean image sensor** – This function allows immediate cleaning of the imaging sensor to remove dust spots, or you can configure the camera to clean the sensor at startup and shutdown.
- **Lock mirror up for cleaning** – You can safely lock the mirror up and open the shutter so that you can manually clean the sensor with a brush, blower, or chemicals and swabs.
- **Video mode** – Select the video mode appropriate for your part of the world (NTSC or PAL).
- **HDMI** – You can select various HDMI sync rates for interfacing with an HDTV or monitor.
- **Flicker reduction** – If you often shoot under fluorescent or mercury-vapor lights while making a movie, this function allows you to choose a frequency that matches the local electrical power supply to reduce flickering.
- **Time zone and date** – Set the Time zone, Date and time, Date format, and Daylight saving time in your camera.

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- **Language** – Choose the language you would like your camera to use from a list of 22 languages. It will use the chosen language when displaying menus and screens.
- **Image comment** – Add a comment (up to 36 characters) that embeds itself in the internal metadata of each image. This can help you protect yourself from image theft or simply add pertinent information to each image.
- **Auto image rotation** – This function adds camera orientation information to each image so it will display correctly on your camera's Monitor and later on your computer's monitor.
- **Image Dust Off ref photo** – You can create a dust off reference photo to help remove a dust spot from images accidentally taken with some dust on the sensor. This requires the use of a program like Nikon Capture NX 2 to actually remove the dust with the reference photo as a guide.
- **Battery info** – This function gives you information about the battery's current charge, how many pictures were taken with the battery on the current charge, and the useful life left in the battery before you should dispose of it.
- **Wireless transmitter** – This function allows you to adjust the settings for connecting the camera to a wireless network using an optional Nikon WT-4 wireless transmitter.
- **Copyright information** – You can add two items of information, including Artist (34 characters) and Copyright (54 characters). This function is designed for those who use their images commercially. It allows you to embed specific identity information into the picture's internal metadata.
- **Save/load settings** – This function allows you to save the current menu configuration of most internal camera settings to a memory card for transfer to a computer. You can backup complex configurations and restore them to the camera when needed.
- **GPS** – If you own a GPS that can be connected to the Nikon D7000—such as the Accessory shoe-mounted Nikon GP-1 or another GPS unit—you can record Latitude, Longitude, Altitude, Heading, and UTC (Coordinated Universal Time) into the metadata of each image.
- **Virtual horizon** – This function displays a virtual horizon on the camera's Monitor. This display shows tilt to the left or right but not forward or backward.
- **Non-CPU lens data** – This function lets you select from a series of nine non-CPU lenses, such as AI and AI-S Nikkor lenses from the 1970s and 1980s. Each lens is registered within the camera with its own number so you can select it and use it later.
- **AF fine tune** – You can fine-tune the autofocus for up to 12 of your AF and AF-S lenses. The camera will detect which lens you have mounted and correct for front or back focus, according to your settings.

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- **Eye-Fi upload** – You can use an Eye-Fi Express or Pro wireless SD card to transmit images from your D7000 to your home computer and 25 online services (e.g., Flickr). Or you can use the Eye-Fi Pro X2 cards to transmit images directly to your Wi-Fi enabled computer using Ad Hoc transfer. You'll have menu access to enable or disable uploading, along with connectivity information.
- **Firmware version** – Discover the current firmware version installed in your camera. Firmware is the camera's operating system software that is embedded on in-camera memory chips. It can be upgraded when Nikon releases new firmware specific to your camera.

Let's examine each of these settings in detail.

Format Memory Card

(User's Manual – Page 236)

Format memory card allows you to prepare your memory card(s) for use in your camera. This is the best way to prepare the memory card, and it should be done before using a new one.

Interestingly, formatting a memory card doesn't actually remove any images from the card. Instead, it removes their entries in the memory card's file allocation table (FAT) so they can no longer be seen or found by the camera. However, you could use card recovery software to rescue the images if you do not write anything new to the card after you format it. That's a good thing to remember in case you ever accidentally format a card with images you wanted to keep.

The D7000 has two memory card slots, Slot 1 (top) and Slot 2 (bottom). You have to format each of them separately. There are two ways to format a memory card. First, you can use the Setup Menu > Format memory card function; second, you can use external camera controls. We'll look at both methods in this section.

Let's see how it is done with the Setup Menu by looking at the screens and steps for card formatting.

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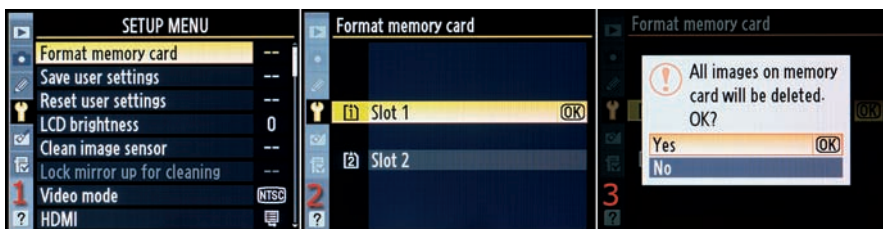


Figure 5.2 – Format memory card with Setup Menu screens

Use the following steps to format a memory card:

1. Select **Format memory card** from the **Setup Menu** and scroll to the right (figure 5.2, image 1).
2. Next, you'll see a screen that asks you to select the card you want to format (figure 5.2, image 2). You have a choice of **Slot 1** or **Slot 2**. Choose the one you want to format, and scroll to the right. You'll need to repeat this action to format the second slot.
3. Select **Yes** from the final screen with the big red exclamation point and warning that all images will be deleted (figure 5.2, image 3).
4. Press the **OK button** to start the format. When you press the **OK button**, you'll see two screens in quick succession. The first will say *Formatting memory card*. A few seconds later—when the card has been successfully formatted—you'll briefly see a final screen that says *Formatting complete*. Then the camera switches back to the first screen of the **Setup Menu**. The card is now formatted and you can take lots of pictures.

Camera Button Format Method

This is the fastest method to format the memory card, and it is not very difficult. The camera defaults to formatting the primary card slot, not the secondary slot. You can select the secondary slot instead, as I'll describe in the upcoming step-by-step method. Figure 5.3 shows the buttons and Control panel screens used to format the card. Notice how these two buttons are marked with the red **FORMAT** symbol.



Figure 5.3 – Format memory card with camera controls

To do the actual formatting process with external controls, follow these steps:

1. Hold down the [Delete/format button](#) and [Metering/format button](#) at the same time ([figure 5.3, images 1 and 2](#)), until *For* starts flashing on the [Control panel](#) ([figure 5.3, image 3, red arrow](#)).
2. While you're still holding down the two buttons and *For* is flashing, you can rotate the [Main command dial](#) with your thumb to select either [Slot 1](#) or [Slot 2](#). It's a three-finger operation, but it's easier than it sounds. You can see in [figure 5.3, image 3](#), that I selected [Slot 1](#).
3. When *For* is flashing in the [Control panel](#), as shown in [figure 5.3, image 3](#) (red arrow), quickly release and instantly re-press the [Delete/format button](#) and [Metering/format button](#) together. You'll see the screen change so that *For* is flashing where the image count normally appears on the [Control panel](#), which means the format operation is in process. *Do not turn your camera off during a format*. When the flashing *For* changes back to the image count, the format operation is done.

My Recommendation: You can repeat the operation for the other slot on the D7000 if needed. Both the Setup Menu > Format memory card and the camera button format methods are easy to use. Most people learn to use the button press method since it's so fast. However, I sometimes use the Setup Menu > Format memory card method immediately after viewing images on the Monitor for verification of previous transfer to my computer. If it's safe to format the card, I quickly switch to the Setup Menu to format since I'm already looking at the Monitor. It's a good idea to learn how to use both methods.

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Save User Settings

(User's Manual – Page 75)

Save user settings allows you to save up to two user settings into camera memory. Later you can recall those settings by selecting U1 or U2 from the Mode dial. Each user setting can save certain configuration information, but they can't save others. The following lists include items that can be saved and items that can't be saved:

Items that Can Be Saved

- Adjustments to one of the shooting modes (P, S, A, M, SCENE, Auto) per user setting, including aperture (modes A and M) and shutter speed (modes S and M).
- Exposure and flash compensation (+/- EV settings)
- Flash mode (Front-curtain sync, Rear-curtain sync, Slow sync, Fill flash, no flash, etc.)

- Focus point (currently active AF point)
- Metering mode (Matrix meter, Center-weighted area meter, Spot meter)
- Focus modes (Single-servo autofocus, Continuous-servo autofocus, Auto-servo) for Viewfinder only
- AF-area modes (Single-point AF, Dynamic-area AF, Auto-area AF) for Viewfinder only
- Bracketing (Exposure, Flash, White balance, Active D-Lighting)
- Shooting Menu (16 of 21 settings can be saved; 5 cannot be saved)
- Custom Setting Menu (48 settings)
- Live view mode and Movie mode settings controlled by the Custom Setting Menu or Shooting Menu (Shooting Menu > Movie settings)

Items that Can't Be Saved

- Release modes (S, CL, CH, Q, MUP)
- Storage folder (100D7000)
- File naming (DSC_1234)
- Manage Picture Control
- Multiple exposure
- Interval timer shooting
- Settings on other menus (Playback Menu, Setup Menu, Retouch Menu, My Menu, or Recent Settings menu)
- Autofocus (AF) and AF-area modes in Live view mode or Movie mode

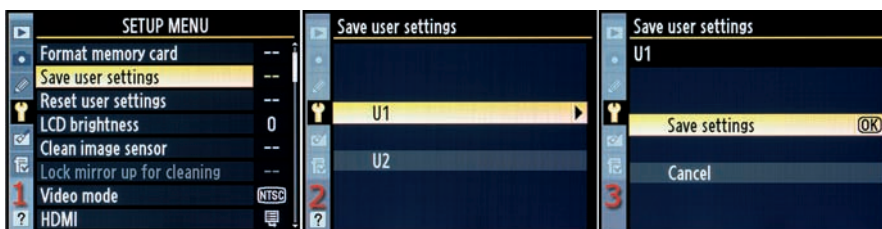


Figure 5.4 – Saving a user setting (U1 or U2)

Now, let's examine how to save a user setting. Use the following steps to save one of the two user settings (U1 and U2). This must be repeated for each of the settings:

1. Configure your camera's settings exactly how you want them to be saved for one user setting. Be sure to configure all the items in the ***Items that Can Be Saved*** list that you want to save. When you have the camera configured exactly as you would like, plus you have the **Mode dial** set to whatever mode you want to use for the user setting—such as **P**, **S**, **A**, **M**, **Auto**, or **SCENE**—then you can save it. *Do not select U1 or U2 on the Mode dial before you save the setting;* instead,

leave it set to one of the shooting modes.

2. Press the **MENU** button and select **Save user settings** from the **Setup Menu**, then scroll to the right (figure 5.4, image 1).
3. Choose either **U1** or **U2** from the menu and scroll to the right (figure 5.4, image 2).
4. Select **Save settings** from the menu (figure 5.4, image 3).
5. Press the **OK** button to save the selected setting.

My Recommendation: Any time you make a modification to the Shooting Menu or Custom Setting Menu that you want to reuse, be sure to save it under one of the user settings, such as U1. If you are merely making a temporary setting change, it isn't important to save it. The user settings will not change unless you resave them. However, if you want to save a particular configuration for future reuse, just set the camera up the way you want to shoot and save the configuration under one of the user settings. Later, you can retrieve that configuration by simply selecting U1 or U2 on the Mode dial.

Reset User Settings

(User's Manual – Page 76)

Reset user settings allows you to reset one of the camera's user settings back to factory defaults. The two user settings, U1 and U2 are independent of each other and must be reset individually. If you have a preowned D7000 it is a good idea to reset both of the user settings. That way, the user settings are fresh and ready to be configured for your styles of shooting. The two choices on the Reset user settings menu are Reset or Cancel.

Here's how to reset *one* of your camera's user settings, either U1 or U2. Repeat for each user setting:

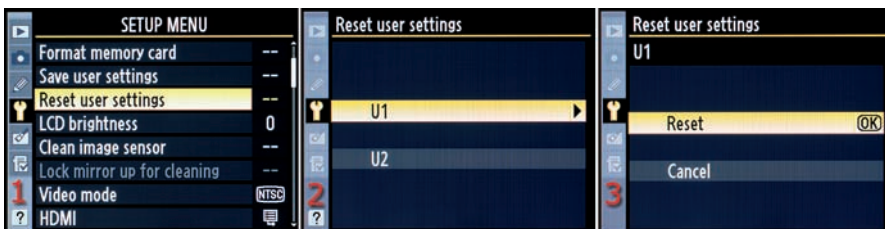


Figure 5.5 – Resetting a user setting (U1 or U2)

1. Select **Reset user settings** from the **Setup Menu** and scroll to the right (figure 5.5, image 1).
2. Select either **U1** or **U2**. Whichever one you select will be reset to the factory defaults in the next screen. Scroll to the right (figure 5.5, image 2).

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3. Choose **Reset** from the final screen, or choose **Cancel** (figure 5.5, image 3).
4. Press the **OK** button to lock in your setting. If you chose **Reset**, the selected user setting will be reset immediately.

My Recommendation: If I were to buy a used Nikon D7000 I would definitely reset the user settings. That way I can reconfigure the camera to my own styles of shooting. It is a good idea to reset the settings on a new Nikon as well, just in case someone at the factory was fiddling around with the camera for some reason, or just to start fresh.

LCD Brightness

(User's Manual – Page 237)

LCD brightness is more important than many people realize. If the Monitor is too dim, you'll have trouble seeing your images in bright light. If it is too bright, you might allow some images to be underexposed because they look fine on the Monitor. Even a seriously underexposed image may look okay on a screen that is too bright.

You can select from seven levels of brightness, from -3 - +3. Use the following steps to adjust your camera's Monitor intensity:

1. Select **LCD brightness** from the **Setup Menu** and scroll to the right (figure 5.6, image 1).
2. Use the **Multi selector** to scroll up or down through the values -3 to +3 (figure 5.6, image 2).
3. Press the **OK** button when you've found the value you like best.

My Recommendation: Using the bars with varying levels of brightness, as shown in the two images of figure 5.6, adjust the brightness until you can barely make out a distinction between the last two dark bars on the left. That may be the best setting for your camera. The camera defaults to 0 (zero), which is right in the middle, yet this setting is quite bright. I think that 0 is a little too bright and makes my images look like they are exposed more brightly than when I see them later in the computer. I've been using -1 on my D7000, because that seems bright enough for outdoor use but it doesn't make my images appear overly bright.

If you choose to set your camera to a level higher than 0, be sure to check the histogram frequently to validate your exposures. Otherwise, you may find that you

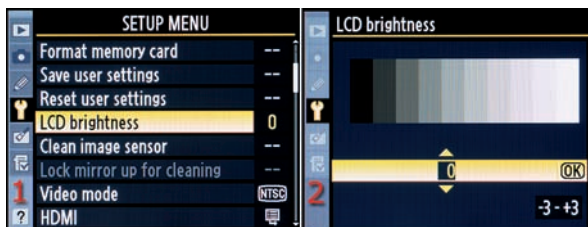


Figure 5.6 – LCD (Monitor) brightness level adjustment



are allowing the camera to slightly underexpose your images. The D7000 has one of the best exposure meters I've seen in a camera, yet it is not perfect and needs your help sometimes.

Letting the Monitor run too brightly might mask those times when the camera needs help. If you need extra brightness to see in outdoor light, just be cautious about underexposure. The bright screen can fool you. Use your histogram!

Clean Image Sensor

(User's Manual – Page 284)

Clean image sensor is Nikon's helpful answer to dust spots on your images from a dirty imaging sensor. Dust is everywhere and will eventually get on your camera's sensor. Well, it doesn't really get on the sensor itself, since there are filters in front of the sensor. The D7000 cleans the sensor by vibrating the entire sensor unit, which includes the low-pass filter in front of the sensor. These high-frequency vibrations will dislodge dust and make it fall off the filter so you won't see it as spots on your pictures.

The vibration cleaning method seems to work pretty well. Of course, if any sticky pollen or other wet dust gets into the camera, the vibration system won't be able to remove it. Then it may be time for brush or wet cleaning.



Figure 5.7 – Clean now screens

Clean Now

This option allows you to clean the sensor at any time. If you detect a dust spot, or just get nervous because you are in a dusty environment with your D7000, you can simply select Clean now, and the camera will execute a cleaning cycle. Use the following steps to immediately clean the camera's sensor (figure 5.7):

1. Select **Clean image sensor** from the **Setup Menu** and scroll to the right (figure 5.7, image 1).
2. Select **Clean now** from the menu and scroll to the right (figure 5.7, image 2).

5



- Step 2 starts the automatic cleaning process. A screen will appear that says *Cleaning image sensor* (figure 5.7, image 3). When the process is complete another screen will appear that says *Done* (figure 5.7, image 4). Then the camera switches back to the **Setup Menu**.

Now, let's look at how to select an active method for regular sensor cleaning.

Clean at Startup/Shutdown

For preventive dust control, many people set their cameras to clean the sensor at startup, shutdown, or both. There are four selections for startup/shutdown cleaning:

- Clean at startup
- Clean at shutdown
- Clean at startup & shutdown
- Cleaning off

These settings are self-explanatory. I find it interesting that I don't detect any startup or shutdown delay when using the startup/shutdown cleaning modes. I can turn my camera on and immediately take a picture. The cleaning cycle seems to be very brief in this mode.

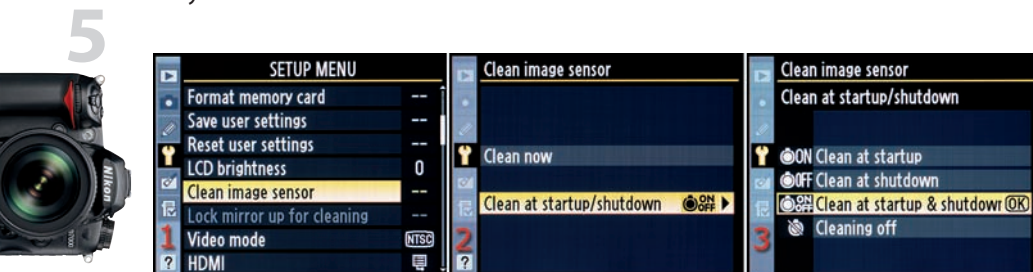


Figure 5.8 – Clean at startup/shutdown screens

Use the following steps to choose a Clean at startup/shutdown method:

- Select **Clean image sensor** from the **Setup Menu** and then scroll to the right (figure 5.8, image 1).
- Choose **Clean at startup/shutdown** from the menu and scroll to the right (figure 5.8, image 2).
- Select one of the four methods shown in figure 5.8, image 3. I chose **Clean at startup & shutdown**.
- Press the **OK button** to lock in your choice.

My Recommendation: Nikon suggests that you hold the camera at the same angle as when you are taking pictures (bottom down) when you use these modes to clean the sensor.

I leave my camera set to Clean at startup & shutdown so that it cleans itself each time I start and end a shooting session. If I am in a dusty environment, I usually turn my camera off and back on from time to time so that it can clean the sensor.

I rarely use the Clean now method but like knowing it's there when I need it. I suspect that Clean now may have a longer cleaning cycle since it seems to take at least two or three seconds. I don't detect a several-second delay when I use the Clean at startup & shutdown method. I can shoot immediately upon turning on the camera. Of course, taking a picture may just cancel the startup cleaning.

Lock Mirror Up for Cleaning

(User's Manual – Page 286)

Lock mirror up for cleaning is for those times when the high-frequency vibration method of cleaning your D7000's sensor does not dislodge some stickier-than-normal dust. You may have to clean your sensor more aggressively.

In many cases, all that's needed is to remove the dust with a puff of air from a dust blower. I remember having to do this with my Nikon D100 in 2002, and I was always afraid I might ruin the shutter if I did it incorrectly. With the D100, I had to hold the shutter open in bulb mode with one hand while I blew off the sensor with the other hand.

The D7000 helps out by providing the Lock mirror up for cleaning mode so you can more safely blow a stubborn piece of dust off the low-pass filter. Using this function is much safer for blowing off the sensor; you can use both hands while the battery power holds the reflex mirror up and the shutter open.

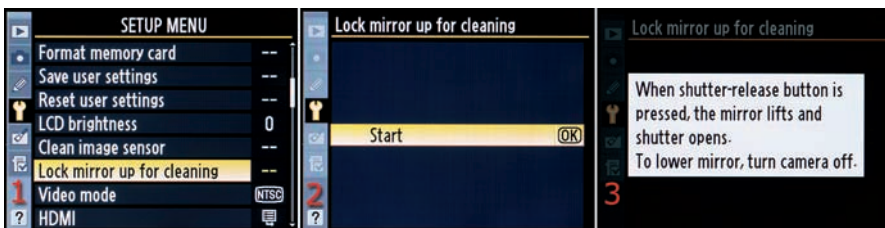


Figure 5.9 – Lock mirror up for cleaning

Use the following steps to select this mode for manual sensor cleaning:

1. Select **Lock mirror up for cleaning** from the **Setup Menu** and then scroll to the right (figure 5.9, image 1).
2. Press the **OK** button on **Start** (figure 5.9, image 2).

5



3. You'll see a message screen that says as soon as you press the [Shutter-release button](#) the camera will raise the mirror and open the shutter ([figure 5.9, image 3](#)).
4. Remove the lens and press the [Shutter-release button](#) once. The sensor will now be exposed and ready for cleaning. Be careful not to let new dirt in while the sensor is open to air.
5. Clean the sensor with proper fluids and pads, (i.e., Eclipse fluid and Pec pads).
6. Turn the camera off and put the lens back on.

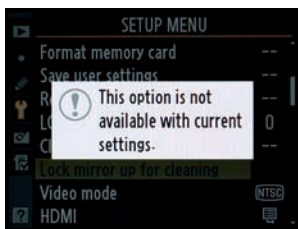


Figure 5.10 – Battery too low

Make sure you have a fresh battery in the camera since that's what holds the shutter open for cleaning. It must have a 60 percent or greater charge or the camera will refuse to allow you to start the process, and the message shown in [figure 5.10](#) will be displayed.



Figure 5.11 – Giotto's Rocket-air blower

My Recommendation: You'll need a good professional sensor-cleaning blower, such as my favorite, the Giotto's Rocket-air blower with a long tip for easy insertion ([figure 5.11](#)). I bought mine from the Nikonians PhotoProShop at this web address: <http://www.PhotoProShop.com>.

If even an air blower fails to remove stubborn dust or pollen, you will have to either have your sensor professionally cleaned or do it yourself. Nikon states that you will void your warranty if you touch the low-pass filter in front of the sensor. However, many people still wet or brush clean their D7000's sensor. I've done it myself, although I'll never admit it! (Oops!)

If all of this makes you nervous, then send your camera off to Nikon for approved cleaning, or use a professional service. Fortunately, a few puffs of air will often remove dust too stubborn for the high-frequency vibration methods. It helps to have the proper tools, such as the Giotto's Rocket-air blower from the Nikonians PhotoProShop.

Video Mode

(User's Manual – Page 237)

If you plan to connect your D7000 to a video device, like a standard-definition television (SDTV) or VCR, be sure to use the correct Video mode for communication with the device.

Your camera has a video-out port under the rubber flap on the side (A/V OUT), which allows you to connect with devices that use RCA jacks for input. Nikon includes a cable in the camera box for this connector. It has a ministereo plug on one end and yellow and white RCA jacks on the other end. Insert the ministereo plug into the A/V OUT port on the camera, and insert the RCA jacks into the video device. When you turn the camera on and press the Playback button, the image should display on the video device.

Make sure that you have the correct Video mode selected for your area of the world. There are two video modes available in the D7000: NTSC and PAL. Use the following steps to select a Video mode:

1. Select **Video mode** from the **Setup Menu** and then scroll to the right (figure 5.12, image 1).
2. Choose **NTSC** or **PAL** from the menu (figure 5.12, image 2).
3. Press the **OK** button to lock in your selection.



Figure 5.12 – Choosing a Video mode



My Recommendation: You'll need to refer to the manual of your television, VCR, or other device to determine what video standard it uses. In the United States and many other areas of the world, the NTSC mode is commonly used. Many European countries use PAL. It won't harm the device or camera if you use the wrong mode. If one doesn't work, try the other.

HDMI

(User's Manual – Page 194)

HDMI (high-definition multimedia interface) allows you to display your images and video on a high-definition television (HDTV) or monitor. The camera's Monitor shuts off when you are connected to an HD device.

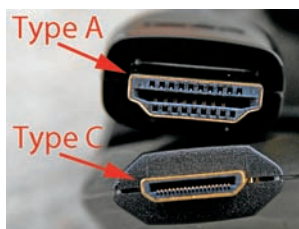


Figure 5.13 – HDMI connectors

You'll need an HDMI type A to type C cable, which is not included with the camera but is available from many electronics stores. This cable is also known as a mini-HDMI to HDMI A/V HD cable.

Figure 5.13 gives you a closeup look at both ends of the cable. The smaller end (mini-HDMI, type C) goes into the HDMI port under the rubber flap on your camera, and the other end (HDMI, type A) plugs into your

HD device. The HDMI setting has two options, Output resolution and Device control, which we'll discuss next.

Output Resolution

You can select one of the following formats for output to your HDMI device:

- **Auto (default)** – This allows the camera to select the most appropriate format for displaying your image on the currently connected device.
- **480p (progressive)** – 640 x 480 progressive format.
- **576p (progressive)** – 720 x 576 progressive format.
- **720p (progressive)** – 1280 x 720 progressive format.
- **1080i (interlaced)** – 1920 x 1080 interlaced format.



Figure 5.14 – Selecting an HDMI Output resolution

Use the following steps to select an Output resolution:

1. Select **HDMI** from the **Setup Menu** and then scroll to the right (figure 5.14, image 1).
2. Choose **Output resolution** from the menu and scroll to the right (figure 5.14, image 2).
3. Select one of the five output resolutions (figure 5.14, image 3).
4. Press the **OK** button to lock in your selection.

Check your HDMI device's user's manual for its appropriate format, or use Auto.

Device Control

Select one of the two settings that affect how you will control your HDMI device:

- **On** – When you connect your camera to a television that supports HDMI-CEC (consumer electronics control), a simple display will appear on your TV screen. There will be two choices: Play and Slide show. When you see this display you can use your TV's remote control to control the camera during full-frame playback and slide shows.
- **Off** – You must use the camera's Multi Selector to control the image display on the TV.

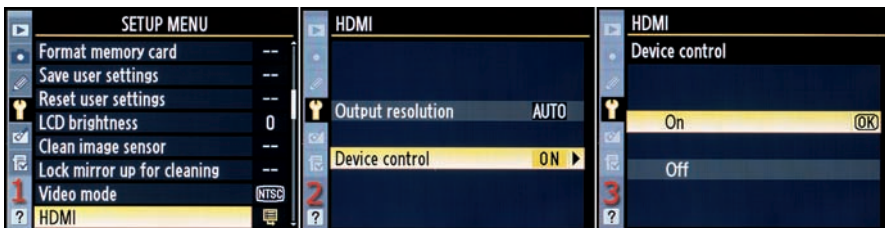


Figure 5.15 – Enable or disable Device control for HDMI-CEC

Use the following steps to enable or disable Device control:

1. Select **HDMI** from the **Setup Menu** and then scroll to the right (figure 5.15, image 1).
2. Choose **Device control** from the menu and scroll to the right (figure 5.15, image 2).
3. Select **On** or **Off** from the menu (figure 5.15, image 3).
4. Press the **OK button** to lock in your selection.

My Recommendation: These modes will be discussed in more detail in the chapter titled **Live View and Movie Modes**. Here we've examined only how to select the modes. Leave the HDMI mode set to Auto until you learn more about HDMI. The D7000 can interface with both progressive and interlaced devices.

5



Flicker Reduction

(User's Manual – Page 237)

Flicker reduction allows you to attempt to match the camera's recording frequency to that of the local AC power supply

so that when you use Live View or shoot a movie under fluorescent or mercury-vapor lighting you can minimize flickering. Use the following steps to select a setting in hopes of reducing flicker:



Figure 5.16 – Selecting Flicker reduction frequencies

1. Select **Flicker reduction** from the **Setup Menu** and then scroll to the right (figure 5.16, image 1).
2. Choose **50 Hz** or **60 Hz** from the menu (figure 5.16, image 2).
3. Press the **OK button** to lock in your setting.

My Recommendation: This function is somewhat limited since there are only two settings: 50 Hz or 60 Hz. However, it could help to control the flickering that looks like dark horizontal bands moving through the movie. Experiment to see if it helps to switch between the two settings when you detect flickering under fluorescent or mercury-vapor lighting.



Time Zone and Date

(User's Manual – Page 237)

Time zone and date allows you to configure the Time zone, Date and time, Date format, and Daylight saving time for your camera.

If you haven't set the time and date you'll see the word **CLOCK** flashing on the Control panel. In addition to the main li-ion battery pack, the camera has a built-in clock battery that is not user replaceable. The built-in battery charges itself from the main camera battery pack. **CLOCK** blinking in the Control panel can also mean that the internal battery is exhausted and the clock has been reset.

It takes about two days of having a charged battery in the camera to fully charge the separate built-in clock battery. When the clock battery is fully charged, the clock will remain active without a main camera battery for up to two months.

Time Zone

Figure 5.17 shows the Time zone configuration screens. The screen used to set the time zone displays a familiar world map from which you will select the area of the world where you are using the camera.

As an example, New York is in the Eastern Time zone (ET). You'll need to select your time zone by choosing it from the map (figure 5.17, image 3). I hope you remember your geography lessons! Fortunately, the camera displays some major city names above the time zone map in case you don't recognize your location.



Figure 5.17 – Time zone settings

Use the following steps to set the Time zone:

1. Select **Time zone and date** from the **Setup Menu** and scroll to the right (figure 5.17, image 1).
2. Choose **Time zone** from the menu and scroll to the right (figure 5.17, image 2).
3. To set the **Time zone**, use the **Multi Selector** to scroll left or right until your location is under the vertical yellow bar or when you see the nearest city marked with a small red dot (figure 5.17, image 3).
4. Press the **OK button** to lock in the **Time zone**.

Date and Time

Figure 5.18 shows the three Date and time configuration screens. The final screen in the series allows you to select the year, month, and day (Y, M, D) and the hour, minute, and second (H, M, S).

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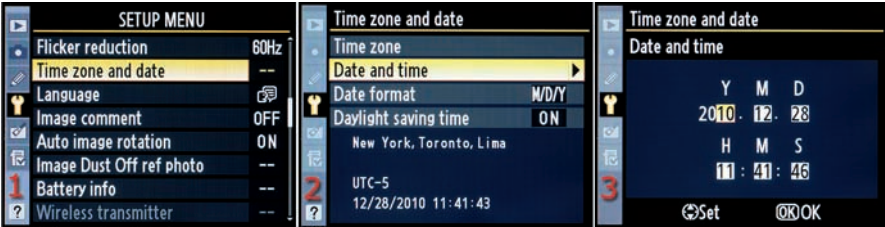


Figure 5.18 – Date and time settings

Use the following steps to set the Date and time:

1. Select **Time zone and date** from the **Setup Menu** and scroll to the right (figure 5.18, image 1).
2. Choose **Date and time** from the menu and scroll to the right (figure 5.18, image 2).
3. Using the **Multi Selector**, scroll left or right until you've selected the value you want to change. Then scroll up or down to change the value. The top line shown in figure 5.18, image 3, includes the year, month, and day (Y, M, D). The bottom line includes the hour, minute, and second (H, M, S).
4. Press the **OK** button to lock in the **Date and time**.

Note: The time setting uses the 24-hour military-style clock. To set the clock to 3 p.m., you would set the H and M settings to 15:00. Please refer to the following 12 - to 24-Hour Time Conversion Chart.

12- to 24-Hour Time Conversion Chart

A.M. Settings:

12:00 a.m. = 00:00 (midnight)	06:00 a.m. = 06:00
01:00 a.m. = 01:00	07:00 a.m. = 07:00
02:00 a.m. = 02:00	08:00 a.m. = 08:00
03:00 a.m. = 03:00	09:00 a.m. = 09:00
04:00 a.m. = 04:00	10:00 a.m. = 10:00
05:00 a.m. = 05:00	11:00 a.m. = 11:00

P.M. Settings:

12:00 p.m. = 12:00 (noon)	06:00 p.m. = 18:00
01:00 p.m. = 13:00	07:00 p.m. = 19:00
02:00 p.m. = 14:00	08:00 p.m. = 20:00
03:00 p.m. = 15:00	09:00 p.m. = 21:00
04:00 p.m. = 16:00	10:00 p.m. = 22:00
05:00 p.m. = 17:00	11:00 p.m. = 23:00

Note: There is no 24:00 time (midnight). After 23:59 comes 00:00.

Date Format

The camera gives you three different ways to format the camera's date:

- Y/M/D Year/Month/Day (2011/12/31)
- M/D/Y Month/Day/Year (12/31/2011)
- D/M/Y Day/Month/Year (31/12/2011)

United States camera owners will probably use the second setting, which matches the Month/Day/Year format. People in other parts of the world can select their favorite date format from the two additional choices.

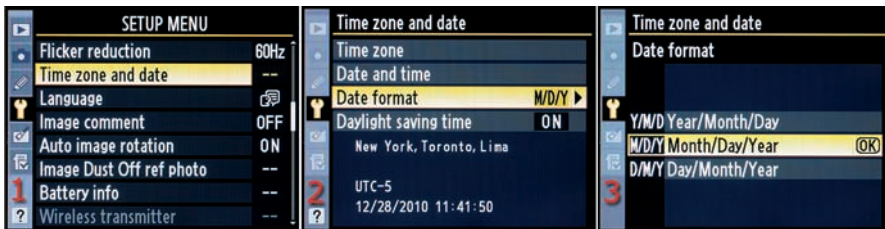


Figure 5.19 – Date format settings

Here are the steps to set the Date format:

1. Select **Time zone and date** from the **Setup Menu** and scroll to the right (figure 5.19, image 1).
2. Choose **Date format** from the menu and scroll to the right (figure 5.19, image 2).
3. Choose your favorite **Date format** from the menu (figure 5.19, image 3). I selected **M/D/Y Month/Day/Year**.
4. Press the **OK button** to lock in the **Date format**.

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Daylight Saving Time

Many areas of the world observe Daylight saving time. On a specified day in spring of each year, many people set their clocks forward by one hour. Then in the fall they set them back, leading to the clever saying, “spring forward, fall back.” If you set Daylight saving time to On, the camera will change the time automatically and save you the trouble.

Here are the steps to enable or disable Daylight saving time:

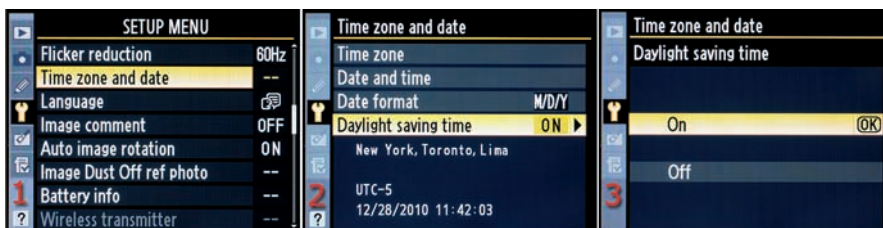


Figure 5.20 – Daylight saving time settings

1. Select **Time zone and date** from the **Setup Menu** and scroll to the right (figure 5.20, image 1).
2. Choose **Daylight saving time** from the menu and scroll to the right (figure 5.20, image 2).
3. Figure 5.20, image 3, shows you the two choices for **Daylight saving time**: **On** or **Off**. If you select **On** your camera will automatically spring forward and fall back. Select **Off** if you don't observe **Daylight saving time** or if you'd rather change the time yourself.
4. Press the **OK button** to lock in the setting.

My Recommendation: This is the one of the first settings you'll modify when you get a new D7000 camera. It is important that all these items are set correctly since it is written into the metadata of each image you make. Daylight saving time is optional but very convenient.

Language

(User's Manual – Page 238)

Language is a function that lets the camera know what language you prefer for the camera's menus, screens, and messages. Nikon is an international company that sells cameras and lenses around the world. For that reason, the D7000 can display its screens and menus in up to 22 languages.

The D7000 includes the following languages on its Setup Menu > Language screen:

- Czech
- Danish
- German
- English
- Spanish
- French
- Indonesian
- Italian
- Dutch
- Norwegian
- Polish
- Portuguese
- Russian
- Finnish
- Swedish
- Turkish
- Arabic
- Traditional Chinese
- Simplified Chinese
- Japanese
- Korean
- Thai

Use the following steps to select your preferred Language:

1. Select **Language** from the **Setup Menu** and scroll to the right (figure 5.21, image 1).
2. Choose your preferred **Language** from the list shown in figure 5.21, image 2.
3. Press the **OK** button to lock in your choice.



Figure 5.21 – Language selection

My Recommendation: The camera should come preconfigured for the main language that is spoken where you live. If you prefer a different one, use this setting to select it.



Image Comment

(User's Manual – Page 238)

Image comment is a useful setting that allows you to attach a 36-character comment to each image you shoot. The comment is embedded in the picture's internal metadata and does not show up on the image itself. I attach the words "Copyright Darrell Young" to my images.

Unfortunately, Nikon does not include the copyright symbol (©) in the list of numbers and letters, or I would include that in my comment.



Figure 5.22 – Attaching an Image comment

Use the following steps to create an Image comment:

1. Select **Image comment** from the **Setup Menu** and scroll to the right (figure 5.22, image 1).
2. Select **Input comment** from the menu and scroll to the right (figure 5.22, image 2).
3. In figure 5.22, image 3, you'll see a series of symbols, numbers, and letters on top and a rectangle with tiny lines at the bottom. The little lines are where you will put the text of the comment you want to attach to the image. There is a blank spot just after the lowercase z, which represents a blank space that you can insert in the line of text. This can be used for separating words. Notice that lowercase letters follow the uppercase letters.
4. Use the **Multi Selector** to scroll through the numbers and letters to find the characters you want to use.
5. Press the **OK button** to insert a character. Keep inserting new characters until you have the entire comment typed into the rectangle at the bottom of the screen. I added "Copyright Darrell Young."

6. If you make a mistake, hold down the checkered **Thumbnail/playback zoom out button** while using the **Multi Selector** to move to the position of the error. Push the **Delete button** and the character will disappear.
7. Press the **Playback zoom in button** when you are finished entering the comment.
8. The camera will switch back to the screen shown in [figure 5.22, image 4](#). You need to put a check mark in the **Attach comment** check box so the comment will attach itself to each image. To check the box, highlight the **Attach comment** line and scroll to the right, or press the **OK button** to **Set** the check mark in the box. You'll see a check mark appear as soon as you scroll to the right ([figure 5.22, image 5](#), red arrow).
9. Scroll up to **Done** and press the **OK button** to save the new comment ([figure 5.22, image 6](#)).

My Recommendation: You can use this comment field for any text you want to add to the internal metadata of the image. There is another Setup Menu selection called Copyright information that allows you to add your personal copyright. We'll consider that function later in the chapter. I add copyright information here because I am worried about image theft. You may want to add other text—since the camera provides a specific Copyright information screen—such as information to identify the shoot. Remember, you are limited to 36 characters in the comment.

Auto Image Rotation

(User's Manual – Page 239)

Auto image rotation is concerned with how vertical images are displayed on your camera's Monitor and later on your computer. Horizontal images are not affected by this setting. The camera has a direction-sensing device, so it knows how the camera was oriented when a picture was taken.

Depending on how you have Auto image rotation set, how the Playback Menu > Rotate tall setting is set, and the direction you hold your camera's hand grip, the camera will display a vertical image either as an upright portrait image, with the top of the image at the top of the Monitor, or lying on its side in a horizontal direction, with the top of the image to the left or right of the Monitor. The two selections are as follows:

- **On** – With Auto image rotation turned On, the camera stores orientation information within each image, primarily so the image will display correctly in computer software, such as Nikon Capture NX 2 and ViewNX 2. In other words, the camera

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records, as part of the image metadata, whether you were holding your camera horizontally or vertically (hand grip down) or even upside-down vertically (hand grip up). The image will display in the correct orientation on your camera's Monitor only if you have Playback Menu > Rotate tall set to On. Auto image rotation lets the image speak for itself as to orientation, while Rotate tall lets the camera listen to the image and display it in the proper orientation.

- **Off** – If Auto image rotation is turned Off, the vertical image will be displayed as a horizontal image lying on its side in your computer software. The top of the image will be on the left or right according to how you held the hand grip—up or down—when you took the picture. The camera does not record orientation information in the image metadata. It will display images horizontally, even if you have the Playback Menu > Rotate tall function set to On.

Use the following steps to set the Auto image rotation function:



Figure 5.23 – Auto image rotation settings

1. Select **Auto image rotation** from the **Setup Menu** and scroll to the right (figure 5.23, image 1).
2. Choose **On** or **Off** from the menu (figure 5.23, image 2).
3. Press the **OK button** to lock in your selection.

If you're shooting in one of the Continuous frame advance modes (CL or CH), the position in which you hold your camera for the first shot sets the direction the images are displayed.

My Recommendation: If you want your images to be displayed correctly on your camera's Monitor and in your computer, you'll need to be sure that Auto image rotation is set to On. I always keep mine set that way.

Image Dust Off Ref Photo

(User's Manual – Page 240)

You may go out and do an expensive shoot only to return and find that some dust spots have appeared in the worst possible places in your images. If you immediately create an Image Dust Off ref photo, you can use it to remove the dust spots from your images and then clean the camera's sensor for your next shooting session.

When you use the following instructions to create the Image Dust Off ref photo, you'll be shooting a blank, unfocused picture of a pure white or gray background. The dust spots in the image will then be readily apparent to Nikon Capture NX 2 software. Yes, you must use Nikon's software to automatically batch-remove dust spots from a large number of images.

When you load the image to be cleaned into Capture NX 2, along with the dust-off image, the software will use that image to remove the spots in your production image.

The position and amount of dust on the low-pass filter may change. You should take Image Dust Off ref photos regularly and use one that was taken within one day of the photographs you wish to clean up.

Finding a Subject for the Dust-Off Reference Photo

First, you'll need to select a featureless subject to make a photograph for the Image Dust Off ref photo. The key is to use a material that has no graininess, such as a bright white, slick plastic, or white card. I tried using plain white sheets of paper held up to a bright window, but the resulting reference photo was unsatisfactory to Capture NX 2. It gave me a message that my reference photo was too dusty when I tried to use it.

After some experimentation, I finally settled on three different subjects that seem to work well:

- A slide-viewing light table with the light turned on
- A computer monitor with a blank white word processor document
- A plain white card in the same bright light in which your subject resides

All of these provided enough light and few enough features to satisfy both my camera and Capture NX 2. The key is to photograph something fairly bright, but not too bright. You may need to experiment with different subjects if you don't have a light table or computer.

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Figure 5.24 – Image Dust Off ref photo settings

Now, let's prepare the camera for the actual reference photo. Here are the steps you'll use to create an Image Dust Off ref photo:

1. Select **Image Dust Off ref photo** from the **Setup Menu** and scroll to the right (figure 5.24, image 1). There is also a **Clean sensor and then start** selection. However, since I want to remove dust on current pictures, I won't use this setting. It might remove the dust bunny that is imprinted on the last 500 images I just shot! I'll clean my sensor after I get a good **Image Dust Off ref photo**.
2. Choose **Start** and press the **OK** button (figure 5.24, image 2). Afterward, you'll see the characters *REF* in the **Viewfinder** and on the **Control panel**. This simply means that the camera is ready to create the image. (If you would rather clean the sensor before you start, select **Clean sensor and then start** instead of **Start**; however, I don't recommended doing that because it will remove the dust that you are trying to photograph so you can remove it from your images. Choose **Clean sensor and then start** only if the **Image Dust Off ref photo** will not be used with existing images!)
3. When the camera is ready, hold the lens about 4 inches (10 cm) away from the blank subject. The camera will not try to autofocus during the process, which is good because you want the lens at infinity. You are not trying to take a viewable picture; you're creating an image that shows where the dust is on the sensor. Focus is not important, and neither is minor camera shake. If you try to take the picture and the subject is not bright enough, or if it's too bright, you will see the screen shown in figure 5.25. If you are having problems with too much brightness, use a gray surface instead of white. Most of the time this error is caused by insufficient light.
4. If you don't see the screen in figure 5.25 and the shutter fires, you have successfully created an **Image Dust Off ref photo**. You will find the image shown in figure 5.26 on your camera's **Monitor**. A 2 MB file is created on your camera's memory card with a file extension of NDF instead of the normal NEF, TIF, or



Figure 5.25 – Image Dust Off ref photo failure

JPG (an example file name is DSC_1234.NDF). This NDF file is basically a small database of the millions of clean pixels in your imaging sensor and a few dirty ones (figure 5.26).

You cannot display the Image Dust Off ref photo on your computer. It will not open in Nikon Capture NX 2 or any other graphics program that I tried. It is used only as a reference by Capture NX 2 when it's time to clean images.

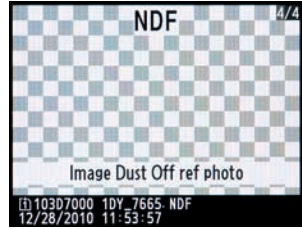


Figure 5.26 – Successful Image Dust Off ref photo

Where to Store the Reference Photo

Copy the NDF file from your camera's memory card to the computer folder containing the images that have dust spots on them and for which you created this Image Dust Off ref photo. You can now use Nikon Capture NX 2 to remove the dust spots from all the images represented by the Image Dust Off ref photo. That process is beyond the scope of this book, but there are many good Nikon Capture NX 2 books on the market that will explain it well.

White Card Tips

Remember, all your camera needs to create an Image Dust Off ref photo is a good, bright look at its imaging sensor so it can map the dirt spots into an NDF file (ref photo file).

If you get the warning screen shown in figure 5.25 that says, Exposure settings are not appropriate. Change exposure settings and try again, shoot another Image Dust Off ref photo with a nice bright, clean, white surface. Put the lens very close to the surface, and make sure it is not in focus. Nikon recommends less than 4 inches (10 cm). You might even want to manually set the lens to infinity if you are having problems with this.

When you've found your favorite white or gray surface for Image Dust Off ref photos, keep it safe and use it consistently.

5



Battery Info

(User's Manual – Page 242)

The Battery info screens will let you know how much battery charge has been used (Bat. meter), how many images have been taken

with this battery since the last charge (Pic. meter), and how much life the battery has before it will no longer hold a good charge (Battery age).

Here are the steps to examine the Battery info:

1. Select **Battery info** from the **Setup Menu** and scroll to the right (figure 5.27, image 1).
2. The next screen is the **Battery info** screen. It is just for information, so there's nothing to set (figure 5.27, image 2).
3. When you've finished examining your camera's **Battery info**, press the **OK button** to exit.

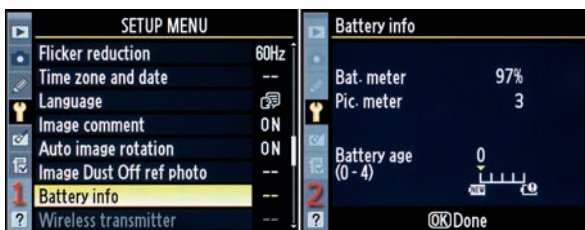


Figure 5.27 – Battery info screen

The D7000 goes a step further than most cameras. Not only does it inform you of the amount of charge left in your battery, it also lets you know how much life is left. After some time, all batteries weaken and won't hold a full charge. The Battery age meter will tell you when the battery needs to be completely replaced. It shows five stages of battery life, from 0 - 4, so you'll be prepared to replace the battery before it gets too old to take many shots.

My Recommendation: It's important to use Nikon brand batteries in your D7000 so they will work properly with the camera. Aftermarket batteries may not charge correctly in the D7000 battery charger. In addition, they may not report correct Battery age information. There may be an aftermarket brand that works correctly, but I haven't found it. Instead, I use the batteries designed by Nikon to work with this camera. I am a bit afraid to trust a camera that costs this much to a cheap aftermarket battery of unknown origin.

Battery Info with an MB-D11 Battery Pack

If you are using the MB-D11 battery pack with an EN-EL15 battery, the Battery info screen will display a split screen. The left side of the screen shows information for the battery in the camera, and the right side shows information for the battery in the MB-D11 battery pack.

Wireless Transmitter

(User's Manual – Page 181)

The Wireless transmitter menu system is concerned with having the WT-4 wireless transmitter attached to the D7000. Using the WT-4, you can send images wirelessly to a computer or printer. You can also use Nikon Camera Control 2 software to control the D7000 remotely.

Here are the four Wireless transmitter modes in the D7000 with a WT-4 transmitter attached:

- **Transfer mode** – Using this mode, you can upload new or existing images to a computer or even to a file transfer protocol (FTP) server.
- **Thumbnail select mode** – This allows someone to preview the images you are shooting on a remote computer. They can select the ones they like and upload them to a computer. Sports shooters love this!
- **PC mode** – This might have been called *Studio mode* instead. It allows studio artists to control their D7000 from a computer using the Nikon Camera Control Pro 2 software.
- **Print mode** – This allows someone shooting near a network to print the images on a networked printer.

This book doesn't cover the use of the WT-4 transmitter in any more detail since the transmitter has its own comprehensive feature set and manual.

Low-Cost Wireless Image Transmission

If you need to wirelessly transmit images between your camera and computer but cannot afford the expensive WT-4 transmitter, please read the upcoming section called Eye-Fi Upload. Eye-Fi cards allow limited-range (50 to 90 feet) wireless transmission of images between your camera and a Wi-Fi network access point. If you use the new Eye-Fi Pro X2 8 GB SD/SDHC card, you can even do direct to computer Ad Hoc wireless transmission of images. At the time of this writing, there are Eye-Fi cards that range from 2 to 8 GB capacity.

5



Copyright Information

(User's Manual – Page 243)

Copyright information allows you to embed Artist and Copyright data into each image. Refer to [figure 5.28](#) and use the following steps to add personal information to your camera. It will then write your Artist name and Copyright information into the metadata of the image.



Figure 5.28 – Copyright information settings

Here are the steps to enter your Artist and Copyright information:

1. Select **Copyright information** from the **Setup Menu** and scroll to the right ([figure 5.28, image 1](#)).
2. Select **Done** from the menu and scroll to the right ([figure 5.28, image 2](#)).
3. Scroll down to **Artist** and scroll to the right ([figure 5.28, image 3](#)).
4. You'll now see the **Artist** screen with all the available characters ([figure 5.28, image 4](#)). Add your name here, with a maximum of 36 characters. Use the **Multi Selector** to scroll around within the characters. Lowercase characters follow the uppercase letters. Select a character by pressing the **OK button**.

Correct errors within the text you've already entered by holding down the **Thumbnail/playback zoom out button** and scrolling left or right with the **Multi Selector**. Remove a character that's already in the name area by scrolling to it and pressing the **Delete button**. Press the **Playback zoom in button** when you have entered your name. (Refer to the **Camera Body Reference** section at the beginning of this book to find the button locations.)

5. Now scroll down to the **Copyright** line on the **Copyright information** screen, and then scroll to the right (**figure 5.28, image 5**).
6. Add your name using the method and controls described in step 4 (**figure 5.28, image 6**).
7. Scroll down to the **Attach copyright information** line (**figure 5.28, image 7**). Notice that there is no check mark in the little box (**figure 5.28, image 7, red arrow**).
8. Now scroll to the right toward **Set**, and you'll see a tiny check mark appear in the box (**figure 5.28, image 8, red arrow**).
9. Finally, scroll up to **Done** on the **Copyright information** screen (**figure 5.28, image 9**).
10. Press the **OK button** to save your **Artist** and **Copyright information**.

My Recommendation: Be sure to add your name in both the Artist and Copyright sections of this function. With so much intellectual property theft going on these days, it's a good idea to identify each of your images as your own. Otherwise, you may post an image on Flickr or Facebook to share with friends and later find it on a billboard along the highway. With the Artist and Copyright information embedded in the image metadata, you will be able to prove that the image is yours and charge the infringer.

Embedding your personal information is not a foolproof way to identify your images since unscrupulous people may steal them and strip the metadata out of them. However, if you do find one of your images on the front page of a magazine, or on someone else's website, you can at least prove that you took the image and have some legal recourse under the Digital Millennium Copyright Act (DMCA). When you've taken a picture, you own the copyright to that image. You must be able to prove you took it. This is one convenient way.

You'll have even more power to protect yourself if you register your images with the U.S. Copyright Registry at the following web address:

<http://copyrightregistry-gov-form.com/>

5



Save/Load Settings

(User's Manual – Page 244)

Do you have your D7000 set up exactly the way you like it? Have you spent hours and hours with this book and the User's Manual, or simply exploring menus, and finally got all the settings in place? Are you worried that you might accidentally reset your camera or that it could lose its settings in one way or another? Well, worry no more!

Save/load settings works a little like the Save user settings function we examined at the beginning of this chapter, except that Save/load settings writes configuration settings to the memory card—instead of storing them in the camera's memory (i.e., it doesn't use U1 or U2)—allowing you to back up camera settings to your computer.

When you have your camera configured to your liking, or at any time during the process, simply use the Save/load settings function to save the camera configuration to your memory card. It creates a 2 KB file named NCSETUP7.BIN in the root directory of your memory card. You can then save that file to your computer's hard drive and have a backup of your camera settings.

Here are the steps to save or load the camera's settings:

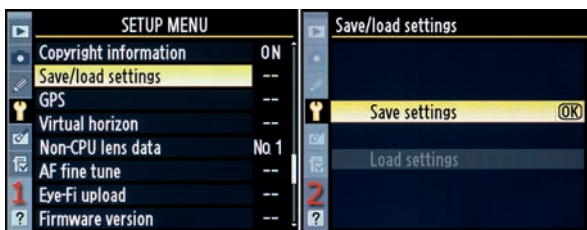


Figure 5.29 – Save/load settings

1. Choose **Save/load settings** from the **Setup Menu** and scroll to the right (figure 5.29, image 1).
2. Select **Save settings** or **Load settings** from the **Save/load settings** screen, and then follow one of these two easy procedures (figure 5.29, image 2):
 - a. **Save settings** – Select **Save settings** and press the **OK button**. Your most important camera settings will be saved to your memory card. Afterward, copy the settings file (NCSETUP7.BIN) to your computer for safekeeping. **Warning:** You may notice in figure 5.29, image 2, that the **Load settings** selection is grayed out. If it is not grayed out when you get ready to **Save settings**, be careful—you are about to overwrite previously saved settings that are currently on the memory card. The *only* time you'll see **Load settings** not grayed out is when an NCSETUP7.BIN file already exists on the memory card.

- b. **Load settings** – Insert a memory card with a previously saved NCSETUP7.BIN file on it, select **Load settings**, and press the **OK button**. The settings you previously saved will be reloaded into the D7000 and will overwrite your current settings without prompting you for permission, so be sure that you are ready to have the settings overwritten. If you change the name of the NCSETUP7.BIN file, the D7000 will not be able to reload your settings.

Here is a list of settings that are saved or loaded when you make use of these functions. It doesn't save or load every setting in the D7000, only the ones listed here:

Playback Menu

- Display mode
- Image review
- After delete
- Rotate tall

Shooting Menus

- File naming
- Role played by card in Slot 2
- Image quality
- Image size
- JPEG compression
- NEF (RAW) recording
- White balance (includes fine-tuning adjustments and presets d-0 to d-4)
- Set Picture Control
- Auto distortion control
- Color space
- Active D-Lighting
- Long exp. NR
- High ISO NR
- ISO sensitivity settings
- Movie settings
- Remote control mode

Custom Settings

- Custom settings (includes all configurable settings)
- Setup Menu
- Clean image sensor
- Video mode
- HDMI

5



- Flicker reduction
- Time zone and date (except date and time)
- Language
- Image comment
- Auto image rotation
- Copyright information
- GPS
- Non-CPU lens data

My Menu and Recent Settings

- My Menu (includes all items you've entered)
- Recent Settings
- Choose tab

My Recommendation: This function is a great idea. After using my new camera for a few days and getting it set up just right, I save the settings file to my computer for safekeeping. Later, if I change things extensively and want to reload my original settings, I just put the backed-up settings file on a memory card, pop it into the camera, hit Load settings, and I'm back in business.

5



Save User Settings versus Save/Load Settings

Early in the chapter we discussed a function called Save user settings and how you can use it to configure your camera in custom ways and save the customizations under U1 or U2 for quick access on the Mode dial. Now we have another similar-sounding function called Save/load settings. How is it different? As previously mentioned, Save/load settings does not save the camera's settings to the camera's memory; instead, it saves them to a memory card. By placing the camera's settings on a memory card, you can back them up to computer or share them with a friend that has a D7000. It not only allows you to back up the settings, but it also allows you to trade them with others. The Save/load settings function is completely separate from and does not affect the Save user settings (U1 and U2). In other words, if you do a Save/load setting operation, it does not save or load the user settings in U1 and U2. This is a protection for your camera's configuration. How would you feel if you spent hours configuring the user settings for U1 and U2 and then Save/load settings overwrote them? I know I would be very upset! The bottom line is that when you use Save/load settings, it will not affect your camera's U1 and U2 user settings in any way.

GPS

(User's Manual – Page 162)

Nikon has wisely included the ability to geotag your images with global positioning system (GPS) location data. Now when you shoot a spectacular travel image, you can rest assured that you'll be able to find that exact spot next year. With the Nikon GP-1 GPS (or an aftermarket brand), the D7000 will record the following GPS information about your location into the metadata of each image:

- Latitude
- Longitude
- Altitude
- Heading
- UTC (time)

Using a GPS Unit with Your D7000

The GPS unit you choose must be compatible with the National Marine Electronics Association (NMEA) 0183 version 2.01 or 3.01 data format.

As shown in [figure 5.30](#), I use a Nikon GP-1 GPS unit on my D7000. It's small, easy to carry and store, and works very well. I have other Nikon DSLRs too, and this GPS unit works on all of them, with the proper cables.

The GP-1 comes with a GP1-CA90 cable to interface with the D7000 (and D90). (It also includes a GP1-CA10 cable for Nikon cameras with a 10-pin port on the body, such as the D200, D300, D300S, D700, D2X, D3, D3S, and D3X.) You can also get an optional Nikon MC-DC2 remote release cable that plugs directly into the GP-1 for hands-off, vibration-free photography.

In figure 5.30, you can see a Nikon GP-1 attached to the camera's Accessory shoe. You can also see the included GP1-CA90 cable plugged into the GPS connector on the side of the camera (look for MIC and GPS on the outside of the lower accessory terminal cover). I deliberately put the curl in the cable to keep it from sticking out awkwardly. If you look on the other side of the GPS unit you'll see the MC-DC2 remote release cable (not included).

One thing to note about the Nikon GP-1 GPS unit is that it doesn't have a built-in digital compass, so it will not report Heading information to the camera.



Figure 5.30 – Nikon D7000 with a Nikon GP-1 GPS unit, GP1-CA90 cable, and MC-DC2 remote release cable

5



Preparing the Camera for GPS Usage

There are several screens used in setting up the D7000 for GPS use. First, you have to make a decision about the exposure meter when a GPS unit is plugged in to the camera. While the GPS is plugged in, the camera's exposure meter must be active to record GPS data to the image. You'll have to do one of two things:



Figure 5.30A – Nikon GP-1 GPS Unit mounted in Accessory shoe

- Set the exposure meter to stay on for the entire time that a GPS is plugged in, which, of course, will increase battery drain, but it keeps the GPS locked to the satellites (no seeking time).
- Press the Shutter-release button halfway down to activate the exposure meter before finishing the exposure. If you push the Shutter-release button down quickly and the GPS is not active and locked, it won't record GPS data to the image. The meter must be on before the GPS will seek satellites.

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Auto Meter-Off

Figure 5.31 shows the screens used to set the meter to stay on the entire time the GPS is connected or to shut down after the Auto meter-off delay expires (Custom setting c2 Auto meter-off delay defaults to six seconds). You can select either Enable or Disable. Here's what each setting does:

- **Enable** (default) – The meter turns off after the Custom setting c2 Auto meter-off delay expires (default six seconds). GPS data will be recorded only when the exposure meter is active, so allow some time for the GPS unit to reacquire a satellite signal before taking a picture. This is hard to do when Auto meter-off is set to Enable. You just about have to stand around with your finger on the Shutter-release button trying to keep the meter active. I suggest using Disable, as described below.
- **Disable** – The exposure meter stays on the entire time a GPS unit is connected. As long as you have a good GPS signal, you will be able to record GPS data at any time. This is the preferred setting for using the GPS for continuous shooting. It does use extra battery life, so you may want to carry more than one battery if you're going to shoot all day. Turn the camera off between locations.

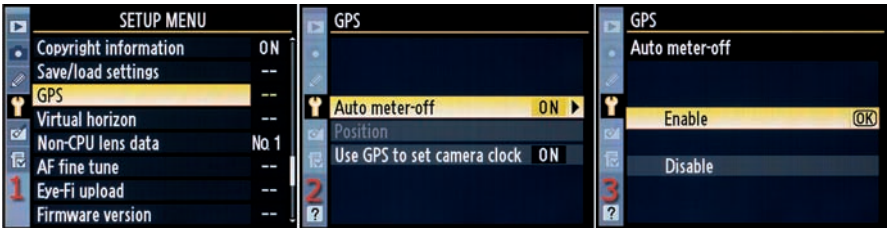


Figure 5.31 – Setting an Auto meter off delay for GPS usage (Disable is best!)

Here are the steps to configure the GPS settings:

1. Choose **GPS** from the **Setup Menu** and scroll to the right (figure 5.31, image 1).
2. Select **Auto meter-off** and scroll to the right (figure 5.31, image 2).
3. Select **Enable** or **Disable** (figure 5.31, image 3). Use **Disable** for more reliable GPS usage, with somewhat greater battery drain. It is a good idea to carry multiple batteries if you are shooting all day with a Nikon GP-1 GPS unit attached.
4. Press the **OK** button to lock in the setting.

Position

There is also a Position setting, as shown in figure 5.32, image 2. If your GPS unit is not attached to the camera, the Position selection is grayed out.

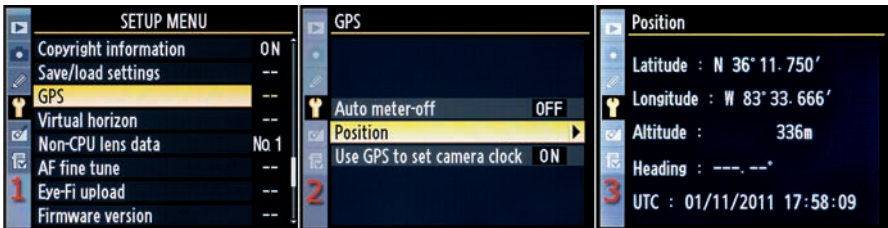


Figure 5.32 – GPS Position setting

When a GPS is attached, the next screen after Position shows the actual GPS location data being detected by the D7000 (figure 5.32, image 3). When the camera establishes communication with your GPS, it does three things:

- Position information appears on the GPS Position screen (figure 5.32, image 3).
- A small GPS symbol will display on the Control panel and Information display (red arrow in figure 5.33A). It will blink when acquiring a GPS signal lock, and stop blinking when at least three global positioning satellites are acquired.



Figure 5.33A – GPS symbol on Control panel

- An additional data information display screen will be displayed when you are using the Playback button to review the captured images (figure 5.33B). You can press up or down with the Multi Selector button to scroll through the image data screens on the Monitor. One of them will be the screen shown in figure 5.33B, which is a picture of the GPS data screen with the lens cap on so you can see the numbers with no distractions. Normally the location numbers are overlaid on top of an actual image.

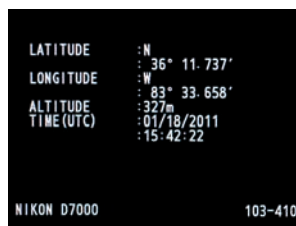


Figure 5.33B – GPS Information display screen (Playback)

Note: The Nikon GP-1 GPS unit will blink its rear LED light in red while acquiring satellites and shine solid green when locked onto satellites. Allow a few seconds for the GPS to acquire satellites when the camera has been turned off. If you are a great distance from where you last used the GP-1 GPS unit, it may require up to a minute or two to acquire a satellite lock. Once the GP-1 has a local satellite lock and you turn the camera off, the GPS unit will reacquire the signal in just a few seconds when the camera is turned back on.

Use GPS to Set Camera Clock

The D7000 has a cool feature designed to let the GPS satellite keep your camera's time accurate. The camera can query the GPS satellite and set the camera's clock. If you use GPS a lot, you might want to leave this on.

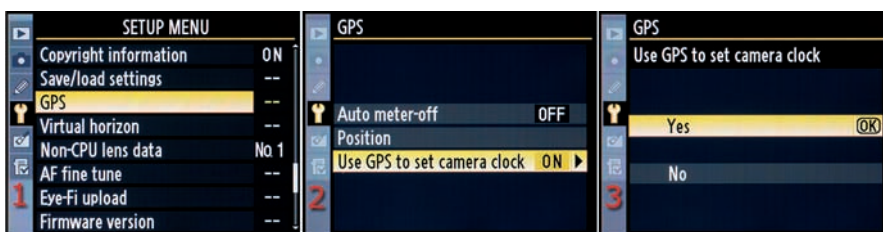


Figure 5.34 – Use GPS to set camera clock

Here are the steps to enable Use GPS to set camera clock:

1. Choose **GPS** from the **Setup Menu** and scroll to the right (figure 5.34, image 1).
2. Select **Use GPS to set camera clock** and scroll to the right (figure 5.34, image 2).
3. Select **Yes** to enable the setting or **No** if you want to check the clock yourself (figure 5.34, image 3).
4. Press the **OK** button to save the setting.

Using the GPS

If the GPS icon is flashing on the Control panel and Information display, it means that the GPS is searching for a signal (figure 5.33A). If you take a picture with the GPS icon flashing, no GPS data will be recorded. If the GPS icon is not flashing, it means that the D7000 is receiving good GPS data and is ready to record data to a picture. If the D7000 loses communication with the GPS unit for more than two seconds, the GPS icon will disappear. Make sure the icon is displayed and isn't flashing before you take pictures!

If you want the GPS Heading information to be accurate, keep your GPS unit pointing in the same direction as the lens. Some aftermarket GPS units also contain a digital compass, unlike the Nikon GP-1. Point the GPS in the direction of your subject and give it enough time to stabilize before you take the picture, or the Heading information will not be accurate. This does not apply to the Nikon GP-1 GPS unit, which has no digital compass. It records only Latitude, Longitude, Altitude, and UTC time, not the Heading.

The Nikon GP-1 GPS unit mounts either onto the camera's Accessory shoe (figure 5.30A) or on the camera's strap, with the included GP1-CL1 strap adapter.

My Recommendation: Get the Nikon GP-1 GPS unit! It's easy to use, foolproof, and has all the cables you need for using it with your camera. The only other cable you'll need to buy is the optional MC-DC2 shutter-release cable (coiled on the left in figure 5.30). I use the tiny Nikon GP-1 GPS unit constantly when I'm shooting nature images so I can remember where to return in the future. After you start using a GPS unit, you'll find it hard to stop.

Virtual Horizon

(User's Manual – Page 245)

The Virtual horizon is a function that allows you to level your camera when it's on a tripod. It's

not for live picture-taking use. All it does is bring up the Virtual horizon indicator on the camera's Monitor. You can use it to help level your camera on a tripod or other stable shooting base.

The Live View and Movie modes have a smaller version of this Virtual horizon that you can see through for live usage. Here are the steps to use the Virtual horizon:

1. Choose **Virtual horizon** from the **Setup Menu** and scroll to the right (figure 5.35, image 1).

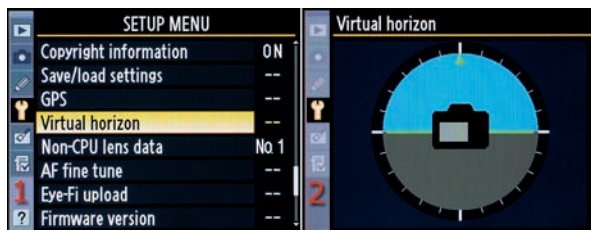


Figure 5.35 – Virtual horizon

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2. The next screen shows the **Virtual horizon** indicator. You can use it to level the camera on your tripod (figure 5.35, image 2). This indicator shows left and right tilts, but not forward or backward tilts.

My Recommendation: I don't use Virtual horizon very often. Instead I have Custom setting d2 Viewfinder grid display turned on. The gridlines allow me to look at my subject while leveling my camera. The stand-alone, non-see-through Virtual horizon screen doesn't offer me much functionality. You may have other uses for it. To me, the smaller see-through version found in Live View and Movie modes are much nicer to use.

Non-CPU Lens Data

(User's Manual – Page 159)

Non-CPU lens data helps you use older non-CPU Nikkor lenses with your camera. Do you still have several older AI or AI-S Nikkor lenses? I do! The image quality from the older lenses is simply outstanding with the D7000, especially since the smaller DX-sized sensor uses only the sweet-spot center of the older lenses.

Since the D7000 is positioned as an advanced camera, it must have the necessary controls to use both Auto focus (AF) and Manual focus (MF) lenses. Many photographers on a budget use the older MF lenses to obtain professional-level image quality without having to break the bank on expensive lens purchases. You can buy excellent AI and AI-S Nikkor lenses on eBay for US\$100–\$300 and have image quality that only the most expensive zoom lenses can produce.

Lens manufacturers like Zeiss and Nikkor are still making MF lenses, and because some of them do not have a CPU (electronic chip) that communicates with the camera, it's important to have a way to let the D7000 know something about the lens in use.

This Non-CPU lens data function allows you to do exactly that. You can store information for up to nine separate non-CPU lenses within this section of the D7000.

Here is a detailed analysis of the Non-CPU lens data screen selections (figure 5.36, image 2):

- **Done** – When you have completed the setup of a particular lens, or several lenses, simply scroll to this selection and press the OK button. Your lens data will be saved within the D7000. Later, you can put a non-CPU lens on your camera and select it from the list of nine lenses. You can use external camera controls or the Non-CPU lens data menu to change to your current lens.
- **Lens number** – Using the Multi Selector, you can scroll left or right to select



one of your lenses. There are nine lens records available. When you select a Lens number here, the focal length and maximum aperture of that lens will show up in the Focal length and Maximum aperture fields. If you haven't stored information for a particular Lens number, you'll see double dashes -- in the Focal length and Maximum aperture fields.

- **Focal length (mm)** – This field contains the actual focal length in millimeters (mm) of the Lens number in use. You can select focal lengths from 6 mm to 4000 mm. Hmm, I didn't know they even made a 4000 mm lens. I want one!
- **Maximum aperture** – This field is for the Maximum aperture of the lens. You can enter an f-stop number from F1.2 to F22. Remember, this is for the maximum aperture only (largest opening or f-stop). When you've entered a maximum aperture, the camera will be able to determine the other apertures by your use of the aperture ring on the lens. (Remember those?)

Use the following steps to configure (save) each of your non-CPU lenses for use with your D7000:

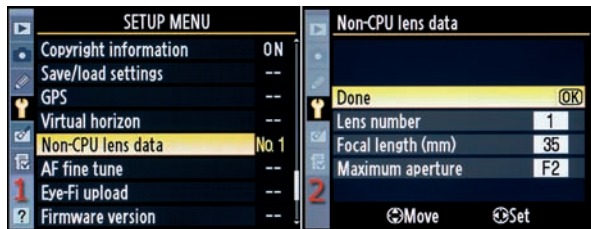


Figure 5.36 – Non-CPU lens data

1. Select **Non-CPU lens data** from the **Setup Menu** and scroll to the right (figure 5.36, image 1).
2. Scroll down to **Lens number** and scroll left or right until you find the number you want to use for this particular lens (figure 5.36, image 2).
3. Scroll down to **Focal length (mm)** and scroll left or right to select the focal length of the lens. If you are configuring a zoom lens, select the widest setting. This works because the meter will adjust for any light falloff that may occur as the lens is zoomed out.
4. Scroll down to **Maximum aperture** and scroll left or right to select the maximum aperture of the lens. If you are configuring a variable-aperture zoom lens, select the largest aperture the lens can use. This works because the meter will adjust for the variation in the aperture.
5. Scroll to **Done** and press the **OK button** to store the setting.

When you're done entering data for your nine lenses, don't forget to use the Done selection to save your work! The Done selection serves double duty by allowing you to either select a lens or save changes to one or all nine of your lenses. In other words, you can use the set of screens in figure 5.36 to both input and select a non-CPU lens.

When you have selected a lens for use, the Setup Menu > Non-CPU lens data



selection will show the number of the lens you've selected. It will be in the format of No. 1 to No. 9. Notice that in [figure 5.36, image 1](#), you can see the lens selection (No. 1) at the end of the Non-CPU lens data line.

Selecting a Lens by Using the Non-CPU Lens Menu

You can select a non-CPU lens when it's time to shoot pictures by following these steps:

1. Open the **Non-CPU lens data** screen ([figure 5.36, image 2](#)).
2. Select a lens by scrolling left or right on the **Lens number** field.
3. Scroll up to the **Done** selection and press the **OK button**.

Selecting a Non-CPU Lens with External Camera Controls

The D7000 allows you to customize its buttons to do things the way you want them to be done. You may have only one or two non-CPU lenses, so it may be sufficient to use the Non-CPU lens data menu to select a lens. However, if you have a large selection of non-CPU lenses, you may wish Nikon had provided more than nine lens selections in the Non-CPU lens data menu.

Since I use several older manual-focus AI Nikkor lenses, I use the Custom Setting Menu's assign button functions to map my Fn button for using Non-CPU lens data on the fly.

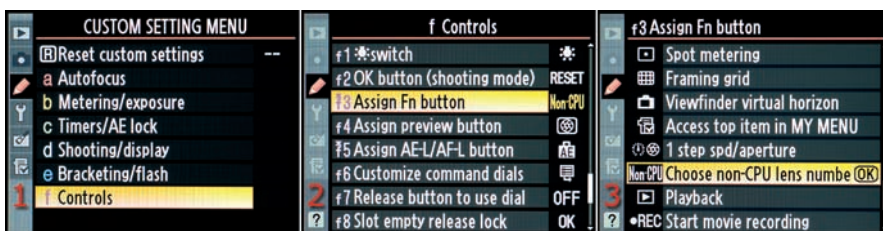


Figure 5.37 – Assign FN button to Non-CPU lens data screens

Here are the steps to assign your camera's Fn button for this purpose (alternatively, you could assign the Preview button instead):

1. Notice that we've left the **Setup Menu** briefly and switched to the **Custom Setting Menu** to make the button assignment.
2. Select **f Controls** from the **Custom Setting Menu** and scroll to the right ([figure 5.37, image 1](#)).

3. Highlight **Assign Fn button** (or **Assign preview button** if you would prefer to use the Preview button) and scroll to the right (figure 5.37, image 2).
4. Select **Choose non-CPU lens number** from the menu (figure 5.37, image 3).
5. Press the **OK button** to lock in the assignment.



Figure 5.38 – Using the Fn button and rear Main command dial to select Non-CPU lenses

You can choose a non-CPU lens by holding down the camera's Fn button (figure 5.38, image 1), while turning the rear Main command dial (figure 5.38, image 2), and choosing one any of my nine lens selections on the Control panel (bottom red arrow, figure 5.38, image 3). You'll see n-1 to n-9 scroll by as you rotate the Main command dial. In figure 5.38, image 3, the top red arrow points to the focal length and maximum aperture of the currently selected non-CPU lens. At the bottom red arrow in figure 5.38, image 3, n-1 is selected, which, as we can see from the top red arrow, is a 35mm f/2 lens.

This is a really quick way to change the camera's Non-CPU lens data settings after you mount a different non-CPU lens.

My Recommendation: I like using the Fn button in combination with the rear Main command dial to select my non-CPU lenses. I leave the Preview button assigned to depth of field preview.

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AF Fine Tune

(User's Manual – Page 246)

One thing that really impresses me about the D7000 is its ability to be fine-tuned in critical areas like metering and autofocus. With many older cameras, if an AF lens had a back focus problem, you just had to tolerate it or send it off to be fixed by Nikon. Now, with AF fine tune controls, you can adjust your camera so that the lens focuses where you want it to focus.

Nikon has made provisions for keeping a table of up to 12 lenses that you've fine-tuned. It recommends that you use the fine-tuning system only if you know what you are doing and only when required. The idea behind fine-tuning is that

you can push the focus forward or backward in small increments, with up to 20 increments in each direction.

When the little round, green AF indicator comes on in your camera's Viewfinder and AF fine tune is enabled for a lens you've already configured, the actual focus is moved from its default position forward or backward by the amount you've specified. If your lens has a back focus problem and you move the focus a little forward, the problem is solved. There are four selections on the AF fine tune menu:

- AF fine tune (On/Off)
- Saved value
- Default
- List saved values

Use the following steps to start the process of fine-tuning a lens:

1. Choose **AF fine tune** from the **Setup Menu** and scroll to the right (figure 5.39, image 1).
2. Select **AF fine tune (On/Off)** from the menu and scroll to the right (figure 5.39, image 2).
3. The next four subsections show the screens to configure **AF fine tune** (figures 5.40 to 5.43).

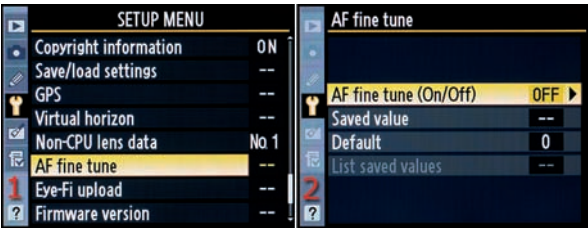


Figure 5.39 – Fine-tuning the focus of a lens

Each of the following figures continues where figure 5.39, image 2, left off.

AF Fine Tune (On/Off)

Figure 5.40 shows the AF fine tune (On/Off) screen and its selections. The two values you can select are as follows:

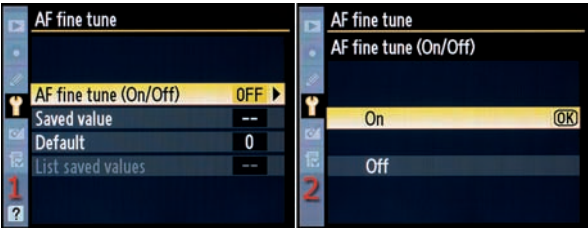


Figure 5.40 – Enabling AF fine tune

- **On** – This setting turns the AF fine tune system on. Without this setting enabled, the D7000 focuses like a factory default D7000. Set AF fine tune (On/Off) to On if you are planning to fine-tune a lens now.
- **Off** – This default setting disables the AF fine tune system.

Saved Value

With an autofocus lens mounted, Saved value allows you to control the amount of front or back focus you'd like to input for the listed lens. At the top left of [figure 5.41, image 2](#), just under

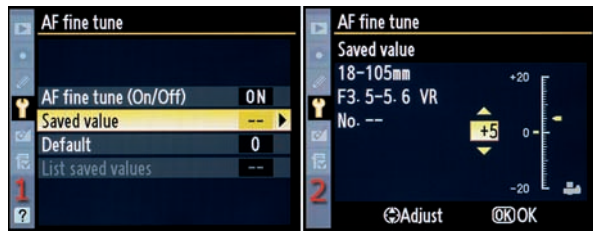


Figure 5.41 – Fine-tuning a lens with a Saved value

the words Saved value, you'll see the focal length of the lens that is mounted on your camera, the maximum aperture, and the number assigned to the lens. If you're configuring a lens for the first time, you'll see No. --. You can fine-tune a maximum of 12 lenses. After you save a lens configuration a number will appear in place of the dashes (No. 1 to No. 12).

To the right of the lens information is a scale that runs from +20 on the top to -20 on the bottom. The yellow pointer starts out at 0. You can move this yellow pointer up or down to change the amount of focus fine-tuning you want for this lens. Moving the pointer up on the scale pushes the focal point away from the camera, and moving it down pulls the focal point toward the camera. In [figure 5.41, image 2](#), I set my 18-105 mm lens to +5 front focus. When you are done, press the OK button.

Default

The Default configuration screen looks a lot like the Saved value screen, except there is no lens information listed. This Default value will be applied to all AF lenses you mount on

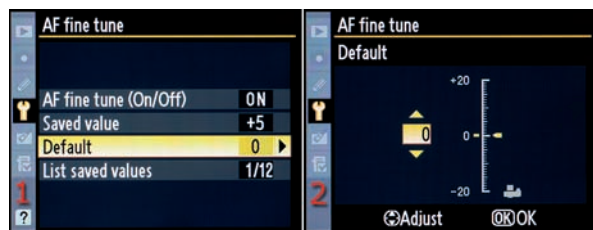


Figure 5.42 – Setting a Default fine-tuning value

your camera. If you are convinced that your particular camera always has a back or front focus problem and you are not able or ready to ship it off to Nikon for repair, you can use the Default value to push the autofocus in one direction or the other until you are satisfied that your camera is focusing the way you'd like. *Again, this will affect all autofocus lenses you mount on your camera.*

As shown in [figure 5.42, image 2](#), to set an AF fine tune > Default value, use the scale that runs from +20 on the top to -20 on the bottom. The yellow pointer starts at 0. You can move this yellow pointer up or down to change the amount of focus

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fine-tuning you want for whatever lens you currently have on the D7000, if no value already exists in the Saved value for the lens. Moving the pointer up on the scale pushes the focal point away from the camera (front focus), and moving it down pulls the focal point toward the camera (back focus). When you are done, press the OK button.

Note: It looks to me like you could use this Default value as a value for any of your AF lenses that do not have a Saved value. I tested this with a different lens (not shown) by setting a Saved value of +1 for my AF-S Nikkor 18-70 mm lens. While the 18-70 mm lens was still mounted, I set a value of -2 for the Default value. When I removed the 18-70 mm lens and mounted an AF Nikkor 60 mm micro lens, the +1 in the Saved value field disappeared, but the -2 in the Default field stayed put. So it looks like you could use the Default field either for all AF lenses that have no Saved value or for a currently mounted AF lens that you want to adjust but not save a value.

List Saved Values

Notice in [figure 5.43](#) that there are several screens used to configure the list of saved values. List saved values helps you remember which lenses you've fine-tuned. It also allows you to set an identification number for a particular lens.

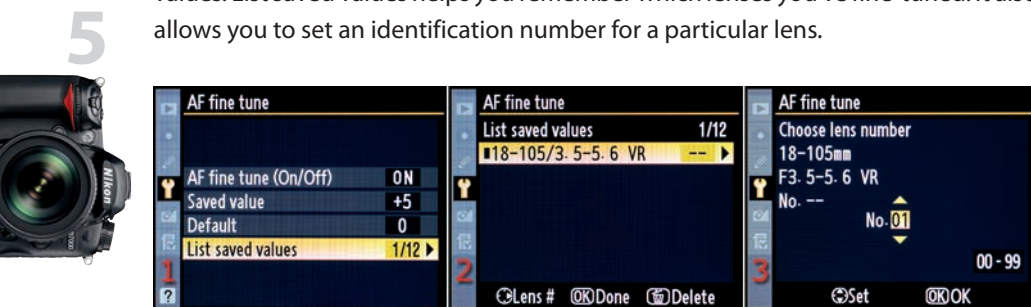


Figure 5.43 – List saved values

Many people use the last two digits of the lens's serial number as the List saved values number for that lens. Alternatively, you can select a sequential number from 1–12. In [figure 5.43, image 2](#), you'll see a list of lenses. Notice in the third screen that there is a little box in the middle after No. This box scrolls, so you can use your Multi Selector to scroll up or down from 00 to 99. That way, you can set whatever number you want to use for each particular lens.

My Recommendation: AF fine tune is good to have! If I buy a new lens and it has focus problems, I don't keep it. Back it goes to the manufacturer for a replacement. However, if I buy a used lens or have had one long enough to go out of warranty and it later develops front or back focus problems, the camera allows me to fine-tune the autofocus for that lens. An advanced camera has these little necessities to keep you out of trouble when shooting commercially.

Eye-Fi Upload

(User's Manual – Page 247)

Eye-Fi upload appears on the Setup Menu of your D7000 only when you have an Eye-Fi card inserted.

The Eye-Fi company makes several of these tiny SD/SDHC cards with built-in Wi-Fi transmitters. Figure 5.44 shows my Eye-Fi Pro X2 8 GB high-speed Class 6 SD card.

With an Eye-Fi card inserted and Eye-Fi software installed on a computer with a wireless network connection, you can take pictures and they are automatically transferred to your computer. You can also simultaneously transfer images to file-sharing websites like Flickr and Facebook (plus 23 more).

Most lower-cost Eye-Fi cards require a wireless network to transfer the images. However, Eye-Fi recently came out with a card that will do Ad Hoc transfers, meaning that they don't need a wireless network connection and will send pictures directly to a computer with wireless capability. In effect, the Eye-Fi card becomes a wireless (Wi-Fi) transmitter that can talk directly to a Wi-Fi-enabled computer—without an intervening network.

At the time of this writing, only one card—the Eye-Fi Pro X2 8 GB—will transfer images directly to a computer without needing a wireless network as an intermediary. The other cards cost less but require a wireless network connection to move images.

Eye-Fi names its cards that are capable of Ad Hoc transfer under the Pro moniker. The other cards have names like Connect X2, Geo X2, and Explore X2. Only the Pro X2 cards can do the no-network-required, direct-to-computer Ad Hoc file transfers. Since memory card prices are extremely volatile, I'm sure that the capacities and card names will change quickly. However, be aware that only the Pro Eye-Fi cards will do Ad Hoc transfers.



Figure 5.44 – Eye-Fi Pro X2 8 GB Wi-Fi card

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Enabling Eye-Fi Uploads on the D7000

An Eye-Fi card does not use any more battery life than a normal SD card until you enable Wi-Fi. Unless you are currently shooting images for transfer, I wouldn't leave the Eye-Fi upload feature (Wi-Fi) enabled. Why waste battery life out in the woods where there are no wireless networks? To make it really convenient to access the Eye-Fi upload function for quick enabling—only when needed—I simply added it to My Menu in the D7000. We'll examine how to do that in an upcoming chapter.

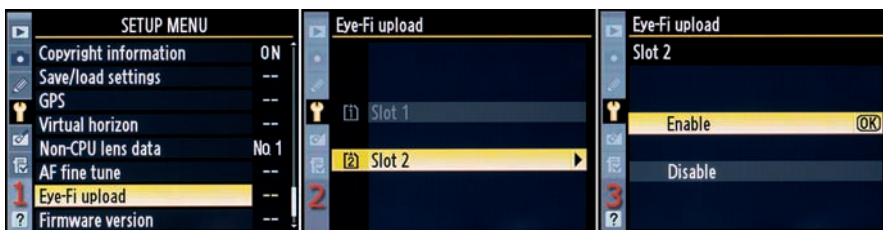


Figure 5.45 – Enabling Eye-Fi (Wi-Fi)

Here are the steps to Enable or Disable Eye-Fi upload:

1. Choose **Eye-Fi upload** from the **Setup Menu** and scroll to the right (figure 5.45, image 1).
2. Select which slot you want to disable (**Slot 1** or **Slot 2**). The camera will detect which slot has an Eye-Fi card in it (figure 5.45, image 2). My D7000 had an Eye-Fi card in **Slot 2**, so **Slot 1** is grayed out. I suppose you could run an Eye-Fi card in both slots, so Nikon gave you the ability to disable the card in either slot.
3. Select **Enable** or **Disable** from the **Eye-Fi upload** screen (figure 5.45, image 3).
4. Press the **OK** button to lock in the setting.

Note: You may download additional information on using an Eye-Fi card from this book's downloadable resources on the web at <http://rockynook.com/NikonD7000>.

My Recommendation: I wanted to buy a nice Nikon WT-4 transmitter until I saw the price. Whew! I think I'd rather buy that AF-S Nikkor 200-400 mm f/2.8 ED VR lens I crave mightily. So, instead, I bought an Eye-Fi card for about one-eighth of the price of the WT-4. It doesn't give me the large wireless range and multiple modes the powerful WT-4 transmitter offers, but I can shoot an event within 50–90 feet of my notebook computer and have immediate wireless Ad Hoc file transfer capability.

Since even the low-priced Eye-Fi cards have the ability to use an existing Wi-Fi connection to transfer images through the internet to a home computer, you could do a photographic walkabout downtown, stop in at a McDonalds for a burger or Starbucks for a coffee, and use their wireless connection to transfer images to your home computer while you eat. I really like this little Eye-Fi card!



Firmware Version

(User's Manual – Page 247)

Firmware version is a simple informational screen, like the Battery info screen. It informs you which version of the camera's operating system (firmware) you



Figure 5.46 – Viewing the camera's Firmware version

are running. My camera is currently running version A1.00, B1.00, and L1.002. Here are the steps to see the Firmware version of your camera:

1. Choose **Firmware version** from the **Setup Menu** and scroll to the right (figure 5.46, image 1).
2. Examine the **Firmware version** (figure 5.46, image 2).
3. Select **Done** and press the **OK** button.

Upgrading Your Camera's Firmware

From time to time, Nikon releases firmware upgrades for their cameras. You may want to install the upgrades for the D7000 because it often fixes bugs, speeds things up, and even adds features to your camera.

When you are ready to upgrade your camera's firmware, you can go to the downloadable resources website for this book (<http://rockynook.com/NikonD7000>) and download a document called **Firmware Upgrade**.

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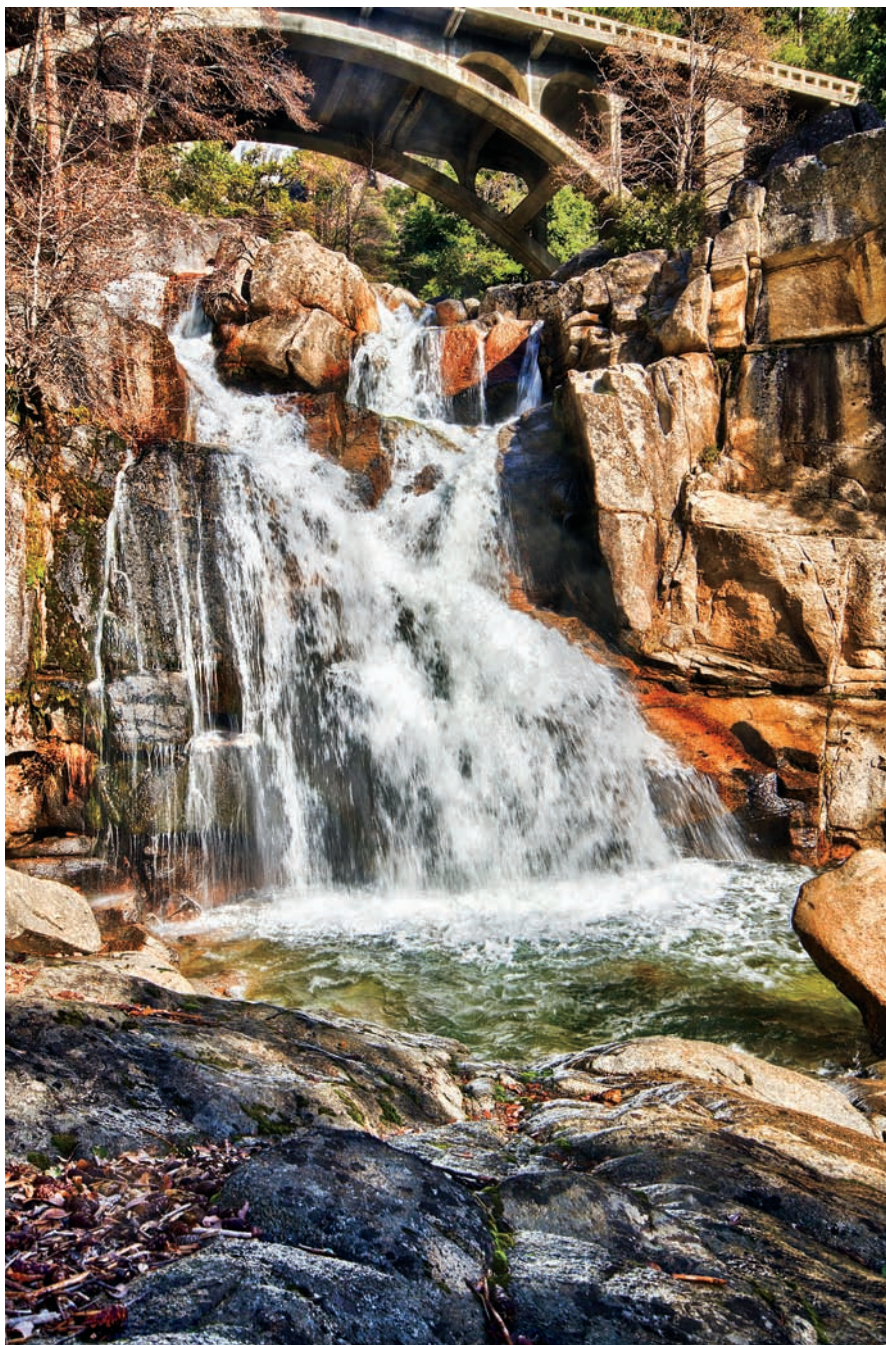
My Conclusions

Whew! The D7000 may seem like a complicated little beast, but that's what you get when you fold advanced-level functionality into a relatively small DSLR body. For as complex as it is, I'm certainly delighted with it.

Next, we'll consider how to use the camera's Retouch Menu to adjust images without using a computer. If you are in the field shooting RAW files and you need a quick JPEG or black-and-white version of a file, the Retouch Menu has you covered.

You can even do things like Red-eye correction, Color balance changes, filtration, cropping, and image resizing—all without touching a computer. Let's see how!

Retouch Menu



Bridge Over Waterfall Yosemite NP – Courtesy of Jim Hammond (*hamjam*)

Retouching allows you to modify your images in-camera. If you like to do digital photography but don't particularly like to adjust images on a computer, these functions are for you. Obviously, the camera's Monitor is not large enough to allow you to make heavily creative changes to an image—as you could do within Nikon Capture NX 2 or Photoshop. However, it is surprising what you can accomplish with the Retouch Menu.

The D7000 has 19 Retouch Menu selections. The following is a list of each function and what it does:

- **D-Lighting** – This feature opens up detail in the shadows and tends to protect highlight details from blowing out. This is similar to the Shooting Menu > Active D-Lighting function, but it's applied after the image is taken.
- **Red-eye correction** – This removes the unwanted red-eye effect caused by light from a flash reflecting back from the eyes of your human subjects.
- **Trim** – This feature creates a trimmed (cropped) copy of a selected photograph. You can crop the image into several aspect ratios, including 1:1, 3:2, 4:3, 5:4, and 16:9.
- **Monochrome** – You can convert your color images into monochrome. There are three tints available, including Black-and-white (grays), Sepia (reddish), and Cyanotype (bluish).
- **Filter effects** – Seven filter effects are available that can be applied to the image to change its appearance. The seven filters are Skylight, Warm filter, Red intensifier, Green intensifier, Blue intensifier, Cross screen, and Soft.
- **Color balance** – To change the color balance of your image, you can increase or decrease the amount of Green, Blue, Amber, and Magenta.
- **Image overlay** – This creates a new image by overlaying two existing NEF (RAW) files. Basically, you can combine two RAW images to create special effects—like adding an image of the Moon into a separate landscape picture.
- **NEF (RAW) processing** – You can create highly specialized JPEG images from your NEF (RAW) files without using your computer.
- **Resize** – You can take a full-size image and convert it into several smaller sizes. This is useful if you would like to send an image via e-mail or if you need a smaller image for other reasons.
- **Quick retouch** – The camera automatically tweaks the image with enhancements to saturation and contrast. In addition, when a subject is dark or is backlit, the camera applies D-Lighting to open up shadow detail.
- **Straighten** – You can straighten an image with crooked horizons by rotating it in-camera until it looks good. The camera will trim (crop) the edges of the image to create a normal image perspective, without the tilt.
- **Distortion control** – You can remove barrel and pincushion distortion that affects the edges of the image. You can cause the camera to make automatic

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adjustments, or you can do it manually. The camera automatically trims (crops) the edges of the image after adjustment.

- **Fisheye** – This feature allows you to incrementally bulge images from their centers in an often hilarious way to get that strange fisheye effect you can often see while looking through a door peephole. It provides a very distorted image that will either make your friends laugh or chase you. Warning: This effect can be dangerous to use on wives, sisters, and girlfriends! (Don't ask me how I know!)
- **Color outline** – This creates an outline effect, as if you had traced an underlying image on paper with a pencil. The effect is in monochrome, contrary to the name of the function. Nikon provides this effect to "Create an outline of a photograph to use as a base for painting." If you are a painter, this may be useful to you.
- **Color sketch** – The effect is very similar to Color outline; the main difference is that it is in pastel color. It sketches the edges of the subjects in your image and colorizes them in a way similar to using colored pencils or crayon. You can control the vividness of the color and the contrast of the line edges.
- **Perspective control** – This is a useful control that helps adjust perspective distortion out of an image. It's useful for pictures of things like buildings, which can have a falling-over-backward effect when shot with a wide-angle lens. You can adjust the building so it looks more natural and not like it's about to fall over backward. The camera automatically crops the edges of the image to allow the distortion to be removed.
- **Miniature effect** – This effect allows you to create a reverse diorama (an image taken from a high vantage point of a real scene with a very limited band of sharpness) to make the image look fake. The image may be of a real subject, like a city shot from the top of a tall building; however, the Miniature effect causes the scene to look artificial, as if small models of reality were being used.
- **Edit movie** – You can shorten a movie by cropping out a smaller section from a large movie file.
- **Side-by-side comparison** – You can compare a retouched image—created via the Retouch Menu—with the original image. The images are presented side by side so you can see before and after effects.

The Retouch Menu of the D7000 is shown in figure 6.1. It is the fifth menu down the menu selection bar, just below the Setup Menu. Its icon resembles a pallet and paintbrush.

Retouched File Numbering

When you use Retouch Menu items, the D7000 does not overwrite your original file. It always creates a JPEG file with the next available image number. The retouched

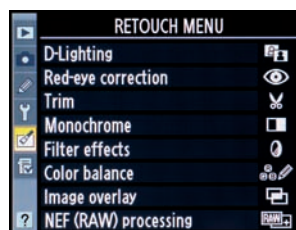


Figure 6.1 – Retouch Menu

image will be numbered as the last image on the memory card. If you have 100 images on your card and you are retouching image number DSC_0047, the new JPEG image will be number DSC_0101 (it will be the 101st image).

Accessing the Retouch Functions – Two Methods

There are two methods for accessing the Retouch Menu. You can use the main Retouch Menu—under the MENU button—to choose an image to work with, or you can display an image in Playback mode and press the OK button to open the Retouch Menu. They work basically the same, except the Playback Retouch Menu leaves out the step of choosing the image (since there is already an image on the screen), and it has fewer retouch selections. The most comprehensive retouch selections are available under the Retouch Menu.

Since both the Playback Retouch Menu and Retouch Menu methods have the same functions, we'll discuss them as if you were using the Retouch Menu. However, in case you decide to use the Playback method, let's discuss it briefly.

Playback Retouching

Use the following steps if you want to work with an image that you are viewing on your camera's Monitor—what I call Playback retouching. To use the Retouch Menu options, follow four basic steps:



Figure 6.2 – Playback Retouch Menu

1. Press the **Playback button** and choose a picture by displaying it on the **Monitor** (figure 6.2, images 1 and 2). You now have a picture ready for retouching.
2. Press the **OK button** to open an abbreviated **Retouch Menu** (figure 6.2, image 3).
3. Select one of the Playback Retouch Menu items (figure 6.2, image 4).

Some of the Retouch Menu options are not available under the Playback Retouch Menu. Remember that Playback retouching is available by simply pressing the OK button when an image is displayed on the Monitor.

The following descriptions require that you select a Retouch Menu function and then select an image to apply the effect. Let's consider each Retouch Menu function.

Limitations on Previously Retouched Images

Sometimes there are limitations imposed when you are working on an image that has already been retouched. You may not be able to retouch a previously retouched image with another retouch function. When using the Playback retouch method, the items will be grayed out on the menu. If you use the Retouch Menu directly, any images that are overlaid with a box containing a yellow X cannot be retouched again with the current retouch function.

Using Retouch Menu Items Directly

D-Lighting

(User's Manual – Page 251)

D-Lighting allows you to reduce the shadows in an image and maybe even reign in the highlights a bit. It lowers the overall image contrast, so it should be used sparingly. The D7000 is not aggressive with its D-Lighting, so you can use it quickly if needed. Also, remember that Retouch Menu effects are applied to a copy of the image, so your original is safe.

Use the following steps for applying D-Lighting to an image:

1. Select **D-Lighting** from the **Retouch Menu** and scroll to the right (figure 6.3, image 1).
2. Select the image you want to modify and press the **OK** button (figure 6.3, image 2).
3. Choose the amount of **D-Lighting** you want for the chosen image, using the **Multi Selector** to scroll up or down. You'll choose from **Low**, **Normal** (or medium), and **High D-Lighting** (figure 6.3, image 3). When the image on the right of the side-by-side comparison images looks the way you want it to, press the **OK** button to save the new file.



Figure 6.3 – D-Lighting

- The D7000 will display a brief *Image saved* notice and then display the new file on the **Monitor**. The retouched image will have a small pallet-and-paintbrush icon to show that it has been retouched (figure 6.3, image 4, red arrow). The original image is still available for future retouching.

My Recommendation: There is no one setting that is correct for all images. I often use Normal (medium) to see if an image needs more or less D-Lighting then change to High or Low if needed. Remember that any amount of D-Lighting has the potential to introduce noise in the darker areas of the image, so the less D-Lighting you use, the better.

Red-Eye Correction

(User's Manual – Page 251)

Red-eye correction attempts to change bright red pupils—caused by flash exposure reflection—back to their normal dark color. Red eye makes a person look like one of those aliens with glowing eyes from a science

fiction show. If you've used flash to create a picture, the Red-eye correction function will work on the image if it can detect any red eye. If it can't detect red eye in the image, it will not open the red-eye system but will briefly display a screen that says *Unable to detect red-eye in selected image*.

If you try to select Red-eye correction for an image in which flash was not used, the camera will display a screen that says *Cannot select this file*. Use the following steps to execute the Red-eye correction function:

- Select **Red-eye correction** from the **Retouch Menu** and scroll to the right (figure 6.4, image 1).
- Select the image you want to modify and press the **OK** button (figure 6.4, image 2).
- You'll see an hourglass on the **Monitor** for several seconds (figure 6.4, image 3).
- Press the **OK** button to save the file with a new file name (figure 6.4, image 4, red arrow) or press the **Playback** button to cancel. After **Red-eye correction** is complete, you can use the **Playback zoom in** button to zoom in on the image

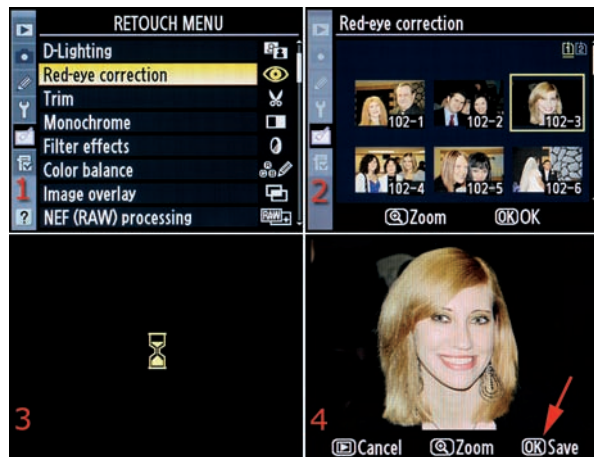


Figure 6.4 – Red-eye correction

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to see how well it worked. Zoom back out with the checkered [Thumbnail/playback zoom out button](#).

My Recommendation: I've found that the Red-eye correction function works pretty well as long as the subject is fairly large in the frame. The lovely young lady in figure 6.4, image 4, had serious red eye in the original image. That gives you an idea of how large in the frame the subject has to be for this function to work well.

I have tried Red-eye correction on smaller subjects where there are larger groups of people. Sometimes it works and other times it doesn't. When the subject is smaller, the eyes are much smaller too. The camera may struggle to find red eye in very tiny pictures. I've had it correct one eye that was closer to the camera (and therefore larger) and not the other. I would rate this function as quite helpful, but not always completely effective. However, it's a good function to have for quick Red-eye correction on critical images you need to use immediately.

Trim

(User's Manual – Page 252)

The Trim function allows you to crop an image in-camera, change its aspect ratio, and save the file as a new image. Your original image is not modified.

This is a useful function if you need to cut out, or trim, the most useful area of an image to remove distracting elements from the background.

Use the following steps to Trim an image in-camera:

1. Select the [Trim](#) function from the [Retouch Menu](#) and scroll to the right ([figure 6.5, image 1](#)).
2. Select the image you want to modify ([figure 6.5, image 2](#)). Press the [OK button](#) when you have selected your target image.
3. You'll see a screen that has a crop outlined in yellow ([figure 6.5, image 3](#)). Use the checkered [Thumbnail/playback zoom out button](#) to enlarge the yellow crop outline or the [Playback zoom in button](#) to reduce the size of the yellow crop outline. Use the [Multi Selector](#) to move the yellow selection rectangle in any



Figure 6.5 – Trim function



direction within the frame until you find your best crop.

4. Select the aspect ratio of the crop by rotating the rear **Main command dial**. Your choices are 3:2, 4:3, 5:4, 1:1 (square), or 16:9. **Figure 6.5, image 3** (red arrow), shows that the 4:3 **Aspect** ratio is selected.
5. When you have the crop correctly sized and the **Aspect** ratio set, press the **OK** button to save the image with a new file name (**figure 6.5, image 4**).

My Recommendation: This is a very useful function for cropping images without a computer. The fact that you have multiple Aspect ratios available is just icing on the cake. The D7000 has some useful Aspect ratios, including a square (1:1) and an HD format (16:9).

Monochrome

(User's Manual – Page 253)

The Monochrome function in the D7000 is fun to play with and can make some nice images. Converting the images to one of the three monochrome tones is a good starting point for creative manipulation. The three different types of Monochrome are as follows: Black-and-white (grays), Sepia (golden tone), and Cyanotype (blue tone).



Figure 6.6 – Monochrome images

Figure 6.6 shows a sample of the three monochrome tones you can use to convert a normal color photo. I chose the Darker setting on the Sepia and Cyanotype versions to show their maximum effects. Notice in image 1 that the Black-and-white version has no darkness or lightness setting because the D7000 provides only one level. However, for Sepia and Cyanotype, you can fine-tune the tint from almost nothing to very saturated in three levels.





Figure 6.7 – Monochrome (Sepia) image creation

Use the following steps to create a Monochrome image from a color image:

1. Select **Monochrome** from the **Retouch Menu** and scroll to the right (figure 6.7, image 1).
2. Select a **Monochrome** tone—**Black-and-white**, **Sepia**, or **Cyanotype** (figure 6.7, image 2). I selected **Sepia**.
3. Select the image you want to modify (figure 6.7, image 3).
4. For a **Black-and-white** image, you cannot adjust the level of lightness or darkness. For **Sepia** and **Cyanotype**, you can use the **Multi Selector** to saturate or desaturate the tone (figure 6.7, image 4). Scroll up or down and watch the screen until the tint is as dark or light as you want it to be. You can cancel the operation by pressing the **Playback** button.
5. Press the **OK** button to save the new image with a new file name (figure 6.7, image 4, red arrow).
6. An screen that says *Image saved* will appear briefly, then the final image will appear with a retouch icon in the top left of the image—it is only on the camera screen, it's not embedded in the image (figure 6.7, images 5 and 6).

My Recommendation: I normally use the **Black-and-white** conversion when I need an immediate **Monochrome** image. However, it's a lot of fun to make a new image look old-fashioned with either **Sepia** or **Cyanotype**. Here's a **Sepia** creation of three lovely ladies (figure 6.8).



Figure 6.8 – Sample Sepia image conversion (border from Photoshop manipulation)

Filter Effects

(User's Manual – Page 254)

The D7000 allows you to add six filter effects to any image. You can intensify the image colors in various ways and add starburst effects to points of light. Here is a list of the effects that are available:

- Skylight
- Warm filter
- Red intensifier
- Green intensifier
- Blue intensifier
- Cross screen (starburst filter)
- Soft

Skylight Filter Effect

This effect is rather mild and removes the blue effect caused by atmospheric diffraction in distant scenes. Basically, by using this effect you will make the image slightly less blue. Use the following steps to choose the Skylight filter effect:



Figure 6.9 – Skylight filter effect

1. Select **Filter effects** from the **Retouch Menu** and scroll to the right (figure 6.9, image 1).
2. Select **Skylight** and scroll to the right (figure 6.9, image 2).
3. Choose an image and press the **OK** button (figure 6.9, image 3).
4. You will see the image with the **Skylight** effect added (figure 6.9, image 4). Press the **OK** button to save the image with a new file name or press the **Playback** button to cancel.

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Warm Filter Effect

The Warm filter effect adds a mild red cast to the image to make it appear a little warmer. Here's how to set the Warm filter effect:

1. Select **Filter effects** from the **Retouch Menu** and scroll to the right (figure 6.10, image 1).
2. Select **Warm filter** and scroll to the right (figure 6.10, image 2).
3. Choose an image and press the **OK** button (figure 6.10, image 3).
4. You will see the image with the **Warm filter** effect added (figure 6.10, image 4). Press the **OK** button to save the image with a new file name or press the **Playback** button to cancel.



Figure 6.10 – Warm filter effect

Red Intensifier Filter Effect

The Red intensifier filter effect intensifies the reds in an image and adds a red cast. This effect can be controlled by making an initial selection then increasing or decreasing the effect by using the Multi Selector to scroll up or down when the image is on-screen. Even

though it doesn't tell you, there are three levels of intensity. The default level is applied first. You can scroll up with the Multi Selector for the maximum effect and down for the minimum effect. Here's how to set the Red intensifier filter effect:

1. Select **Filter effects** from the **Retouch Menu** and scroll to the right (figure 6.11, image 1).
2. Select **Red intensifier** and scroll to the right (figure 6.11, image 2).



Figure 6.11 – Red intensifier filter effect



3. Choose an image and press the **OK button** (figure 6.11, image 3).
4. You will see a new image with the **Red intensifier** effect added (figure 6.11, image 4). Press the **OK button** to save the image with a new file name or press the **Playback button** to cancel.

Green Intensifier Filter Effect

The Green intensifier filter effect intensifies the greens in an image and adds a green cast. This effect can be controlled by making an initial selection, and then increasing or decreasing the effect by using the Multi Selector to scroll up or down when the



Figure 6.12 – Green intensifier filter effect

image is on-screen. Even though it doesn't tell you, there are three levels of intensity. The default level is applied first. You can scroll up with the Multi Selector for the maximum effect and down for the minimum effect. Here's how to set the Green intensifier filter effect:

1. Select **Filter effects** from the **Retouch Menu** and scroll to the right (figure 6.12, image 1).
2. Select **Green intensifier** and scroll to the right (figure 6.12, image 2).
3. Choose an image and press the **OK button** (figure 6.12, image 3).
4. You will see a new image with the **Green intensifier** effect added (figure 6.12, image 4). Press the **OK button** to save the image with a new file name or press the **Playback button** to cancel.

Blue Intensifier Filter Effect

The Blue intensifier filter effect intensifies the blues in an image and adds a blue cast. This effect can be controlled by making an initial selection, and then increasing or decreasing the effect by using the Multi Selector to scroll up or down when the image is on-screen. Even though it doesn't tell you, there are three levels of intensity. The default level is applied first. You can scroll up for the maximum effect and scroll down for the minimum effect.



Here's how to set the Blue intensifier effect:

1. Select **Filter effects** from the **Retouch Menu** and scroll to the right (figure 6.13, image 1).
2. Select **Blue intensifier** and scroll to the right (figure 6.13, image 2).
3. Choose an image and press the **OK** button (figure 6.13, image 3).
4. You will see a new image with the **Blue intensifier** effect added (figure 6.13, image 4). Press the **OK** button to save the image with a new file name or press the **Playback** button to cancel.



Figure 6.13 – Blue intensifier filter effect

Cross Screen Filter Effect

The Cross screen filter effect adds a starburst to any points of light. There are four adjustments for this effect, along with Confirm and Save commands.

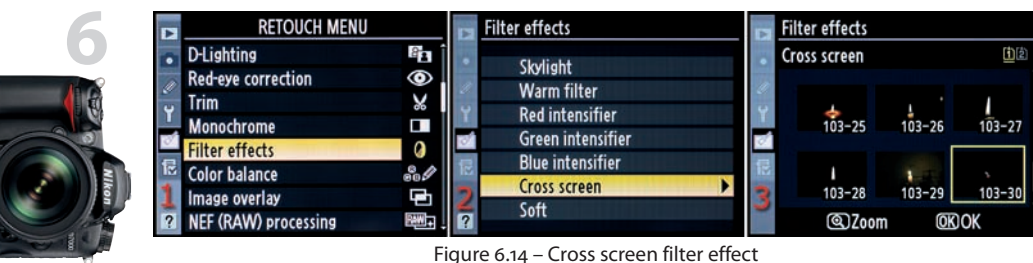


Figure 6.14 – Cross screen filter effect

To create the Cross screen filter effect, use the following steps:

1. Select **Filter effects** from the **Retouch Menu** and scroll to the right (figure 6.14, image 1).
2. Select **Cross screen** and scroll to the right (figure 6.14, image 2).
3. Choose an image with the **Multi Selector** and press the **OK** button (figure 6.14, image 3).
4. Now follow steps 5 through 10. Step 5 and figure 6.15 starts where figure 6.14, image 3, leaves off.

- The first adjustment is the **Number of points** (4, 6, or 8) in the starburst (figure 6.15). Scroll to the right to select the **Number of points**. In the image on the right,

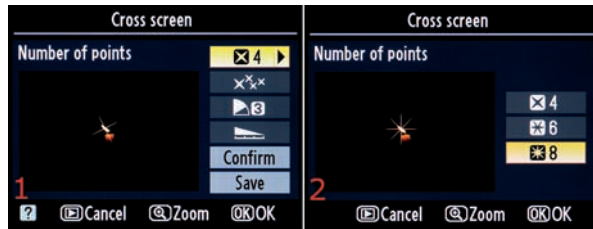


Figure 6.15 – Cross screen filter effect - Number of points

you can see that an icon with the number of rays in the starburst is provided along with a numeral. I selected 4 points. Press the **OK button** to lock in your selection. You will follow the same procedure for the next three adjustments, which are **Filter amount**, **Filter angle**, and **Length of points** on the starburst.

- The second adjustment is the **Filter amount** (figure 6.16). This adjustment affects the brightness of the light source(s). The more Xs, the brighter the light source. I selected the maximum level in the image on the right.

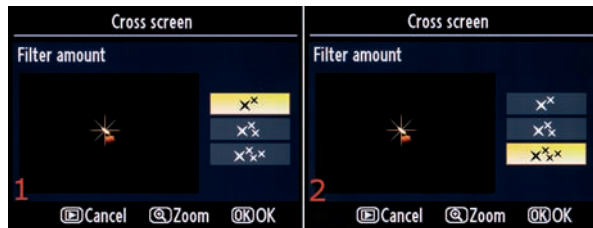


Figure 6.16 – Cross screen filter effect – Filter amount

- Select the angle of the starburst rays with the **Filter angle** adjustment. You can rotate the rays in a clockwise direction until the starburst is at the angle you prefer (figure 6.17).

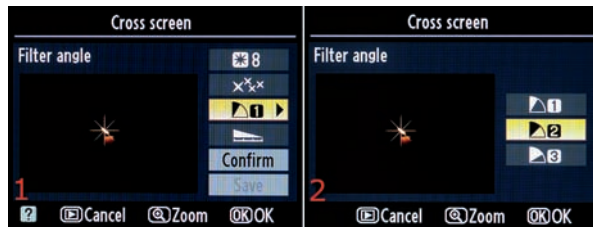


Figure 6.17 – Cross screen filter effect – Filter angle

- Select the length of the starburst rays



Figure 6.18 – Cross screen filter effect – Length of points

with the **Length of points** adjustment (figure 6.18). I wanted the longest rays, so I selected the bottom setting in the image on the right.

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9. Select **Confirm** to see the effect applied to your image (figure 6.19). This is like an update button. You can change the adjustments in steps 5 through 8 multiple times and **Confirm** them each time to see the updated image until the effect is the way you want it. You must do the **Confirm** step after each change or you will not see a difference.

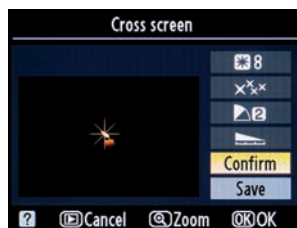


Figure 6.19 – Cross screen filter effect – Confirm

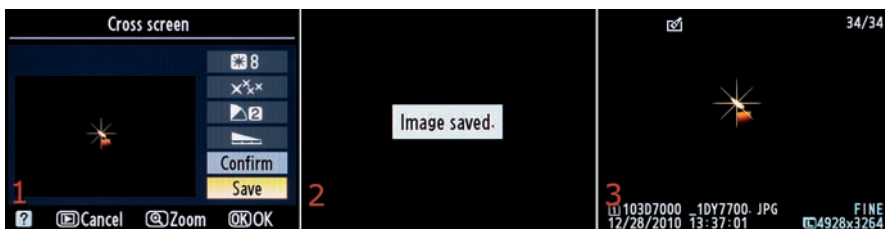


Figure 6.20 – Cross screen filter effect – Save

10. Select the **Save** menu item and press the **OK** button (figure 6.20, image 1). After a moment you'll see a screen that says *Image saved* (figure 6.20, image 2). Then you'll see the full-size image in normal Playback mode (figure 6.20, image 3). Notice the retouch icon at the top left of the image, which tells you that the image has been retouched.

Soft Filter Effect

The Soft filter effect is designed to give your subject that dreamy look popularized by old movies, where the beautiful woman looks soft and sweet. You can select from three levels of softness: Low, Normal, and High.

Figure 6.21 shows small versions of the original image and the three softness settings. The images are in this order: 1 = Original, 2 = Low, 3 = Normal, 4 = High:



Figure 6.21 – Soft filter effect samples

This is an interesting effect. Even though the overall image has a softness to it after the effect has been applied, the subject is still somewhat sharp. It doesn't look like the image is soft because of not being in focus or camera movement. It's like a softness

has been overlaid on the image, and the original image is still sharp. You'll have to see this misty look in a full-size image to see what I mean. Here are the steps to select one of the Soft filter levels:

1. Select **Filter effects** from the **Retouch Menu** and scroll to the right (figure 6.22, image 1).
2. Choose **Soft** from the menu and scroll to the right (figure 6.22, image 2).
3. Select the image to which you want to apply the **Soft** filter effect and press the **OK** button (figure 6.22, image 3).
4. You'll see the word **Normal** surrounded by yellow (figure 6.22, image 4, red arrow). Use the **Multi Selector** to scroll up or down and select one of the softness levels (**Low**, **Normal**, or **High**). The small image on the left is the original image, and the one on the right is the adjusted image. You can easily see the softness vary as you select different levels. Choose the level you want to use.
5. Press the **OK** button to save the new image and display it on the **Monitor**.



Figure 6.22 – Soft filter effect settings

My Recommendation: In comparing the levels of softness, I tend to like the Normal setting best. Low looks like I made a mistake, and High is too soft. Compare the three levels and see which works best for you.

Color Balance

(User's Manual – Page 255)

Color balance lets you deliberately add various tones to your pictures. You can visually add a light or strong color cast.

You might want to warm things up a bit by adding a touch of red or cool things down with a touch of blue. Or you could get creative and add various color casts to the picture for special effects. You'll see what I mean when you try it. You can tone the image with the following color casts:

- Green
- Blue
- Amber
- Magenta

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Figure 6.23 shows four samples of the colors used for tinting. Notice the red arrow in image 1. It points to the color box. You move the little black square around in the color box to add tints to the image. In images 1 through 4 you can see that I moved the tiny black square into a different area of the color box.



Figure 6.23 – Color balance samples

The small image above the color box shows how the final image will look. You can return the square to the center of the color box to neutralize any tints.

On the right side of each screen you can see the RGB histogram for the image. As you make color changes you will see the color shift in the histograms. Be careful not to overdo certain colors (clip them off on the right or left) or you will blow out the color channels. We'll discuss the histogram in the chapter titled **Metering, Exposure Modes, and Histogram**.

Use the following steps to modify the Color balance in your image:

1. Select **Color balance** from the **Retouch Menu** and scroll to the right (figure 6.24, image 1).
2. Select the image you want to modify and press the **OK** button (figure 6.24, image 2).



Figure 6.24 – Color balance settings

3. Use the **Multi Selector** to move the black indicator square in the center of the color box toward whatever color makes you happy (figure 6.24, image 3). Watch the histograms as they display the changing color relationships between the red, green, and blue color channels. You can see the color changes or casts as



they are applied to the small version of your image in the upper-left corner of the final **Color balance** screen.

4. Press the **Playback button** to cancel or the **OK button** to save the image with a new file name.

My Recommendation: This is a cool function for persnickety people, and I'm one of them! If you like to fine-tune the color of your pictures—but hate using the computer—here's your control. You can introduce almost any color tint into the image by moving the black square in any direction within the color box, using combinations of colors to arrive at one that pleases you. This also allows you to overcome current color casts caused by various lighting-source color temperatures. Very flexible camera, eh?

Image Overlay

(User's Manual – Page 256)

The Image overlay function is a nice way to combine two RAW images as if they were taken as a multiple exposure. Basically, you can select a couple of NEF (RAW) shots and combine them into a single new overlaid image.

The results can be a lot like what you get when using Shooting Menu > Multiple exposure, but Image overlay gives you a visual way to overlay two separate images instead of shooting multiple exposures on one picture. The results can be high quality because the overlay is done using RAW image data.

Image Overlay Ideas

You can set up all sorts of special effects with Image overlay, from putting the same person twice in one picture to making another person look transparent. Here's how:

- **Overlay idea # 1:** Try shooting two separate pictures of the same person against a solid colored background. Have the person stand on the right side in one picture and the left side in the other. Have him extend a hand as if about to shake hands with himself in the other picture. Overlay the two images and adjust the density to match. See if you can make people believe the person in the picture just met his long lost twin.
- **Overlay idea # 2:** Using a tripod, take a picture of someone sitting on the left side of a couch. Without moving the camera, shoot another person sitting on the right side of the same couch. Overlay the two images and lower the density of the second image so that it is partially transparent. The second person will appear to be see-through—this is called ghosting. It's also called fun. Try it!

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Figure 6.25 – Image overlay (combining two images into one)

Use the following steps to do an Image overlay:

1. Select **Image overlay** from the **Retouch Menu** and scroll to the right (figure 6.25, image 1).
2. Insert the first RAW image in the **Image 1** box (outlined in yellow) by pressing the **OK** button and selecting an image from the selection screen (figure 6.25, image 3). Press the **OK** button again to return to the combination screen (figure 6.25, image 4). You can vary the gain (density) of the first image by using the **Multi Selector** to scroll up or down in the **X1.0** field (figure 6.25, image 4). The **X1.0** setting is variable from **X0.1** to **X2.0**. It lets you control how bright or dark (dense) an image is so it can more closely match the density of the other image in the overlay. **X1.0** is normal image density.
3. Use the **Multi Selector** to move the yellow box to the **Image 2** position (figure 6.25, image 5). Press the **OK** button, select the second picture from the image selection screen, then press the **OK** button again to insert the image (figure 6.25, image 6). As mentioned in step 2, you can use the **X1.0** field to vary the density of the second image in the overlay (figure 6.25, image 7). Try to match the density as much as possible to provide a realistic overlay, unless you are trying to create a special effect, such as ghosting.

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4. Use the **Multi Selector** to move the yellow box to the **Preview** area. You'll see two selections below it: **Overlay** and **Save**. Choose one of them and press the **OK button** (figure 6.25, image 8).
5. If you select **Overlay**, the D7000 will temporarily combine the images and you'll see another screen that displays a larger view of the new image. You can press the **OK button** to save the image with a new file name, or you can press the checkered **Thumbnail/playback zoom out button** to return to the previous screen.
6. If you choose **Save** instead of **Overlay** and press the **OK button**, the D7000 immediately combines the two images and saves the image with a new file name without letting you review the image first. Basically, the **Save** selection saves now, and **Overlay** gives you a preview of the combination so you can modify or save it.

My Recommendation: This is an easy way to overlay images without a computer. There are some drawbacks, though. One image may have a strong background that is impossible to remove, no matter how much you fiddle with the image density or gain (X0.1 to X2.0). This is a situation in which a computer excels, since you can use software tools like masking in Capture NX2 or Photoshop to remove parts of the background and make a more realistic overlay. However, if you must combine two images in the field, you have a way to do it in-camera.

NEF (RAW) Processing

(User's Manual – Page 258)

NEF (RAW) processing is a function that allows you to convert a RAW image into a JPEG inside the camera. If you normally shoot in RAW but need a JPEG quickly, this is a great function. It works only on images taken with the D7000, so you can't insert a card from a different Nikon and expect to process its images.

There is quite a comprehensive catalog of things you can do to an image during NEF (RAW) processing. A RAW file is not yet an image, so the camera settings you used when you took the picture are not permanently applied. In effect, when you use NEF (RAW) processing you are applying camera settings to the JPEG image after the fact, and you can change the settings you used when you originally took the picture.

You can apply settings when you take a picture through the Shooting Menu or by using external camera controls. However, with NEF (RAW) processing, the settings are applied to the image after the fact, instead of while shooting. See the chapter titled **Shooting Menu** for a thorough explanation of each setting.

Let's see how to convert a RAW image to JPEG—in the camera. If you don't like working with computers, but like to shoot RAW images, this is an important function!

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Here's a list of post-shooting adjustments you can make with in-camera NEF (RAW) processing, with basic explanations of each function:

- **Image quality** – With NEF (RAW) processing, you are converting a RAW file to a JPEG file, so the camera gives you a choice of FINE, NORM, or BASIC. These are equivalent to the Shooting Menu > Image quality settings called JPEG fine, JPEG normal, or JPEG basic.
- **Image size** – This lets you select how large the JPEG file will be. Your choices are L, M, or S, which are equivalent to the Large (16.1 megapixels), Medium (9.0 megapixels), and Small (4.0 megapixels) Shooting Menu > Image size settings.
- **White balance** – This lets you change the White balance of the image after you've already taken the image. You can select from a series of symbols that represent various types of White balance color temperatures. As you scroll up or down in the list of symbols, notice that the name of the corresponding White balance type appears just above the small picture. You can see the effect of each setting as it is applied.
- **Exposure comp.** – This function allows you to brighten or darken the image by applying +/- Exposure compensation to it. You can apply compensation up to 2 EV in either direction (+2.0 to -2.0 EV).
- **Picture control** – With this setting you can apply a different Picture Control than the one with which you took the image. It shows abbreviations, such as SD, NL, VI, MC, PT, or LS for each Nikon Picture Control, plus any Custom Picture Controls you might have created with the designation of C-1, C-2, C-3, etc.
- **High ISO NR** – You can change the amount of High ISO noise reduction applied to the image. The camera offers you H, N, L, or Off settings, which are equivalent to the Shooting Menu > High ISO NR settings called High, Normal, Low, and Off.
- **Color space** – You can change which Color space is applied to the image. You can choose from the camera's two Color space settings, sRGB or Adobe RGB. Adobe RGB is abbreviated as Adobe in this setting. This is equivalent to the Shooting Menu > Color space setting.
- **D-Lighting** – Lets you manage the level of contrast in the image by brightening the shadows and protecting the highlights. You have three choices, Low (L), Normal (N), and High (H).
- **EXE** – This simply means execute. When you select this and press the OK button, all your new settings will be applied to a new JPEG image and it will be saved to the memory card with a separate file name.

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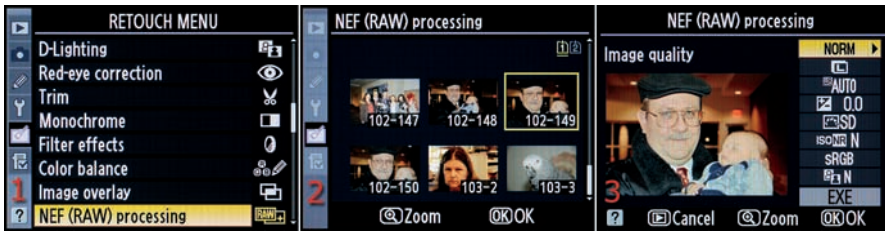


Figure 6.26 – NEF (RAW) processing

Now, let's look at the steps you can use to convert a file from NEF (RAW) to JPEG in-camera:

1. Select **NEF (RAW) processing** from the **Retouch Menu** and scroll to the right (figure 6.26, image 1).
2. Select a RAW image with the **Multi Selector** and then press the **OK** button (figure 6.26, image 2). Now we'll look at each setting found on the screen shown in figure 6.26, image 3. The following steps, and figures 6.27 to 6.38, begin where figure 6.26, image 3 leaves off.

3. Select one of the **Image quality** settings—**FINE**, **NORM**, or **BASIC**—from the **Image quality** menu (figure 6.27). **FINE** gives you the best possible quality in a



Figure 6.27 – NEF (RAW) processing – Image quality

JPEG image. Select the setting you want to use, then press the **OK** button to return to the main **NEF (RAW) processing** configuration screen. You can cancel the operation with the **Playback** button. You can zoom in to check the image quality with the **Playback zoom in** button.

4. Select one of the **Image size** settings from the **Image size** menu (figure 6.28). Your choices are **L** (16.1 MP), **M** (9.0 MP), and **S** (4.0 MP).



Figure 6.28 – NEF (RAW) processing – Image size

5. Select the setting you want to use then press the **OK** button to return to the main **NEF (RAW) processing** configuration screen. You can cancel the operation with the **Playback** button.

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Figure 6.29 – NEF (RAW) processing – White balance

6. Select one of the **White balance** settings for your new JPEG (figures 6.29 to 6.32). You can choose from **AUTO**, **Incandescent**, **Fluorescent**, **Direct sunlight**, **Flash**, **Cloudy**, **Shade**, **K-Choose color temp.**, or **PRE - Preset manual**. Please review the chapter titled **White Balance** for information on each of these items. The **Fluorescent**, **K**, and **PRE** settings have additional screens with choices that you must select.

- a. **Fluorescent** – You must choose a type of fluorescent light. There are seven choices, with names like **Sodium-vapor**, **Warm-white**, **Cool-white**, etc. Each choice has a number assigned to it. Figure 6.30, image 3, shows **Cool-white fluo-**

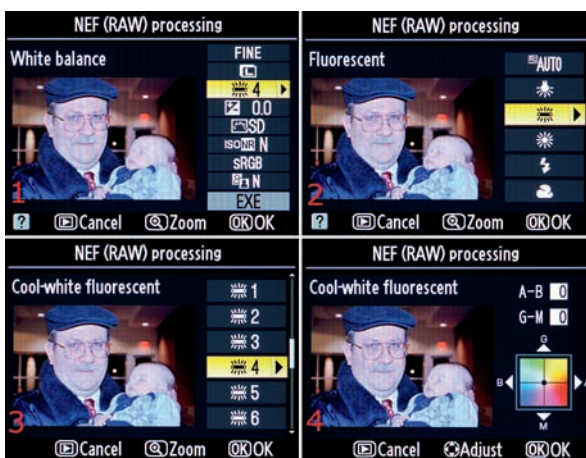


Figure 6.30 – NEF (RAW) processing – White balance – Fluorescent

rescent, which is number 4 on the list. Scroll to the right to move to the fine-tuning screen, where you can adjust the color tint of the image by moving the black dot in the color box (figure 6.30, image 4). Press the **OK** button to save the setting, or press the **Playback** button to cancel.



b. **K-Choose color temp.** – You can choose a color temperature from the list shown in

figure 6.31, image 3. Remember that color temperatures change how the image color looks by warming it (red-

dish) or cooling it (bluish). The list ranges from

2500K (cool) to 10000K (warm). You can also use the fine-tuning screen to modify the color's base, if you'd like (figure 6.31, image 4). Press the **OK** button to save the setting, or press the **Playback** button to cancel.



Figure 6.31 – NEF (RAW) processing – White balance – K-Choose color temp.

c. **PRE-Preset**

manual – With this setting you can choose an already-saved **White balance** that you previously obtained while letting the camera measure the ambient light reflected from a gray or white card (the **PRE** method). See the chap-

ter titled **White Balance** for information on doing ambient light (**PRE**) readings. You can choose from up to five previous **PRE** readings that are stored in memory locations **d-0** to **d-4** (figure 6.32, image 3). As you scroll through the list of settings, you'll be able to see the color temperature of the image change. Clearly, my current **d-0** setting contains a rather cool **White balance**—just look at the the color of the faces. Select the setting

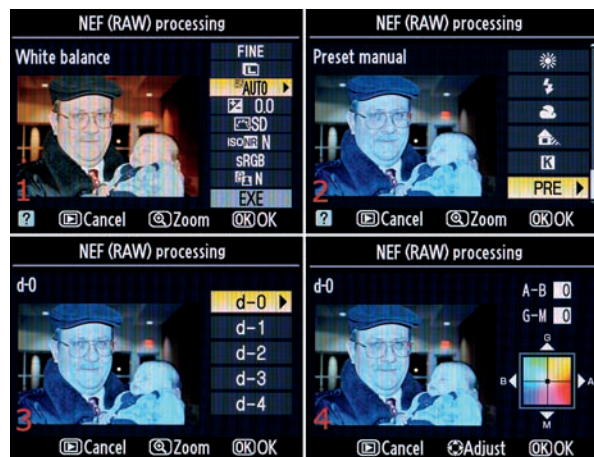


Figure 6.32 – NEF (RAW) processing – White balance – PRE-Preset manual

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you want to use and press the **OK button** to return to the main **NEF (RAW)** processing configuration screen. You can fine-tune the colors of the individual **White balance** by using the screen shown in figure 6.32, image 4. You'll see your fine-tuning adjustment change the color temperature of the image. If you don't want to fine-tune the **White balance**, simply press the **OK button** when you get to the fine-tuning screen. The camera will return to the main **NEF (RAW)** processing configuration screen. You can cancel the operation with the **Playback button**.

7. Now you have an opportunity to lighten or darken the image by selecting an **Exposure comp.** value of ± 2 EV steps in either direction (figure 6.33,

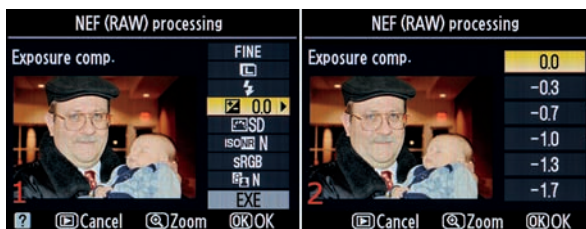


Figure 6.33 – NEF (RAW) processing – Exposure comp.

image 2). When the image looks just right, press the **OK button** to return to the main **NEF (RAW)** processing configuration screen. You can cancel the operation with the **Playback button**.



Figure 6.34 – NEF (RAW) processing – Picture Control

8. Next you can apply a Nikon Picture Control or one of your own Custom Picture Controls, if you've created any (figure 6.34, image 2). These controls make changes to how the image looks. You can make it sharper and give it more contrast, give it more or less color saturation, or even change it to monochrome. In fact, you can even modify the current Picture Control's settings by using the fine-tuning screen (figure 6.34, image 3). Choose from **SD**-Standard, **NL**-Neutral, **VI**-Vivid, **MC**-Monochrome, **PT**-Portrait, **LS**-Landscape, or any of your custom controls (C-1 to C-9) that appear farther down the list than this picture shows (figure 6.34, image 2). You can scroll to the right with the **Multi Selector** if you want to fine-tune the image (figure 6.34, image 3). Scroll up or down to select one of the set-

tings—**Sharpening**, **Contrast**, **Brightness**, etc.—and scroll left or right (-/+) to modify the selected setting. If you make a mistake and want to start over, press the **Delete** button and the camera will display a screen that says *Selected Picture Control will be reset to default settings. OK?* Choose **Yes** or **No** and press the **OK** button. While a Picture Control is adjusted different from the factory default, an asterisk will appear next to its name in all menus. The **Monochrome (MC)** Picture Control lets you adjust not only things like **Sharpening**, **Contrast**, and **Brightness** in the fine-tuning screen, but it also gives you toning (tint) controls like the **Shooting Menu > Set Picture Control** function. When the image looks just right, press the **OK** button to return to the main **NEF (RAW) processing** configuration screen. You can cancel the operation with the **Playback** button.

9. If the image needs high ISO noise reduction, you can apply it now (figure 6.35, image 1). You have a choice of four settings: High (H), Normal (N), Low (L), or Off (figure 6.35, image 2). Choose one and press the **OK** button to return to the main **NEF (RAW) processing** configuration screen. You can cancel the operation with the **Playback** button.



Figure 6.35 – NEF (RAW) processing – High ISO NR

10. **Color space** lets you choose one of the camera's two color space settings, **sRGB** or **Adobe RGB**. The latter is displayed as **Adobe** on the screen (figure 6.36, image 2). Choose one and press the **OK** button to return to the main **NEF (RAW) processing** configuration screen. You can cancel the operation with the **Playback** button.

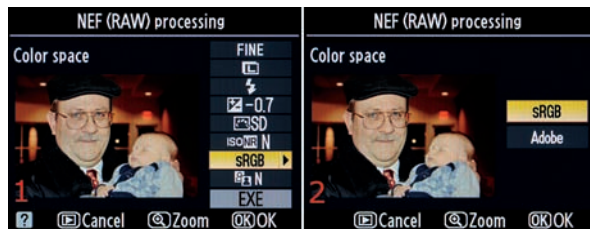


Figure 6.36 – NEF (RAW) processing – Color space

11. **D-lighting** (figure 6.37) is very similar to **Shooting Menu > Active D-Lighting** in that it restores shadow detail and protects highlights



Figure 6.37 – NEF (RAW) processing – D-Lighting



in your images. However **D-Lighting** is applied after the fact. **Active D-Lighting** is applied at the time the image is taken. Otherwise, they are basically the same thing. You can select from high (H), normal (N), low (L), or Off (figure 6.37, image 2). Press the **OK button** to set the **D-Lighting** level, or press the **Playback button** to cancel.



Figure 6.38 – NEF (RAW) processing – EXE (execute)

12. When you are finished with **NEF (RAW) processing**, scroll down to the **EXE** (execute) selection and press the **OK button** (figure 6.38, image 1). An hourglass will display for a few seconds while the new JPEG is being created with your carefully crafted settings. An *Image saved* screen will appear briefly (figure 6.38, image 2), and then the new JPEG will be displayed in a normal **Playback screen** and will be saved on the memory card with a new file name (figure 6.38, image 3). You can cancel the operation with the **Playback button**.

This is a nice way to create specialized JPEG images from NEF (RAW) files without using a computer. How much longer will it be until our cameras come with a keyboard, monitor, and mouse ports? They are computerized after all!

My Recommendation: NEF (RAW) processing is a complex, multistep process because you're doing a major conversion from NEF (RAW) to JPEG in-camera, without using your computer. You're in complete control of each level of the conversion and can even replace the camera settings you originally used when you took the picture. If you want to simply convert the image without going through all these steps, just scroll down to the EXE selection and press the OK button. That will convert the image with the camera settings you used to take the picture.

Resize

(User's Manual – Page 259)

The **Resize** function allows you to convert an image from a full-size 16.1 M (4928 x 3264) picture to a smaller one, with four available megapixel sizes. This function appears to be designed so you can create images that can easily be e-mailed or used on a website or a blog.



There are three selections:

- **Select image** – This selection allows you to choose one or more images for resizing.
- **Choose destination** – This selection allows you to choose a destination for the resized pictures.
- **Choose size** – You can choose from five sizes:
 - a. 920x1280 – 2.5 M
 - b. 1280x856 – 1.1 M
 - c. 960x640 – 0.6 M
 - d. 640x424 – 0.3 M
 - e. 320x216 – 0.1 M

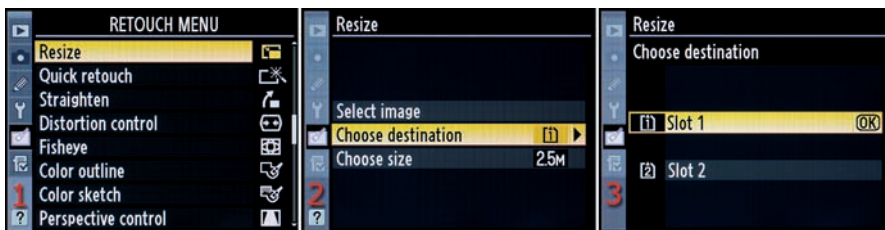


Figure 6.39 – Resize – Choose destination



Figure 6.40 – Resize – Choose size

Let's examine the steps for resizing images, in the best order:

1. Select **Resize** from the **Retouch Menu** and scroll to the right (figure 6.39, image 1). Although it seems out of order, select **Choose destination** and scroll to the right (figure 6.39, image 2). Select one of the card slots to be a destination for the resized images and press the **OK** button (figure 6.39, image 3). This selection will be grayed out if one of the memory card slots is empty. In that case the destination will be the single card slot that contains a card. Skip this step if you are using only one memory card.
2. Next, select **Choose size** and scroll to the right (figure 6.40, image 2). You'll see five sizes, from 2.5 M to 0.1 M (figure 6.40, image 3). These are the actual megapixel sizes available for images after you save them. Select a size and press the **OK** button.





Figure 6.41 – Resize – Select image

3. Next, choose **Select image** and scroll to the right (figure 6.41, image 2). You'll see six image thumbnails. Use the **Multi Selector** to scroll around in this group of thumbnails. When you see an image you want to resize, press the **Thumbnail/playback zoom out button** to set the image as the one to be resized. You can select and set as many images as you'd like, and each of them will be resized. A tiny resize symbol will appear in the top right corner of each thumbnail you set (figure 6.41, image 3, red arrow). When all the images are set, press the **OK button**. A message will ask, *Create resized copy? N images* (figure 6.41, image 4). Select **Yes** and press the **OK button** to create the resized images. An screen that says *Image saved.* will briefly appear (figure 6.41, image 5). The last image in the group of resized images will display (figure 6.41, image 6). The resized images will look just like the originals except for the retouch icon in the top-left corner (figure 6.41, image 6, red arrow).

My Recommendation: I use this function when I'm in the field and want to make a small image to send via e-mail. The full-size JPEG file is often too large to send through some e-mail systems. It's nice to have a way to reduce image size without having to find a computer. Please notice that this function does not reduce the image size by cropping, like the Trim function we studied earlier. Instead, it simply reduces the image size in the same aspect ratio as the original, except it has a smaller megapixel size.

Quick Retouch

(User's Manual – Page 260)

If you want to simply adjust an image so that all parameters are within viewable range, use the Quick retouch function. It creates a new copy of an existing image with “enhanced saturation and contrast,” according to the User's Manual. D-Lighting is automatically applied to your old image, and the new image is supposed to look better. You can scroll up and down in the preview screen to see the range of enhancements that can be applied when the new image is created. Here are the steps to Quick retouch an image:



Figure 6.42 – Quick retouch of a cute baby image

1. Select **Quick retouch** from the **Retouch Menu** and scroll to the right (figure 6.42, image 1).
2. You'll see the images on your SD memory card that are eligible for a quick retouch. Use the **Multi Selector** to scroll to an image you want to retouch, and press the **OK** button to select it (figure 6.42, image 2).
3. Use the **Multi Selector** to scroll up or down, and select **High**, **Normal**, or **Low** (figure 6.42, image 3, red arrow). You can preview the effect of your changes on the image by looking at the before and after images. I chose **Normal**.
4. Press the **OK** button when you're satisfied with the look. The new image will be created and displayed on the **Monitor** (figure 6.42, image 4).

My Recommendation: This function can help some images have a little more snap. I use Quick retouch only if I am going to give someone an image directly out of the camera and want to enhance it a little first.

Straighten

(User's Manual – Page 261)

Straighten is another really cool function. Often, I'll be shooting a landscape or ocean view handheld, and in my excitement I'll forget to level the horizon. With Straighten I can adjust the image to level before anyone else sees it.

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You can rotate an image up to 5 degrees clockwise or counterclockwise. You use the Multi Selector to scroll right or left through a graduated scale line. Each increment is equal to about 0.25 degree. As you rotate the image, the camera will automatically trim the edges so that the picture looks normal. Of course, this means you are throwing away some of the image and making it smaller. However, it's better for the image to be a little smaller and have a nice level horizon, don't you think?

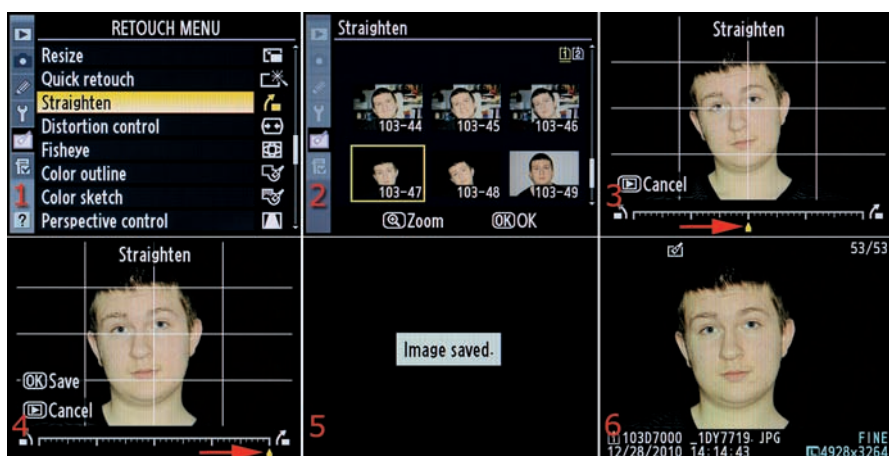


Figure 6.43 – Straighten an image

Here are the steps to Straighten or level an image:

1. Select **Straighten** from the **Retouch Menu** and scroll to the right (figure 6.43, image 1).
2. You'll see the images on your memory card. Scroll to the one you want to **Straighten** with the **Multi Selector** and press the **OK** button to select it (figure 6.43, image 2).
3. Now, rotate the image to the right (clockwise) or the left (counterclockwise) in 0.25 degree increments with the **Multi Selector** (figure 6.43, image 3, red arrow). The little yellow pointer is in the middle of the tilted image in figure 6.43, image 3. This image needs to be rotated to the right, so I pushed the yellow pointer all the way to the right in image 4 (red arrow).
4. When you are happy with the new image, press the **OK** button to save it, or press the **Playback** button to cancel (figure 6.43, image 4).
5. A screen that says *Image saved.* will briefly appear (figure 6.43, image 5).
6. You'll see the newly saved image on the **Monitor** (figure 6.43, image 6).

My Recommendation: This is a handy function to level an image—as long as it is not tilted more than 5 degrees—without using a computer.

Distortion Control

(User's Manual – Page 261)

The Distortion control function is a companion to the Straighten function. Where the Straighten function is concerned with leveling the image left to right, the Distortion control function is concerned with barrel and pincushion distortion. Barrel distortion causes the edges of a subject to bow outward, like a barrel. Pincushion distortion is the opposite; the edges bow inward, like an hourglass. Using this control will remove some of the edge of the image as distortion compensation takes place. There are two settings in the Distortion control function: Auto and Manual.

Auto Distortion Control

You can use this setting only if you have a D or G lens on your D7000. Select Auto when you want the camera to automatically make rough distortion adjustments, and then you can fine-tune the adjustments yourself if you think the new image needs it.

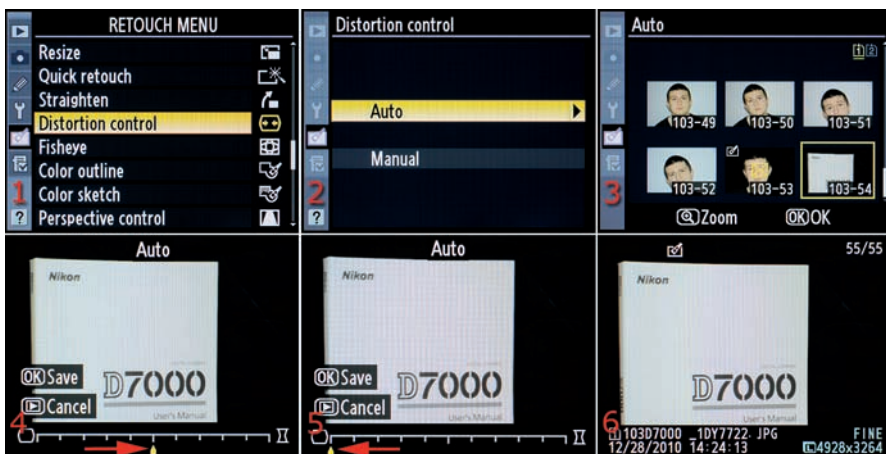


Figure 6.44 – Auto Distortion control

Here are the steps to let the camera make an Auto distortion adjustment:

1. Select **Distortion control** from the **Retouch Menu** and scroll to the right (figure 6.44, image 1).
2. Choose **Auto** from the menu to let the camera make automatic distortion adjustments (figure 6.44, image 2).
3. Next you'll see the images on your memory card. Select the one you want to fix with the **Multi Selector**, and press the **OK button** to select it (figure 6.44, image 3). Now, on to step 4.

4. The camera will automatically make its best adjustment and then display the adjusted image (figure 6.44, image 4). The red arrow in image 4 points to the yellow adjustment pointer, which will be centered. You can move the pointer between barrel and pincushion distortion adjustments, as represented by the small icons on either end of the slider scale (the barrel is on the left, and the pincushion is on the right).
5. If you are not satisfied with the camera's **Auto** adjustment, use the **Multi Selector** to move the yellow pointer along the scale to the left to remove pincushion distortion (add barrel) or to the right to remove barrel distortion (add pincushion). I chose full barrel distortion correction (figure 6.44, image 5).
6. When you are happy with the appearance of the image, press the **OK** button to save it or the **Playback** button to cancel.
7. You'll see the new adjusted image on the **Monitor** (figure 6.44, image 6).

The effect is not easy to see in these small images or on the monitor of the camera. However, if you look closely at figure 6.44, image 4 and compare it to image 5, you can see a slight difference. Images that need greater adjustments should be corrected on a computer with full-sized images.

Manual distortion adjustments work the same way, except the camera does not make an **Auto** adjustment before displaying an image that you can manually adjust.

Manual Distortion Control

You are in control of this operation. You can adjust the image until you think it looks good, without interference from the camera.

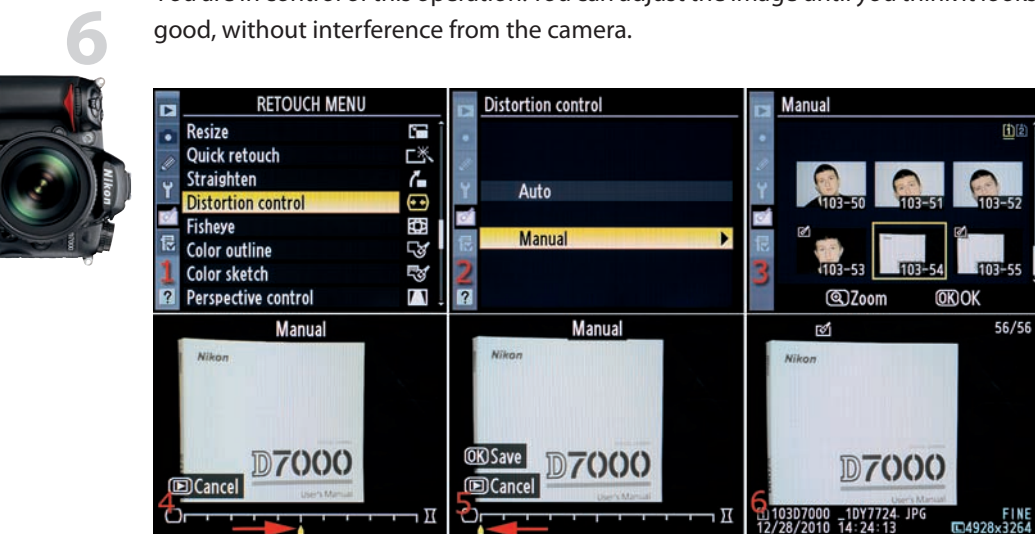


Figure 6.45 – Manual Distortion control

Here are the steps to manually correct distortion:

1. Select **Distortion control** from the **Retouch Menu** and scroll to the right (figure 6.45, image 1).
2. Choose **Manual** from the menu and scroll to the right (figure 6.45, image 2).
3. You'll see the images on your memory card. Use the **Multi Selector** to scroll to the one you want to fix, and press the **OK button** to select it (figure 6.45, image 3). You can zoom in to check the image with the **Playback zoom in button**.
4. The image will be displayed with the yellow pointer centered under the scale (figure 6.45, image 4, red arrow). No adjustment has been made yet.
5. Move the yellow pointer along the scale to the left to remove pincushion distortion (add barrel) or to the right to remove barrel distortion (add pincushion). I chose full barrel distortion correction (figure 6.45, image 5, red arrow).
6. When you are happy with the appearance of the image, press the **OK button** to save it, or press the **Playback button** to cancel.
7. You'll see the new adjusted image on the **Monitor**.

As with the Auto distortion adjustment, the Manual distortion adjustment is rather minor. If you look closely at figure 6.45, image 4 and compare it to image 5, you'll see that the User's Manual appears less distorted.

My Recommendation: These functions are not overly useful because they do not allow for larger corrections. However, they do allow minor distortion correction for images with just a little distortion.

Fisheye

(User's Manual – Page 261)

The Fisheye function is quite fun! You can distort your friends and make hilarious pictures that will make everyone laugh (well, maybe not everyone). Although the results are not true circular fisheye images, they do have a similar distorted appearance.

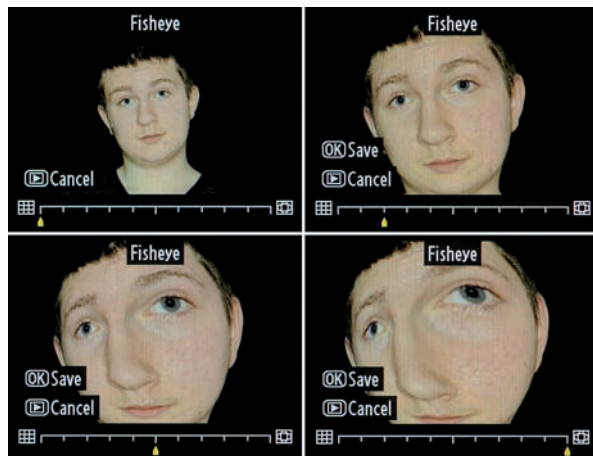


Figure 6.46 – Fisheye distortion samples

Figure 6.46 shows four samples of the Fisheye setting. Notice the small yellow pointer at the bottom under the scale. The farther right you move it, the more

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distorted the image. The first image is normal, the second and third are more distorted, and the fourth fully fisheyed! (Can you detect trouble brewing with wives and girlfriends? I carefully used a picture of my son to stay out of trouble!) Here are the steps to use Fisheye to distort one of your images:

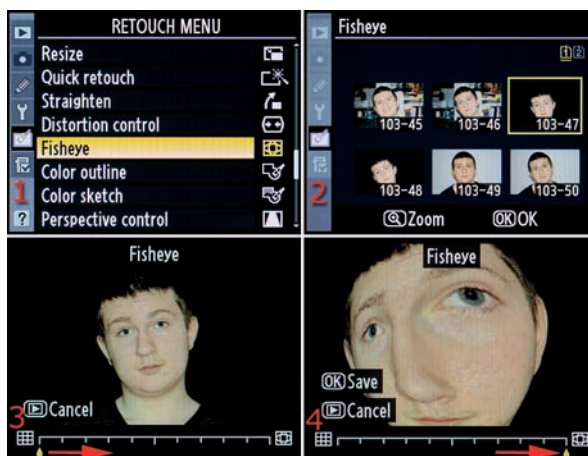


Figure 6.47 – Fisheye settings

1. Select **Fisheye** from the **Retouch Menu** and scroll to the right (figure 6.47, image 1).
2. You'll see the images on your camera's memory card. Scroll to the one you want to distort and press the **OK** button to select it (figure 6.47, image 2).
3. Now press the **Multi Selector** to the right and watch the yellow pointer move and the distortion grow (figure 6.47, images 3 and 4).
4. When you've found the perfect distortion amount (to the max, right?), simply press the **OK** button to save the image, or press the **Playback** button to cancel.

My Recommendation: Be careful with this one! If you publish many pictures of your friends with this effect, I'm afraid they'll start running when they see you with your camera.

Color Outline

(User's Manual – Page 262)

Have you ever wanted to convert one of your images to a cartoon or

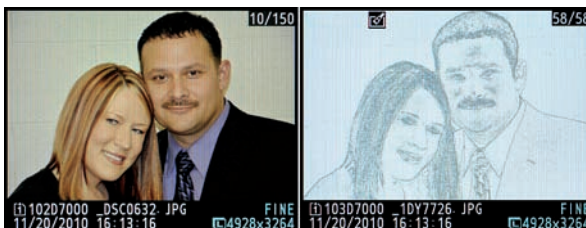


Figure 6.48 – Color outline sample

a line drawing? This retouch setting creates an interesting outline effect on the distinct lines or color changes in your image. Figure 6.48 shows an original image and the image after Color outline was applied. The final image is not actually in color.

You can convert an image to a color outline, open it in Photoshop, and use the fill functions to add cartoon colors between the lines (like the Color sketch function, coming up next). Or you can post-process the image into a fine-art line tracing. This is an unusual functionality and shows the direction that our highly computerized

cameras are going. They have computer power built in, so why not make use of it in new and fun ways? Here are the steps to create a Color outline:

1. Choose **Color outline** from the **Retouch Menu** (figure 6.49, image 1).
2. Select an image from the list of thumbnails. You can either press the **OK button** to start the conversion to outline form, or press the **Playback zoom in button** to check the image (figure 6.49, image 2).
3. After conversion, press the **OK Button** to save the new image, or press the **Playback button** to cancel (figure 6.49, image 3).
4. The new image will display on the **Monitor** (figure 6.49, image 4).

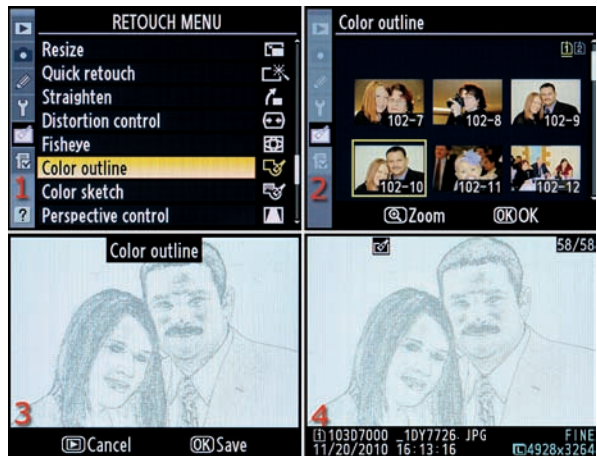


Figure 6.49 – Color outline settings

My Recommendation: The Color outline setting gives you the opportunity to be creative and have some fun with your images. It makes a very sparse image that resembles a line drawing. You could use this as a basis for a painting, hand coloring, or just to have a cool-looking image that most cameras won't make.

Color Sketch

(User's Manual – Page 262)

With the Color sketch setting you can create a copy of your image that looks like a sketch

made with colored pencils or crayons. This function is similar to Color outline, except it uses pastel colors instead of a gray scale. Figure 6.50 shows an image before and after Color sketch was applied.

You can convert an image to a Color sketch and change the Vividness (pastel color saturation) and Outlines (line and color contrast) until it meets your needs.



Figure 6.50 – Color sketch sample





Figure 6.51 – Color sketch settings

Use the following steps to create a Color sketch:

1. Choose **Color sketch** from the **Retouch Menu** (figure 6.51, image 1).
2. Select an image and press the **OK** button (figure 6.51, image 2).
3. You can now set the **Vividness**, or color saturation, of the pastel colors. Change the **Vividness** until you like the look (figure 6.51, image 3).
4. Next, you'll choose an **Outlines** setting, which will change the contrast of the lines and colors (figure 6.51, image 4).
5. I set both **Vividness** and **Outlines** to the plus side, or maximum (figure 6.51, image 5, red arrow). Press the **OK** Button to make the new image, or press the **Playback** button to cancel.
6. The new image will display on the **Monitor** (figure 6.51, image 6).

My Recommendation: Like Color outline, the Color sketch function lets you play around with the post-processing computer in your camera. Occasionally, I like to play with these functions. Are they really useful? Well, I guess it depends on how often you need a Color outline or Color sketch. Maybe you have a great use for them in mind.

Perspective Control

(User's Manual – Page 263)

When you take a picture from the base of a tall object, like a building, with a wide-angle lens, the building looks like it's falling over backwards. You can correct the problem with large-format view cameras and their rise, fall, shift, tilt, and swing controls. Nikon makes perspective-control lenses that perform some of the func-

tions of a view camera, namely tilt and shift. However, good view cameras and perspective-controls lenses cost significantly more than the D7000 camera.

Nikon has given D7000 users some image correction capability with the Straighten, Distortion control, and Perspective control functions. We discussed the first two earlier in this chapter. Now let's see how to use Perspective control.

Perspective control allows you to stretch the left, right, top, or bottom of an image in a way that tends to twist objects that are leaning so they appear straighter in the corrected image. [Figure 6.52, image 3](#), shows yellow pointers and their indicators (identified by the red arrows). You can move these pointers to change the perspective of the image by tilting the top toward or away from you or rotating the image to the left or right. This is a powerful control because it can help give certain images a much better perspective.

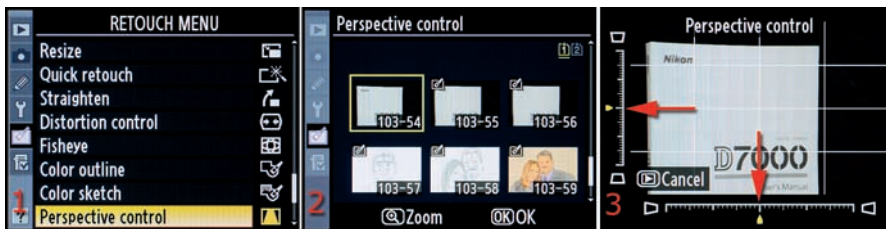


Figure 6.52 – Adjusting an image with Perspective control

Use the following steps to configure Perspective control:

1. Select **Perspective control** from the **Retouch Menu** and scroll to the right ([figure 6.52, image 1](#)).
2. Choose an image from the list of thumbnails and press the **OK button** ([figure 6.52, image 2](#)).
3. You'll see gridlines for edge comparison and two slider controls that are operated by the **Multi Selector** ([figure 6.52, image 3](#)). Move the yellow pointer on the vertical scale up or down to tilt the top of the image toward you or away from you. Slide the yellow pointer on the horizontal scale to the left or right to turn the left or right edge toward you or away from you.
4. When the image looks the way you want it, press the **OK button** to save the image, or press the **Playback button** to cancel.

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The images in [figure 6.53](#) show what happens to the subject when you use the vertical slider (red arrows). Notice how the top of the subject leans either toward you or away from you (forward-to-backward tilt) according to how the slider is positioned.



Figure 6.53 – Tilting the top of the image

[Figure 6.54](#) shows how the image swings to the left or right as you move the yellow sliders (red arrows). Can you see how powerful this functionality is to control perspective? The camera automatically crops off the top and bottom of the stretched ends to keep the image looking like a normal rectangle, so the final image will be smaller.



Figure 6.54 – Rotating the sides of the image

My Recommendation: Learn to use this rather powerful function! You now have excellent Perspective control, with no additional lens purchases! Add Straighten for leveling horizons (rotating the image), then Distortion control for removing barrel and pincushion distortion, and you have the basics of a graphics software program built right into the camera.

Miniature Effect

(User's Manual – Page 263)

Miniature effect is unusual because it allows you to create a reverse diorama. A diorama is a small 3-D model that looks like the real thing. You may have seen a city diorama, where there are tiny detailed houses and cars and even figures of people. A diorama is often used to make a movie when the cost would be too high to use real scenes.

The reason I call the Miniature effect a reverse diorama is that the camera takes an image that you have shot and uses a very narrow band of sharpness with a very shallow depth of field to make it appear to be a diorama when it is actually real.

[Figure 6.55](#) is a sample Miniature effect image I took while overlooking a train depot from a bridge over the tracks. It's best to shoot this type of image from a high vantage point so it looks like a real miniature.





Figure 6.55 – Miniature effect reverse diorama

The camera added lots of extra saturation to the image to make the train cars look unreal. Notice how there is a band of sharpness running horizontally across the middle of the image. That very shallow depth of field in a full-sized image makes it look fake. The depth of field is usually that narrow only in closeup and macro shots. Here are steps to create your own Miniature effect reverse diorama:

1. Select **Miniature effect** from the **Retouch menu** and scroll to the right (figure 6.56, image 1).
2. Choose an image shot from a high vantage point that would make a good reverse diorama and press the **OK** button (figure 6.56, image 2).
3. Notice the narrow yellow rectangle in figure 6.56, image 3. This band represents a horizontal, movable band of sharpness. You can move it up or down on the screen until you find the optimum place to put the sharpness. Everything in



Figure 6.56 – Miniature effect settings

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front of and behind the band is blurry. If you are working with a vertical image, the band will be vertical instead of horizontal. In other words, it is across the image, left to right, no matter what direction you hold the camera. After you position the band where you want it, press the **OK button** (Save).

4. You will now see the new **Miniature effect** image on the **Monitor** (figure 6.56, image 4). It is saved with a new file name on your memory card.

My Recommendation: In order to get good use out of this function you'll need to be looking down on your subject, such as from a bridge, on top of a building, or in an airplane. It's a lot of fun to make these images, although it's difficult to make one look realistic. Next time you are high above a real scene with lots of detail, try shooting a Miniature effect image for fun.

Edit Movie

(User's Manual – Page 63)

Edit movie gives you a two-step process to cut a section out of the middle of a movie created with your D7000, or you can remove a beginning or ending segment. In addition, you can save an individual frame as a still image from anywhere in the movie.

There are two individual parts to the process of editing a movie—Choose start point and Choose end point—and you use them one at a time. When you complete one of the start point or end point choices, the camera saves the file as a new movie with a new file name. This tends to create a bunch of smaller movies on your memory card that you'll need to delete, taking care that you don't delete the wrong one. There are three parts to Edit movie:

- **Choose start point** – This allows you to delete frames from the beginning of your movie and choose a new starting point.
- **Choose end point** – This allows you to delete frames from the end of your movie and choose a new ending point.
- **Save selected frame** – You can take a low-resolution snapshot of any frame in the movie.

Since Choose start point and Choose end point use exactly the same screens and steps, the two functions are combined in the next section. Do one, and if needed, do the other by repeating the steps (figure 6.57).

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Choose Start Point and Choose End Point



Figure 6.57 – Edit movie

Let's examine the steps to remove a movie segment:

1. Choose **Edit movie** from the **Retouch Menu** and scroll to the right (figure 6.57, image 1).
2. Select **Choose start point** or **Choose end point** and scroll to the right (figure 6.57, image 2).
3. Choose one of the available movies and then press the **OK button** (figure 6.57, image 3).
4. The selected movie will show up on the **Monitor** and await your input (figure 6.57, image 4). Press the **OK button** to start playing the movie. When you've reached the point at which you want to start or end the new movie (that is, remove the frames before or after this point), press up on the **Multi Selector**, which will pause the movie.
5. A new screen will appear after you pause the movie to allow you to proceed with cutting the starting or ending frames (figure 6.57, image 5). It says *Proceed? Yes/No*.
6. Select **Yes** to remove all frames up to this new start point. The new, shorter movie will now be saved (figure 6.57, image 6). You'll briefly see a screen that says *Done*, and then the new movie will appear on the **Monitor**.
7. Repeat these steps for the other end of the movie. All steps are the same for **Choose start point** and **Choose end point**.

Note: Your movie must be at least two seconds long when you're done or the camera will refuse to cut any more frames; it will give you the terse message *Cannot edit movie*.

6



Save Selected Frame

You can save an individual low-resolution frame from anywhere in the movie. The frame size is based on the Shooting Menu > Movie settings > Movie quality setting:

- A 1920x1080 movie creates an image a little larger than 2 megapixels.
- A 1280x720 movie creates an image about 921 KB, or less than a 1 megapixel image.
- A 640x424 movie creates an image about 271 KB, or a little more than one-fourth of a megapixel (about Facebook size!).



Figure 6.58 – Save individual frame from movie

6

Let's examine how it's done using the Retouch Menu.

1. Choose **Edit movie** from the **Retouch Menu** and scroll to the right (figure 6.58, image 1).
2. Select **Save selected frame** and scroll to the right (figure 6.58, image 2).
3. Choose one of the available movies and then press the **OK** button (figure 6.58, image 3).
4. Press the **OK** button to start playing the movie, and when it gets to the point where you want to cut out a frame, press up on the **Multi Selector** (figure 6.58, image 4). Notice that the icon above the movie in image 4 looks like a frame being removed from a piece of film (red arrow).
5. Press up on the **Multi Selector**, and a small box will appear that says *Proceed?* Yes/No. Choose **Yes** from the menu and the camera will make a copy of the frame as a separate image (figure 6.58, image 5). While the selected frame is being saved you will see an hourglass, then a screen that says *Done*.
6. The new image will be displayed on the **Monitor** (figure 6.58, image 6). It is in the format of the movie—mine has a 16:9 ratio—even though it is now a still

image. The icon at the top of the screen, which looks like a pair of scissors over a film frame, indicates that the image has been cut out of a movie (figure 6.58, image 6, red arrow).

Alternate Method for Editing Movies

There is an alternate method for editing a movie or saving an individual frame. You can use the camera controls while viewing a movie to access the Retouch Menu.

You can Choose start point, Choose end point, and Save selected frame by pressing the Playback button and selecting a movie. Then you start the movie and access the Retouch Menu by pressing down on the Multi Selector while the movie is playing. This works basically the same way as using the Retouch Menu to directly select a movie.

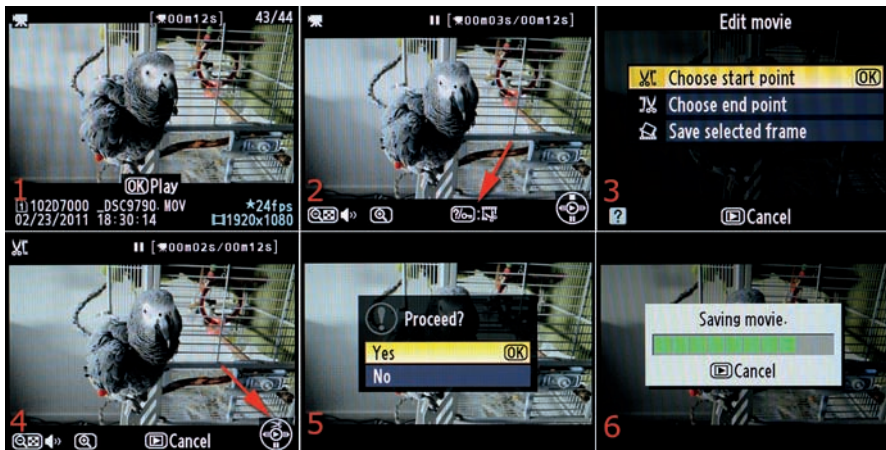


Figure 6.59 – Editing a movie from Playback

Here are the alternate steps to cut the beginning or ending of a movie:

1. Press the [Playback button](#) and scroll to the movie you want to edit. Press the [OK button](#) to play the movie (figure 6.59, image 1).
2. Let the movie play until you reach the point where you want to delete the beginning or ending of the movie. Quickly press down on the [Multi Selector](#), which will pause the movie. The screen shown in figure 6.59, image 2, will appear. The red arrow points to an icon that displays to let you know you can access the [Retouch Menu](#) by pressing the [Help/protect button](#). Press the [Help/protect button](#) now to access the [Retouch Menu](#).
3. Figure 6.59, image 3, shows the [Retouch Menu](#) with the same three choices we discussed earlier. Select [Choose start point](#) or [Choose end point](#) and press the [OK button](#).



4. The movie will now display again, still paused (figure 6.59, image 4), and the camera's **Memory card access lamp** will be shining brightly. Nothing will happen until you press up on the **Multi Selector** or cancel with the **Playback button**. (This was confusing to me until I had done it several times!)
5. Press up on the **Multi Selector**, and a message that says *Proceed? Yes/No* will appear (figure 6.59, image 5). Select **Yes** from the menu.
6. The camera will now save the edited movie with a new file name and display it on the **Monitor** (figure 6.59, image 6). You will see the new movie after the *Saving movie* process is complete.

Finally, let's examine the alternate method of saving a single movie frame as an individual image.

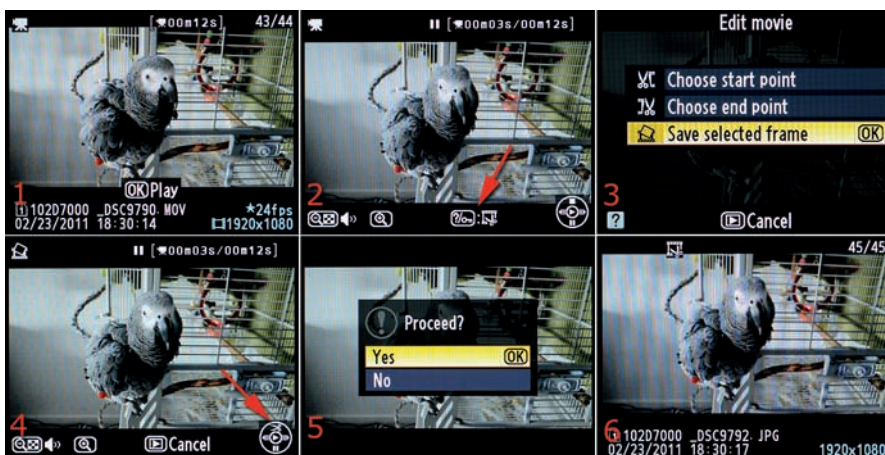


Figure 6.60 – Save selected frame from Playback

Here are the alternate steps to save a single frame of a movie:

1. Press the **Playback button** and scroll to the movie you want to edit. Press the **OK button** to play the movie (figure 6.60, image 1).
2. Let the movie play until you reach the single frame you want to save. Quickly press down on the **Multi Selector**, which will pause the movie. The screen shown in figure 6.60, image 2, will appear. The red arrow points to an icon that is displayed to let you know you can access the **Retouch Menu** by pressing the **Help/protect button**. Press the **Help/protect button** now to access the **Retouch Menu**.
3. Figure 6.60, image 3, shows the **Retouch Menu**. Choose **Save selected frame** and press the **OK button**.
4. The movie will now display again, still paused (figure 6.60, image 4), and the

camera's [Memory card access lamp](#) will be shining brightly. The camera will now wait for you to press up on the [Multi Selector](#) or cancel with the [Playback button](#).

5. Press up on the [Multi Selector](#), and a message that says *Proceed? Yes/No* will appear ([figure 6.60, image 5](#)). Select [Yes](#) from the menu.
6. The camera will now save the single frame of the movie as a new picture and display it on the [Monitor](#) ([figure 6.60, image 6](#)).

My Recommendation: I like to use the alternate methods to edit a movie or save a frame as a picture. Because I'm already viewing the movie I want to edit, this removes the extra steps of opening a menu. This series of steps seems complex, but it becomes easier when you do it a few times. Practice this once or twice and you'll remember it later.

Side-by-Side Comparison

(User's Manual – Page 264)

Side-by-side comparison allows you to compare an image you've retouched with its original source image. Interestingly, this function is not available from the Retouch Menu. You'll find it on the Playback Retouch Menu, which you access by pressing the OK button when a picture is displayed on

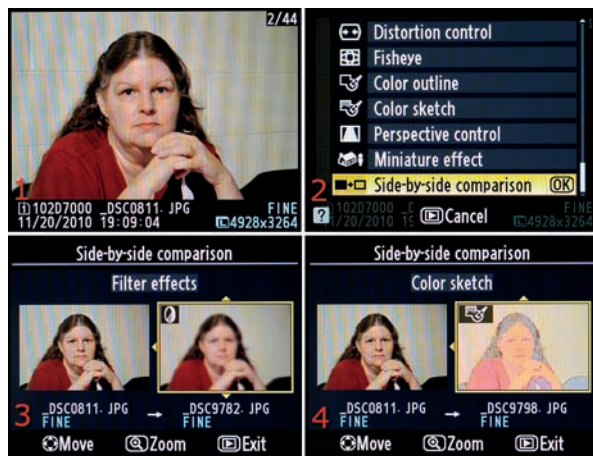


Figure 6.61 – Side-by-side comparison

the Monitor. Here are the steps to compare the original and retouched image side by side on the camera's Monitor:

1. Press the [Playback button](#) and find the image you want to compare ([figure 6.61, image 1](#)).
2. Press the [OK button](#) to access the Playback Retouch Menu. Scroll all the way down to the bottom of the menu, select [Side-by-side comparison](#), and scroll to the right ([figure 6.61, image 2](#)).
3. The original image will appear on the left, and one of the retouched versions will appear on the right ([figure 6.61, images 3 and 4](#)). If you retouched an

6



original image more than once, a tiny yellow arrow will appear above and below the retouched image. This means that you can scroll up or down to see the other retouched images. The right-side pictures of the woman in [figure 6.61](#), [images 3](#) and [4](#), are two different retouched images from one original image (the left-side pictures in the images). Image 3 shows the **Soft** filter effect, and image 4 shows the **Color sketch** filter effect.

My Recommendation: I often use this function when I want to compare images to which I've added a color cast so I can see how they compare to the original. It's very convenient since you can choose the original image or one of the retouched images and the camera is smart enough to place them in the proper position in the Side-by-side comparison. You can tell an image is retouched by looking for the retouch icon in the upper-left corner of the image when it's displayed on the Monitor.

My Conclusions

Nikon has given camera users who dislike computers a way to work with their images in-camera. Although the Retouch Menu is not as fully featured as a computer graphics program, it does allow you to do quick one-off conversions for convenience.

I didn't think this group of Retouch Menu functions would be all that useful to me when I first read about them. However, in the field I find myself using them more than I expected. Whether you use them often or not, it's good to know you have them for emergency use.

Next, we'll move into the final menu system in the camera. It's called My Menu, and it may become very valuable to you as you learn how it works. It's a place to put your often-used, favorite settings so you can get to them very quickly. Let's see how My Menu, and its cousin, Recent Settings, works in the next chapter.

6



6



My Menu and Recent Settings



Glass on Black – Courtesy of Greg Jones (*gregor1*)

As you have read through this book and experimented with your camera, you've surely noticed that the D7000 has a large number of menus, screens, functions, and settings. When I took pictures of the camera's menus and screens for this book, I had about 1,000 images when I was done. That many screens can be somewhat complex to navigate. We need a shortcut menu for our most-used settings—a place to keep the functions we are constantly changing.

Nikon has given us two specialty menus in the D7000: My Menu and Recent Settings. These are both designed to give us exactly what we need—a menu that can be customized with only the most-used functions or a menu of recent changes to functions.

For instance, I often turn Exposure delay mode on and off. Instead of having to search through all the Custom settings, trying to remember exactly where Exposure delay mode lives, I simply added that Custom setting to My Menu. Now, whenever I want to add a one-second exposure delay after pressing the Shutter-release button so that mirror vibrations can settle down, I just go to My Menu and enable Exposure delay mode. I can do it quickly, and without searching, since I added it to My Menu.

My Recommendation: I rarely use Recent Settings. I prefer the control I get with my own personally customizable menu—My Menu. The Recent Settings menu has very little flexibility since it's an automatically updated, camera-controlled menu system. You really can't do much in the way of configuring it. You'll just select and use it. On the other hand, My Menu is a personal collection of links to my most-used settings. It is completely configurable.

We'll consider both menus in this chapter, with heavy emphasis on configuring My Menu.

My Menu and Recent Settings—What's the Difference?

You can add up to 20 settings from the Playback Menu, Shooting Menu, Custom Settings Menu, Setup Menu, and Retouch Menu to My Menu. Recent Settings will automatically show the last 20 settings you've modified in the other menus, but it's not configurable. The most important difference between the two menus is the level of control you have over what appears on the menu. My Menu is completely customizable and does not change unless you change it, and Recent Settings simply shows the last 20 changes you've made to your camera's settings. Recent Settings will change every time you change a different setting in your camera. However, since it shows the last 20 changes, you ought to be able to find the ones you most often change somewhere in the list. The two menus are mutually exclusive and cannot appear on the D7000 at the same time. One takes the place of the other when you select the Choose tab setting at the end of each menu and choose your favorite.

7



My Menu

(User's Manual – Page 265)

My Menu is my menu! I can add or remove virtually any camera setting found on one of the primary menus. When I use My Menu I don't have to spend time looking for the function buried in the main menus system. Since I often use each function on My Menu, I'm glad to have it immediately available.

In figure 7.1 you can see that My Menu is the last selection on the D7000's menu system. Its icon looks like a file folder tab turned sideways, with a check mark on it. Press the MENU button and scroll down with the Multi Selector until the yellow highlight looks like the image in figure 7.1.

When you first look at My Menu you'll see nothing but the selections shown, as follows:

- Add items
- Remove items
- Rank items
- Choose tab

Let's examine each of these menu choices in detail.

Add Items

To add an item to My Menu, you'll need to locate the item first. Search through the menus until you find the setting you want to add, then make note of where it's located. You could do this from within the Add items menu, but I find that it's harder to locate what I'm looking for if I haven't already confirmed where it lives. Is it under the Custom Setting Menu or the Shooting Menu?

Find the item you want to add and make note of its location, then use the following steps:

1. Select **Add items** from **My Menu**. Notice that I already have **Set Picture Control** and **Active D-Lighting** added to **My Menu** (figure 7.2, image 1). I want to add something else.
2. Use the **Multi Selector** to scroll right and you'll find a list of menus to choose

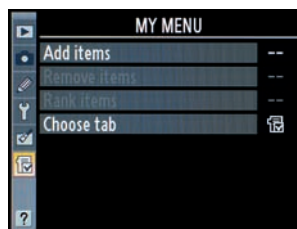


Figure 7.1 – My Menu

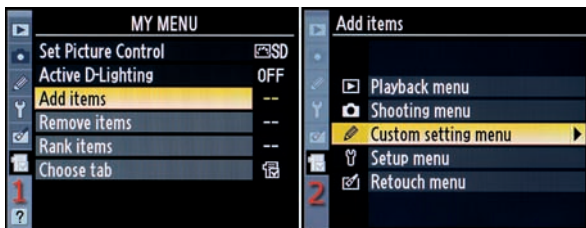


Figure 7.2 – Add items to My Menu



from. The **Add items** screen shows all the menus available in the D7000 except **My Menu** and **Recent Settings** (figure 7.2, image 2). Let's add one of my favorites, **Exposure delay mode** (figure 7.3).

3. Figure 7.3 picks up where figure 7.2 left off. I already know that **Exposure delay mode** is under the **Custom setting menu**, so let's scroll down to it (figure 7.3, image 1), then scroll to the right.
4. We now see the **Custom setting menu** and **Custom settings a-f** (figure 7.3, image 2). Scroll down to **Custom Setting d Shooting/display**, and then scroll to the right so we can select **Custom setting d11 Exposure delay mode**.

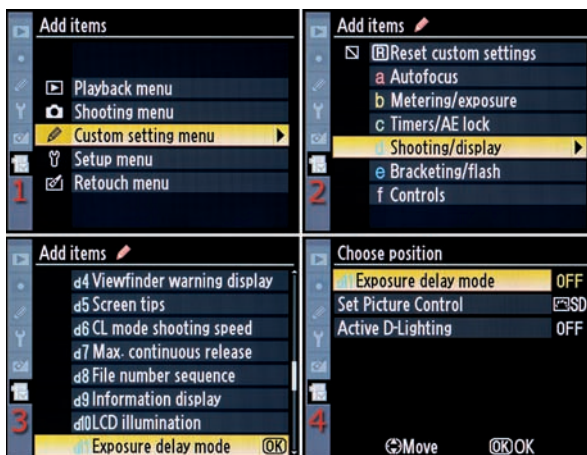


Figure 7.3 – Adding Exposure delay mode to My Menu

5. Figure 7.3, image 3, shows the **d11 Exposure delay mode** function that I want to add. All I have to do is highlight it and press the **OK** button. When I've done that, the D7000 switches to the **Choose position** screen (figure 7.3, image 4).



Figure 7.4 – Choosing a position for Custom setting d11 Exposure delay mode on My Menu

6. Figure 7.4 begins where figure 7.3 ends. Since I've already added a couple of other items to **My Menu**, I now have to decide the order in which I want them to be presented. The new **d11 Exposure delay mode** setting is on top because it is the newest entry (figure 7.4, image 1). I think I'll move it down two rows and put **Set Picture Control** in the top position.
7. To move the position of the selected item, simply scroll down. The **d11 Exposure delay mode** setting has a yellow box around it (figure 7.4, image 2). As you scroll down, a yellow underline moves to the last position (figure 7.4, image 3).



2, red arrow). This yellow underline represents the place to which I want to move **d11 Exposure delay mode**. When I've decided on the position and have the yellow underline in place, I just press the **OK button**. The screen pops back to the first **My Menu** screen, with everything arranged the way I want them (**figure 7.4, image 3**). Notice that **d11 Exposure delay mode** is now at the bottom of the list (it was originally at the top of the list).

Remove Items

Now that we've figured out how to Add items, let's examine how to Remove items. I've decided that one of my items, **Active D-Lighting**, is not used often enough to warrant a spot on My Menu, so I'll remove it. Use the following steps to Remove items from My Menu:



Figure 7.5 – Remove an item from My Menu

1. Select **Remove items** from **My Menu** and scroll to the right (**figure 7.5, image 1**).
2. The **Remove items** screen presents a series of selections with check boxes. Whichever boxes I check will be deleted when I select **Done** (**figure 7.5, image 2**). You can check the boxes by highlighting the line item you want to delete and scrolling right. You can also simply press the **OK button** to place a check mark in a setting's box. I like to use the **OK button** because scrolling left does not work; it takes you back to the **My Menu** screen. Pressing the **OK button** acts like a toggle and will check or uncheck a line item.
3. When you've checked the settings you want to remove, simply scroll back up to **Done** and press the **OK button** (**figure 7.5, image 3**). A small white box pops up and asks, *Delete selected item?*
4. Press the **OK button** to remove the setting from **My Menu**. A box pops up and says the item has been deleted, then the D7000 switches back to the **My Menu** screen. You can press the **MENU button** to cancel if you decide you don't want to remove an item.



Rank Items

Ranking items works very similarly to positioning new additions in My Menu. All the Rank items selection does is move an item up or down in My Menu. You can switch your most-used My Menu items to the top of the list. Use the following steps to Rank items:



Figure 7.6 – Rank items in My Menu

1. Select **Rank items** from **My Menu** and scroll to the right (figure 7.6, image 1).
2. Now you'll see the **Rank items** screen and all the current **My Menu** items (figure 7.6, image 2). I've decided that I use **d11 Exposure delay mode** more than **Set Picture Control**, so I'll move it to the top.

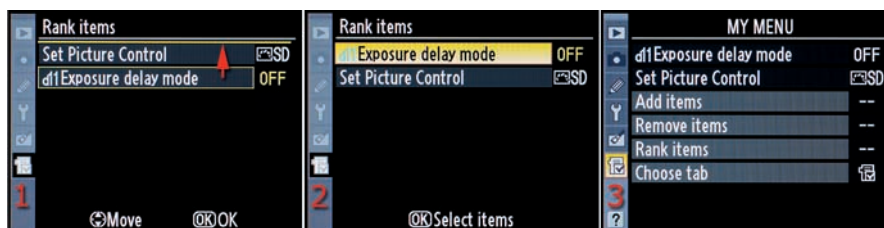


Figure 7.7 – Rank items in My Menu (continued)

3. Highlight **d11 Exposure delay mode** and press the **OK button**, and a yellow box will appear around that item. **Move** appears at the bottom of the screen (figure 7.7, image 1).
4. Next, scroll up with the **Multi Selector** (figure 7.7, image 1). This action moves the yellow positioning underline to the top of the list (figure 7.7, image 1, red arrow). Press the **OK button** to select the new position, and **d11 Exposure delay mode** will move to the top of the list (figure 7.7, image 2).
5. This setting is where we want it, so press the **MENU Button** to return to the main **My Menu** screen (figure 7.7, image 3).

Choose Tab

Choose tab allows you to switch between My Menu and Recent Settings. Both menus have the Choose tab selection as their last menu choice.



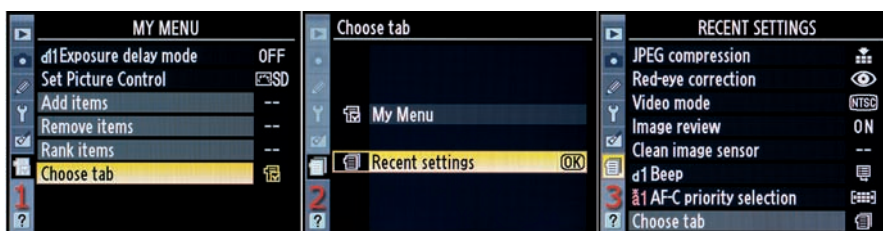


Figure 7.8 – Select My Menu or Recent Settings (Choose tab)

Use the following steps to switch between My Menu and Recent Settings:

1. At the bottom of **My Menu**, select **Choose tab** and scroll to the right (figure 7.8, image 1).
2. You'll now have a choice between **My Menu** and **Recent Settings**. Choose **Recent Settings** and press the **OK** button (figure 7.8, image 2).
3. The **Recent Settings** screen will now appear, completely replacing **My Menu** on the main menu screen (figure 7.8, image 3). Notice that it has a **Choose tab** selection at the bottom, just like **My Menu**.
4. Select **Choose tab** and press the **OK** button to return to **My Menu** (figure 7.8, image 3).

Clearly, this is a circular reference. You can use the **Choose tab** selection as a toggle between the two screens. When you do, one replaces the other as the last selection on the main menu screen.

My Recommendation: You can see how **My Menu** gives you nice control over a customized menu that is entirely yours. Configure it however you want by choosing from selections in the primary menus. **My Menu** will save you a lot of time when you look for your 20 most-used selections.

If you're inclined to use **Recent Settings**, just remember that after you pass 20 camera setting adjustments, the next setting you use will jump to the top of the list, moving everything down by one position. The last item on the list will simply disappear.

Now, let's take a look at **Recent Settings** in a little more detail.

Recent Settings

(User's Manual – Page 268)

Recent Settings is very simple. This menu remembers the last 20 changes you've made to your D7000 camera. Each menu selection that was modified is stored in a temporary place called **Recent Settings**.



If you change something in your camera that's not already on the Recent Settings menu, it will be added to the menu, replacing the oldest change with your new one—at the top of the list—if there is no room left at the bottom (i.e., you've exceeded 20 items).

This can be a convenient way to find something you've changed recently but have trouble remembering where it is on the main menu systems.

My Recommendation: If you want a more permanent menu for your favorite changes to the D7000, you'll need to enable the My Menu system instead of the Recent Settings menu. Recent Settings are fine, but I want to directly control what settings I have quick access to without searching. My Menu is my choice!

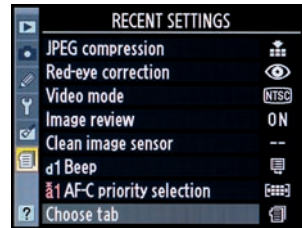


Figure 7.9 – Recent Settings Menu

My Conclusions

This is the last of the text-based menus we'll cover in the D7000. We've been through all the menu screens in the last several chapters!

Now that we've completed the menus, it's time to move into the chapters that pull everything together. You have stepped through the internal setup of every part of your D7000. Now, let's begin to see how best to use the controls we've carefully configured. Our next chapter takes up the subject of **Metering, Exposure Modes, and Histogram**. Please pay extra attention to the section on histogram if you want excellent exposures every time.



Metering, Exposure Modes, and Histogram



8

Iris Under Overcast – Courtesy of Connor Holmes (*ConnorH*)

I've been using Nikon cameras since way back in 1980. It seems that with each new camera there have been improvements in metering and exposure modes. The Nikon D7000 is no exception. With this camera, Nikon has designed metering and exposure to work not only with still images, but also with moving pictures and video.

In this chapter you'll learn how the exposure metering system and modes work. We'll look at how each of three different light meter types is best used. We'll examine the various modes you can use when taking pictures, including several exposure modes for when you want the camera to do most of the work while you enjoy shooting. Finally, we'll look in detail at how the histogram works on the Nikon D7000.

The histogram is a new feature to those who are coming over from film photography to digital photography. This little readout gives you great control over metering and will help you make the most accurate exposures you've ever made. It is very important that you understand the histogram, so we'll look at it in detail. This chapter is divided into three parts:

- **Section 1 – Metering** – The Nikon D7000 provides three major light metering systems: matrix, center weighted, and spot.
- **Section 2 – Exposure Modes** – The camera's Mode dial is simply loaded with exposure—or shooting—modes, such as auto exposure (AUTO), programmed auto (P), shutter-priority auto (S), aperture-priority auto (A), manual (M), and user settings U1 and U2. In addition, there are 19 SCENE modes that give an inexperienced user command of a certain style of shooting.
- **Section 3 – Histogram** – The histogram is a digital bell-curve readout that shows how well an image is exposed. It's an important tool for advanced photographers. This chapter discusses how to read it and better control your exposures.

Let's get started by looking into the three exposure metering systems.

Section 1 – Metering

(User's Manual – Page 105)

The basis for the Nikon D7000's exposure meter is a 2,016-pixel RGB sensor that meters a wide area of the frame. [Figure 8.1](#) shows a closeup of that sensor, which is used to meter the light and provide a correct exposure.

When used with a Nikkor G or D lens that contains a CPU, the camera can set the exposure based on the distribution of brightness, color, distance, and

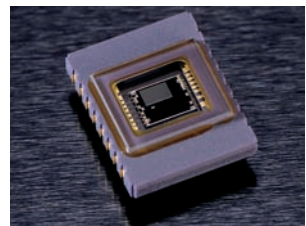


Figure 8.1 – 2,016-pixel RGB Sensor



composition. Most people leave their light meter set to matrix metering and enjoy excellent results.

Let's look more closely at each of the D7000's three exposure metering systems. Figure 8.2 shows the Metering button (figure 8.2, red arrow) and the Control panel readout set to matrix metering, spot metering, and center-weighted metering. Use the following steps to change the metering mode:



Figure 8.2 – Metering button and three meter types: Matrix, Spot, and Center-weighted icon

1. Hold down the **Metering button** with your index finger. You'll see the metering icon on the **Control panel** while you hold it down (figure 8.2).
2. While still holding down the **Metering button**, turn the rear **Main command dial** until the icon for the meter you want to use appears.
3. Release the **Metering button**.
4. Check the **Control panel** to validate that you have selected the meter you want to use.

Figure 8.3 shows the control panel with the metering icon and all the other icons you'll normally see. I have matrix metering selected on my camera; its icon is shown at the point of the red arrow. Now, let's examine the three meter types to see which you will use most often.

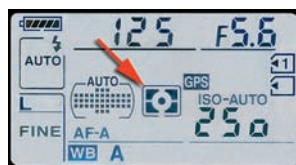


Figure 8.3 – Metering mode icon (matrix)

3D Color Matrix II Metering

The Nikon D7000 contains a 3D Color Matrix II metering system that's one of the most powerful and accurate automatic exposure meters in any camera today. In figure 8.4 you can see a closeup of the matrix meter symbol from the Control panel. This is the factory default meter.



Figure 8.4 – Matrix metering mode symbol



How does matrix metering work? Through complex mathematical formulas, there are characteristics for many thousands of images stored in the camera. These characteristics are used along with proprietary Nikon software and complex evaluative computations to analyze the image that appears in your Viewfinder. The meter is then set to provide accurate exposures for the greatest majority of your images.

A simple example is when the horizon runs through the middle of an image. The sky above is bright, and the earth below is much dimmer. The metering system evaluates this image and compares it to hundreds of similar images in the camera's database, then it automatically selects and inputs a meter setting for you.

The meter examines four critical areas of each picture. It compares the levels of brightness in various parts of the scene to determine the total range of EV values. It then notices the color of the subject and surroundings. If you are using a G or D lens with a CPU chip, it also determines how far away your lens is focused so it can determine the distance to your subject. Finally, it looks at the compositional elements of the subject.

When it has all that information, it compares your image to tens of thousands of image characteristics in its image database, makes complex evaluations, and comes up with an exposure value that is usually right on target, even in complex lighting situations.

Center-Weighted Metering

If you're a bit old-fashioned, having been raised on a classic center-weighted meter and still prefer that type, the D7000's exposure meter can be transformed into a flexible center-weighted meter with a variable-sized sensitivity that you can control.

Figure 8.5 shows the center-weighted metering symbol from the Control panel. The center-weighted meter in the D7000 meters the entire frame but concentrates 75 percent of the sensitivity into an adjustable circle in the middle of the frame. The other 25 percent of the frame outside the circle provides the rest of the metering. If you'd like, you can make the circle as small as 6 mm or as large as 13 mm. You can even completely eliminate the circle and use the entire Viewfinder frame as a basic averaging meter.



Figure 8.5 – Center-weighted metering mode symbol

Let's examine the center-weighted meter more closely. Using Custom setting b4 Center-weighted area, you can change the size of the circle where the camera concentrates the meter reading. (See Custom setting b4 > Center-weighted area in the chapter titled **Custom Setting Menu**.)



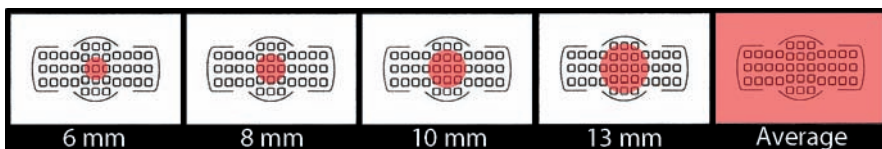


Figure 8.6 – Center-weighted metering

The default circle is 8 mm in the center of your camera's Viewfinder ([figure 8.6](#)). However, by changing Custom setting b4 Center-weighted area, you can adjust this size to one of the following:

- 6 mm (0.24 inch)
- 8 mm (0.32 inch) (default)
- 10 mm (0.39 inch)
- 13 mm (0.51 inch)
- Average (full frame)

The center-weighted meter is a pretty simple concept. Whatever part of your subject that's in the center of your D7000's Viewfinder influences the meter more than the edges of the frame, on a 75/25 basis. The circle gets 75 percent importance.

Note: If you are using a non-CPU lens, the center-weighted meter defaults to 8 mm and cannot be changed. Adjustments to Custom setting b4 Center-weighted area have no effect.

Where's the Circle?

You can't actually see any indication of circles in the Viewfinder, so you'll have to imagine them, like I did in [figure 8.6](#).

Locate your current autofocus (AF) sensor in the middle of your Viewfinder. Now imagine the smallest circle, 8 mm, which at 0.32 inches is about one-third of an inch. The largest circle is 13 mm, which at 0.51 inches is a little bigger than one-half inch. This unseen circle in the center area of the Viewfinder provides the most important 75 percent metering area.

My Recommendation: When I use the center-weighted meter, I stay with the default setting of 8 mm. That's a pretty small circle (almost a spot meter), so it should give accurate readings. It's large enough to see more than a pure spot meter, though, so you have the best of both worlds. There is so little difference between 6 mm and 13 mm that it probably makes little difference which one you use. If you are concerned, then experiment with the settings and see which one works best for you.

Using the Averaging Meter

If you set your meter to Average (Avg) in Custom setting b4 Center-weighted area, the light values of the entire Viewfinder are averaged to arrive at an exposure value. No particular area of the frame is assigned any greater importance ([figure 8.6](#)).



This is a little bit like matrix metering but without the extra smarts. In fact, on several test subjects, I got remarkably similar meter readings from Average and matrix. However, matrix metering should do better in difficult lighting situations because it has a database of image characteristics to compare with your current image, and it looks at color, distance, and where your subject is located in the frame.

Spot Metering

Often only a spot meter will do. In situations where you must get an accurate exposure for a very small section of the frame, or if you must get several meter readings from various small areas, the D7000 can, once again, be adjusted to fit your needs. The spot meter evaluates only 2.5 percent of the frame, so it is indeed a spot meter.

Figure 8.7 shows the spot metering icon as displayed on the Control panel. The D7000's spot meter consists of a 3.5 mm circle (0.14 inch) surrounding the currently active AF point if you are using single or continuous AF modes (AF-S or AF-C). In auto AF mode (AF-A) the spot meter uses only the center AF sensor and does not move when other AF sensors are automatically selected. If you are going to use the spot meter effectively, you might want to set your D7000 to AF-S or AF-C mode.

How big is the 3.5 mm spot? The spot meter barely surrounds the AF point square in your viewfinder (figure 8.8). It is fairly close to the size of the little brackets that appear around the active AF sensor when you slightly press the Shutter-release button. In fact, the spot meter follows the currently active AF point around the Viewfinder, so you can move the spot meter around the frame with the Multi Selector.

When your D7000 is in spot meter mode and you move the AF point to some small section of your subject, you can rest assured that you're getting a true spot reading. In fact, you can use your spot meter to determine an approximate EV range of light values in the entire image by taking multiple manual spot readings and comparing the values. If the values exceed 6 or 7 EV stops, you have to decide which part of your subject is most important and meter for it.

On an overcast day, you can usually get by with no worries since the range of light values is often within the recording capability of the sensor. On a bright sunny day, the range of light can be twice as much as your sensor can record. The scene can be

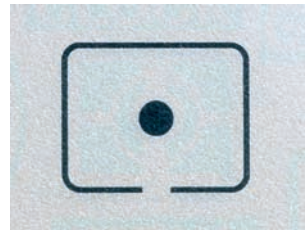


Figure 8.7 – Spot metering mode symbol

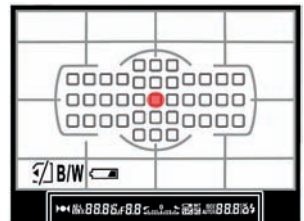


Figure 8.8 – Spot meter size



12 stops, but your sensor can record a maximum of 6 or 7 stops.

Don't let the numbers make you nervous. Just remember that spot metering is often a trade-off. You can either have the highly specific ability to ensure that a certain portion of an image is exposed with spot-on accuracy, or you can use the camera's multiple averaging skills to generally get the correct exposure throughout the frame. The choice is yours, depending on the shooting situation.

If you spot meter the face of someone who is standing in the sun, the shadows around the person will contain little or no data. They will be underexposed and look like they're solid black. If you spot meter from the shadows instead, the person's face is likely to blow out to solid white. We'll discuss this in more detail in section 3 of this chapter, which explores the histogram.

My Recommendation: Use your spot meter to get specific meter readings of small areas on and around your subject; then make some exposure decisions yourself, and your subject should be well exposed. Just remember that the spot meter evaluates only for the small area that it sees, so it cannot adjust the camera for anything except that one tiny area. Spot metering requires some practice, but it is a very professional way to expose images.

Section 2 – Exposure Modes

(User's Manual – Pages 67, 40)

My first Nikon was an FM back in 1980, which I remember with fondness because that was when I first got serious about photography. It's hard for me to imagine that it has already been 30 years since I last used my FM! Things were simpler back then. When I say simple, I mean that the FM had a basic center-weighted light meter, a manual exposure dial, and manual aperture settings. I had to decide how to create the image in all aspects. It was a camera with only one mode—M, or manual.

Later on, I bought a Nikon FE and was amazed to use its A mode, or aperture priority auto. I could set the aperture manually and the camera would adjust the shutter speed for me. Luxury! The FE had two modes, M-manual and A-aperture priority.

A few more years went by and I bought a Nikon F4 that was loaded with features and was much more complex. It had four modes, including the two I was used to (M and A) and two new modes, S-shutter priority auto and P-programmed auto. I had to learn even more stuff! The F4 was my first P, S, A, M camera.

Does this sound anything like your progression? If you're older than 40 years, maybe so; if not, you may just be getting into the digital photography realm with your D7000, and I ought to stop reminiscing and get to the point.

Today's cameras are amazingly complex compared to cameras only a few years



ago. Let's examine how we can use that flexibility for our benefit. The D7000 is also a P, S, A, M camera. That's the abbreviated progression of primary shooting modes that allow you to control the camera's shutter speed and aperture in various ways. In addition, the D7000 has 19 SCENE modes and a fully AUTO mode for when you just want to take good pictures without thinking about exposure. Let's examine each in detail.

There is just one control on the D7000 to set the AUTO, SCENE, P, S, A, M, U1, and U2 modes. It is a convenient control called the Mode dial (figure 8.9). Let's discuss each exposure mode in detail.

P - Programmed Auto Mode

Programmed auto mode (P) is designed for those times that you just want to shoot pictures and not think much about camera settings but still want emergency control when needed. The camera takes care of the shutter speed and aperture for you and uses your selected exposure meter type to create the best pictures it can without human intervention. You can override the aperture by turning the rear Main command dial.

Figure 8.10 shows the mode dial set to programmed auto mode (P). This mode is called programmed auto because it uses an internal software program built into the camera. It tries its best to create optimal images in most situations.

However, even the User's Manual calls this a "snapshot" mode. P mode can handle a wide variety of situations well, but I wouldn't depend on it for my important shooting. It can be great at a party, for example, where I want some nice snapshots. I don't have to think about the camera then, and I can just enjoy the party. P mode to me is "P" for Party.

It's a good mode to use when you want to let the camera control the aperture and shutter while you control the flash. In a sense, it's like AUTO mode except that you decide when to use the pop-up Speedlight instead of letting the camera decide. It also lets you override the camera's aperture in an emergency. You may need more depth of field and decide to use a smaller aperture. The camera allows you to do that by turning the rear Main command dial. When you do, the aperture is under your control, and the camera controls the shutter.

P mode actually comes in two parts: programmed auto and flexible program.



Figure 8.9 – Mode dial set to AUTO



Figure 8.10 – Mode dial set to Programmed auto (P)



Flexible program works similarly to aperture-priority auto (A) mode. Why do I say that? Let me explain with an example.

Get Down, Grandpa!

You're shooting at a family party and suddenly you see a perfect shot of Grandpa dancing on the dinner table and Grandma standing on the floor behind him with her hand over her mouth. You (being a well-trained photographer) glance down at your camera and realize that the f/4 aperture showing on the control panel won't give you enough depth of field to focus on Grandpa and still have a sharp image of Grandma, who by this time is tugging at his pant leg. With only seconds to spare, you turn your rear Main command dial to the left. The D7000 realizes that it is being called upon to leave snapshot mode and give you some control. It displays a small P (P with an asterisk above it)—next to the aperture readout on the Control panel—to let you know it realizes you are taking over control of the aperture. Since you are turning the dial to the left, it obligingly starts cranking down the aperture. A few clicks to the left and your aperture is now at f/8. As soon as the D7000 detected you were turning the command dial, it started adjusting the shutter speed to match the new aperture. With only seconds before Grandma starts dragging Grandpa off the dinner table, you get the camera to your eye, compose the shot, press the shutter, and the D7000 starts grabbing frames. You get several frames off in the few seconds it takes Grandma to get Grandpa down from the table. A family memory, captured!*

What you did in my imaginary scenario was invoke the flexible program mode (P*) in your D7000. How? As soon as you turned the rear Main command dial, the D7000 left normal P mode and switched to flexible program. Before you turned the rear command dial, the D7000 was happily controlling both shutter speed and aperture for you. When you turned the dial, the D7000 immediately switched to flexible program mode and let you have control of the aperture. It then controlled only the shutter speed. In effect, the D7000 allowed you to exercise your knowledge of photography very quickly and only assisted you from that point.

When you enter P*-flexible program mode, you control only the aperture and the D7000 controls the shutter speed. If you turn the rear Main command dial to the left, the aperture gets smaller. Turn it to the right and the aperture gets larger. Nothing happens if you turn the front Sub-command dial. Nikon gave you control of the aperture only in flexible program mode. Can you see why I say flexible program mode acts like aperture priority mode (mode A)?

Beware the Extra Clicks

If you turn the rear Main command dial to the right until the aperture reaches its maximum size (usually f/3.5), the camera starts counting clicks but does nothing

8



else. In order to start making the aperture move again, you have to turn back the same number of clicks (up to 15). I have no idea why Nikon does it this way, but they have for many years.

It's no big deal, really, just be aware that this will happen so you won't think the camera is not working right.

S - Shutter-Priority Auto Mode

Shutter-priority auto is for those who need to control their camera's shutter speed while allowing the camera to maintain the correct aperture for the available light. You'll turn the rear Main command dial to adjust the shutter speed, while the camera controls the aperture.



Figure 8.11 – Mode dial set to Shutter-priority auto (S)

Figure 8.11 shows the mode dial set to S for shutter-priority auto mode. If you find yourself shooting action, you'll want to keep the shutter speed high enough to capture an image without excessive blurring.



Figure 8.12 – Fast shutter speed to stop bird and slow shutter speed to blur water

Shooting sports, air shows, auto races, or any quickly moving subject requires careful control of the shutter. If you shoot a bird in flight, you'll want to use a fast shutter speed that allows for just a tiny bit of motion blur in its wings, while stopping the body of the bird (figure 8.12, first picture). Sometimes you'll want to set your



camera's shutter speed to slow settings for special effects or time exposures, such as a small waterfall in a beautiful autumn stream. Blurred water cascading over rocks can be a very beautiful effect. See figure 8.12's second picture for the slow shutter speed effect.

If the light changes drastically and the camera cannot maintain a correct exposure, it will inform you by replacing the normal aperture reading—in the Viewfinder, Control panel, and Information display—with either HI or Lo. They mean what they imply. HI means there is too much light for a good exposure. Lo means there is not enough light for a good exposure.

To change the shutter speed, simply rotate the rear Main command dial to any value between 30 seconds and 1/8000 of a second. Turn the wheel to the right for faster shutter speeds and left for slower. The camera will adjust your aperture automatically to maintain a correct exposure and will warn you when it can't.

Watch Out for Camera Shake!

Be careful when the shutter speed is set below 1/125 second. Camera shake becomes a problem for many people at 1/60 second and slower. If you are careful to stand still and brace your arms against your chest and spread your feet apart with one in front of the other, you may be able to make sharp images at 1/60 to 1/30 second (figure 8.13, image 1).



Figure 8.13 – Woman holding camera for steady shooting, and pro photographer using a tripod



Surprisingly, your heartbeat and breathing is reflected in your hands during slow shutter speed photography. At 1/15 second and slower most people cannot take sharp pictures without having the camera on a tripod ([figure 8.13, image 2](#)). If you are going to shoot at slow shutter speeds, buy yourself a nice solid tripod. You'll make much nicer pictures.

[Figure 8.13](#) shows the two main ways to steady a camera. Notice in the first picture how the young lady has her elbow tucked into her chest, her feet apart, and one foot in front of the other. She is squeezing the shutter release very slowly to prevent adding shake, and she is breathing out slowly as she is firing the camera. This hand-holding technique provides maximum sharpness. In the other picture is a professional photographer using a tripod for maximum sharpness.

The picture of the small waterfall in Great Smoky Mountains National Park in [figure 8.12](#) was taken at a shutter speed of several seconds. It is virtually impossible to hold a camera perfectly still for several seconds, so a shot like that would be unachievable without a tripod.

A - Aperture-Priority Auto Mode

Nature and macro shooters, and anyone concerned with carefully controlling depth of field, will often leave their camera set to aperture-priority auto mode (A). [Figure 8.14](#) shows the Mode dial set to aperture-priority auto mode.

Aperture-priority auto mode (A) allows you to control the aperture while the camera takes care of the shutter speed for optimal exposures. To select an aperture, you'll use the front Sub-command dial. Turn the wheel to the right for smaller apertures and to the left for larger apertures.

The minimum and maximum aperture settings are limited by the minimum and maximum aperture available on the lens you've mounted on the camera. Most consumer lenses run from f/3.5 to f/22. More expensive pro-style lenses may have apertures as large as f/1.4, but they generally start at f/2.8 and end at f/22–f/32.

The aperture directly controls the “depth of field” (DOF)—or zone of sharpness—in an image. DOF is an extremely important concept for photographers to understand. Simply put, it allows you to control the range or depth of sharp focus in your images. In the bird image in [figure 8.15](#), on the following page, the DOF is very shallow, and in the scenic shot it is very deep.

See the upcoming sidebar to download a tutorial document called **Understanding Depth of Field, Aperture, and Shutter Speed**.



Figure 8.14 – Mode dial set to Aperture-priority auto (A)





Figure 8.15 – Large aperture to blur background and small aperture for deep depth of field

Download Depth of Field, Aperture, and Shutter Speed PDF

Many people who use the D7000 are advanced photographers, reflecting the purpose of this feature-laden camera, and they fully understand things like depth of field, shutter speed, and aperture. However, some newer photographers have decided to go for the D7000 as their first entry into DSLR photography. Aperture and shutter speed are such an important subject for new photographers that I've created a sizable document on the subject, which you may download. Depth of field is a critical thing for new photographers to understand, along with the relationship between aperture and shutter speed. Knowing these photography basics allows you to control the camera for special effects like those seen in figures 8.12 and 8.14. Please go to our downloadable resources website (<http://rockynook.com/NikonD7000>) and get the document (in PDF format) named **Understanding Depth of Field, Aperture, and Shutter Speed**.



M - Manual Mode

Manual mode takes a big step backward to days of old. It gives you complete control of your camera's shutter and aperture so that you can make all the exposure decisions, with suggestions from the light meter. Figure 8.16, image 1, shows the Mode dial set to manual mode.

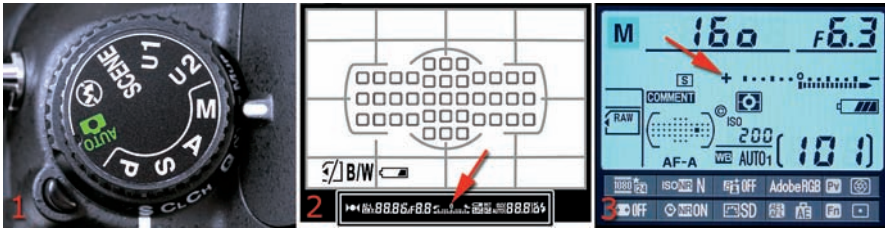


Figure 8.16 – Mode dial set to Manual (M) and analog exposure display in Viewfinder and Information display screen

Also shown in [figure 8.16, images 2 and 3](#), is the analog exposure display (red arrows). This display, found when you look in the Viewfinder eyepiece or press the INFO button on the back of the camera, has a plus sign (+) on the left and a minus sign (-) on the right. Each dot on the scale in image 3 represents 1/3 EV step, and each line represents 1 EV step.

You can control how sensitive this scale is by changing Custom setting b2 EV steps for exposure cntrl. You can set Custom setting b2 to 1/3 step or 1/2 step EV. The camera defaults to 1/3 step.

When you are metering your subject, a bar will appear underneath the analog exposure display and extend from the zero in the center toward the plus side to indicate overexposure, or toward the minus side to indicate underexposure. You can gauge the amount of over- or underexposure by the number of dots and lines the bar passes as it heads toward one side or the other. The goal in manual mode is to make the bar disappear. In [figure 8.16, image 3](#), the bar indicates that the scene is underexposed by more than two stops.

You can adjust the aperture with the front Sub-command dial, and you can adjust the shutter speed with the rear Main command dial. When you're in manual mode, you have control over the aperture for depth of field and the shutter speed for motion control. If your subject needs a little more depth of field, just make the aperture smaller, but be sure to slow down the shutter speed as well (or your image may be underexposed). If you suddenly need a faster shutter speed, then set it faster, but be sure to open the aperture to compensate.

The point is, you are in complete control of the camera and must make decisions for both the shutter speed and aperture. The camera makes suggestions with its meter, but you make the final decision about how the exposure will look. Manual



mode is for taking your time and enjoying your photography. It gives you the most control of how the image looks but also expects you to have a higher level of knowledge to get correct exposures.

As mentioned previously, aperture, shutter speed, and depth of field are discussed in the free downloadable PDF document named **Understanding Depth of Field, Aperture, and Shutter Speed** from <http://rockynook.com/NikonD7000>. It is especially important that you understand how to use aperture and shutter speed before you set the camera to manual mode (M), or you will get bad pictures.

My Recommendation on Exposure Mode Selection

As a nature photographer, I am mostly concerned with getting a nice sharp image with deep depth of field. About 90 percent of the time, my camera is set to aperture-priority auto (A) and f/8. I started using this mode in about 1986 when I bought my Nikon FE, and I've used this setting ever since.

However, if I were shooting sports or action, I would have my camera set to shutter-priority auto (S) most often, which would allow me to control the speed of the shutter and capture those fast-moving subjects without a lot of blur. The camera will control the aperture so that I only have to concentrate on which shutter speed best fits my subject's movement.

I only use the other two modes, programmed auto (P) and manual (M), for special occasions.

Manual mode is for when I have time to just enjoy my photography. When I want to control the camera absolutely, I go to manual. I've even been known to carry a small blanket with me so that when I'm shooting in manual mode I can toss it over the back of the camera and my head. That way I can feel like Ansel Adams or another view camera artist. I do admit that people (especially kids) seem to find that hilarious. Well, I bet they don't know how to use manual mode!

I probably use programmed auto (P) mode least of all. I might use it when I am at a party and just want to take nice pictures for my own use. I'll let the camera make most of the decisions by using P mode while still having the ability to quickly jump into P*-flexible program mode when events call for a little more aperture control.

Some people have recently switched from using a point-and-shoot (P&S) camera to a more powerful DSLR like the Nikon D7000. Most P&S cameras have a completely auto mode and some scene modes, representing common photographic opportunities. If you have come over from the P&S world, you might enjoy using the AUTO or SCENE modes while learning the more advanced uses of the P, S, A, and M modes. Let's look into how these extra modes work.



Auto Exposure Mode

The AUTO exposure mode is for those times you want to get the picture with no thought as to how the camera works (figure 8.17). All you need be concerned about in AUTO mode is how well the image is composed and whether the battery is fully charged.

The D7000 becomes a big point-and-shoot camera, like a heavy Nikon Coolpix. Many of its internal modes go to auto too. For instance, here are some important camera features that become automatic:

- White balance
- Active D-Lighting
- ISO sensitivity
- Picture Control
- Built-in Speedlight flash



Figure 8.17 – Mode dial set to AUTO exposure mode

In addition, several of the Shooting Menu settings and Custom Settings are disabled while in auto. In effect, you relinquish control of the camera's functions for a guarantee that some sort of picture will be provided. In most cases, the D7000 will provide its normal excellent images when you've selected AUTO. However, in difficult circumstances, the camera is free to turn up the ISO sensitivity and Active D-Lighting range extension to get a picture even at the expense of image quality.

If an alien spaceship lands in the local superstore parking lot, I might be convinced to use AUTO since I am going to get a picture no matter what. I don't have to think about anything except framing the subject and pressing the shutter release.

If you want to loan your camera to your grandmother and she has no interest in how cameras work, the D7000 will happily make nice images for her in AUTO mode. While you are learning to use the more advanced functions of the camera, you too might benefit from using this mode for a while. You'll usually get better pictures when you control the camera, but the D7000 has some very efficient software for when you don't want to take control.

Scene Modes

Scene modes are considered “creative photography” modes by Nikon. In fact, they allow a beginning photographer to emulate the camera settings they would be inclined to use if they had more experience. These modes allow you to make consistently good images, and later, as your experience grows, you can use the P, S, A, M modes to get more creative control over the image.



Since the Nikon D7000 has thousands of images stored in its matrix metering system, I wouldn't be surprised if each of these modes uses a subset of stored image types that more closely match the selected scene mode. This might hold true in matrix metering mode. I have no way to prove this, so don't quote me!

If you choose to use scene modes, do so with the understanding that you can eventually learn to control the image to a finer degree with the P, S, A, M modes. Don't be afraid to experiment with the more powerful features of the D7000. You can always fall back on the scene modes if you feel uncomfortable. With the P, S, A, M, AUTO, and SCENE modes on the Mode dial, Nikon has given us the best of both worlds in one camera—full or partial automation, or complete manual control. What flexibility!

The Nikon D7000 provides 19 distinct scene modes designed to give an inexperienced user control over certain styles of photography (figure 8.18). Here is a list of the various scene modes:



Figure 8.18 – Mode dial set to SCENE exposure mode and controls

- Portrait
- Landscape
- Child
- Sports
- Close-up
- Night portrait
- Night landscape
- Party/indoor
- Beach/snow
- Sunset
- Dusk/dawn
- Pet portrait
- Candlelight
- Blossom
- Autumn colors
- Food
- Silhouette
- High key
- Low key



Here are the steps to select a scene mode:

1. Set the **Mode dial** on top of the camera to **SCENE** (figure 8.18, image 1).
2. Make sure the light meter is active by pressing the **Shutter-release button** halfway, and then release pressure from the button (figure 8.18, image 2). (Nikon does not mention this step in the User's Manual on page 40; however, my camera does not display scene modes unless the meter is active.) If the light meter is already active, skip this step.
3. Turn the rear **Main command dial** at least two clicks while examining the camera's **Monitor** (figure 8.18, image 3). If you turn it just one click, the camera displays the **Information display screen** only for the current scene mode. Each click past the first one displays a different scene mode on the **Monitor**, with a small picture showing the effect provided (figure 8.18, image 4). The scene mode display shows for only about two seconds before the **Monitor** turns off. Quickly turn the dial again to show more scene modes.
4. When you have selected the scene mode you want and the **Monitor** goes off, you are ready to shoot.

My Recommendation: It almost seems that Nikon added scene modes to the D7000 as an afterthought. I judge a user interface by how intuitively it works. In my opinion, the steps to set a scene mode are not intuitive at all for the D7000. When I first got my D7000 I could not figure out how to get to the scene modes. I set the Mode dial to SCENE and . . . nothing happened. I expected to see scene modes immediately appear on the monitor, but no! I had to read the manual to figure out how to display the scene modes. That's silly for an interface designed with inexperienced users in mind!

The following is an abbreviated version of how to get into the scene modes:

1. Set the **Mode dial** to **SCENE** (figure 8.18).
2. Make sure the light meter is active.
3. Turn the rear **Main command dial** at least two clicks.

Now, let's look at some detail on the scene modes. In each of the following 19 sections, I have included a graphic with two images: the left side is the screen used to select the mode, and the right side is the Information display screen you'll see when you've chosen a particular scene mode or if you press the Info button with a scene mode active.



Portrait Scene Mode

Portrait scene mode is best used when you are taking pictures of people or static subjects. Its icon looks like a lady wearing a hat (figure 8.19). The camera tends



Figure 8.19 – Portrait SCENE mode

to emphasize a shallow depth of field (large apertures) so that only your subject is in sharp focus, which is a flattering way to focus attention on your subject and blur the background as much as possible. If you are taking pictures of friends (alone or in small groups), use this mode. The camera uses the following settings in Portrait scene mode:

- Picture Control: Portrait (PT)
- White balance: Auto1
- Sharpening: Auto
- Contrast: 0
- Brightness: 0
- Saturation: 0
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Auto with balanced Fill flash
- Autofocus: Auto-area AF

Landscape Scene Mode

If you are spending a day in the mountains, you'll want to use the Landscape scene mode. Its icon looks like a couple of mountain peaks with a square around them



Figure 8.20 – Landscape SCENE mode

Landscapes are usually best photographed on a tripod at small apertures so the entire scenic view is nice and sharp (figure 8.14, image 2). The landscape mode will use smaller apertures for more depth of field. This is sort of like using the aperture-priority auto mode (A), but you don't have as much control because the camera decides which aperture to use.



The camera uses the following settings in Landscape scene mode:

- Picture Control: Landscape (LS)
- White balance: Auto1
- Sharpening: Auto
- Contrast: 0
- Brightness: 0
- Saturation: Auto
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Auto-area AF

Child Scene Mode

Child scene mode tries to balance the need for saturating the colors in the child's clothes and any colorful backgrounds while not overly saturating skin tones. Its



Figure 8.21 – Child SCENE mode

icon looks like a child wearing a cap with his arms raised (figure 8.21). The primary emphasis of this mode seems to be making skin tones look good while giving you a fast enough shutter speed to capture a moving child and a small enough aperture to have some depth of field. It seems to be a balanced mode when it comes to shutter speed and aperture. The camera uses the following settings in Child scene mode:

- Picture Control: Standard (SD)
- White balance: Auto1
- Sharpening: Auto
- Contrast: 0
- Brightness: 0
- Saturation: Auto
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Auto with balanced Fill flash
- Autofocus: Auto-area AF

Sports Scene Mode

Since sports usually involve people and other subjects moving at a rapid pace, the Sports scene mode emphasizes faster shutter speeds. Its icon is a person who is running (figure 8.22). Since you certainly don't want slow shutter speeds at a car race or air show, the camera will attempt to use the fastest shutter speed that the light



Figure 8.22 – Sports SCENE mode



will allow, and it will open up the aperture to keep the exposure reasonable. Expect a shallow depth of field in Sports mode. This mode is similar to using shutter-priority mode (S), but you have less control over specific shutter speeds. Autofocus is in continuous-servo mode because sports are constantly in motion. The camera uses the following settings in Sports scene mode:

- Picture Control: Standard (SD)
- White balance: Auto1
- Sharpening: Auto
- Contrast: 0
- Brightness: 0
- Saturation: Auto
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Single-point AF with Continuous-servo AF

Close Up Scene Mode

Another name for the Close up scene mode might be flower mode or even macro mode. Its icon is a flower (figure 8.23). It's designed to let you to take closeup

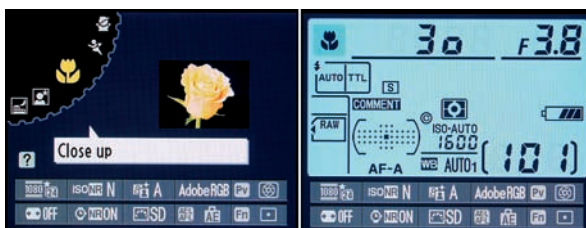


Figure 8.23 – Close up SCENE mode

pictures of flowers, insects, and other small items. It's difficult for me to tell what this mode emphasizes. If anything, it seems a bit neutral and tries to balance a shutter speed that is fast enough to cut down on camera shake while providing enough depth of field to give your subject a chance for sharp focus. It acts somewhat like programmed auto mode (P). After focus is acquired, it locks on your subject. The camera uses the following settings in Close up scene mode:

- Picture Control: Standard (SD)
- White balance: Auto1
- Sharpening: Auto
- Contrast: 0
- Brightness: 0
- Saturation: 0
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Auto with balanced Fill flash
- Autofocus: Single-point AF with Single-servo AF



Night Portrait Scene Mode

The Night portrait scene mode is also a bit difficult for me to interpret. It acts somewhat similar to Close up scene mode in that it tends to use



Figure 8.24 – Night portrait SCENE mode

medium apertures and shutter speeds. Its icon looks like a small man with a star on the right side of his head and is surrounded by a square frame (figure 8.24). The mode seems to follow these rules: if a person is shooting handheld at night, it is best to try to balance the shutter speed and aperture so that the shutter speed stays fast enough to handhold the camera while the aperture is open as much as possible to let in as much light as possible. It seems to emphasize large apertures more than faster shutter speeds. The camera uses the following settings in Night portrait scene mode:

- Picture Control: Portrait (PT)
- White balance: Auto2 (warm colors)
- Sharpening: Auto
- Contrast: 0
- Brightness: 0
- Saturation: 0
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Auto with Slow sync
- Autofocus: Auto-area AF

Night Landscape Scene Mode

This mode is designed to use with a tripod for landscape exposures at night. If you want to shoot a cool moonlight landscape or a city view at night, this is the mode for you. Its icon is a building with a crescent moon (figure 8.25).

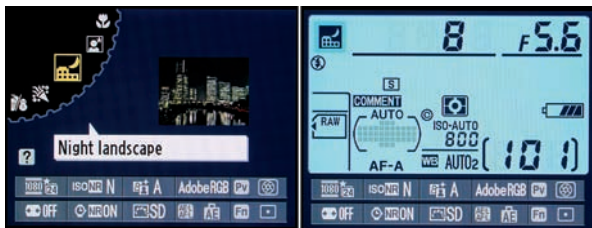


Figure 8.25 – Night landscape SCENE mode

When it's dark outside the camera uses longer exposures, higher ISO sensitivity, and noise reduction to keep noise from being a big problem. Since various light sources have different colors, the camera tries to “reduce . . . unnatural colors,” according to Nikon. The pop-up flash and the focus assist light are disabled. The camera will still fire an accessory shoe mounted flash in case you want to use flash for special effects or fill light.



The camera uses the following settings in Night landscape scene mode:

- Picture Control: Standard (SD)
- White balance: Auto2 (warm colors)
- Sharpening: Auto
- Contrast: 0
- Brightness: 0
- Saturation: 0
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Auto-area AF

Party/Indoor Scene Mode

Party/indoor scene mode balances the use of your fill flash and ambient background lighting and adds red-eye reduction. Its icon is



Figure 8.26 – Party/indoor SCENE mode

a short vuvuzela (horn) with confetti and bubbles (figure 8.26). This scene mode tries to overcome the look of too-bright people and dark backgrounds by allowing more background light to register on the sensor. It's great for shooting at events with people! Be careful if people are moving quickly because this mode uses slower shutter speeds, most of the time around 1/60 second. This can cause ghosting if the subject is moving too quickly. The camera uses the following settings in Party/indoor scene mode:

- Picture Control: Standard (SD)
- White balance: Auto2 (warm colors)
- Sharpening: Auto
- Contrast: 0
- Brightness: 0
- Saturation: Auto
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Auto with balanced Fill flash + Red-eye reduction
- Autofocus: Auto-area AF



Beach/Snow Scene Mode

Beach/snow scene mode is optimized to work well with the often bright expanses of water, sand, or snow. Its icon is a beach scene and a snowman (figure 8.27). Use this mode when you are shooting by the ocean or when you're out enjoying a snowy day. It's a landscape mode, so it will intensify the colors and sharpen the image a little more than normal. The pop-up flash and focus assist light are disabled. The camera uses the following settings in Beach/snow scene mode:

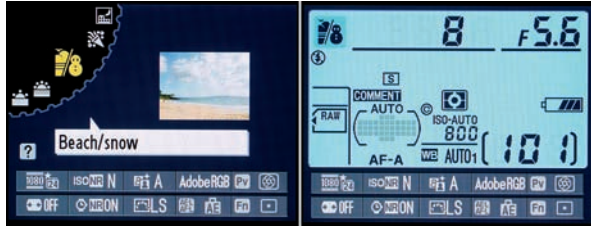


Figure 8.27 – Beach/snow SCENE mode

- Picture Control: Landscape (LS)
- White balance: Auto1
- Sharpening: +3
- Contrast: 0
- Brightness: 0
- Saturation: Auto
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Auto-area AF

Sunset Scene Mode

Sunsets often provide deep colors, so the Sunset scene mode is designed to emphasize them. Its icon is a horizon with a setting Sun (figure 8.28). This mode



Figure 8.28 – Sunset SCENE mode

uses smaller apertures and slower shutter speeds, so it may be best to use a tripod to keep from blurring the image from handheld camera shake. The pop-up flash and focus assist light are disabled. To provide nice sharp images it raises image sharpening. The camera uses the following settings in Sunset scene mode:

- Picture Control: Landscape (LS)
- White balance: Direct sunlight
- Sharpening: +3
- Contrast: 0
- Brightness: 0
- Saturation: Auto
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Auto-area AF



Dusk/Dawn Scene Mode

Dusk and dawn often have nice color in the sky and muted color elsewhere due to darkness, so Dusk/dawn scene mode saturates

the color a bit. Its icon looks like the Sunset scene mode icon except that the Sun has fewer rays (figure 8.29). This mode works like the Sunset mode, except that it uses a cooler white balance of 4450K (K stands for Kelvin, a system of color temperature degrees for color management. We'll discuss Kelvin and color management in the chapter titled **White Balance**).

Since light is so low at dusk and dawn you may want to use a tripod. The pop-up flash and focus assist light are disabled. The camera uses the following settings in Dusk/dawn scene mode:

- Picture Control: Landscape (LS)
- White balance: 4450K
- Sharpening: +3
- Contrast: 0
- Brightness: 0
- Saturation: Auto
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Auto-area AF



Figure 8.29 – Dusk/dawn SCENE mode

Pet Portrait Scene Mode

Pet portrait scene mode emphasizes faster shutter speeds to capture wiggling kittens and puppies. Its icon is a cat

(figure 8.30). The depth of field is shallow to better draw your attention to your pet. Color saturation and contrast is normally set to medium so your pet won't have abnormally strong colors. However, the camera retains the ability to increase saturation when there are colorful backgrounds or pet clothing. It also increases sharpening a little to bring out your pet's lovely fur and eyes (or beak, feathers, gills, claws, scales, etc.). Autofocus continually updates to keep up with a moving pet.

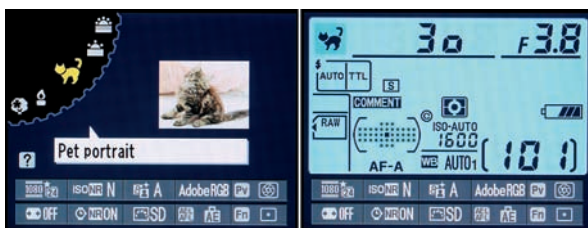


Figure 8.30 – Pet portrait SCENE mode



The camera uses the following settings in Pet portrait scene mode:

- Picture Control: Standard (SD)
- White balance: Auto1
- Sharpening: Auto
- Contrast: 0
- Brightness: 0
- Saturation: Auto
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Auto with balanced Fill flash
- Autofocus: Single-point AF with Continuous-servo AF

Candlelight Scene Mode

This mode is designed to get those delightful candlelight pictures at parties and for special effect shots. As expected, its icon is a candle lit with a flame (figure 8.31).

If you can, use a tripod because the shutter speed will be slow to compensate for the lack of light. The camera uses a medium-cool white balance of 4350K to balance against the warmer color of candlelight. A little extra sharpening is provided in case you shake the camera a little while shooting in the dim ambient light. The pop-up flash and focus assist light are disabled. When focus is acquired, it locks on your subject. The camera uses the following settings in Candlelight scene mode:

- Picture Control: Standard (SD)
- White balance: 4350K
- Sharpening: +2
- Contrast: 0
- Brightness: 0
- Saturation: 0
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Single-point AF with Single-servo AF



Figure 8.31 – Candlelight SCENE mode



Blossom Scene Mode

If you are a gardener or visit places with lots of flowers, you'll enjoy this mode. It tends to emphasize color saturation. The icon is a tree with a flower on the left side (figure 8.32).



Figure 8.32 – Blossom SCENE mode

Since you need a deeper depth of field when taking pictures of landscape flower blossoms (not closeups), the camera uses smaller apertures. Use a tripod if the ambient light is low. The pop-up flash and focus assist light are disabled. The camera uses the following settings in Blossom scene mode:

- Picture Control: Landscape (LS)
- White balance: Auto1
- Sharpening: +3
- Contrast: 0
- Brightness: 0
- Saturation: Auto
- Hue: -1
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Auto-area AF

Autumn Colors Scene Mode

Who doesn't love the beautiful reds, yellows, and oranges of autumn? Autumn colors scene mode tends to saturate the deep colors for lots



Figure 8.33 – Autumn colors SCENE mode

of snap. This mode's icon is a tree with a leaf on the right (figure 8.33). It uses smaller apertures to get a greater depth of field for those colorful landscape shots. If the light is low, use a tripod because the shutter speeds will be slow. The pop-up flash and focus assist light are disabled. The camera uses the following settings in Autumn colors scene mode:

- Picture Control: Vivid (VI)
- White balance: Auto1
- Sharpening: Auto
- Contrast: 0
- Brightness: 0
- Saturation: Auto
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Auto-area AF



Food Scene Mode

Food images should have nice color but not be overly saturated. Food scene mode uses medium color saturation and contrast to provide a natural look to food



Figure 8.34 – Food SCENE mode

images. Its icon is a fork and knife (figure 8.34). This mode emphasizes smaller apertures to provide enough depth of field to get most of the food in focus. You'll need to use a tripod if you are shooting food images in low light. The pop-up flash and the focus assist light are disabled. The camera uses the following settings in Food scene mode:

- Picture Control: Standard (SD)
- White balance: Auto1
- Sharpening: Auto
- Contrast: 0
- Brightness: 0
- Saturation: +1
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Single-point AF with Single-servo AF

Silhouette Scene Mode

When you take a picture of a silhouette, your subject is dark and the background is well lit. Silhouette scene mode is not for taking pictures of someone standing in

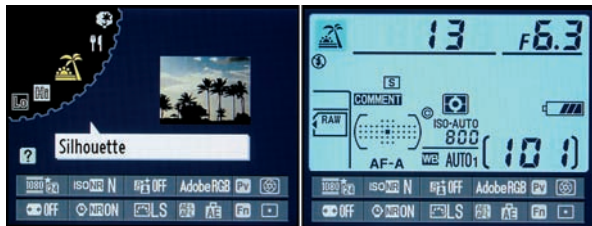


Figure 8.35 – Silhouette SCENE mode

front of a window, since the camera disables the pop-up flash (use Portrait or Night portrait scene mode for that). Instead, use this mode to take pictures of interesting foreground objects—like trees—silhouetted against a beautiful sunset or sky. Its icon is a sunset with a palm tree (figure 8.35). The focus assist light is disabled. When focus is acquired, it locks on your subject.



The camera uses the following settings in Silhouette scene mode:

- Picture Control: Landscape (LS)
- White balance: Auto1
- Sharpening: Auto
- Contrast: +3
- Brightness: 0
- Saturation: 0
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Single-point AF with Single-servo AF

High Key Scene Mode

High key imagery is deliberately overexposed slightly to give a very bright look to the image. The image almost seems to shine with extra light, to the point

that some highlight detail is lost. Its icon is the word Hi (figure 8.36). High key scene mode is often used with white subjects on white backgrounds for a bright, dreamy effect. The contrast is lowered slightly to save some highlights, and the brightness is raised automatically. The pop-up flash and focus assist light are disabled. When focus is acquired, it locks on the subject. The camera uses the following settings in High key scene mode:

- Picture Control: Standard (SD)
- White balance: Auto1
- Sharpening: Auto
- Contrast: -1
- Brightness: +1
- Saturation: 0
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Single-point AF with Single-servo AF

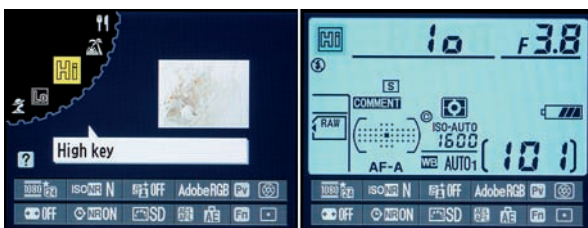


Figure 8.36 – High key SCENE mode



Low Key Scene Mode

Low key photography is all about the highlights. Reflections from shiny subjects do well as low key subjects. Its icon is the word Lo (figure 8.37).

Use Low key scene mode

when you desire the effect where most of the subject is dark and somber looking, with highlights preserved. The camera raises contrast to deepen the shadows and automatically lowers the brightness. Since the light is low, it's a good idea to use a tripod when shooting in this mode. The color saturation is set to medium, since dark images often do not emphasize color. The pop-up flash and focus assist light are disabled. When focus is acquired, it locks on the subject. The camera uses the following settings in Low key scene mode:

- Picture Control: Standard (SD)
- White balance: Auto1
- Sharpening: Auto
- Contrast: +1
- Brightness: -1
- Saturation: 0
- Hue: 0
- ISO sensitivity: Auto
- Active D-Lighting: Auto
- Built-in Flash: Disabled (external flash optional)
- Autofocus: Single-point AF with Single-servo AF

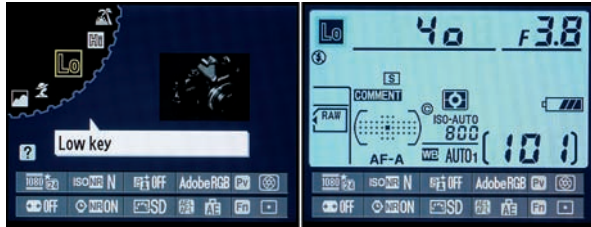


Figure 8.37 – Low key SCENE mode

Using the Help System While in Scene Modes

If you find yourself unsure of what a certain scene mode does, you can use the help system to get a short tutorial on the mode. Simply select one of the scene modes (as shown previously), and when the scene mode selection screen or Information display is showing, press and hold the WB/help/protect button (red arrow in figure 8.38). A screen

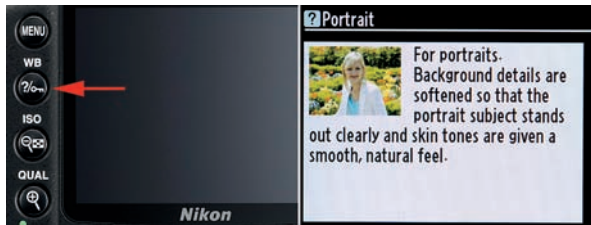


Figure 8.38 – Help system

will show on the Monitor with information about the current scene mode. I had Portrait mode selected when I pressed the WB/help/protect button to create this figure.



U1 and U2 User Settings

The user modes U1 and U2 on the Mode dial are used to allow you to make adjustments to many of the camera's settings and then save them under U1 or U2. You'll need to configure your camera's settings (see the upcoming list) and then use Setup Menu > Save user settings > U1 (or U2) to save the configuration for that specific user setting. Please refer to the chapter titled **Setup Menu** and the heading called **Save User Settings** to see the steps to save a user setting.



Figure 8.39 – U1 and U2 user settings

Later you can recall your settings by selecting U1 or U2 from the Mode dial. The following is a list of items that can be saved to a user setting:

- Adjustments to one of the shooting modes (P, S, A, M, SCENE, Auto) per user setting, including aperture (modes A and M) and shutter speed (modes S and M)
- Exposure and flash compensation (+/- EV settings)
- Flash mode (Front curtain, Rear curtain, Slow sync, Fill flash, no flash, etc.)
- Focus point (currently active AF point)
- Metering mode (Matrix, Center-weighted, Spot)
- Focus modes (Single-servo, Continuous-servo, Auto-servo) for Viewfinder only
- AF-area modes (Single-point, Dynamic-area, Auto-area) for Viewfinder only
- Bracketing (Exposure, Flash, White balance, Active D-Lighting)
- Shooting Menu (16 of 21 settings; five settings are not saved!)
- Custom Setting Menu (48 settings)
- Live view mode and Movie mode settings controlled by the Custom Settings Menu or Shooting Menu (see Shooting Menu > Movie settings)

When you have saved your configuration of the listed items into a user setting, you can recall them into use by simply selecting U1 or U2 from the Mode dial. This allows you to set your camera up for two very specific purposes and switch to them quickly. It is very powerful!

My Recommendation: I set my user setting U1 for highest-quality NEF (RAW) shooting, and I use U2 for party JPEG shooting.



No Flash Mode

This setting, which I call the no flash mode, is basically the same as the AUTO setting we discussed before (figure 8.40). All shooting functions are controlled by the camera, rendering the D7000 a large, fully-automatic point-and-shoot camera. The only difference between this setting and AUTO is that the flash is disabled. Otherwise, everything works the same. See the previous section called **Auto Exposure Mode** earlier in this chapter.



Figure 8.40 – No flash mode

Section 3 – Histogram

Back in the good old film days we didn't have histograms, so we had to depend on our experience and light meter to get a good exposure. Since we couldn't see the exposure until after we had left the scene, we measured our success by the number of correctly exposed images we were able to create. With the exposure meter/histogram combination found in the D7000, and the ability to zoom in to our images with the high-resolution Monitor on the back, our success rate is much higher than ever before.

The histogram can be as important, or even more so, than the exposure meter. The meter sets the camera up for the exposure, and the histogram verifies that the exposure is a good one.

If your exposure meter stopped working, you could still get perfect exposures using only the histogram. In fact, I gauge my efforts more by how the histogram looks than anything else. The exposure meter and histogram work together to make sure you get excellent results from your photographic efforts.

Figure 8.41 shows the D7000's two histogram screens. The screen on the left is called the RGB histogram screen, and it shows a series of histograms. On the top is a luminance histogram, followed by the red, green, and blue (RGB) channels. The screen on the right shows the luminance (white) histogram beside a small picture. It works the same; it just looks a little different.



Figure 8.41 – The two histogram screens



If your camera does not display the RGB histogram shown in [figure 8.41](#), you'll need to select the check box found at Playback Menu > Display mode > RGB histogram. This setting enables or disables the RGB histogram screen.

The luminance histogram is one of the camera's main screens and can always be called into use. Both the RGB histogram and luminance histogram screens are available by scrolling up or down with the Multi Selector when you have a picture displayed on the camera's Monitor. Now, let's discuss histograms in detail.

Understanding the Histogram

Using your D7000's histogram screens will guarantee you a much higher percentage of well-exposed images. It is well worth spending time to understand the histogram. It's not as complicated as it looks.

I'll cover this feature with enough detail to give you a working knowledge of how to use the histogram to make better pictures. If you are deeply interested in the histogram, there is a lot of research material available on the Internet. Although this overview is brief, it will present enough knowledge to improve your technique immediately.

Light Range

The D7000's sensor can record only a certain range of light values—about 5 to 7 usable EV steps. Unfortunately, many of the higher-contrast subjects we shoot can contain over 12 stops of light values. This is quite a bit more than you can capture in a single exposure. It's important to understand how your camera records light so you can better control how the image is captured.

The gray rectangular area in [figure 8.42](#) represents an in-camera histogram.

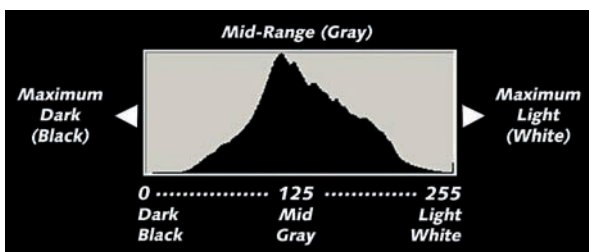


Figure 8.42 – A basic histogram

Examine it carefully! Think about it for a minute before reading on.

The histogram is basically a graph of 256 steps that represents the maximum range of light values your camera can capture (0 = pure black

and 255 = pure white). In the middle of the histogram are the midrange values that represent middle colors like grays, light browns, and greens. The values from just above zero and just below 255 contain detail.



The actual histogram looks like a mountain peak, or a series of peaks, and the more there is of a particular color, the taller the peak.

In some cases the graph will be rounder on top, and in other cases it will be flattened.

The left side of the histogram represents the maximum dark values that your camera can record. The right side represents the maximum brightness values your camera can capture. On either end of the histogram the light values contain no detail. They are either completely black or completely white.

The height of the histogram (top of mountain peaks) represents the amount of individual colors. You cannot easily control this value in-camera, other than changing to a Picture Control with more or less saturated color, so it is for your information only.

We are mostly concerned with the left- and right-side values of the histogram, since we do have much greater control over those (dark versus light).

Simply put, the histogram's horizontal scale is related to the darkness and lightness of the image, and the vertical scale of the histogram (valleys and peaks of the mountains) has to do with the amount of color information.

The left (dark) and right (light) directions of the horizontal scale are very important for your picture taking. If the image is too dark, the light values will be clipped off on the left side; if it's too light, the light values will be clipped off on the right side. This will become easier to understand as we look at well-exposed and poorly exposed images. Check out the Histogram Basic Tutorial in figure 8.43, and then we'll look at the histogram in more detail.

When you see the three histograms next to each other, does it make more sense? See how the underexposed histogram is all the way to the left of the histogram window and is clipped midpeak? Then

note how both edges of the well-exposed histogram just touch the horizontal edges of the histogram window. Finally, notice how the overexposed histogram is crammed toward the right and clipped. Now, let's look at some histogram details.

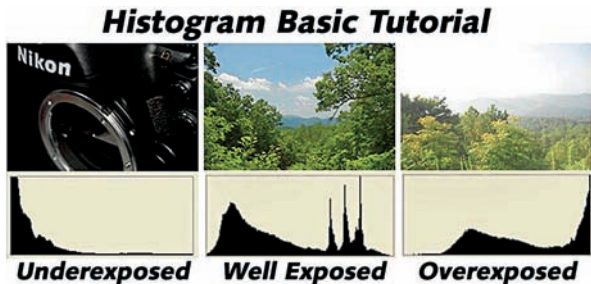


Figure 8.43 – Three histograms: underexposed, correctly exposed, and overexposed



Histogram Shape

Look at the image in [figure 8.44](#). It is well exposed with no serious problems. The entire light range of this particular image fits within the histogram window, which means that it's not too light or too dark and will need very little or no adjustment to view or print.

It contains no more than 4 or 5 stops (EV steps) of light. To finalize the image, I might increase the brightness in the trees a little, but otherwise it's a sound image with potential for immediate usage.

Compare the histogram in [figure 8.44](#) to the histogram in [figure 8.45](#). Notice that the histogram in [figure 8.44](#) is not crammed against the dark value side (left side) like



Figure 8.44 – Good image with normal histogram shape, no clipping

the histogram in [figure 8.45](#). In other words, the dark values in [figure 8.44](#) are not clipped on the left. This means that the camera recorded all the dark values in this image, with no loss of shadow detail.

Now look at the right side of the histogram in [figure 8.44](#) and note that it is not completely against the light value

side (right side), although it is quite close. The image contains all the available light values. Everything between the right and left sides is exposed quite well, with full detail. A histogram does not have to cover the entire window for the exposure to be correct. When there is a very limited range of light, the histogram may be rather narrow.

The image in [figure 8.44](#) is a relatively bland image with smooth gradations of tone, so it makes a smooth mountain-shaped histogram. This will not occur every time, since most images contain quite a bit more color information. Each prominent color will be represented with its own peak on the histogram. The most prominent colors will have higher peaks, and the less prominent colors will have lower or no peaks.

As we progress into images with more color or light information, we'll see that the corresponding histograms look quite different.



Look at the image in [figure 8.45](#). This image exceeds the range of the camera's digital sensor. Notice that, overall, this image is dark and looks underexposed. The histogram is crammed to the left and is clipped. There are no gradual climbs like on a mountain range, from valley to peak and back



Figure 8.45 – Histogram showing underexposure (dark side)

to valley. Instead, the image shows up on the left side in midpeak. This is an underexposed image, and the histogram reflects that well.

The most important thing to understand when you see a histogram like the one in [figure 8.45](#), with part of the peak clipped off on the left, is that some or all of the image is significantly underexposed.

Now look at another image in [figure 8.46](#). In this image, a larger aperture was used and more light was allowed in. We can now see much more detail. But once again, the range of light is too great for the sensor, so it is clipped on the high-light side (right). The dark values (left side) are not clipped; instead, the graph extends to the left edge and stops before it is clipped.



Figure 8.46 – Histogram showing overexposure (light side)

The image in [figure 8.46](#) shows more detail but is not professional looking and will win no awards. The range of light is simply too great to be recorded fully. Many of the details are overly light, and that can be seen by the clipping of the histogram on the right side. The most important thing to remember is that when you see a histogram that is crammed all the way to the right and clipped, some or all of the image is significantly too light. Overall, a great deal of the image in [figure 8.46](#) is recorded as pure white and is permanently gone, or blown out.



It is important that you try to center the histogram without clipping either edge. This is not always possible, as shown in [figure 8.46](#), because the light range is often too great and the sensor or histogram window can't contain it. If you center the histogram, your images will be better exposed. If you take a picture and the histogram is shifted toward the left or right, you can retake the photograph and adjust the exposure.

If there is too much light to allow the histogram to be centered, you must decide which part of the image is more important—the light or dark values—and expose for those values.

How Does the Eye React to Light Values?

The D7000 camera, with its imaging sensor and glass lenses, is only a weak imitation of our marvelously designed eye and brain combination. There are very few situations in which our eyes cannot adjust to the available light range. So, as photographers, we are always seeking ways to record even a small portion of what our eyes and mind can see.

Since our eyes tend to know that shadows are black, and we expect that, it is usually better to expose for the highlights. If you see dark shadows, that seems normal. We're simply not used to seeing light so bright that all detail is lost. An image exposed for the dark values will look very weird because most highlight detail will be burned out.

Your eyes can see a huge range of light in comparison to your digital sensor. The only time you will ever see light values that are so bright that detail is lost is when you are looking directly at an overwhelmingly bright light, like the sun. In a worst-case scenario, expose the image so the right side of the histogram just touches the right side of the histogram window, and the image will look more normal.

Since photography's beginning, we have always fought with being able to record only a limited range of light. But with the digital camera and its histogram, we can now see a visual representation of the light values. We can immediately review the image, reshoot it with emphasis on lighter or darker values, or see that we must use a filter or multiple-exposure high dynamic range imaging (HDRI) to capture it at all.

Computer Adjustment of Images

Looking at the image in [figure 8.47](#), taken in midday with overhead sunshine, we see an example of a range of light that is too great to be captured by a digital sensor but is exposed in such a way that we can get a usable photo later.

Notice how the dark values are clipped and the dark detail is lost. But look to the right side of the histogram and notice how the light values are not clipped. The camera recorded all the light values but lost some dark values.

Since our eyes see this as normal, this image looks okay. If we were standing there



looking at the cabin ourselves, our eye would be able to see much more detail in the front porch area. But the camera just can't record that much light range. If we want to get a bit more detail in the shadows than this image seems to contain, we can do it. Normally, a camera does not give us enough control to add light values on the fly, so we use the histogram to get the best possible exposure and then adjust the image later in the computer. Some cameras can be profiled to capture light ranges more effectively in one direction or the other, but when you push one area, the opposite area must give. So we need a way to take all this light and compress it into a more usable range.



Figure 8.47 – Cabin picture and histogram with correct exposure but dark shadows

We are now entering the realm of post-processing, or in-computer image manipulation. Look at the image in figure 8.48. This is the same image as [figure 8.47](#), but it has been adjusted in Photoshop to cram more image detail into the histogram by compressing the midrange values. Notice that the entire histogram seems to be farther right, toward the light side. Also notice that the midrange peaks are basically gone. We removed a good bit of the midrange, but since there was already a lot of midrange there, our image did not suffer greatly.



Figure 8.48 – Post-processed cabin picture and its histogram

How this computer post-processing was done is outside the scope of this book, but it is not very difficult. Buy a program like Nikon Capture NX 2, Photoshop, Photoshop Elements, Lightroom, or another fine graphics program designed for photographers. Your digital camera and your computer are a powerful imaging



combination—a digital darkroom, where you are in control from start to finish, from clicking the shutter to printing the image. Retreating from philosophy, let's continue with our histogram exploration.

Notice in [figure 8.48](#) that the histogram edge is just touching the highlight side of the histogram window. It is slightly clipped, and you can see the slightly blown out area on the peak of the cabin's roof. Sometimes a very small amount of clipping does not seriously harm the image.

The photographer must be the judge. The greater apparent detail in this image is the result of compressing the midrange of the light values a bit in the computer. If you compress or make the midrange light values smaller, that will tend to pull the dark values toward the light side and the light values toward the dark side, so you will have more apparent detail in your image. It's like cutting a section out of the middle of a garden hose. If you pull both of the cut ends together, the other two ends of the hose will move toward the middle, and the hose will be shorter overall. If you compress or remove the midrange of the histogram, both ends of the graph will move toward the middle. If one end of the graph is beyond the edge of the histogram window (clipped), it will be less so when the midrange is compressed.

We are simply trying to make the histogram fit into the frame of its window. We can cut out some of the middle to bring both ends into the window because there is usually plenty in the middle to cut out, so the image rarely suffers. Remember, this is done outside of the camera in a computer. You can't really control the in-camera histogram to compress values, but you need to be aware that it can be done in a computer so that you can expose accordingly with your camera's histogram. Then you will be prepared for later post-processing of the image. Now that we have compressed the midrange values, [figure 8.48](#) more closely resembles what our eye normally sees, so it looks more normal to us.

In many cases, your progression from the shooting site to your digital darkroom can benefit if you shoot NEF (RAW) images. A RAW digital image contains an adjustable range of light. With a RAW image you can use controls in Capture NX2, Photoshop, or even the basic Nikon ViewNX 2 software included with the D7000 to select from the range of light within the big RAW image file. It's like moving the histogram window to the left or right over all that wide range of RAW image data. You select a final resting place for the histogram window, capture the underlying RAW data, and your image is ready for use.

This is a serious oversimplification of the process, but I hope it is more understandable. In reality, the digital sensor records a wider range of light than you can use in one image. Although you might be able to use about five stops of light in a normal image, the digital sensor probably records about seven stops of light. Although you can't get all of that range into the final image, it is there in the RAW file as a selectable range. I prefer to think of it as a built-in bracket, since it works the same way.



This bracketed light range within the image is present to a very limited degree in JPEG, but it is more pronounced in pure RAW images. That is why many people choose to shoot in RAW mode instead of JPEG.

My Recommendation: As you know by now, the Nikon D7000 has a Multi Selector that can be pressed right or left to scroll through the images you have already taken. You can also press the Multi Selector up or down to scroll through the various informational screens, such as the histogram display. When you take a picture of an important subject, find the histogram view of your image. If you can't find the screen with multiple histograms, as shown in [figure 8.41](#), see the Playback Menu > Display mode and select RGB histogram.

Your camera meter should be used to get the initial exposure only. Then you can look at the histogram to see if the image's light range is contained within the limited range of the sensor. If it is clipped to the right or the left, you may want to add or subtract light with your Exposure compensation button or use Manual mode. Expose for the light range with your histogram. Let your light meter get you close, then fine-tune with the histogram.

There are also other Monitor viewing modes that you can use along with the histogram, such as the Highlights (blink) mode for blown-out highlights (see the Playback Menu > Display mode and select Highlights). This mode will cause your image to blink from light to dark in the blown-out highlight areas. This is a rough representation of a highlight-value clipped histogram, and it is quite useful for quick shooting. Using your camera's light meter, histogram, and the highlight burnout blinky mode together is a very powerful method to control your exposures.

If you master this method, you will have a very fine degree of control over where you place the light range of your images. This is sort of like using the famous Ansel Adams black-and-white Zone System, but it is represented visually on the Monitor of your D7000.

The manipulation of the histogram levels in-computer is a detailed study in itself. It's part of having a digital darkroom. Learn to use your computer to tweak your images, and you'll be able to produce superior results most of the time. Even more importantly, learn to use your histogram to capture a nice image in the first place!

Your histogram is simply a graph that lets you see at a glance how well your image is contained by your camera. If it's too far left, the image is too dark; if it's too far right, the image is too light. Learn to use the histogram well and your images are bound to improve!

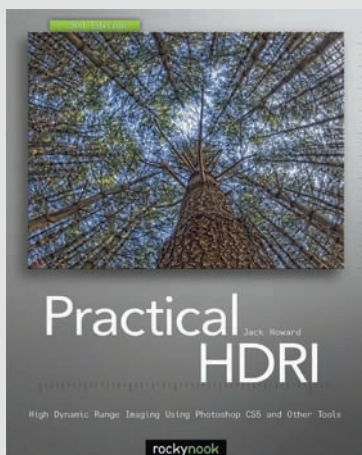


High Dynamic Range Imaging (HDR or HDRI)

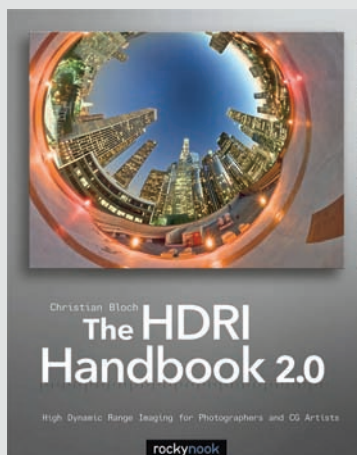
Besides post-processing a single image in your computer to try and make its full range of light fit in the histogram window—as shown in [figure 8.48](#)—you can use a different method called High Dynamic Range Imaging (HDR or HDRI). This type of imaging can vastly expand the dynamic range of your pictures by allowing you to take multiple shots of the same subject at different exposures, and then combine them into one image with huge dynamic range ([figure 8.49](#)).

You will use the AE Bracketing method discussed in the chapter titled **Custom Setting Menu**, under the heading **e5Auto Bracketing Set** and subheading called **Steps to Use AE and/or Flash Bracketing**.

If you want to learn more about this topic, check out these other books from Rocky Nook:



Practical HDRI, 2nd Edition, by
Jack Howard
ISBN: 978-1-933952-63-5
August 2010



The HDRI Handbook 2.0, by
Christian Bloch
ISBN: 978-1-933952-57-4
November 2011

High Dynamic Range Imaging (HDR or HDRI) is a very interesting subject. It seriously extends the capability of your camera for certain types of subject matter. You can take pictures using HDR techniques that otherwise would be nearly impossible to capture. While it doesn't work well for moving subjects because multiple exposures are involved, it can be wonderful for scenic shots of nearly any type. See Nikonian José A.S. Diniz's image in [figure 8.49](#) as an example.





Figure 8.49 – © José A. S. Diniz: “HDR image on this year’s first sunset, taken on the sea shore in Estoril, Portugal. The three composing pictures were shot with the Nikon D7000 and Nikkor 35mm f/1.8 lens, and post-processed in Adobe Lightroom and Nik HDR Pro software. Exposure was centered around 1/80 sec, aperture f/4.5 and ISO 100, and the shots were made using the camera’s auto-bracketing function (-2, 0, +2) and high-speed burst shooting mode.”

In [figure 8.49](#) is a sample high dynamic range image taken by Nikonian José A. S. Diniz (*jadiniz*). The caption gives his description of the incredible image and explains how it was created—by combining three HDR images into one magnificent fine-art landscape picture that anyone would love to have gracing their wall.

My Conclusion

This camera certainly gives you a lot of choices on light meters and exposure modes. You can start using this camera at whatever level of photographic knowledge you have. If you are a beginner, use the AUTO and SCENE modes. If you want to progress into partial automation, use one of the P, S, or A modes. And if you are a dyed-in-the-wool imaging fanatic, use the M mode for full manual control of the camera. You have a choice with the D7000!

The next chapter is about a subject of great importance to digital photographers—white balance (WB). Understanding WB gives you an edge over other photographers. Learning about the histogram and white balance will place you in a spot occupied by relatively few people. When you have mastered those two subjects and learned about color spaces, you will indeed be an advanced digital photographer.





White Balance



Yamaha Piano HDR – Courtesy of Marcel Carey (*mcplanoca*)



Back in the good old days photographers bought special rolls of film or filters to meet the challenges of color casts that come from indoor lighting, overcast days, or special situations.

The D7000's method for balancing the camera to the available light comes with the white balance (WB) controls. Fortunately, the D7000's Auto white balance settings does a great job for general shooting. However, discerning photographers learn how to use the white balance controls so they can achieve color consistency in special situations.

How Does White Balance (WB) Work?

(User's Manual – Page 117)

Normally white balance is used to adjust the camera so that whites are truly white and other colors are accurate under whatever light source you are shooting in. You can also use the white balance controls to deliberately introduce color casts into your image for interesting special effects.

Camera WB color temperatures are exactly backwards from the Kelvin scale we learned in school for star temperatures. Remember that a red giant star is cool, while a blue/white star is hot. The WB color temperatures are backwards because the WB system adds color to make up for a deficit of color in the original light of the subject.

For instance, under a fluorescent light, there is a deficit of blue, which makes the subject appear greenish yellow. When blue is added, the image is balanced to a more normal appearance.

Another example might be shooting on a cloudy, overcast day. The cool ambient light could cause the image to look bluish if left unadjusted. The white balance control in your camera sees the cool color temperature and adds some red to warm the colors a bit. Normal camera white balance on a cloudy, overcast day might be about 6000K.

Just remember that we use the real Kelvin temperature range in reverse and that red colors are considered warm and blue colors are cool. Even though this is backwards from what we were taught in school, it fits our situation better. To photographers, blue seems cool and red seems warm! Just don't let your astronomer friends convince you otherwise.

White Balance Fundamentals

Understanding WB in a fundamental way is simply realizing that light has a range of colors that go from cool to warm. We can adjust our cameras to use the available light in an accurate and neutral, balanced way that compensates for the actual light source. Or we can allow a color cast to enter the image by unbalancing the settings.



In this chapter, we will discuss this from the standpoint of the D7000's camera controls and how they deal with WB.

Color Temperature

(User's Manual – Pages 118, 122)

The D7000 WB range can vary from a very cool 2500K to a very warm 10,000K. [Figure 9.1](#) shows the same picture adjusted in Photoshop, with the use of photo filters, to three WB settings. Notice how the image in the center is about right; the image on the left is cooler (bluish cast) and the image on the right is warmer (reddish cast).

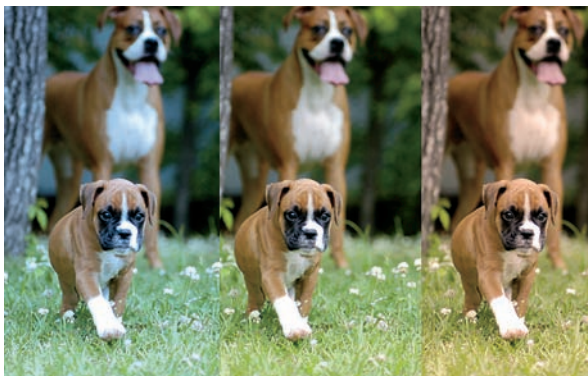


Figure 9.1 – Same image with three different WB settings

The same adjustments we made with film and filters can now be achieved with the white balance settings built into the D7000. To achieve the same effect as daylight film and a warming filter, simply select the Cloudy white balance setting while shooting in normal daylight. This sets the D7000 to balance at about 6000K, which makes nice warm-looking images. If you want to really warm the image up, choose the white balance called Shade, which sets the camera to 8000K. Or you could set the D7000's white balance to Auto2, which warms up the colors and automatically adjusts for current light sources.

On the other hand, if you want to make the image appear cool or bluish, try using the Fluorescent (4200K) or Incandescent (3000K) settings in normal daylight.

Remember, the color temperature shifts from cool values to warm values. The D7000 can record your images with any color temperature from 2500K (very cool or bluish) to 10,000K (very warm or reddish) and any major value in between. There is no need to carry different film emulsions or filters to deal with light color range. The D7000 has very easy-to-use color temperature controls and a full range of color temperatures available.



There are two separate methods for setting the white balance on the D7000:

- **Method 1** – Manual WB using the WB button and selecting options
- **Method 2** – Manual WB using the Shooting Menu and selecting options

We'll consider each of these techniques since you may prefer to use different methods according to the amount of time you have to shoot and the color accuracy you want. Many critical photographers use method 2 to select the PRE method from the Shooting Menu and measure the color of the ambient light with a white or gray card.

Understanding Mired

Often in this chapter I will talk about adjusting white balance in mired increments. Please refer to the sidebar What Is Mired? for technical information on how a mired value is determined.

What Is Mired?

Mired is a word that stands for micro reciprocal degree. It is a unit of measurement used to express color temperature value differences. It is based on a just-noticeable difference between two light sources and founded on the difference of the reciprocal of their Kelvin color temperatures (not the temperatures themselves). The use of mired values dates back to 1932 when Irwin G. Priest invented the method. It is based on a mathematical formula, as follows: $M = 1,000,000 / T$, where M is the desired mired value and T is the color temperature in degrees Kelvin. Most of us don't need to be concerned about understanding mired. Just realize that it means a visual difference between color values.

Method 1 – Manual White Balance Using the WB Button

(User's Manual – Page 117)

Sometimes you might want to control the WB in a totally manual way. This method and the next method are basically the same thing, except this method configures the WB using a button and dial and the other uses the camera's menu system.

Each of these methods will allow you to set a particular WB temperature. If you want your image to appear cool, medium, or warm, you can set the appropriate color temperature, take the picture, and then look at the image on the Monitor.



Figure 9.2 shows the external camera controls used to adjust WB. Later figures in this chapter will refer to figure 9.2 as a means to select a white balance type. Usually, they will only show the Control panel screen (figure 9.2, image 3), assuming that you will remember the controls shown in figure 9.2, images 1 and 2 (WB button and Main command dial). Examine figure 9.2 and the following steps carefully until it makes sense to you.



Figure 9.2 – Manual white balance controls

Here is how to manually choose a WB type using the WB button, Main command dial, and Control panel:

1. Press and hold the **WB button** (WB/protect/help) near the top left of your D7000's **Monitor**, just below the **MENU button** (figure 9.2, image 1, red arrow).
 2. Rotate the **Main command dial** (figure 9.2, image 2, red arrow).
 3. The symbols in the following list will appear one at a time on the **Control panel** (figure 9.2, image 3, red arrow). Each click of the dial will change the display to the next WB setting. These symbols, options, and their Kelvin values are as follows:
- **AUTO** Auto White Balance – 3500K to 8000K (A on Control panel)
 - Incandescent – 3000K
 - Fluorescent – 2700K to 7200K
 - Direct Sunlight – 5200K
 - Flash – 5400K
 - Cloudy – 6000K
 - Shade – 8000K
 - K – Choose your own color temperature from 2500K to 10,000K
 - **PRE** PRE (Preset manual) – Use to measure WB for the actual ambient light. If no measurement is taken, the value used is whatever was last stored in white balance memory location d-0.

Manually Selecting a Color Temperature between 2500K and 10,000K

(User's Manual – Page 122)

The K selection on the Control panel is flexible and allows you to manually select a WB value between 2500K and 10,000K. Here are the steps to select a specific Kelvin (K) white balance value:

1. Select the **K** symbol on the **Control panel** by holding down the **WB button** and rotating the rear **Main command dial** (figures 9.2 and 9.3).
2. While still holding down the **WB button**, rotate the front **Sub-command dial** to select the actual WB Kelvin temperature you desire (2500K to 10,000K). In figure 9.3, I used the front **Sub-command dial** to select **5000K**.



Figure 9.3 – Manually selecting a WB value

When you have selected an exact white balance temperature, all images you shoot from that point forward—until you change to another WB—will have that setting. You can have very consistent white balance from image to image by using this method. For in-studio product shoots, or in any circumstance where you need a constant white balance, this is a desirable function.

Measuring Actual Ambient Light by Using PRE

This method allows you to measure ambient light values and set the camera's WB. It's not hard to learn and is very accurate since it's an actual through-the-lens measurement of the source light's Kelvin temperature.

You'll need a white or gray card to accomplish this measurement. Figure 9.4 shows the



Figure 9.4 – Michael Tapes Design – WhiBal cards

popular WhiBal white balance reference cards, which are available for purchase at <http://mtapesdesign.com/whibal>. The WhiBal cards come in various sizes, several that will easily fit in your pocket or camera bag—and even one for your keyring.



Here's how to select the PRE white balance measurement method:

1. Press and hold the **WB button** (figure 9.2).
2. Rotate the **Main command dial** until **PRE** shows in the lower-right of the **Control panel** (figures 9.2 and 9.5). You'll also see **d-0** in the top of the **Control panel** in figure 9.5.
3. Release the **WB button**.
4. Press and hold the **WB button** again until **PrE** (with a lowercase r) starts flashing on the **Control panel**.
5. Point the camera at a white or neutral gray card in the light source under which you will be taking pictures. It does not have to focus on the card; it can just be pointed at the card so it fills the frame.
6. Press the **Shutter-release button** fully, as if you were photographing the card. The shutter will fire, but nothing will appear on the **Monitor**.
7. Check the **Control panel** to see if **Good** is flashing. If you see *no Gd* flashing (instead of *Good*), the operation was *not* successful. Your available light may not be bright enough to take an accurate reading. If *Good* is flashing, the **PRE** white balance measurement was successful.



Figure 9.5 – PRE white balance measurement method

The PRE measurement is very sensitive because it uses the light coming through the lens to set the WB. Unless you are measuring in an extremely low-light level, it will virtually always be successful.

In step 2, I mentioned that **d-0** appears in the top-left corner of the **Control panel** during a WB measurement (figure 9.5). This **d-0** is where the current WB value is stored. There are four other memory locations, **d-1** to **d-4**, which you can use to store WB values you regularly use. Later, you can copy a value stored in **d-1** to **d-4** back into **d-0**.

Storing White Balance Values for Future Use

If you have previously used the manual measured PRE method to set the WB, you will already have a value in WB memory location **d-0**. You can keep up to five WB values stored in your D7000. In location **d-0** you'll find the current PRE WB, and in **d-1** through **d-4** you'll find any stored WB values. They appear as tiny images, as shown in figure 9.6. If there is nothing stored in **d-0** to **d-4**, there will be a blank spot above the number.

If you shoot under a certain light source on a frequent basis, such as in a studio, you may want to store one or more of your PRE white balance values in one of the four permanent storage areas in your camera (**d-1** to **d-4**).



I tried to enter a white balance PRE measurement directly into one of the d-1 to d-4 memory locations by selecting the location before doing the light measurement. However, my values did not show up in d-1 to d-4 but instead overwrote the value in d-0 each time. You may only copy a value from d-0 into one of the four storage locations. I suppose Nikon was concerned that people might accidentally overwrite a carefully prepared white balance setting, so it added a copy step between the measurement and long-term storage.

In effect, you may have up to five white balance values stored in your camera. One is the current temporary setting, and the other four are in memory for long-term use.

Figure 9.7 shows the steps used to copy the current white balance value from a PRE reading to one of the four memory locations. As you progress through

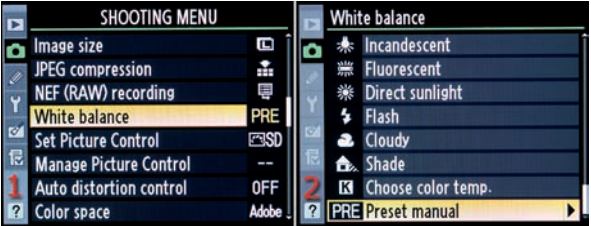


Figure 9.7 – Copying PRE values to memory locations

the steps, you'll see a visual representation of the stored WB values, where d-0 is a PRE measurement and d-1 to d-4 are WB values from previously taken images.

Here's how to save the current WB reading (d-0) to one of the memory locations from d-1 to d-4:

1. Use method 1 to obtain a PRE white balance reading. It will automatically be placed in memory location d-0.
2. Use the screens shown in figure 9.7 to start the WB maintenance process. Select White balance from the Shooting Menu screen and scroll to the right (figure 9.7, image 1).
3. Select Preset manual and scroll to the right (figure 9.7, image 2). Figure 9.8 begins where figure 9.7 leaves off.

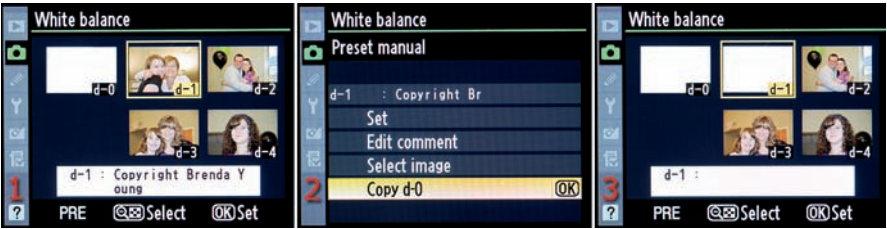


Figure 9.8 – Copying d-0 to d-1



4. Scroll to one of the memory locations d-1 to d-4 (I selected d-1 in [figure 9.8, image 1](#)).
5. Press the checkered [Thumbnail/playback zoom out button](#) to open the selection screen shown in [figure 9.8, image 2](#).
6. Scroll down to [Copy d-0](#) and press the [OK button](#). The camera will then write a copy of d-0 into the memory location you selected ([figure 9.8, image 3](#)).
7. The display will show that the PRE reading you took in step 1 has now been copied to d-1, overwriting the value that was previously in that location ([figure 9.8, image 3](#)). It is a solid white value because I took the reading from a white card.
8. Press the [OK button](#) to [Set](#) the value. [Figure 9.9](#) begins where [figure 9.8](#) leaves off.
9. The camera will now display the fine-tuning screen ([figure 9.9](#)) where you can modify the WB value. Simply move the little square toward a particular color in the color box. You can add tints (amber, blue, green, or magenta) to the WB setting you just stored in memory location d-1. This is entirely optional. When you are done, press the [OK button](#).

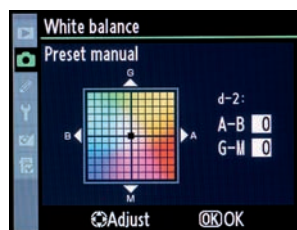


Figure 9.9 – WB Fine-tuning screen

We'll talk more about fine-tuning a white balance with the Shooting Menu in an upcoming section.

When you've written a WB value to one of the memory locations from d-1 to d-4, it will remain there for future use as needed. You can access any of the saved WB values by selecting PRE with the WB button and then rotating the Sub-command dial until you find the one you want (d-0 to d-4). Or you can use the Shooting Menu > White balance > Preset manual menu to directly select the numbered memory location.

Editing the Comment Field

As shown in [figure 9.10](#), you can edit (rename) the comment field of the memory location in which you just stored a White balance setting. Change the comment to something that will remind you of this WB setting's use.

The initial comment is a copy of the Setup Menu > Image comment field. If you edit the name and save it, you will have a better reminder of what type of WB setting this memory location offers. It will not overwrite the original picture's Image comment field.



Figure 9.10 – Editing the comment field

Here are the steps to edit the WB setting's comment field:

1. Select **White balance** from the **Shooting Menu** and scroll to the right (figure 9.10, image 1).
2. Choose **Preset manual** from the menu and scroll to the right (figure 9.10, image 2).
3. Select the memory location for which you want to edit the comment (figure 9.10, image 3) and press the **Thumbnail/playback zoom out** button. This will open the **Preset manual** menu.
4. Choose **Edit comment** from the menu and scroll to the right (figure 9.10, image 4).
5. The character-selection panel will now display (figure 9.10, image 5). Use the **Multi Selector** to navigate among the letters and numbers. Press the **OK** button to add a character to the name. To scroll through characters already in the new name, hold down the **Thumbnail/playback zoom out** button while navigating to the left or right with the **Multi Selector**. Press the **Delete** button to delete the current character. Press the **Playback zoom in** button to save the memory location comment.
6. The **White balance** memory location screen will now display, with the newly named memory location comment displayed (figure 9.10, image 6). I renamed memory location **d-3** to **Party Direct Flash** to signify that this white balance choice is useful for shooting with direct flash at a party.



Using the White Balance from a Previously Captured Image

You can also select a white balance setting from an image you have already successfully taken. The value from this image can be applied to the picture you are about to take, or it can be copied to memory locations d-1 to d-4 (using the function described previously) for later use.



Figure 9.11 – Using white balance from a previously taken image

Here are the steps to recover the White balance setting from an image stored on your camera's memory card:

1. Select **White balance** from the **Shooting Menu** and scroll to the right (figure 9.11, image 1).
2. Choose **Preset manual** from the menu and scroll to the right (figure 9.11, image 2).
3. Choose a memory location to save the WB from an existing picture. I chose **d-1** (figure 9.11, image 3). You must select **d-1** to **d-4**. You cannot use **d-0** for this operation.
4. Choose **Select image** from the **Preset manual** menu and scroll to the right (figure 9.11, image 4). **Select image** will be grayed out if there are no images on your current memory card.
5. You will now see the **Select image** screen (figure 9.11, image 5). Navigate through the available images until you find the one you want to use for white balance information. Press the **OK** button to select the image.
6. A small picture of the image will appear in your selected white balance memory location and is saved there for future use (figure 9.11, image 6). The white balance from that picture is now the white balance setting for the camera, until you change it.



Fine-Tuning White Balance

(User's Manual – Page 120)

If you want to fine-tune a certain white balance to have more amber or blue, you can use the camera's external WB controls to do it in mired steps. Using the Shooting Menu allows you to fine-tune not only amber and blue, but you can add green and magenta.

Fine-Tuning with External Controls

Basically, you select one of the white balance values provided by the camera and add amber or blue in 5-mired steps. You can add or subtract amber or blue in up to six steps—A1 to A6, or b1 to b6. That means you can change the color from a minimum of 5 mired to a maximum of 30 mired. Remember, a 1-mired step is equivalent to a barely perceptible change in color.

Here is how to add or subtract amber or blue from a Nikon-provided white balance value, using external camera controls:

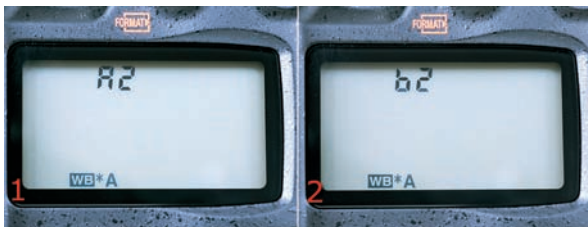


Figure 9.12 – Fine-tuning white balance with external controls

1. Press and hold the **WB button** and turn the rear **Main command dial** until you select a white balance value you would like to fine-tune (refer to [figure 9.2](#) for the location of the controls). In [figure 9.12](#) you can see the results of selecting a WB value; I selected auto (A) white balance.
2. While still holding down the **WB button**, turn the front **Sub-command dial** to the left for amber values (A1–A6) or to the right for blue values (b1–b6). Remember that each **Sub-command dial** click is a 5-mired value. In [figure 9.12](#) there are two **Control panel** screens showing the two color types that I selected (A2 and b2). Image 1 is two 5-mired steps additional amber, and image 2 is two 5-mired steps extra blue in the WB value.
3. Release the **WB button**, and you're ready to take pictures with your fine-tuned WB value. It stays fine-tuned until you change it back. You'll see a small asterisk next to the WB symbol on the **Control panel** (WB*) when you are using a fine-tuned WB value. You can see the asterisk in both images in [figure 9.12](#).

Unfortunately, fine-tuning is not an in-camera visual process. You'll need to examine the results of images taken with your new WB* value to determine if you like the results of your fine-tuning effort.



Fine-Tuning with the Shooting Menu

In addition to fine-tuning with the camera's external controls, you can use the Shooting Menu to fine-tune even more effectively. Instead of two colors (amber and blue), you can adjust four colors (amber, blue, green, and magenta).

If you want to fine-tune a previously saved White balance value, you can do it with the Set function. The value in any of the d-0 to d-4 memory locations can be manually changed. The color balance can be moved toward G-Green, A-Amber, M-Magenta, or B-Blue, or it can be moved toward intermediate combinations of those colors. Here are the steps to Set a new color balance.



Figure 9.13 – Fine-tuning white balance with Shooting Menu screens

Here are the steps used to fine-tune a white balance setting using Shooting Menu screens:

1. Select **White balance** from the **Shooting Menu** and scroll to the right (figure 9.13, image 1).
2. Choose **Preset manual** from the menu and scroll to the right (figure 9.13, image 2).
3. Use the **Multi Selector** to scroll to the **d-1** to **d-4** memory location you want to fine-tune (figure 9.13, image 3). Press the **Thumbnail/playback zoom out** button to select it.
4. Choose **Set** from the **Preset manual** menu and scroll to the right (figure 9.13, image 4).
5. Use the **Multi Selector** to **Adjust** the color balance (figure 9.13, images 5 and 6). Scroll around in the color box toward whatever color you want to add to the currently stored **White balance** (figure 9.13, image 6, red arrow). If you change your mind, return the little black square to the center of the color box. You'll see the color-mired values change on the right side of the screen in the fields



next to **A-B** and **G-M**. Each increment (click) of the **Multi Selector** is equal to about 5-mired steps.

6. Press the **OK button** to save your adjustments to the stored **White balance** (figure 9.13, image 6).

Method 2 – Manual White Balance Using the Shooting Menu

This method is similar to method 1, but it uses the Shooting Menu screens to select the Kelvin range. Instead of using the WB button and Sub-command dial, you'll open your menus and set the color temperature by selecting from them.

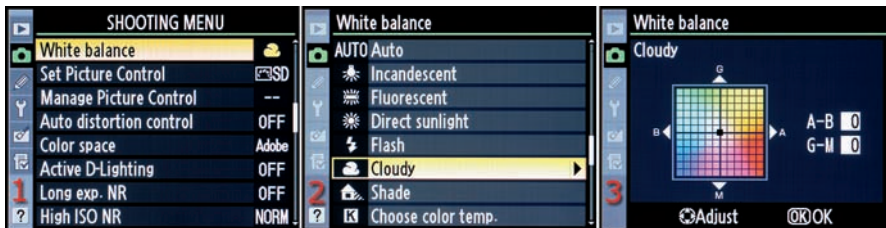


Figure 9.14 – Manual white balance with Shooting Menu screens

Here are the steps used to select a White balance setting:

1. Select **White balance** from the **Shooting Menu** and scroll to the right (figure 9.14, image 1).
2. Select one of the preset values, such as **Flash** or **Cloudy**, and scroll to the right (figure 9.14, image 2).
3. Press the **OK button** immediately, without moving the little square from its center position, unless you want to fine-tune the **White balance** setting (figure 9.14, image 3).

Normally you'll use only the first two screens in figure 9.14 to select one of the preset WB values, such as **Cloudy**, **Shade**, or **Direct sunlight**. Then you'll press the **OK button** on the final screen, without changing anything.

Note that the **Fluorescent** selection allows you to choose one of seven different light sources that cover a wide spectrum. It has an additional screen, as shown in figure 9.15.

If you choose to fine-tune any of the color temperature settings after you have

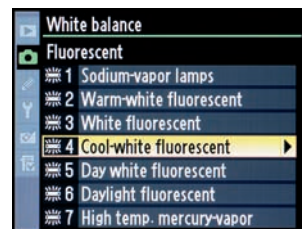


Figure 9.15 – Seven Fluorescent selections



selected one of the preset WB values, the color box in [figure 9.14, image 3](#), allows you to do so with mired clicks. Each press of the Multi Selector in a given direction is equal to 5-mired steps in that direction—up is green (G), down is magenta (M), left is blue (B), and right is amber (A).

If you aren't familiar with adjusting the preset's default color temperature, or if you don't want to change it (most people don't), then simply press the OK button without moving the little square from the center. If you've accidentally moved it, simply move it back with the Multi Selector until it's in the middle again, then press the OK button. That will select the preset WB value without modifying its default value (see method 1 for a list of the preset WB default values).

My Recommendation: That is all there is to selecting a WB preset from within the Shooting Menu system. The only difference between this method and method 1 is that this method uses the Shooting Menu. I normally do not use method 2 since method 1 allows me to select a preset WB value without accidentally modifying its default color temperature, and it doesn't require me to use the menus.

I find that method 1 is much faster because I use external camera controls, and it takes only seconds to set the values or even do a PRE reading of ambient light.

Auto White Balance

Auto White balance works pretty well in the D7000. As the camera's RGB meter senses colors, it does its best to balance to any white or midrange grays it can find in the image. However, the color will vary a little on each shot. If you shoot only in Auto WB mode, your camera considers each image a new WB problem and solves it without reference to the last image taken. Therefore, you may see a variance in the color balance of each image when using Auto WB mode.

The Auto WB setting also has the fine-tuning screen, as mentioned in method 2. When you select Auto under Shooting Menu > White balance, you can scroll to the right to reach the next screen and fine-tune the colors. I don't see how this is particularly useful, since each image is likely to have slightly different color temperatures to deal with. That would mean the fine-tuning would have little value for more than an image or two. If you were shooting in the exact same light for a period of time, I suppose the fine-tuning would be useful; however, wouldn't it make more sense to do a PRE reading of the light for exact WB? This choice will depend on your shooting style and personal preferences.

Using Auto WB (Auto1 and Auto2)

Auto white balance comes in two flavors: Auto1 and Auto2. The difference is that Auto2 uses warmer colors all the time in comparison to Auto1.

For general shooting, Auto1—or Auto2 if you prefer warm colors—is all that's needed.

Here are the steps to select one of the Auto white balance choices:



Figure 9.16 – Auto white balance choices

1. Choose **White balance** from the **Shooting Menu** and scroll to the right (figure 9.16, image 1).
2. Select **Auto** from the menu and scroll to the right (figure 9.16, image 2).
3. Choose **Auto1** or **Auto2** (according to your color warmth preference) and scroll to the right (figure 9.16, image 3).
4. Press the **OK** button to lock in the WB setting. You can fine-tune on the final screen if you'd like (figure 9.16, image 4).

My Recommendation: I often use Auto1 white balance on my D7000. The only times I have been using anything but Auto1 is when I am shooting special types of images. For instance, if I am shooting an event with flash and I want consistent image color, I often set Flash white balance. Or, if I am shooting landscapes under direct sunlight, I often shoot with the Direct sunlight white balance setting. Other than special occasions, Auto white balance works very well for me. Give it a try, along with each of the others in their respective environments. This is all part of improving our digital photography. A few years back we carried different film emulsions and colored filters to get these same effects. Now it's all built in!



Should I Worry about White Balance if I Shoot in RAW mode?

The quick answer is no, but that may not be the best answer. When you take a picture using NEF (RAW) mode, the sensor image data has no WB, sharpening, or color saturation information applied. Instead, the information about your camera settings is stored as markers along with the RAW black-and-white sensor data. Color information is applied permanently to the image when you post-process and save the image in another format, like JPEG, TIFF, or EPS.

When you open the image in Nikon Capture NX2, or another RAW conversion program, the camera settings are applied to the sensor data in a temporary way so you can view the image on your computer screen. If you don't like the color balance or any other setting you used in-camera, you can simply change it in the conversion software and the image looks as if you used the new setting when you took the picture.

Does that mean I am not concerned about my WB settings since I shoot RAW most of the time? No. The human brain can quickly adjust to an image's colors and perceive them as normal, even when they are not. This is one of the dangers of not using correct WB. Since an unbalanced image on your computer screen is not compared to another correctly balanced image side by side, there is some danger that your brain may accept the slightly incorrect camera settings as normal and your image will be saved with a color cast.

As a rule of thumb, if you use your WB correctly at all times, you'll consistently produce better images. You'll do less post-processing if the WB is correct in the first place. As RAW shooters, we already have a lot of post-processing work to do. Why add WB corrections to the workflow? It's just more work, if you ask me!

Additionally, you might decide to switch to JPEG mode in the middle of a shoot, and if you are not accustomed to using your WB controls, you'll be in trouble. When you shoot JPEGs, your camera will apply the WB information directly to the image and save it on your memory card—permanently. Be safe; always use good WB technique!

White Balance Tips and Tricks

When measuring WB with a gray or white card, keep in mind that your camera does not need to focus on the card. In PRE mode, it will not focus anyway because it is only trying to read light values, not take a picture. The important thing is to put your lens close enough to the card to prevent it from seeing anything other than the card. Three or four inches (about 75 mm to 100 mm) away from the card is about right for most lenses.



Be careful that your lens does not cast a shadow onto the card in a way that lets your camera see some of the shadow. This will make the measurement less accurate. Also, be sure that your source light does not produce glare on the card. This problem is not common since most cards have a matte surface, but it can happen. You may want to hold the card at a slight angle to the source light if the light is particularly bright and might cause glare.

Finally, when the light is dim, use the white side of the card because it has more reflectivity. This may prevent a no Gd reading in low light. The gray card may be more accurate for color balancing, but it might be a little dark for a good measurement in dim light. If you are shooting in normal light, the gray card is best for balancing. You might want to experiment in normal light with your camera to see which you prefer.

Sample Full WB Range D7000 Image

The three pictures in [figure 9.17](#) show three major steps from the full Kelvin color temperature range of your camera's white balance system.

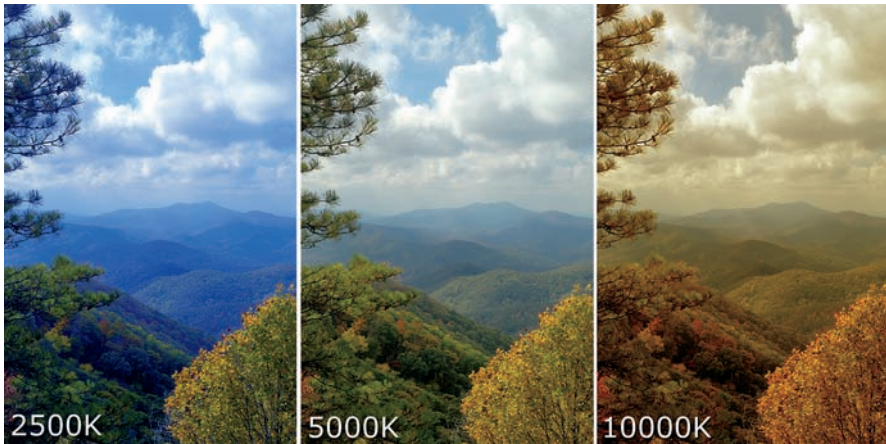


Figure 9.17 – The D7000 has a full range of white balance color temperatures available

The D7000 can be adjusted to shoot with a value as cool as 2500K, as warm as 10,000K, and any place in between. It gives you pro-level flexibility and control!



My Conclusions

With these simple tips and some practice, you can become a D7000 WB expert. Starting on page 117 of your D7000 User's Manual you'll find extensive WB information, if you want another perspective on Nikon WB.

Learn to use the color temperature features of your camera to make superior images. You'll be able to capture very accurate colors or make pictures with color casts to reflect how you feel about the image. Practice a bit, and you'll find it easy to remember how to set your WB in the field.

Now, let's turn our attention to the autofocus (AF) system in the D7000. Many people find the various modes hard to remember and even a bit confusing. In the upcoming chapter, we'll examine how the AF modes work and how they relate to other important camera functions.



Autofocus, AF-Area, and Release Modes

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Willet on the Wing – Courtesy of John C. Gamble (*jgamble*)

Autofocus and release modes are active settings that you'll deal with each time you use your camera. Unlike adjusting settings in the menus, which you'll do from time to time, you'll use autofocus and release modes every time you make an image or movie.

To take pictures and make movies you need to be very familiar with these settings, so this is a very important chapter for your mastery of the Nikon D7000. Grab your camera and let's get started!

This chapter is divided into three sections:

- Section 1 – Autofocus in Viewfinder Photography
- Section 2 – Autofocus in Live View Photography
- Section 3 – Release Modes

Section 1 – Autofocus in Viewfinder Photography

The Nikon D7000 has two types of autofocus built in, with different parts of the camera controlling AF in different shooting modes (figure 10.1). Taking pictures through the Viewfinder has one type of autofocus, and shooting a picture or movie using Live View has a different type. They are as follows:

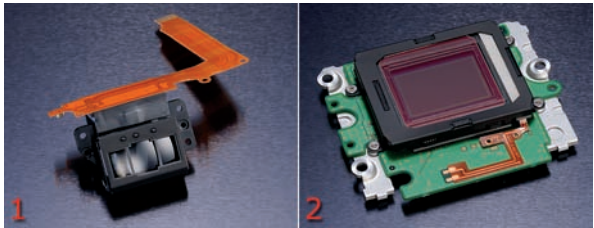


Figure 10.1 – (1) Multi-CAM 4800 DX AF module, and (2) CMOS DX format imaging sensor

- **TTL phase detection autofocus** – Through-the-lens (TTL) phase detection autofocus uses the Multi-CAM 4800 DX autofocus module with 39 AF points in a grid-like array in the central area of the Viewfinder (figure 10.1, image 1). This type of AF is known simply as phase-detection AF. It is a very fast type of autofocus and is used by the camera only when you are taking pictures through the Viewfinder.
- **Focal plane contrast AF** – Focal plane contrast AF uses pixel-level contrast detection directly from the camera's imaging sensor (figure 10.1, image 2). A simple name for this is contrast-detect AF. It can use the entire surface of the imaging sensor to detect contrast between light and dark boundaries to provide autofocus. This is a relatively slow form of autofocus, but it is extremely accurate since it is done at the pixel level. This form of autofocus is used only while shooting in Live View and Movie modes.



What Is the Multi-CAM 4800 DX Autofocus Module?

The Multi-CAM 4800 DX AF module is a thoroughly expanded and improved AF module compared to the Multi-CAM 1000 AF module found in the Nikon D90 (figure 10.1, image 1).

The Nikon D7000 offers a significant boost in the number of Viewfinder AF points. Where the D90 has 11 AF points, the D7000 has 39. What do we gain from all these extra AF points and more powerful modes? As we progress through this chapter, we'll discuss these questions in detail, along with how your photography will benefit most from using all the features of the Multi-CAM 4800 DX AF system.

Three Mode Groups

There are three specific mode groups that you should fully understand: autofocus modes, AF-area modes, and release modes.

Many people get these modes confused and incorrectly apply functions from one mode to a completely different mode. It is a bit confusing at times, but if you read this carefully and try to wrap your head around the different functionalities provided, you'll have much greater control of your camera later.

Note: I have provided the Nikon User's Manual page numbers in case you want to see what the manual has to say. Using the manual is entirely optional since I cover the information in more explicit detail. The three mode groups for Viewfinder shooting are as follows:

Autofocus modes (User's Manual – Page 91):

- Auto-servo AF (AF-A)
- Single-servo (AF-S)
- Continuous-servo (AF-C)

AF-area modes (User's Manual – Page 94):

- Single-point AF
- Dynamic-area AF (9, 21, and 39 AF points)
- 3D-tracking AF
- Auto-area AF

Release modes (User's Manual – Page 77):

- Single frame (S)
- Continuous low speed (CL)
- Continuous high speed (CH)
- Quiet shutter-release (Q)
- Self-timer



- Remote control
- Mirror up (MUP)

What's the difference between these modes? Think of them like this: the AF-area modes are where the AF module focuses, the focus modes are how it focuses, and the release modes control how often a picture is taken.

In upcoming sections we will look into all of these mode types and see how they work together to make the D7000's autofocus and subject tracking system one of the world's best.

With the controls built into the D7000's body, you'll be able to select whether the AF module uses one or many of its 39 AF points to find your subject. You'll also select whether the camera grabs the focus and locks on a static subject or whether it continuously seeks new focus if your subject is moving, and how fast (in frames per second) it captures the images.

My Recommendation: If you are having trouble remembering what all these modes do—join the club! I've written multiple books about Nikon cameras and I still get confused about what each mode does. I often refer back to my own books to remember all the details. I have both the print and e-book versions of my books so they are always nearby (I love my Kindle).

You'll become familiar with the modes you use most often, and that is usually sufficient. Try to associate the type of mode with its name, and that will make it easier. Learn the difference between an AF-area mode (focus where), a focus mode (focus how), and a release mode (how often). This camera has amazing power, quality, and flexibility—at the cost of sometimes overwhelming complexity.

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Custom Settings for Autofocus

The AF module has eight configurable Custom settings, a1–a8. We've examined each of those Custom settings in the chapter titled Custom Setting Menu. You may want to review each of them.

Using Autofocus and AF-Area Modes (Viewfinder)

(User's Manual – Pages 77, 91, 94)

The D7000 has distinct modes for how and where to focus. We'll examine each of those modes as a starting point in our understanding of autofocus with the Multi-CAM 4800 DX AF module. We'll tie together information about the AF-area modes, focus modes, and release modes since they work together to acquire and maintain

good focus on your subject. Release modes are covered in the last section of this chapter because both Viewfinder and Live View photography use the same Release modes.

Figure 10.2 shows the controls we'll use in combination to change how the camera focuses and captures images. The caption helps you identify each control.

Notice in figure 10.2, image 4, that the Multi Selector has a lock switch below it. You can see a white dot and an L to the left side of the switch. Move the switch to the dot setting, which unlocks the internal AF point movement capability. Otherwise, you won't be able to move the AF point around the Viewfinder within the 39 available points.

If you want to use the D7000 as a point-and-shoot camera, center the AF point rectangle in the Viewfinder and set the lock on L. When it is locked, the camera will use only the center AF point in Single-point AF mode. I leave mine unlocked all the time, but I check as I'm focusing to make sure I am using the AF point I want to use. I can use the Multi Selector to move a single AF point, or a group of points, around the array of 39 available points.

Be aware that nine of the 39 AF points on the D7000 are cross-type AF points, which means that they will initiate focus in either a horizontal or a vertical direction. The center three columns and three rows of AF points are cross-type. All AF points outside of the ones shown in red are sensitive only in a horizontal direction. Figure 10.3 shows the cross-type AF points in red.

Autofocus Modes in Detail (Viewfinder)

(User's Manual – Page 91)

The focus modes allow you to control how the autofocus works with static and moving subjects. They allow your camera to lock focus on a subject that is not moving or is moving very slowly. They also allow your camera to follow focus on an actively

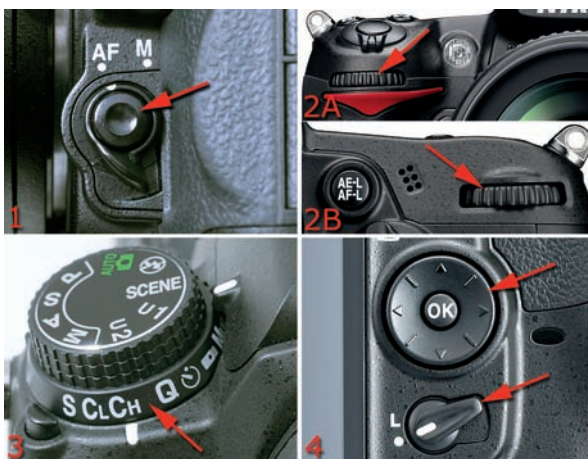


Figure 10.2 – (1) AF-mode button, (2A) Front sub-command dial, (2B) Rear main command dial, (3) Release mode dial, and (4) Multi Selector, with AF-lock switch below

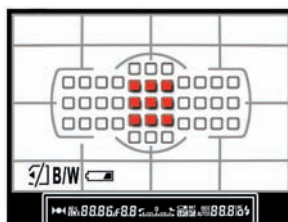


Figure 10.3 – Nine cross-type AF points

moving subject. Let's consider the three servo-based focus modes to see when and how you might use them best.



Figure 10.4 – Auto-servo AF mode (AF-A)

Here are the steps to select an Autofocus mode:

1. Hold in the **AF-mode button** (figure 10.4, image 1).
2. Turn the rear **Main command dial** (figure 10.4, image 2).
3. The **Control panel** will show each of the three modes (**AF-A**, **AF-S**, **AF-C**) as you turn the dial (figure 10.4, image 3).
4. Let go of the **AF-mode button** when the mode you want to use is displayed on the **Control panel**.

Let's consider what each of the three modes do.

Auto-Servo AF Mode (AF-A)

Auto-servo AF (AF-A) is an automatic mode that pays attention to your subject's movement. It is rather simple to use because it senses whether your subject is static or moving.

- **Subject is not moving** – If the subject is not moving, the camera automatically uses AF-S mode. In this mode the focus locks on the subject and does not update as long as the subject remains still. However, the focus can unlock if the camera detects subject movement, and it will switch to AF-C mode.
- **Subject is moving** – If the subject is moving, the camera automatically sets itself to AF-C mode. It detects the movement across the AF sensors and automatically starts focus tracking the subject.

Single-Servo AF Mode (AF-S)

Single-servo AF (AF-S) works best when your subject is stationary—like a house or landscape. You can use AF-S on slowly moving subjects if you'd like, but you must be careful.

The two scenarios listed next may help you decide:

- **Subject is not moving** – When you press the Shutter-release button halfway down, the AF module quickly locks focus on your subject and waits for you to fire the shutter. If your subject starts moving and you don't release pressure on the Shutter-release button to refocus, the focus will be obsolete and useless. When you have focus lock, take the picture quickly. This mode is perfect for stationary subjects or, in some cases, very slowly moving subjects.
- **Subject is regularly moving** – This will require a little more work on your part. Since the AF system locks focus on your subject, if the subject moves even slightly, the focus may no longer be good. You'll have to lift your finger off of the Shutter-release button and reapply pressure halfway down to refocus. If the subject continues moving, you'll need to continue releasing and pressing the Shutter-release button halfway down over and over to keep the focus accurate. If your subject never stops moving, is moving erratically, or stops only briefly, AF-S is probably not the best mode to use. In this case, AF-C is better because it never locks focus and the camera is able to track your subject's movement, keeping it in constant focus.

Continuous-Servo AF Mode (AF-C)

Using Continuous-servo AF (AF-C) is slightly more complex since it is a focus tracking function. The camera looks carefully at whether the subject is moving, and it even reacts differently if the subject is moving from left to right, up and down, or toward and away from you. Read these three scenarios carefully:

- **Subject is not moving** – When the subject is standing still, Continuous-servo AF acts a lot like Single-servo AF with the exception that the focus never locks. If your camera moves, you may hear your lens chattering a little as the autofocus motor makes small adjustments in the focus position. Since focus never locks in this mode, you'll need to be careful that you don't accidentally move the AF point off of the subject because it may focus on something in the background instead.
- **Subject is moving across the Viewfinder** – If your subject moves from left to right, right to left, or up and down in the Viewfinder, you'll need to keep your AF point on the subject when you are using Single-point AF area mode. If you are using Dynamic-area AF or Auto-area AF modes, your camera can track the subject across a few or all of the 39 AF points. We'll cover this in more detail in the upcoming section called **AF-Area Modes in Detail**.
- **Subject is moving toward or away from the camera** – If your subject is coming toward you, another automatic function of the camera kicks in. It is called *predictive focus tracking*, and it figures out how far the subject will move before

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the shutter fires. After you've pressed the Shutter-release button all the way down, predictive focus tracking moves the lens elements slightly to correspond to where the subject should be when the shutter fires a few milliseconds later. In other words, if the subject is moving toward you, the lens focuses slightly in front of your subject so that the camera has time to move the mirror up and get the shutter blades out of the way. It takes 50 milliseconds for the camera to respond to a press of the Shutter-release button.

50-Millisecond Shutter Lag

Let's talk about the practical use of these Autofocus mode functions. If you are shooting an air show, for instance, in 50 milliseconds a fast-moving airplane can move enough to slightly change the focus area by the time the shutter opens. If you press the Shutter-release button all the way down until the shutter releases, first autofocus occurs and then the mirror moves up and the shutter starts opening. That takes about 50 milliseconds in the D7000. In the time it takes for the camera to respond to your press of the Shutter-release button, the airplane has moved slightly, which just barely throws the autofocus off. With predictive focus tracking, the camera predicts where the airplane will be when the image is actually exposed, and it adjusts the focus accordingly.

Predictive Focus Tracking

Let's say you're playing a ball game and you throw the ball to a running player. You would have to throw the ball slightly in front of the receiving player so that the player and the ball arrive in the same place at the same time. Predictive focus tracking does something similar for you. It saves you from trying to focus your camera in front of your subject and waiting 50 milliseconds for it to arrive. The timing would be a bit difficult!

Effect of Lens Movement

Lens movement (especially with long lenses) can be misinterpreted by the camera as subject movement. In that case, predictive focus tracking follows your camera movement while simultaneously trying to track your subject.

Attempting to handhold a long lens will drive your camera crazy. Use a vibration reduction (VR) lens or a tripod for best results. Nikon says that there are special algorithms in predictive focus tracking that allow it to notice sideways or up-and-down movement, and the camera shuts down the predictive focus tracking. That is, predictive focus tracking is not activated by the D7000 for sideways or up-and-down subject movement or panning.

My Recommendation: I leave my camera's Autofocus mode set to AF-A most of the time because it is capable of automatically changing to another mode as needed.

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If I am shooting sports, I switch to AF-C mode so that there will be no autofocus delay if the subject moves very quickly. I rarely use AF-S mode now since AF-A does the same thing when the subject is static, yet the camera can change modes if the subject moves.

AF-Area Modes in Detail (Viewfinder)

(User's Manual – Page 94)

The AF-area modes are designed to let you control how many Viewfinder AF points—the area of focus attention—are in use at any one time. Three of the four modes will track subject movement.

You can use 1 AF point in Single-point AF mode; 9, 21, or 39 AF points in Dynamic-area AF mode; and you can even use 3D tracking mode (39 AF points), which uses the color of the subject to help track it, keeping it in focus while it moves around. If you don't want to think about the autofocus area, you can let the camera automatically control the AF-area by using the Auto AF-area mode.



Figure 10.5 – Controls to set AF-area mode

Figure 10.5 shows the AF-mode button (image 1), front Sub-command dial (image 2), and Control panel readout (image 3) for changing AF-area modes. Here are the steps to choose an AF-area mode:

1. Hold in the **AF-mode button**.
2. Turn the front **Sub-command dial** as you watch the **Control panel** and see the four available modes scroll by. Figure 10.5, image 3, shows the camera set to Auto-area AF mode.
3. Release the **AF-mode button** when the mode you want to use is displayed on the **Control panel**.

Single-Point AF

This mode uses a single AF point out of the array of 39 points to acquire good focus. As mentioned before, you can control which AF point is used by selecting it with the Multi Selector.

In figure 10.6, notice that the center AF point (of the 39 sensor points) is the one that provides focus information.

If two people are standing next to each other, with a gap in the middle, the single center AF point will examine the space between the two subjects. You can do one of two things to overcome this problem:

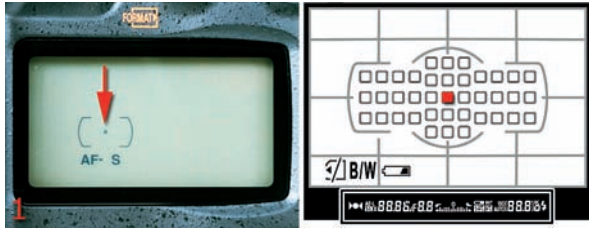


Figure 10.6 – Single-point AF-area mode

- **Focus and Recompose** – You can get the focus first by pointing the center AF point at the face of one of the subjects, press the Shutter-release button halfway to focus, and then hold it down while recomposing the image. When you have recomposed the shot—without releasing the button—you'll press the Shutter-release button the rest of the way down and take the picture.
- **Move the AF Point** – You can compose the picture first by centering it however you'd like, then use the Multi Selector to move the single AF point until it rests on the face of one of the subjects. With the AF point repositioned, press the Shutter-release button halfway down to get good focus and the rest of the way down to take the picture.

Either of these methods will solve the age-old autofocus problem of having a perfectly focused background with out-of-focus subjects caused by the center AF point concentrating on the background between the subjects.

Single-Point AF Example

If a subject is not moving—like a tree or a standing person—then Single-point AF and Single frame (S) release mode will allow you to acquire focus. When the focus is acquired, the AF module will lock focus on the subject, and the focus will not change. If the subject moves, your focus may no longer be perfect and you'll need to recompose while releasing and then pressing the Shutter-release button halfway down.

Often, if the subject is moving very slowly or sporadically, I don't use Continuous low speed (CL) release mode. Instead I leave the camera in Single frame (S) release mode. I tap the Shutter-release button halfway to acquire focus when the subject moves and tap it again as needed. When I'm ready, I simply press the Shutter-release button the rest of the way down, and I've got the shot!

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Release Priority Settings

When you switch your D7000 out of Single frame (S) release mode, you must be aware of how Custom settings a1 and a2 are configured. These two Custom settings allow you to choose focus or release priority when shooting in AF-S and AF-C Autofocus modes. It's important that you understand these two priorities before you start using your camera on critical shoots, or some of your images may not be in focus at all. I won't cover that information in this chapter, but we've looked at Custom settings a1 and a2 in detail in the chapter titled **Custom Setting Menu**. Please be very sure that you understand what they do! (Hint: Use Focus priority so that the camera won't take a picture unless it can autofocus.)

Dynamic-Area AF

This mode is best used when your subject is moving. Instead of a single AF point used alone for autofocus, several sensors surrounding the one you have selected with the Multi Selector are also active. The top row of [figure 10.7](#) shows the Control panel with Dynamic-area AF selected in 9, 21, and 39 point modes. You must select one of the three AF point patterns with the controls shown in [figure 10.5](#).

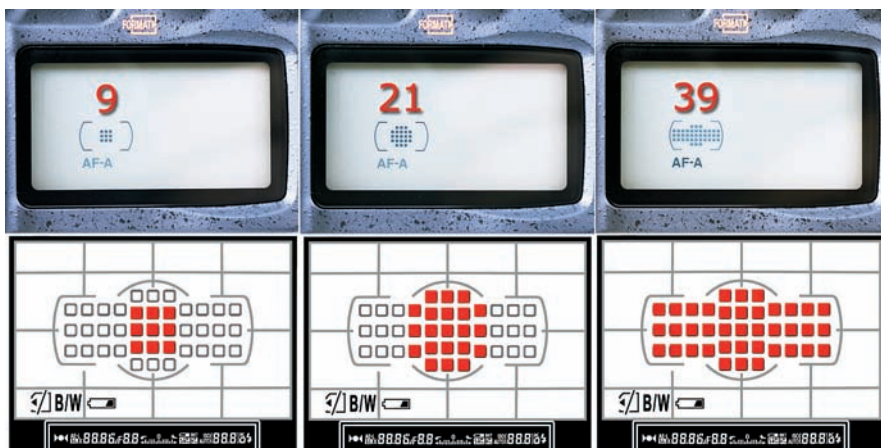


Figure 10.7 – Dynamic-area AF-area mode

The bottom row of [figure 10.7](#) shows the three AF point patterns (9, 21, and 39) in the Viewfinder. You will not actually see all these extra points light up in the Viewfinder. Instead you will see only the AF point in the center of the pattern. You'll have to imagine the other points surrounding the single point you can see. You can move the 9- and 21-point patterns around the Viewfinder with your camera's Multi Selector.

The AF point you can see in the Viewfinder provides the primary autofocus; however, the surrounding points in the pattern you've selected are also active. If the subject moves and the primary AF point loses its focus, one of the surrounding points will quickly grab the focus.

If the subject is moving slowly or predictably, you can use a smaller pattern, such as the 9-point selection. If the subject's movement is more erratic or unpredictable, you might want to increase the number of AF points involved. If 9 won't do it, try 21, or even 39, for subjects that are very unpredictable and move quickly.

One caution is that the more AF points you use, the slower the initial autofocus may be, especially in low light. However, when the initial focus is acquired, the camera can track the subject quite well with all three patterns.

Can you see how flexible Dynamic-area AF could be for you, especially when you adjust the patterns? If your subject will move only a short distance—or is moving slowly—you can simply select a pattern of 9 points. Maybe you're doing some macro shots of a bee on a flower and the bee is moving around the blossom. Or you might be photographing a tennis game, in which case you could use 21 or 39 points to allow for more rapid side-to-side movement without losing focus. You'll have to decide which pattern best fits your needs for the current shooting situation.

Using Dynamic-area AF, you can more accurately track and photograph all sorts, sizes, and speeds of moving subjects. The initial focus reaction speed of the AF system is somewhat slower when you use 39 points since the camera needs to process a lot more information. Take that into consideration when you are shooting events.

3D-Tracking AF

The mode called 3D-tracking (shown as 3D on the Control panel) adds color-detection ability to the tracking system (figure 10.8). The camera will not only track by subject area, it will also remember the color of the subject and use it for tracking.

3D-tracking works like the 39-point pattern except that it is more intelligent. Often your subject will be a different color from the background, and the D7000's color-based system will provide more accuracy in difficult conditions. Be careful if the subject is a similar color to the background because this may reduce the autofocus tracking accuracy.

3D-tracking is a good mode for things like action sports, air shows, races, etc. It allows the camera to become a color-sensitive, subject-tracking machine. Try it and see if it works for you.



Figure 10.8 – Dynamic-area AF-area mode with 3D-tracking

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Auto-Area AF

Auto-area AF turns the D7000 into an expensive point-and-shoot camera (figure 10.9). Use this mode when you simply have no time to think and would still like to get great images. The AF module decides what the subject is and selects the AF points it thinks will work best.

According to Nikon, if you are using a D or G lens, there is a bit of “human recognition technology” built into this mode, similar to the Nikon Coolpix. Since most of us will use Auto-area AF only when we want to shoot for fun, a human subject that is closest to the camera is the most likely subject anyway. Using Auto-area AF, your D7000 can usually detect a human and help you avoid shots with perfectly focused backgrounds and blurry human subjects.

See the sidebar for an example of how the camera uses the three mode groups—AF-area, Autofocus, and Release modes—to track a flying bird.



Figure 10.9 – Auto-area AF-area mode

Capturing a Bird in Flight

Let's imagine that you are photographing a colorful bird perched in a tree, but you want some shots of it in flight. You are patiently waiting for it to fly. Your camera is set to 3D-tracking (39-point) AF-area mode and Continuous high speed (CH) Release mode. You are using Continuous-servo (AF-C) Autofocus mode so that autofocus never locks and will track the bird instantly when it starts flying. You've already established focus with the AF point you selected with the Multi Selector, and you are holding the Shutter-release button halfway down to maintain focus. Since you've set the Release mode to CH (Continuous high), you can fire off rapid bursts of images (up to six per second). Suddenly, and faster than you can react, the bird takes to flight. By the time you can get the camera moving, the bird has moved to the left in the Viewfinder, and the focus tracking system has adjusted by instantly switching away from the primary AF point you used to establish focus and is now using other AF points in the pattern of 39 points to maintain focus on the bird. You press the Shutter-release button all the way down, and the images start pouring into your memory card. You are panning with the bird, firing bursts until it moves out of range. You've got the shot! (See this chapter's opening image by John Gamble of the Willet in flight.)

My Recommendation: Many people use Single-point AF-area mode quite often. It works particularly well for static or slowly moving subjects. When I'm out shooting beautiful nature images, I use Single-point AF-area mode along with Single frame

(S) release mode almost exclusively. If I'm shooting a wedding where the bride and groom are walking slowly up the aisle, Single-point AF and Continuous low speed (CL) release mode seem to work well for me. At a party, I often use Auto-area AF with Single frame (S) release mode.

We've covered the Autofocus and AF-area modes pretty well, so let's move on to the Release modes.

Section 2 – Autofocus in Live View Photography

(User's Manual – Page 49)

Live View (Lv) mode is one of the new features that many old-timers love to hate. New DSLR users generally like to use it since they are accustomed to composing on the LCD screen of a point-and-shoot camera.

Both types of users should reconsider Live View. An old-timer who is used to using only the Viewfinder to compose images might find that some types of shooting are easier with Live View. Point-and-shoot graduates may want to see if they can improve image sharpness by using the Viewfinder.

I've been using SLR, DSLR, rangefinder, and point-and-shoot cameras for more than 40 years. When Lv mode first came out, my initial thought was "gimmick." However, after shooting macro shots with Lv mode, the ease of use has changed my thinking. When I need extreme, up-close focusing accuracy, Lv mode can be superior to using the Viewfinder. If you're an experienced DSLR photographer, try shooting some macros with Lv mode. I think you'll find that your work improves, and your back feels much better too.

If you've come over from the point-and-shoot world with your new D7000, then use Lv mode if it makes you comfortable, at first. However, please realize that it is difficult to make sharp images when you are waving a heavy DSLR around at arm's length while composing a picture on the Monitor. The extra weight of the DSLR will tire your arms needlessly. Learn to use the Viewfinder for most work and Lv mode for specialized pictures. Both image composition tools are useful.

Using Autofocus and AF-Area Modes (Live View)

Lv mode is a little different from the Viewfinder when it comes to autofocus. In some ways it is simpler, and in other ways it is more complex. The Autofocus modes have only two settings, and the AF-area modes have four.

The Release modes that we will discuss in the next section titled **Section 3 – Release Modes** apply in the same way to Lv mode as they do when using the Viewfinder.

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The three mode groups that apply to the Live View mode are as follows:

Autofocus modes (User's Manual – Page 211):

- Single-servo (AF-S)
- Full-time-servo AF (AF-F)

AF-area modes (User's Manual – Page 211):

- Face-priority AF
- Wide-area AF
- Normal-area AF
- Subject-tracking AF

Release modes (User's Manual – Page 77):

- Single frame (S)
- Continuous low speed (CL)
- Continuous high speed (CH)
- Quiet shutter-release (Q)
- Self-timer
- Remote control
- Mirror up (MUP)

Autofocus Modes in Detail (Live View)

Normally, you would not use the Monitor to compose an image since it is not as stable as holding the camera close to your body, and it could result in shaky images. However, in some instances a live view through the Monitor is quite useful. For instance, what if you want to take an image of a small flower growing very close to the ground? You could lie down on the ground and get your clothes dirty or you can use Lv mode instead. Lv mode allows you to see what your camera's lens sees without using the Viewfinder. Anytime you need to take pictures up high or down low, or even on a tripod, the D7000 will happily give you that power with Lv mode.

We covered how to adjust Live View's Autofocus and AF-area modes in the chapter titled **Custom Setting Menu**. Custom setting a8 allows you to choose the modes. If you are going to use Live View often, it may be a good idea to add Custom setting a8 to My Menu so you will have quick access to the modes.

Let's review how the various settings under Custom setting a8 work. First we'll examine the two Autofocus modes. Remember, the Autofocus modes tell the camera how to focus.

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Use the following steps to change the Autofocus mode:

1. Select **a Autofocus** from the Custom Setting Menu and scroll to the right (figure 10.10, image 1).
2. Highlight **a8 Live view/movie AF** and scroll to the right (figure 10.10, image 2).
3. Choose **Autofocus mode** and scroll to the right (figure 10.10, image 3).
4. Select either **Single-servo AF (AF-S)** or **Full-time-servo AF (AF-F)** from the menu (figure 10.10, image 4).
5. Press the **OK button** to lock in the **Focus mode**.

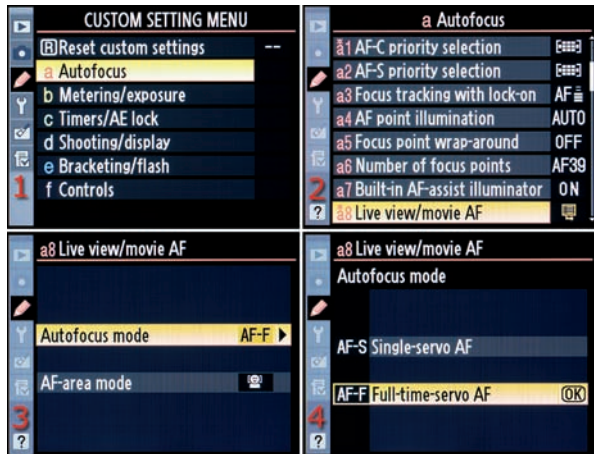


Figure 10.10 – Choosing a Focus mode under Live view/movie AF

Descriptions of the two selections under Autofocus mode are described next. I photographed the screens with the lens cap on so you can clearly see them on a black background.

Single-Servo AF

Figure 10.11 has a red arrow pointing to the Single-servo AF (AF-S) mode symbol location on the Live View screen. You control the focus by pressing the Shutter-release button down halfway. If your subject moves, you'll need to release pressure from the Shutter-release button and then reapply pressure to refocus. When focus is acquired, it locks and does not update unless you deliberately update it. In Movie mode, you'll have to refocus if you or your subject moves. A big red or green AF point square will appear in the middle of the camera's display. It will be red when the scene is not in focus and green when the scene is in good focus. You can move the square around the screen to select the area of your subject on which the camera will focus. If your subject doesn't move or moves very slowly, use this AF mode.



Figure 10.11 – Single-servo AF (AF-S) mode

Full-Time-Servo AF

Figure 10.12 has a red arrow pointing to the Full-time-servo AF (AF-F) mode symbol location on the Live View screen. The red or green AF point square appears in the middle of the camera's display, like in Single-servo AF mode. You can move it around to select a focus area. This mode provides constantly updating autofocus that tracks your subject and is tempered by the AF-area mode (discussed next) you have selected. The focus doesn't lock on the subject, which simply means it updates continuously until you press the Shutter-release button halfway. Generally, you won't press the Shutter-release button until you are ready to take a picture in Live View mode. In Movie mode you won't press the Shutter-release button at all. The camera will maintain focus on your subject automatically.

My Recommendation: Unless I am going to do some very specialized macro shooting, I leave Live View mode's Autofocus mode set to AF-F, or Full-time servo AF. That way, the camera will automatically attempt to keep a good focus on my subject. If I am shooting a macro shot, I want to control exactly where the focus falls for depth of field control, so I use AF-S, or Single-servo AF.



Figure 10.12 – Full-time-servo AF (AF-F) mode

AF-Area Modes in Detail (Live View)

The AF-area mode lets you choose where the camera senses your subject. Autofocus works differently for each of the four AF-area modes. You can cause the camera to look for people's faces, track a moving subject, widen out for landscapes, or pinpoint the focus on a small area of the frame. Let's examine the four AF-area modes, then see how to select them. Use the following steps to change the AF-area mode:

1. Select **a** Autofocus from the Custom Setting Menu and scroll to the right (**figure 10.13, image 1**).

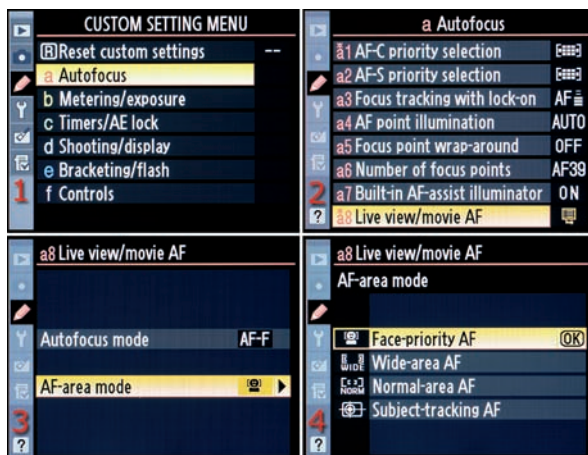


Figure 10.13 – Choosing an AF-area mode under Live view/movie AF

2. Highlight **a8 Live view/movie AF** and scroll to the right (figure 10.13, image 2).
3. Choose **AF-area mode** and scroll to the right (figure 10.13, image 3).
4. Select one of the four AF-area modes from the menu (figure 10.13, image 4).
5. Press the **OK button** to lock in the **AF-area mode**.

Face-Priority AF

The red arrow in figure 10.14 points to the Face-priority AF symbol. When you are taking portraits in Live View mode or shooting movies with people in Movie mode, use Face-priority AF. The camera has the ability to track focus on the faces of several people at the same time. It is quite fun to watch as the little green and yellow AF point squares find faces and stay with them as they move—green squares are for focused faces and yellow squares are for people who are being tracked but are not in best focus.

Nikon claims it can detect up to 35 faces at the same time. That's a lot of people! Here is a quote from a Nikon website: "When multiple faces are detected, the camera will focus on the subject recognized to be the closest. Alternatively, you can also choose a different subject with the Multi Selector."



Figure 10.14 – Face-priority AF

Wide-Area AF

The red arrow in figure 10.15 points to the Wide-area AF symbol. For the landscape shooters among us who like to use Live View mode to shoot movies of beautiful scenic areas, this is your mode. The camera will display a big green AF point square on the Monitor. You can move this big AF point around until it rests exactly where you want the best focus to be. The camera will sense a wide area and determine the best focus, with priority on the area under the green square.

Nikon says, "Suitable for hand-held shooting such as landscape. AF area can be moved to the desired position within a frame."



Figure 10.15 – Wide-area AF

Normal-Area AF

The red arrow in figure 10.16 points to the Normal-area AF symbol. This mode is primarily for shooters who need to get very accurate focus on a small area of the frame. If you are shooting a butterfly closeup and want to focus on one of the antennae, use Normal-area AF. This is a great mode to use with a macro lens because it gives you a much smaller AF point square that you can move around the frame.



Figure 10.16 – Normal-area AF



Compare it to the AF point in Wide-area AF mode, and you'll see that it is about 25 percent of the size. You can pinpoint the exact area of the subject that you want to have the sharpest focus. Nikon comments, "Suitable for tripod shooting with pin-point focus such as close up. AF area can be moved to the desired position within a frame."

Subject-Tracking AF

The red arrow in [figure 10.17](#) points to the Subject-tracking AF symbol. When autofocus is locked in—either by using the Shutter-release button in AF-S mode or automatically in AF-F mode (discussed previously)—this mode lets you start subject tracking with the OK button. When the subject is selected (after you press the OK button) the camera locks its attention on the subject and tracks it whether the subject or the camera moves.

If you are making a movie of a black bear in the Great Smoky Mountains, you just move the focus point to the bear, focus, press the OK button, and focus will stay with the bear. It is amazing to watch the camera do this. Try it and see!

I strongly suggest that you use AF-F, or Full-time servo AF, with this mode. Full-time autofocus allows your camera to fully track the subject without you worrying about keeping it in focus yourself.

Nikon says, "Suitable for a moving subject. After focusing is achieved with the OK button, AF area tracks the subject's movement."

My Recommendation: Why not leave the AF-area mode set to Face-priority AF if you photograph people a lot? If you are using Live View for macro shooting, Normal-area AF gives you the smallest, most accurate area mode for detailed, up-close focusing. Landscape shooters should use Wide-area AF, and wildlife or sports shooters should use Subject-tracking AF.

Now, let's carefully examine the Release modes, which affect the camera for Viewfinder and Live View shooting.



Figure 10.17 – Subject-tracking AF

Section 3 – Release Modes

(User's Manual – Page 77)

The D7000 has several Release modes, which apply to both the Viewfinder and Live View photography. Whether you place your eye up to the Viewfinder or use the Monitor in Lv mode to shoot images, all these modes apply.

Release modes decide how many images can be taken and how fast. In [figure 10.18](#), we see the Release mode dial with its lock release button. Press the lock release button (left red arrow) and turn the Release mode dial (right red arrow) to select a mode. The Release mode dial is directly below the shooting (exposure) Mode dial. Let's look at each of the Release modes in more detail. Here is a list of the seven modes:

- S – Single frame
- CL – Continuous low speed
- CH – Continuous high speed
- Q – Quiet shutter-release mode
- Self-timer
- Remote control
- MUP – Mirror up

In the good-old film days, the first three release modes would have been called motor-drive settings since they are concerned with how fast the camera is allowed to take pictures.

We've already talked about these modes to some degree in the consideration of the AF-area modes.

Single Frame (S) Release Mode

This is the simplest frame rate since it takes a single picture each time you press the Shutter-release button fully. This mode is not for speedy shooting. It is for those shooting a few frames at a time. Nature shooters often use this mode since they are more concerned with correct depth of field and excellent composition.



Figure 10.18 – Release mode dial and Lock release button



Figure 10.19 – Single frame (S) Release mode

Continuous Low Speed (CL) Release Mode

This mode allows you to select a frame rate between one and five frames per second (fps). Choose CL on the Release mode dial to select this mode (figure 10.21, red arrow).

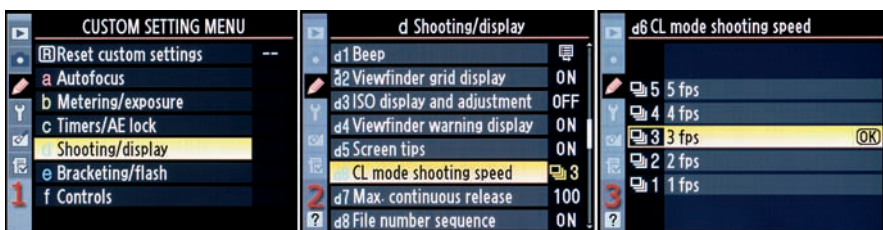


Figure 10.20 – Continuous low speed (CL) Release mode – Selecting a frame rate

The default frame rate from the factory is three fps, which seems about right for most of us. If you want more or less speed, simply open Custom Setting Menu > Custom setting d6 > CL mode shooting speed and select your favorite frame rate (figures 10.20 and 10.21). The factory default of 3 fps seems plenty fast for those of us who have no interest in storing thousands of extra, almost duplicate images.

If I really need to shoot a series of images at high speed then it is easy enough to select CH mode on the Mode dial instead.



Figure 10.21 – Continuous low speed (CL) Release mode

Continuous High Speed (CH) Release Mode

This high-speed mode is designed for when you want to go fast! The camera will attempt to capture six frames per second every time you hold down the Shutter-release button. Choose CH on the Release mode dial to select this mode (figure 10.22, red arrow).

The internal buffer memory of the camera limits how many frames you can take. When shooting in JPEG mode you may be able to shoot as many as 100 frames in one burst. You can control this maximum for JPEGs only by adjusting Custom Setting Menu > Custom setting d7 > Max. continuous release. However, in lossless compressed NEF (RAW) mode you'll be able to shoot only 10 or 11 frames before the buffer memory is full. You'll have to wait for the camera to offload images to the memory card before you can shoot another long burst.

(See the chart on page 320 of your User's Manual for a list of Image quality/Image size modes and buffer capacity.)



Figure 10.22 – Continuous high speed (CH) Release mode

Requirements for Fast Frame Rates

All of the settings for fast frame rates (high fps) are based on the assumption that you are shooting with at least a 1/250s shutter speed, have a fully charged battery, and have some buffer space left in your camera's memory.

Quiet Shutter-Release (Q) Release Mode

Q mode, or Quiet shutter-release mode, is designed to make as little noise as possible when you fire the camera's shutter. Instead of raising the reflex mirror, taking the picture, then lowering the mirror in one smooth step, the D7000 ties the raising and lowering of the mirror to the position of the Shutter-release button. Choose Q on the Release mode dial to select this mode (figure 10.23, red arrow).

When you press the Shutter-release button down and take a picture in Q mode, the mirror raises and the shutter fires. However, the mirror does not lower until you fully release the Shutter-release button.

If you want to reduce noise, you can hold the Shutter-release button down longer than normal and separate the raising and lowering of the mirror into two steps. This tends to draw out the length of the mirror/shutter action and reduces the perception of noise volume. In reality, the noise is not much quieter, but since it is broken into two parts, it sounds quieter. Try it!



Figure 10.23 – Quiet shutter-release (Q) Release mode

Self-Timer Release Mode

The factory default time out for the Self-timer is 10 seconds. You can use Custom Setting Menu > Custom setting c3 > Self-timer to set the time out to 2, 5, 10, or 20 seconds. Choose the Self-timer symbol on the Release mode dial to select this mode (figure 10.24, red arrow).



Figure 10.24 – Self-timer Release mode

If you like to hear that little beep beep beep when the Self-timer is counting down the seconds before firing the shutter, you can control that sound with Custom Setting Menu > Custom setting d1 > Beep. Here are the three steps to use the self-timer after it has been configured (or left at the factory default):

1. Use the **Release mode dial** to select **Self-timer** mode—the little symbol between Q and Remote control modes (looks like a clock face with a second hand).
2. Frame the photograph and focus the camera.



3. Press the **Shutter-release button** all the way down and run like the wind for your position in the group. (Or, if you are using the self-timer or ML-L3 infrared release as a cheap cable release, just press the remote's button and stand there looking cool instead.) The **AF-assist illuminator** will blink twice per second and the beeping will start. When the last two seconds arrive, the **AF-assist illuminator** will shine continuously and the beeping will double in speed. You are out of time when the beeping speeds up! The image is taken at about the time the beeping stops.



Tips on Stopping the Self-Timer

If you want to stop the self-timer, all you have to do is press the MENU or Playback buttons. Or you could just turn the camera off. Of course, that's like turning off your home computer while the operating system is busy with some task and will probably result in your memory card bursting into flames, your lens elements unseating, the OK button changing to NO, or some other ugly thing happening. I think I'll just press the MENU button.

Remote Control Release Mode

Remote control Release mode lets an owner of the optional Nikon ML-L3 remote control fire the shutter remotely. Choose the Remote control release mode position on the Release mode dial to select this mode (figure 10.25, red arrow).

You have three modes available: Delayed remote (two-second delay), Quick-response remote (immediate shutter release), and Remote mirror-up (takes two button presses to release shutter). These three modes are available under Shooting Menu > Remote control mode. Set one of them before you use Remote control Release mode.

Use the Remote control Release mode when you want to shoot pictures hands off. You can cut down on vibrations significantly by shooting via the remote control. The ML-L3 is a very inexpensive item, and D7000 users should own and use one (figure 10.26).



Figure 10.25 – Remote control Release mode



Figure 10.26 – Nikon ML-L3 Remote infrared release

Nikon added Mirror up (MUP) mode to the D7000 (like on the D300S). This allows you to fire the shutter with one button press, wait a moment, and fire it again. The ML-L3 is a great tool for this since it is wireless and inexpensive. Use it instead of the more expensive Nikon MC-DC2 electronic cable release (wired).

Mirror Up (MUP) Release Mode

This mode is very simple and very effective. I use this constantly when I am doing nature photography. Instead of having to find a lever to press, like on older film cameras, all you have to do to use Mirror up mode is follow these simple steps:

1. Use the [Release mode dial](#) to select [MUP](#) mode.
2. Frame your picture and press the [Shutter-release button](#) halfway down to focus. Then press the [Shutter-release button](#) the rest of the way down to raise the mirror—or use your ML-L3 infrared remote or MC-DC2 wired release cable.
3. Press the [Shutter-release button](#) (or the ML-L3/MC-DC2 button) all the way down one more time to take the picture.



Figure 10.27 – Mirror up (MUP) Release mode

10



Don't Touch That Shutter Release!

Please buy one of the electronic shutter releases we discussed previously (Nikon ML-L3 or MC-DC2) so you don't have to use your finger to press the Shutter-release button when the camera is on a tripod and in MUP mode. Touching the camera seems a bit silly after going to all that trouble to stabilize the camera and raise the mirror. A finger press could shake the entire tripod!

If you do not have a wireless or cable release, simply wait 30 seconds after pressing the Shutter-release button in MUP mode and the camera will fire on its own. There is a built-in 30-second delay after you've raised the mirror, and then the shutter will fire. This could be used as a slow but high-quality self-timer.

Custom Settings for Autofocus (a1–a8)

For a complete discussion of the autofocus-related Custom settings a1–a8, please see the chapter titled [Custom Setting Menu](#). When considering autofocus issues, it is very important that you read the information in that chapter concerning Custom settings a1 and a2. If you don't read and understand this section, you may get quite a few out-of-focus images as a result.

Also, please consider using Focus tracking with lock-on when you are using any

mode that does focus tracking (9 point, 21 point, 39 point, or 3D-tracking). This will prevent your camera from losing focus on the subject if something comes between the camera and the subject while the subject is moving. Otherwise, the camera may switch the focus to the intruding object and lose the tracked subject. To enable Focus tracking with lock-on, go to Custom Setting Menu > Custom setting a3 Focus tracking with lock-on and choose a tracking delay time out.

My Conclusions

I've followed the development of the Nikon autofocus systems since the late 1980s. My first camera with autofocus was the Nikon F4 professional SLR. Throughout the past several years I've experienced each new level of autofocus released by Nikon. It's gotten better and better with each new generation!

Autofocus with the D7000 is a real pleasure. It has a more powerful AF system than many cameras before it, and yet it is somewhat simplified in its operation by comparison. The system can still seem complex, but if you spend some time with this chapter, you should come away with a much greater understanding of the D7000's AF module. You'll better understand how you can adapt your camera to work best for your style of photography. Enjoy your D7000's excellent Multi-CAM 4800 DX autofocus system!

The next chapter will continue our examination of Live View mode and add detailed information on how to shoot movies.



10



Live View and Movie Modes

11



Peacock Feathers – Courtesy of William Paul (*Biker Bill*)

The Live View or LV mode on the Nikon D7000 is a mature system, easy to use, and full featured. It allows you to take your eye away from the camera and use the Monitor on back as your viewfinder. If you need to shoot with your camera at arm's length, such as in a crowd while shooting over the tops of people's heads, the big three-inch (7.62 cm) Monitor makes it easy to see your subject. If you need to take pictures that require you to bend over, such as when shooting closeups (macros) of plants or insects, the LV mode will save your back a lot of pain. You'll be able to kneel instead of bend.

LV mode can be used by amateurs and experts alike, with features for both groups. As the basis for the Movie mode, Live View makes creating movies quite easy. Your camera has not only one of the most advanced picture-taking systems, but also a highly refined movie-making capability that few DSLR cameras offer.

First, let's look into Live View itself, examining all the screens and controls, and then we'll see how Movie mode works, including how to display movies on computers and televisions (HD and SD).



Live View Mode

(User's Manual – Page 49)

To enter Live View you'll flip the LV mode lever to the right (figure 11.1, image 1). To exit Live View simply flip the LV mode lever again. Figure 11.1, image 2



Figure 11.1 – Entering and exiting Live View mode

shows the Live View screen you'll see first.

Notice in figure 11.1, image 2, how the green AF point square has detected the woman's face automatically. This is because I was using Face-priority AF, as discussed in the previous chapter. Please review that chapter for information concerning Live View and its Autofocus, AF-Area, and Release modes.

Notes on Using Lv Mode

As discussed in the previous chapter, Lv mode uses contrast-detect autofocus, which is activated by the Shutter-release button if you are using Single-servo AF (AF-S) mode or automatically if you selected Full-time servo AF (AF-F) mode in Custom setting a8.

You can move the red focus square to any location on the screen to select off-center subjects. When you have good focus, the red square turns green. You are not limited to the central 39-point AF area as you are when you're looking through the Viewfinder.

Screen Blackout during Exposure

The screen doesn't black out while autofocus is active since the camera focuses by detecting contrast changes on the image sensor. When you fire the shutter, the Monitor will black out briefly while the picture is taken. The blackout is necessary to allow the camera to meter your subject. The exposure meter is in the Viewfinder area, so the reflex mirror must drop while exposure metering is taking place then raise again to fire the shutter. The blackout is very brief.

Extreme Focusing Accuracy

Use Lv mode when you need extreme autofocus accuracy. Contrast-detect autofocus is somewhat slow but very accurate. You can zoom in to pixel-peeping levels with the Playback zoom in button before starting autofocus. This is great for macro shooting since you can select very specific sections of the subject for focusing.

Taking Pictures with Lv Mode

Most people can hear three clicks when taking a picture. Two of them are made by mirror movement, and the final one is made by the shutter firing.

Hold the Shutter-release button down all the way and wait a moment for the camera to take the image. It's usually slower than taking a picture with the Viewfinder because autofocus takes more time. When you take a picture in Lv mode, it appears on the Monitor. To return to Live View for more pictures, just press the Shutter-release button halfway down. I admit it can be a little confusing until you get used to the sounds and actions of Live View mode.

Nikon posts this exposure warning in the User's Manual: "To prevent light entering via the viewfinder from interfering with exposure, remove the rubber eyecup and cover the viewfinder with the supplied DK-5 eyepiece cap before shooting." Basically, just be very careful not to let direct sunshine or bright light enter the viewfinder eyepiece when you are using Lv mode. You could block it with your body or a thumb if you don't have your DK-5 eyepiece cap handy.

My Recommendation: You can use Live View mode on or off your tripod. I normally use Live View for macro (closeup) images, for which I especially need the extra accuracy and focus positioning capability. Lv mode is not as good for many types of action shots since the autofocus is much slower.

The only time I use Lv mode for general shooting is when I want to shoot around-the-corner images. If I were shooting images in a war zone, I think I'd use Lv mode and stick the camera around the edge of the building to capture my image instead of sticking my head, glued to the Viewfinder, around the corner. It is also useful when reaching over the top of a crowd to shoot a parade or below waist level without bending. Old-timers, give it a try!

11



Live View and Movie Mode Screens

(User's Manual – Page 49)

There are five screens available in Live View and Movie mode. You move between these screens by pressing the Info button repeatedly. Try it!

The first screen looks a little different when used by Lv mode as shown in the section of this chapter called Live View/Movie Screen 1. The rest of the screens—2 through 5—are shared by Lv and Movie modes. They each have their own section in this chapter. Movie mode changes the appearance of the first screen because few of the symbols used by Live View for still picture taking apply to Movie mode. Nikon chose not to display unnecessary symbols. However, it does make it seem that the first couple of Info button screen changes in Movie mode do little. You'll have to press the Info button three times while recording a movie before you'll see significant changes in the screen, but you'll see changes immediately in Lv mode.

In reality, all these screens are simply overlays on the basic blank screen seen in [figure 11.4](#). Let's take a look at each of the screens and see what they do. I took pictures of the screens with my D7000's lens cap on to cut down on distractions. The black background makes it a lot easier to see the symbols. Normally, you would see your subject in the black area behind these symbols, as shown in [figure 11.1, image 2](#).



Live View/Movie Screen 1

[Figure 11.2](#) shows numerous symbols that allow you to see how various features are configured. To help examine the small symbols shown, I zoomed in on this screen in [figure 11.2](#). The symbols are as follows:



Figure 11.2 –Live View screen 1, symbols

1. **Shooting mode** – Selected by the Mode dial on top of the camera (Auto, P, S, A, M, U1, U2, SCENE, no flash).
2. **Autofocus mode** – Controlled by Custom Setting Menu > Custom setting a8, with settings AF-S or AF-F.
3. **AF-area mode** – Set with AF-mode button and front Sub-command dial, with settings Face-priority AF, Wide-area AF, Normal-area AF, and Subject-tracking AF.

4. **Active D-Lighting** – Controlled by Shooting Menu > Active D-Lighting, with settings Low to High, and Auto or Off.
5. **Image size** – Controlled by Shooting Menu > Image size with settings Large, Medium, and Small.
6. **Image quality** – Controlled by Shooting Menu > Image quality, with settings NEF (RAW) + JPEG, NEF (RAW), and JPEG.
7. **White balance** – Controlled by Shooting Menu > White balance, with settings Auto, Incandescent, Fluorescent, Direct sunlight, Flash, Cloudy, Shade, Choose color temp., and Preset manual (PRE).
8. **AF point** (focus) – Can be moved around the screen with the Multi Selector to select the subject for autofocus.
9. **Monitor brightness** – Can be seen only when holding down the Help/protect button. Hold button and press Multi Selector up or down to raise or lower Monitor brightness. This does *not* affect image brightness.
10. **Metering mode** – Set with the Metering button and rear Main command dial, with settings Matrix, Center-weighted, and Spot.
11. **Shutter speed** – Set with the front Sub-command dial, with settings from 30 seconds to 1/8000 second.
12. **Aperture** – Set by the rear Main command dial, with settings that vary according to the mounted lens. The AF-S Nikkor 18–105 mm kit lens aperture is f/3.5 to f/22. Lo means not enough light. Hi means too much light.
13. **Monitor brightness control help** – The symbol means Help/protect button + Multi Selector = Monitor brightness. Using these controls makes the Monitor brightness control display show (number 9), otherwise it is invisible.
14. **ISO mode** – Controlled by Shooting Menu > ISO sensitivity settings, with the choice of Auto or manual ISO control.
15. **ISO sensitivity** – Controlled by Shooting Menu > ISO sensitivity settings, with the choice of ISO value from 100 to Hi 1.0 (25,600 ISO). This is a manual setting.
16. **Frame count (remaining pictures)** – Approximately how many more pictures can be taken and stored on the currently selected memory card.

Live View/Movie Screen 2

This is the default Movie mode screen (figure 11.3), and the camera will switch to it when you press the Movie-record button, unless you've selected a different screen while in Lv mode; in that case it will use the one you've selected.

You can use this same screen in Lv mode too; however, it offers functionality only in Movie mode. In Lv mode it is probably best considered a Movie preview screen so that you can see how movies are configured before shooting them.



It has several of the same symbols as in the first Lv mode screen ([Lv Screen 1](#)), but it adds the following symbols:

1. **Audio recording indicator** – This symbol allows you to see the current microphone volume setting. My camera is set to Auto sensitivity in [figure 11.3](#).

This setting is controlled by Shooting Menu > Movie settings > Microphone, with the choice of Low to High, Off, and Auto.

2. **Time remaining** – When you are recording a movie, this shows how much time is left (20 minutes maximum in minutes and seconds).
3. **Movie quality** – This is controlled by Shooting Menu > Movie settings and shows the quality and frame rate to which your Movie mode is currently set, with the choice of 1080p at 24 fps with high or normal quality, 720p at 24 or 30 fps with high or normal quality, and 640p at 30 fps with high or normal quality.
4. **Gray frame lines** – These gray lines (top and bottom) allow you to see the format of the 16:9 format HD movie (1920 x 1080 or 1280 x 720) or no gray lines if the movie mode is for SD format (640 x 424). If you don't keep your subject within these lines, the camera will not record them.

Live View/Movie Screen 3

[Figure 11.4](#) shows a much cleaner screen with an almost blank area at the top and a single line of information along the bottom. This is for users who prefer an uncluttered screen while shooting pictures or video.

If the camera's Movie mode is set to HD video, you'll see four short lines in the four corners of the screen. This delineates the 16:9 format of an HD video. If your camera is set to SD video, the four lines will not be there. The informational line at the bottom is described in the text accompanying [figure 11.2](#).

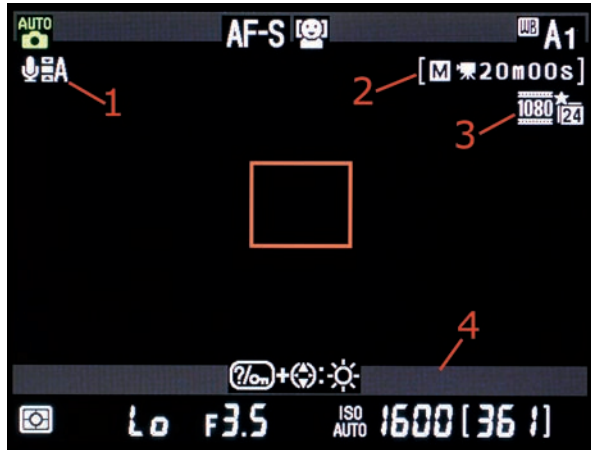


Figure 11.3 – Live View screen 2, symbols



Figure 11.4 – Live View screen 3, uncluttered



Live View/Movie Screen 4

Figure 11.5 shows a screen that is similar to the previous screen, except that gridlines are added. Use these gridlines to level your subject in the Viewfinder, as is necessary when photographing things like a horizon, or buildings or walls in architectural photography. Again, the informational line at the bottom is described in the text accompanying figure 11.2.

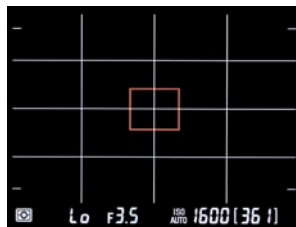


Figure 11.5 – Live View screen 4, gridlines

Live View/Movie Screen 5

The final screen, shown in figure 11.6, displays a Virtual horizon that allows you to level the camera in a single-axis horizontal direction. If you are a private or commercial pilot, you'll feel right at home with this new tool since it resembles the artificial horizon you use to keep the wings level. The other symbols displayed in this screen are described in the text accompanying figure 11.2. Keep in mind that Live View mode is the basis for shooting movies. We'll now see how Movie mode works.



Figure 11.6 – Live View screen 5, Virtual horizon

Movie Mode

(User's Manual – Page 57)

The Movie mode in the D7000 is one of the best video recording systems Nikon has put in a DSLR. It has automatic or manual focus, 1080p HD recording, stereo sound, 20-minute recording segments, and excellent rolling shutter correction.

Another nice feature is the new manual mode control for serious video mavens. With this camera, you can control both shutter and aperture in the Manual movie settings mode found under Shooting Menu > Movie settings. This mode gives you greater control of actual camera body settings during a video recording session.

If you want to buy all the cool attachments, like stabilization frames, bigger external video monitors, and an external stereo mic, this camera has the ports and controls for them.

Let's examine how to prepare for and record videos and then how to display them on various devices.

High-Definition (HD) versus Standard-Definition (SD) Video

Before shooting your first movie, you'll need to configure the camera for your favorite video frame size (Movie quality). We'll look into the actual configuration in a later section. For now, let's just discuss some basics.

A video frame is much smaller, in terms of pixels, than a normal still-image frame. Although your D7000 can create beautiful 16-megapixel still images, its best HD video image is just above two megapixels (2,073,600 pixels).

Whoa! How can two megapixels be considered high definition (HD)? Simply because it matches one of the high-definition television (HDTV) broadcast resolutions. In the good old days of standard-definition television (SDTV) that we all grew up watching, there was even less resolution. Would you believe that the old TV you have stored in the garage displays only 345,600 pixels, or 0.3 megapixels?

I've been talking about the number of megapixels, but that's not normally how HD devices are rated. Instead of the number of pixels, most HD information talks about the number of lines of resolution. There are several HD standards for lines of resolution. The most common standards are 720p, 1080i, and 1080p. The p and i after the numbers refer to progressive and interlaced. We'll talk about what that means in the next section.

The D7000's best Movie mode captures video at 1080p, which is a display-quality HDTV standard. At the time of this writing, most over-the-air broadcast-quality HD is 720p. I'm sure that will change now that TVs have gone digital. The 1080p designation simply means that your camera captures and displays HD images with 1,080 lines of vertical resolution. Each of those lines is 1,920 pixels long, which allows the D7000 to match the 16:9 aspect ratio expected in HDTV. An older SDTV usually has an aspect ratio of 4:3, which is taller and narrower than the HDTV 16:9 aspect ratio.

Progressive versus Interlaced

What's the difference between progressive and interlaced? Technically speaking, progressive video output displays the video frame starting with the top line and then draws the other lines until the entire frame is shown. The D7000 displays 1,080 lines progressively from the top of what the imaging sensor captured to the bottom (lines 1, 2, 3, 4 . . . 1,080).

Interlaced video output displays every even line from top to bottom, then comes back to the top and displays every odd line (lines 2, 4, 6, 8 . . . 1,080, then 1, 3, 5, 7 . . . 1,079).

Progressive output provides a higher-quality image with less flicker and a more cinematic look. I'm sure that's why Nikon chose to make the D7000 shoot progressive video. Now, let's set up our cameras and make some movies!



Camera Setup for Making Movies

The D7000 is capable of creating movies at any time and with little thought, by simply using the following settings and actions:

- Select Autofocus mode AF-F (Full-time-servo AF) under Custom setting a8 for automatic full-time autofocus
- Set the Mode dial to AUTO
- Flip the Live View lever to enter Lv mode
- Press the Movie-record button

Since you have purchased an advanced-level camera, you may want to do more than just take automatic movies. The D7000 can do it either way. Let's discuss how to set up the camera for more professional movie creation. Before you make your first semipro movie, you'll need to configure several things on your D7000:

- Setup Menu > Video mode – Encoding method, NTSC or PAL
- Shooting Menu > Movie settings > Movie Quality
- Shooting Menu > Movie settings > Microphone sound level
- Shooting Menu > Movie settings > Destination memory card
- Shooting Menu > Movie settings > Manual movie settings
- Shooting Menu > Set Picture Control
- Shooting Menu > Color space
- Custom Setting Menu > a8 Live view/movie AF > Autofocus mode
- Custom Setting Menu > a8 Live view/movie AF > AF-area mode

Let's examine each of these settings individually and prepare for recording premium quality videos.

Choosing a Video Encoding Method

(User's Manual – Page 237)

The D7000 allows you to record using either the NTSC or PAL encoding method. NTSC is the standard in North America, Japan, some of South America, and a few other areas. PAL is the standard in most of Europe, Asia, and Australia. There is very little quality difference between the two encoding methods.

You'll need to refer to the manual of your display device to determine which video encoding type it uses.



Here are the steps to select the Video mode:

1. Select **Video mode** from the **Setup Menu** and scroll to the right (figure 11.7, image 1).
2. Select **NTSC** or **PAL** encoding mode, per your hardware standard (figure 11.7, image 2).
3. Press the **OK** button to set the mode and return to the **Setup Menu**.



Figure 11.7 – Choosing a video encoding method

My Recommendation: If you live in the United States, you'll usually use NTSC. If you live in Europe, you'll probably use PAL. Check the user's manual of your display device.

Choosing a Movie Quality

The Movie quality setting allows you to control several aspects of a movie created with your camera. There are 12 Movie quality formats between the NTSC and PAL Video mode selections. Not all choices are available under each Video mode setting. Following are all available choices (table 11.1):

Frame Size	Resolution	Quality	FPS	Ratio	Video Mode
1920 x 1080	1080p HD	high	24	16:9	NTSC/PAL
1920 x 1080	1080p HD	normal	24	16:9	NTSC/PAL
1280 x 720	720p HD	high	24	16:9	NTSC/PAL
1280 x 720	720p HD	normal	24	16:9	NTSC/PAL
1280 x 720	720p HD	high	25	16:9	PAL
1280 x 720	720p HD	normal	25	16:9	PAL
1280 x 720	720p HD	high	30	16:9	NTSC
1280 x 720	720p HD	normal	30	16:9	NTSC
640 x 424	424p SD	high	25	3:2	PAL
640 x 424	424p SD	normal	25	3:2	PAL
640 x 424	424p SD	high	30	3:2	NTSC
640 x 424	424p SD	normal	30	3:2	NTSC

Table 11.1 – All available Movie quality settings



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Note: When you change between NTSC and PAL in Setup Menu > Video mode, the camera changes the available selections under Shooting Menu > Movie settings > Movie quality. The D7000 will warn you of this fact when you select one of the two Video modes. Table 11.1 shows all available settings; however, you'll never see all of them at the same time in a camera menu since some are specific to one of the two Video modes—NTSC or PAL.

The ratios (16:9 and 3:2) are format sizes. The HD format has a ratio of 16:9, and will display on a standard-definition television (SDTV) in the wide-screen format. The 3:2 ratio more closely matches the SDTV format we've been using for years, but it is rapidly becoming obsolete. A 3:2 movie will display full screen on a SDTV. All movie formats are limited to 20 minutes of recording time for each segment. In table 11.2 is a list of approximate file sizes for 20-minute recording sequences.



Frame Size	Quality	FPS	Length	Size
1920 x 1080	high	24	20 minutes	2.9 GB
1920 x 1080	normal	24	20 minutes	1.7 GB
1280 x 720	high	30	20 minutes	1.7 GB
1280 x 720	normal	30	20 minutes	1.1 GB
1280 x 720	high	25	20 minutes	1.7 GB
1280 x 720	normal	25	20 minutes	1.1 GB
1280 x 720	high	24	20 minutes	1.4 GB
1280 x 720	normal	24	20 minutes	1.0 GB
640 x 424	high	30	20 minutes	800 MB
640 x 424	normal	30	20 minutes	510 MB
640 x 424	high	25	20 minutes	800 MB
640 x 424	normal	25	20 minutes	510 MB

Table 11.2 – Approximate file sizes for the various quality ratings

Now, let's examine how to select a Movie quality. Remember that the values shown in the following Shooting Menu screen (figure 11.8, image 3) are based on how Setup Menu > Video mode is configured (NTSC or PAL). Since I am shooting in North America and devices here generally use NTSC, the screen images in figure 11.8 show values based on NTSC. If you are using PAL you will see some additional choices (mostly 25 fps). Refer to table 11.1 for all the Movie quality values.

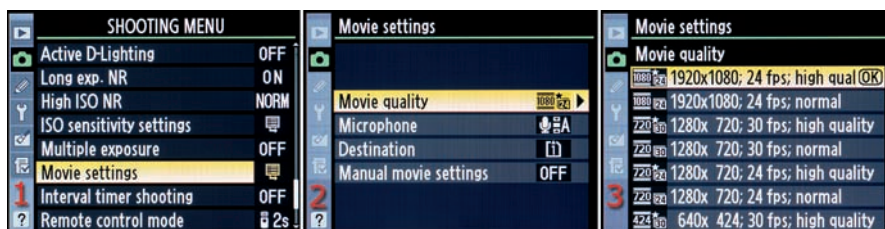


Figure 11.8 – Choosing a Movie quality setting

Use the following steps to choose a Movie quality setting:

1. Select **Movie settings** from the **Shooting Menu** and scroll to the right (figure 11.8, image 1).
2. Choose **Movie quality** from the **Movie settings** menu and scroll to the right (figure 11.8, image 2).
3. Select one of the eight formats for **Movie quality** (figure 11.8, image 3).
4. Press the **OK button** to choose the format.



Video File Format

The file format used by the D7000 is the popular Apple QuickTime MOV format. This format is handled by virtually all computer movie players. The video compression used inside the MOV file is H.264/MPEG-4 Advanced Video Coding.

A computer should display any of the Movie quality modes. Any of the modes, including 1080p and 720p HD, will play on your SDTV through the included AV cable. The HD mode displays in the wide-screen format, with a black space at the top and bottom of the picture. Using a mini-HDMI (type c) to HDMI standard (type a) cable, you can play full HD videos on an HDTV. An HDMI cable is not included with the camera. They are easily available online and in many electronics stores. We'll talk more about how to display video in a later section, which includes pictures of the cables.

My Recommendation: There are three considerations when selecting a Movie quality setting: (a) How much storage capacity do I have in my camera's memory cards?, (b) What type of display device will I show the movies on?, and (c) Am I a video fanatic?

If you are fanatical about video, you'll only shoot at the fastest rates and highest quality. Others may want to shoot a lot of family videos and hate storing the huge files that result from high quality. In that case, the normal quality setting and lower resolutions may be sufficient.

If you can't stand watching a non-HD video on YouTube, maybe you should stick to maximum quality. If standard YouTube videos are sufficient for your needs, nearly any quality setting from the D7000 will look great on your computer.

This is a very personal thing and you'll need to experiment with video modes to balance between quality and storage costs.

Why Different Frame Rates?

The NTSC encoding format, established in the 1940s, originally used two frame rates: 30 or 60 fps. In the 1960s a new German standard was created called PAL, which used 25 or 50 fps. Today, frame rates of 24, 25, 30, and 60 are common in DSLR cameras, in either encoding format. These rates can also be expressed as a hertz (Hz) rate on progressive scan monitors. The primary frame rates used in the movie industry are 24p, 25p, and 30p.

We do not normally think of a video as a bunch of frames, but a video is lots of still pictures joined together and moved past your eye at a very fast rate. The human eye maintains an image at about 10 fps (1/10 second), so any frame rates faster than that do not flicker for most people. However, some people's eyes are more sensitive and can see flicker in slower frame rates. I am afraid to say much more about this issue because it can rapidly degrade into an almost religious discussion, with people having very strong opinions about their favorite frame rates. Let me just say that many people prefer 24 or 25 fps because that is normal for movies. These two rates are called cinematic rates. Other people like the faster frame rate of 30 fps due to its lack of flicker. I suggest that you try all three frame rates and see which you like best. I honestly can't see the difference.

Recording Sound in Your Movies

(User's Manual – Page 60)

Sound recording on the D7000 is accomplished either with the monaural sound pickup mic on the front of the camera (figure 11.9) or with an optional stereo mic that will plug into the camera's stereo sound port (figure 11.11). The camera's audio recording format is Linear PCM.



Figure 11.9 – Built-in mono microphone

The built-in mono mic looks like three tiny holes in a straight line just below the D7000 logo (red arrow in [figure 11.9](#)). Be careful about accidentally covering the microphone with a finger, or you will have very muted sound. Also, be careful about letting wind blow directly on the mic holes when recording since that might cause a rushing noise that interferes with the sound you are trying to record.



Figure 11.10 – Built-in playback speaker

The video's sound is output during playback through a small speaker on the rear of the camera, near the tip of your thumb when holding the camera ([figure 11.10](#)). You'll see six small holes in two angled lines between the AE-L/AF-L button and the rear Main command dial. This little speaker can put out an amazing amount of volume.

You can control the volume output of the speaker with the Thumbnail/playback zoom out button (volume down) and Playback zoom in button (volume up).

In [figure 11.11](#) you can see the stereo mic port on the bottom under the lower Accessory cover (rubber flap) on the camera's side. Don't accidentally plug a mic into the A/V out port on top (red X).



Figure 11.11 – Stereo microphone port

The D7000 offers the ability to plug in an optional stereo microphone. It disables the built-in mono mic and

overcomes some of its limitations. There are several microphones available for the D7000, including a few that mount onto the camera's Accessory shoe like a flash unit does. You can choose your favorite at online camera stores. A very popular microphone is the Rode Stereo Video Mic X/Y Condenser Microphone, which retails for around US\$250.

In order to record sound in sync with your video, you'll need to make sure the Microphone setting is enabled on the D7000. Using the Shooting Menu screens shown in [figure 11.12](#), you can select from three volume levels: Low sensitivity (1),



Medium sensitivity (2), or High sensitivity (3). You can also select Microphone off or Auto sensitivity (A). Auto lets the camera decide which sound recording level best fits the situation.



Figure 11.12 – Choosing a microphone sensitivity level

Here are the steps to choose a mic sensitivity level for recording:

1. Select **Movie settings** from the **Shooting Menu** and scroll to the right (figure 11.12, figure 1).
2. Select **Microphone** and scroll to the right (figure 11.12, figure 2).
3. Choose one of the four available sensitivity settings, or **Microphone off** (figure 11.12, figure 3).
4. Press the **OK button** to lock in your choice.

Choosing a Destination for Video Recordings

(User's Manual – Page 60)

The D7000 allows you to choose which of your camera's two SD cards slots will receive the video. It also gives you an estimate of available video recording time available for each card, based on the current Movie quality settings.

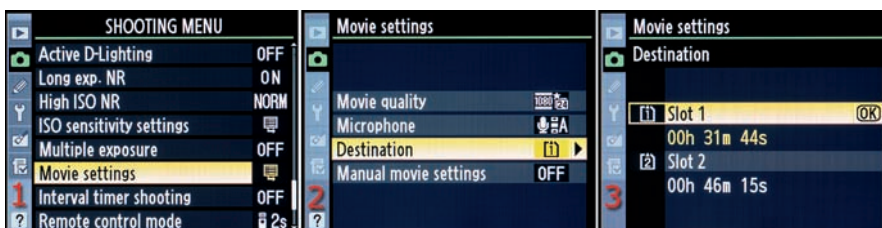


Figure 11.13 – Choosing a Destination for your movies

Here are the steps to choose one of the memory card slots as a Destination:

1. Select **Movie settings** from the **Shooting Menu** and scroll to the right (figure 11.13, image 1).

2. Select **Destination** and scroll to the right (figure 11.13, image 2).
3. Select one of the two memory card slots, paying attention to how much recording time is available at the camera's current video frame size. **Slot 1** on my camera has a little more than 31 minutes available, and **Slot 2** has 46 minutes and 15 seconds available (figure 11.13, image 3).
4. Press the **OK button** to lock in the slot selection.

Using Manual Movie Settings

(User's Manual – Page 60)

With the Manual movie settings set to On and the Mode dial set to M, you can control most aspects of the camera's exposure modes while actually recording the video. You can adjust the shutter speed and ISO sensitivity *during* the recording, and you can adjust the aperture *before* the movie starts.

This mode is not for people who simply want to take some good videos of their family on a trip to Yosemite. Manual control takes more time and expertise to pull off well. If you are the sort of person who wants to excel in video production, then learn to use Manual movie settings. Otherwise, skip this section and use the automatic modes to make movies. Here are the steps to take full manual control of the camera during video.



Figure 11.14 – Mode dial set to M

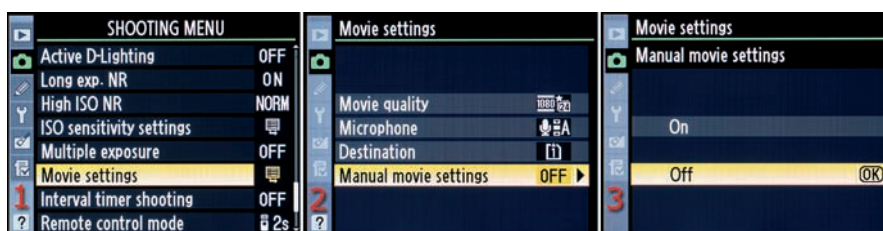


Figure 11.15 – Setting Manual movie settings to On

Here are the steps to record a video in full manual:

1. Set the **Mode dial** to **M** for Manual mode (figure 11.14).
2. Choose **Movie settings** from the **Shooting Menu** and scroll to the right (figure 11.15, image 1).
3. Select **Manual movie settings** and scroll to the right (figure 11.15, image 2).
4. Choose **On** from the menu. The camera defaults to **Off** (figure 11.15, image 3).
5. Press the **OK button** to lock in the setting.



When I first saw this new setting, I was a bit confused. Since the mechanical shutter is not used during video recordings—you know, the one that makes the cool *chika, chika, chika* sound when you hold down the Shutter-release button—I wondered why (and how) one would control the shutter speed during a video.

Remember, your camera is using an electronic shutter at up to 30 frames per second while recording a movie. If it were using the mechanical shutter you use when taking still pictures, the video couldn't exceed six frames per second, and your camera would sound like a sports shooter gone mad with the mechanical shutter firing endlessly. At the frame rate required for shooting movies, the mechanical shutter would wear out in less than two hours—if it were being used. It isn't!

The shutter speed you are controlling in Movie mode is built in to the electronic (not mechanical) shutter and fires at 30, 25, or 24 fps. This has some powerful implications for people who want more control during movie recordings. You can control the shutter speed and ISO sensitivity during a video. Here's how.

Adjusting Aperture, Shutter Speed, and ISO Sensitivity

When you can adjust the shutter speed during the video you can capture a beautiful blur effect for a waterfall (slow shutter speed) and quickly switch to a fast shutter speed to get that deer leaping over a fence.

The following list provides information about using the aperture, shutter speed, and ISO sensitivity settings during a movie, with Shooting Menu > Movie settings > Manual movie settings set to On and the Mode dial set to M (figures 11.14 and 11.15):

- **Aperture** – It is important to know that you must set the aperture before the movie starts. After you have set the aperture (e.g., f/5.6), that aperture will be used for the entire movie. You cannot change the aperture during the movie, so you must think about how much depth of field you will need before you start recording the movie.
- **Shutter speed** – Unlike the aperture, you can change the shutter speed during the movie at any time. This allows you to control motion blur by simply rotating the rear Main command dial, thereby changing the shutter speed to any value between 1/30 and 1/8000 second. Be careful to keep the ISO sensitivity high enough if you turn the shutter speed to very fast settings, otherwise you will underexpose your video. Watch the monitor carefully when you make changes to the shutter speed. In manual mode you are in control of exposure!
- **ISO sensitivity** – You have full control over the ISO sensitivity of the camera when using Manual movie settings. You will control the ISO sensitivity by holding in the ISO button on the rear of the camera while rotating the rear Main command dial. Use this in conjunction with the shutter speed to make adjustments when conditions change. You can adjust ISO sensitivity to anywhere between ISO 100 and Hi 2 (25,600).

11



My Recommendation: I have experimented with these manual settings quite a bit. What I have found is that you can use your left thumb to operate the ISO button and your right thumb to turn the rear Main command dial for quick adjustments of ISO and shutter speed. If you raise the shutter speed, you'll also need to raise the ISO sensitivity, or you'll quickly start underexposing the video. If you practice with this you will become familiar with how to balance it well. You have full manual control of the video's exposure, so be careful. The camera will not adjust to changing light conditions when Manual movie settings is set to On and you are using M on the Mode dial. With this power to control exposure comes the responsibility to get it right.

Remember that the aperture is not going to change during the video, so you must be sure that you are using an aperture with sufficient depth of field to cover minor focusing errors, but it shouldn't be so small that it's impossible to use the shutter effectively.

Fortunately, you have a wide range of ISO sensitivity to keep the image sensor sensitive enough for the current light conditions. Don't forget that the higher the ISO, the grainier your video will be.

You now have the control you need for expert usage, so go practice and make the camera's controls second nature so that you can react well to changes.

Choosing a Picture Control

You can use the included Nikon Picture Controls, or even your own Custom Picture Controls, to control the look of your Movies. I'm not going to go into a great deal of information on using or modifying picture controls, since this subject is covered very well in the chapter titled **Shooting Menu**. However, when you understand the controls and have modified a couple, you will realize that your videos will benefit from different picture controls.

For instance, let's say you are shooting a video on an overcast, low-contrast day, and you want to add some snap to your movie. You can simply preselect the Vivid Picture Control, which will saturate the colors and darken the shadows.

Or you might be shooting on a very high-contrast, sunny day and want to tone down the contrast a bit. Simply preselect the Neutral Picture Control, which will open up the shadows and extend the dynamic range of the sensor for a lower-contrast look.

Maybe you are shooting a video of a lovely colorful autumn scene and want to maximize the colorful look. Simply preselect the optional Landscape Picture Control (free download from Nikon) and your video will be optimized for beautiful scenery.

Just as with the aperture, you must select the Picture Control before you start recording the video. Here's how.

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Figure 11.16 – Choosing a Picture Control

The steps to choose a Picture Control from the Shooting Menu are as follows:

1. Select **Set Picture Control** from the **Shooting Menu** and scroll to the right (figure 11.16, image 1).
2. Choose one of the Nikon Picture Controls from the **Set Picture Control** screen (figure 11.16, image 2).
3. At this point, you can simply press the **OK button** and the control you've chosen will be available for immediate use.
4. Optionally, you can fine-tune the currently highlighted control by scrolling to the right before pressing the **OK button** (figure 11.16, image 3). This will bring you to the **Quick adjust** screen for fine-tuning. You can adjust the **Sharpening**, **Contrast**, **Brightness**, **Saturation**, and **Hue** settings by scrolling up or down to select a line and then right or left (+/-) to change the value of that line item. This is entirely optional.

My Recommendation: Read the section called **Set Picture Control** in the chapter titled **Shooting Menu**. It describes in great detail the benefits of the various Picture Controls. I often shoot video with the Standard (SD) Picture Control selected. I find that it gives me nice contrast and color saturation without going overboard on either. It's much harder to adjust color and contrast on a video after the fact, so make sure you get it right in the first place.

Choosing a Color Space

A Color space is as important for a video as it is for a still picture. Which Color space to use depends on the final quality and where you will display the video.

Since the Adobe RGB Color space has a wider gamut, it will capture a wider range of color. However, that doesn't mean Adobe RGB is the best Color space for video recordings.

Most video recordings for nonprofessionals are destined for Facebook, YouTube, and home usage. Since the web is designed to best use sRGB, that may be the best Color space for home users to select. Otherwise the colors may not appear as bright and saturated.

However, if you are shooting commercially you will have some strong opinions on this already, I'm sure. If you are a video fanatic who shoots in manual mode, you may use Adobe RGB

because of the wider gamut, realizing that you will do special processing of the video in the future and adjust it for the display device upon which it will be shown. Here are the steps to choose a Color space:

1. Choose **Color space** from the **Shooting Menu** and scroll to the right (figure 11.17, image 1).
2. Select **sRGB** or **Adobe RGB** (figure 11.17, image 2).
3. Press the **OK** button to lock in your choice.

My Recommendation: Since I am primarily a still photographer and shoot video only for family usage (mostly Facebook and computer display), I use sRGB for videos. However, if I were a commercial video shooter, I wouldn't hesitate to use Adobe RGB if my client required it. Do a little research on this for yourself. There are some good articles on the web on Color space within video. Most people use sRGB.

Setting an Autofocus Mode

If you are not going to shoot many videos with Manual movie settings set to On and the Mode dial set to M, you'll need to decide whether you want to use autofocus during video recording, by pressing the Shutter-release button to focus (AF-S mode), or let the camera handle autofocus automatically (AF-F mode).



Figure 11.17 – Choosing a Color space

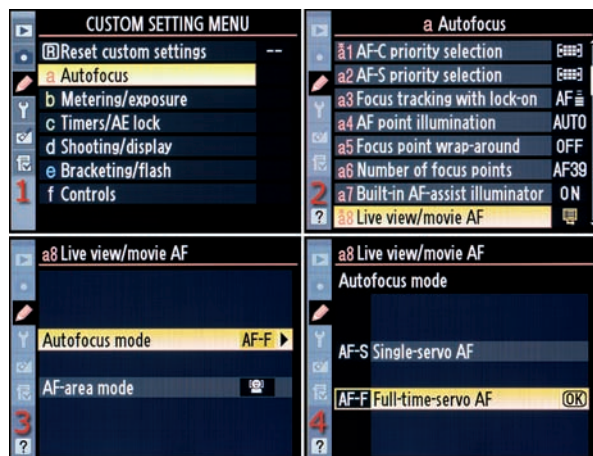


Figure 11.18 – Choosing an Autofocus mode under Custom setting a8 Live view/movie AF



These settings are controlled by Custom setting a8. Let's examine the setting. Use the following steps to change the Autofocus mode:

1. Select **a Autofocus** from the **Custom Setting Menu** and scroll to the right (figure 11.18, image 1).
2. Highlight **a8 Live view/movie AF** and scroll to the right (figure 11.18, image 2).
3. Choose **Autofocus mode** and scroll to the right (figure 11.18, image 3).
4. Select either **Single-servo AF (AF-S)** or **Full-time-servo AF (AF-F)** from the menu (figure 11.18, image 4).
5. Press the **OK button** to lock in the **Autofocus mode**.

My Recommendation: Many people, including myself, use Full-time-servo AF (AF-F mode), as described the chapter titled **Autofocus, AF-Area, and Release Modes** in the section called **Using Autofocus and AF-Area Modes for Live View Photography**. Review the section in the beginning of this chapter called **Live View Mode**, which applies equally to Movie mode.

Setting an AF-Area Mode

The AF-area mode lets your camera choose where it will autofocus on your image. The setting modifies the basic way autofocus decides what part of the subject is important for autofocus. Figure 11.19 shows the symbols for the four AF-area modes where the red arrow points in each image. You can also see the various AF points (green squares) and how they look different in each mode. The following list explains the four available AF-area modes:



Figure 11.19 – The four AF-area modes

- **Face-priority AF** (figure 11.19, image 1) – The camera has the ability to track focus on the faces of several people at the same time. It is quite fun to watch as the little green and yellow AF point squares find faces and stay with them as they move. Nikon claims it can detect up to 35 faces at the same time.

- **Wide-area AF** (figure 11.19, image 2) – For the landscape shooters among us who like to use Live View mode or shoot movies of beautiful scenic areas, this is the mode to use. The camera will display a big red or green AF point square on the Monitor (green when in focus, red when not). You can move this big AF point around until it rests exactly where you want the best focus to be. The camera will sense a wide area and determine the best focus, with priority on the area under the AF point square.
- **Normal-area AF** (figure 11.19, image 3) – This is a mode primarily for shooters who need to get very accurate focus on a small area of the frame. This is a great mode to use with a macro lens because it gives you a much smaller AF point square that you can move around the frame.
- **Subject-tracking AF** (figure 11.19, image 4) – In this mode you have to autofocus first (AF-F mode does this automatically), then you start subject tracking by pressing the OK button once. To stop subject tracking, press it again. Full-time-servo AF (AF-F) allows your camera to track the subject without you worrying about keeping it in focus (see the previous section called **Setting an Autofocus Mode**).



Here are the steps to choose an AF-area mode:

1. Select **a Autofocus** from the **Custom Setting Menu** and scroll to the right (figure 11.20, image 1).
2. Highlight **a8 Live view/movie AF** and scroll to the right (figure 11.20, image 2).
3. Choose **AF-area mode** and scroll to the right (figure 11.20, image 3).
4. Select one of the four AF-area modes from the menu (figure 11.20, image 4).
5. Press the **OK button** to lock in the **AF-area mode**.

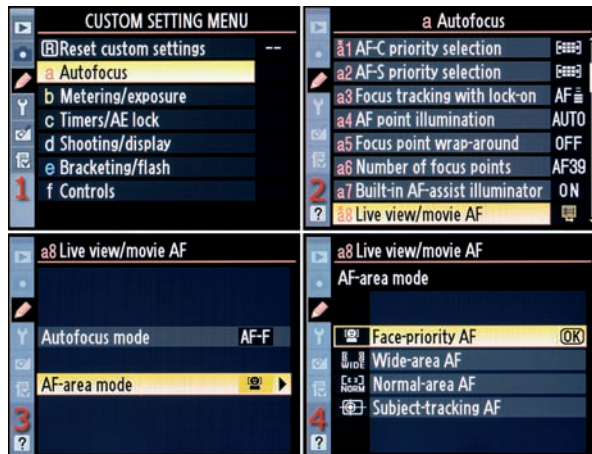


Fig. 11.20 – Choosing an AF-area mode under Live view/movie AF

My Recommendation: Why not leave the AF-area mode set to Face-priority AF if you photograph people a lot? If you are using Live View for macro shooting, Normal-area AF gives you the smallest, most accurate area mode for detailed, up-close focusing. Landscape shooters should use Wide-area AF, and wildlife or sports shooters should use Subject-tracking AF. There is more detail available on

this subject in the chapter titled **Autofocus, AF-Area, and Release Modes** in the section called **AF-Area Mode**. Review the section in this chapter called **Live View Mode**, which applies equally to Movie mode.

Recording a Video with Your D7000

Now let's look at the process of recording a video. There are several easy steps, as shown in the upcoming steps. Here are the steps to start recording a movie:

1. Flip the **Live view switch** on the back of the camera to the right to enable Live View (figure 11.21, image 1).



Figure 11.21 – Recording a movie

2. Press the **Movie record button** to start recording (figure 11.21, image 2).
3. In figure 11.21, image 3, my camera is recording in **Face-priority AF**. It has no faces to focus on, so the focus square is red.
4. In figure 11.21, image 4, a woman walked into the frame, and my D7000 found her face automatically and focused quickly.
5. To end the movie recording, simply press the **Movie record button** once again (figure 11.21, image 2).

Amazingly, that's all there is to it. You have a cool video camera built into your still camera. It is available with the flip of a switch and a press of a button.

In most cases, unless you really want to try to control the camera manually, just shoot your video and enjoy what you captured. The camera will make a good exposure in almost all circumstances.

My Recommendation: The steps I listed for figure 11.21 apply to Face-priority AF, one of the most popular modes for video recording. Plus, I was using AF-F mode, or Full-time-servo AF, so the camera was automatically seeking autofocus. Otherwise, I would have had to use the Shutter-release button to manually focus on the woman's face.

Remember that there are four AF-area modes available, as explained in the last section. Some of them require an extra step. For example, Subject-tracking AF

requires you to press the OK button after autofocus to initiate tracking.

Try making a movie in each of the modes so you can see which you will use most often. They each have a distinct purpose, and you may find yourself using all of them at one time or another.

Displaying Movies

Now the fun begins! The whole point of this section is to allow you to capture some great videos. There are three ways to play back one of your cool movies from the camera:

- Play it back on the camera's large LCD Monitor.
- Use the included AV cable and connect the camera to an SDTV.
- Use an HDMI cable that you've purchased to connect the camera to an HDTV.

Displaying a Movie on the Camera LCD Screen

The method used to view a movie on the D7000 Monitor is simplicity itself, just like video capture. Videos are stored on the camera's memory card just like a still picture. All you have to do is find it and press the OK button to play the video. Use the following steps to play a movie on the Monitor:



Figure 11.22 – Playing a movie on the Monitor

1. Press the **Playback button** to display images on the **Monitor**. It's the same button you use to look at a series of pictures (figure 11.22, image 1, red arrow).
2. Locate the video you want to replay by scrolling through your images and videos with the **Multi Selector**.
3. When the video appears on the camera Monitor you'll be able to identify it by three signs: a small **Movie icon**, a minutes-and-seconds counter at the top of the screen, and the words **OK Play** at the bottom of the screen. The image you see is the first frame of the video (figure 11.22, image 2, red arrows).
4. Press the **OK button** to start playing the video.

My Recommendation: The Monitor on the D7000 is big enough for several people to enjoy one of your videos. Don't be afraid to show off a bit since your camera creates excellent high-resolution videos.



Displaying a Movie on an SDTV

You can plug in the standard A/V cable that is included in the box with your D7000 to display videos directly on your SDTV. The A/V cable looks like the one shown in [figure 11.23](#).

As shown in [figure 11.23](#), this AV cable has a standard ministereo black plug (left) that you'll insert into your D7000. It also has two RCA jacks, yellow and white (right). The yellow jack carries the video signal, and the white jack carries the mono sound.



Fig. 11.23 – Audio/Video cable

[Figure 11.24](#) shows the port on the side of your D7000 where you'll insert the black plug of the A/V cable. Open the rubber flap to find the small round A/V OUT port. Be careful that you don't insert the black plug into the MIC port accidentally (red X). The A/V OUT port is on top (figure 11.24, red arrow). Here are the steps to display a video on your SDTV:



Figure 11.24 – A/V out port

1. Turn your camera off. I never like plugging things into live devices. It may not hurt it, but why take a chance? A 50,000 volt static spark on a live electronic device often results in a dead electronic device.
2. Open the rubber flap on the left side of your D7000 and insert the A/V cable mini stereo plug into the A/V OUT port (figure 11.24, red arrow).
3. Insert the RCA jacks into their respective ports on the display device. Be sure to match the colors—yellow is video, white is sound. If your SDTV has no RCA jacks, feed the signal through an attached VCR or DVD player.
4. Set your TV to channel 3, which seems to be the standard for displaying video. If channel 3 doesn't work, try channel 4. Consult your TV manual if those don't work, but they should!

5. Some TVs require you to press a button on the remote that puts the TV into video mode. This drove me crazy at first, since I had everything hooked up and no video would show on my TV. I left the room and was about to give up when my sweet wife called from the living room, “Darrell, I figured it out! I found a TV/Video button on the remote.” After pressing that, it worked fine. Thank goodness for wives!
6. Turn on the camera and press the **Playback button**; then locate the video you want to show off.
7. Press the **OK button** to play the video on your TV, or record it on your VCR or DVD burner.

My Recommendation: I’ve found that any of the available video Movie quality modes will display just fine on my older SDTV. I was surprised when the 1080p HD mode video played. It used the wide-screen format with a black space at the top and bottom of the screen. The 640 x 424 mode video filled the whole TV screen. You’ll enjoy playing videos for your family and friends on their TVs. The screen is big enough to see things well, and the video quality is good, too.



Displaying a Movie on an HDTV

This mode works like the SDTV mode, except that you will display your HD videos in their native size and format, full-screen on an HDTV. You’ll need an HDMI cable with a mini-HDMI (type c) end to insert into your D7000, and the other end will have to match your HDTV’s HDMI port, which is usually HDMI standard (type a).

We’ll talk more about the cable specs in a moment, but first let’s discuss your camera’s HDMI output frequencies.

Before you attempt to connect your Nikon D7000 to your HDTV, be sure that you’ve correctly configured your HDMI output to match what your HDTV needs, or you won’t get a picture. Use the Setup Menu > HDMI setting to select a specific output type, or just select Auto so the camera and HDTV can figure it out for you.

Here is a list of formats supported by your camera:

- **Auto** – Allows the camera to select the most appropriate format for displaying on the currently connected device
- **480p** – 640 x 480 progressive format
- **576p** – 720 x 576 progressive format
- **720p** – 1280 x 720 progressive format
- **1080i** – 1920 x 1080 interlaced format



Figure 11.25 – Selecting an HDMI Output resolution

Here are the steps to select an Output resolution:

1. Select **HDMI** from the **Setup Menu** and then scroll to the right (figure 11.25, image 1).
2. Choose **Output resolution** from the menu and scroll to the right (figure 11.25, image 2).
3. Select one of the five output resolutions (figure 11.25, image 3).
4. Press the **OK** button to lock in your selection.

Next you'll need to configure Device control if your HDTV supports HDMI-CEC (check your TV manual). Select one of the two following settings that affect how you will control your HDMI device:

- **On** – When you connect your camera to a television that supports HDMI-CEC, a simple display will appear on your TV screen. It will have two choices: Play and Slide show. When you see this display you can use your TV's remote control to control the camera during full-frame playback and slide shows.
- **Off** – You must use the camera's Multi Selector to control the image display on the TV.

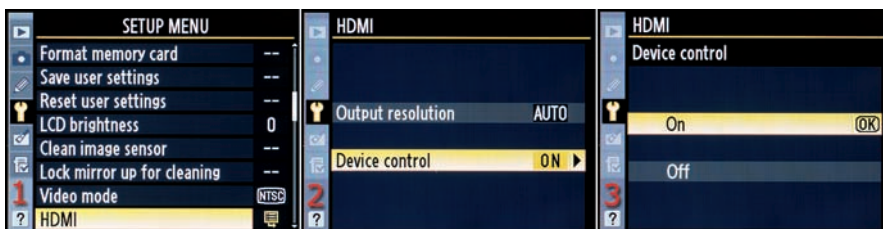


Figure 11.26 – Selecting an HDMI Device control

Here are the steps to enable Device control:

1. Select **HDMI** from the **Setup Menu** and scroll to the right (figure 11.26, image 1).
2. Choose **Device control** from the menu and scroll to the right (figure 11.26, image 2).

3. Select **On** or **Off** from the menu (figure 11.26, image 3).
4. Press the **OK** button to lock in your selection.

Now your camera is ready to output video on a compatible HDTV. Figure 11.27 shows what compatible HDMI cable ends look like. Unfortunately, you'll have to purchase an HDMI cable since one is not included with your D7000. You'll need to use a mini-HDMI (type c) to HDMI standard (type a) cable. And, of course, you'll need to plug your HDMI cable into the correct port on the D7000.

In figure 11.28 you can see the port you'll need to use with your mini-HDMI (type c) connector. After it is plugged in, here are the steps to display a video on your HDTV:

1. Turn your camera off. Why take a chance on blowing up your camera from a static spark?
2. Open the rubber flap on the left side of your D7000 and insert the mini-HDMI (type c) cable end into the HDMI port (figure 11.28, red arrow).
3. Insert the HDMI standard (type a) cable into one of your HDTV's HDMI ports. (Both video and sound are carried on this one cable.)
4. Your HDTV may have multiple HDMI ports, and you may have other devices connected, like a cable box or satellite receiver. When you plug the D7000's HDMI cable into your HDTV, be sure to select that input or you won't see the D7000's video output. You may have to select the input from your TV remote or use another method. If in doubt, check your HDTV manual. (If your TV only has one HDMI port, please ignore this step.)
5. Turn on the camera and press the **Playback** button; then locate the video you want to show off.
6. Press the **OK** button to play the video on your HDTV.

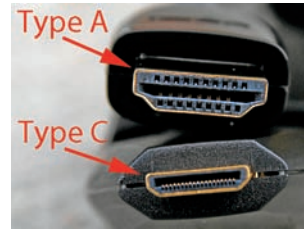


Figure 11.27 – HDMI connectors



Figure 11.28 – HDMI connector, type c (mini-HDMI)

The Nikon D7000 can display movies on both progressive and interlaced devices. The HDMI display will replace the Monitor on the back of your D7000, which will turn



off as soon as you connect an HDMI device.

My Recommendation: Unless you are heavily into HDMI and understand the various formats, I would just leave the camera set to Auto. That allows the D7000 to determine the proper format as soon as it's plugged into the display device and the HDMI input is selected—if the TV has multiple ports.

Limitations in Movie Mode Video Capture

Now, let's look at the limitations of the camera's implementation of video capture. No multiuse device can have all the features of a dedicated device. The D7000 has some limits on how it captures video.

The D7000 uses a CMOS sensor to record video. This type of sensor uses a rolling shutter and has three potential issues that we need to discuss: skew, wobble, and partial exposure. We'll discuss each of these in some detail in the next section.

How the Rolling Shutter Works in Movie Mode

Since video is captured at 24 frames per second (fps), the D7000 has an electronic shutter in addition to the normal mechanical shutter.

Have you ever used your D7000 in Continuous-release mode where you are capturing up to six still images per second? The mechanical shutter activation combines with mirror movement to make the cool chicka-chicka-chicka sound that causes passersby—with their little point-and-shoot cameras—to look at you in awe.

However, you don't hear that sound when using the Movie mode, do you? That's because your D7000 does not use the mechanical shutter when shooting movies. If it did you would wear the camera's shutter out with only an hour or two of video capture. Remember, the camera captures video at a minimum of 24 fps. An hour of video requires 86,400 frames at that speed. You would quickly exceed the tested lifetime 150,000-image capacity of the mechanical shutter.

Instead, the camera uses its electronic shutter and turns the sensor's pixel rows on and off, as needed, in a scan from top to bottom. In other words, the camera records each video frame by scanning it—one line at a time—from top to bottom. This is called a rolling shutter. Not all parts of the image are recorded at exactly the same time! It can produce a skewed and/or wobbly video when you film rapidly moving subjects, like a race car or flying bird.

Rolling shutters are used by video cameras that have CMOS sensors, like the Nikon D7000. Most dedicated video cameras have CCD sensors, with global shutters that do not scan the image. They are mostly immune to the effects we are about to discuss.

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Following is a list of the effects that can be experienced in extreme circumstances when using a CMOS sensor's rolling shutter:

- **Skew** – The image leans in one direction as the camera or subject moves. This is often seen at the edges of buildings and other static objects.
- **Wobble** – This effect is harder to describe. The whole image wobbles in a strange way. It looks like the top of the image is out of sync with the middle and bottom of the image. Since video is a moving picture, the whole video can wobble back and forth in a very unnatural and dizzying way.
- **Partial exposure** – If another camera's flash goes off during the shot, the burst of light may be present for only some of the rows of pixels in a particular frame. The top part of the frame may be brightly lit by the flash, while the bottom part appears dark. The partial exposure appears as a bright band in one or a few frames, depending on how long the brighter light lasts. Some older forms of fluorescent light bulbs have slow ballasts and can cause the video to have a series of moving bands as the light flickers. Our eyes can't see it, but the fast video captures it well. If you are shooting images of an ambulance with its light flashing, it can also cause banding. Anything that has intense bursts of light for short periods may cause partially exposed bands to appear in the video.

To understand skew and wobble better, let's compare our camera to a desktop scanner. It works in a similar way. If you place a paper document on a scanner and press the scan button, you'll see the little row of light under the glass travel from the top of the document to the bottom as it records one line at a time. At the end of the scan, there is a copy of the document in your computer's memory that can be saved to the hard drive. You usually put the scanner's lid down on a paper document to hold it flat and keep it from moving.

Imagine that you're scanning a paper document on your desktop scanner, and halfway through the scan you move the paper a little. The top part of the scan would look normal, since it was already captured by the scanner's sensor, but the bottom part of the scan would be at a different angle than the top part. You could say that it is skewed from the original angle. This is an example of the skew that can result with a rolling shutter.

Now, what if you grab the paper during a scan and rotate it back and forth all the way through the entire scan? The final scanned document would look like a series of zigzags, with some parts at one angle and other parts at a different angle. This is an example of the wobble that can result with a rolling shutter.

The D7000 records video in a similar manner, except it is much faster than a scanner. It records a frame of video in 1/24 second, or 24 fps, and can go as high as 30 fps.



Since the Nikon D7000 scans the image at this speed, there's not a problem in most cases. Most movement is too slow to be zigzagged (wobbled) or angled (skewed).

Skew and wobble become especially evident when a person is walking and recording a video at the same time. These combined movements can be enough to cause wobble in the video. I call this the "jellywobble effect." Like a bowl of Jell-O, your video looks like it is wobbling. What can you do to prevent it?

Avoiding the Jellywobble Effect

Primarily, you have to be careful not to allow too much camera movement. It truly is best to use the D7000 on a nice fluid-head video tripod, or a stabilizing frame, if you want great results. I've found that Nikon's vibration reduction (VR) lenses help when you don't want to use a tripod, since they stabilize the camera a little. VR won't help much if you're walking while recording a video, since the camera movements are often too great for the VR system to overcome. If you're standing quietly and doing your best to hold the camera still, it will help overcome small movements caused by your heartbeat and breathing.

This is one of the main differences between a dedicated video camera and a hybrid like the D7000. Most true video cameras use a CCD sensor instead of a CMOS sensor like the D7000 has. A CCD sensor does not have a rolling shutter; it has a global shutter instead. A global shutter does not scan the image one line at a time. It uses the whole sensor at once to grab the image. There are some newer low-cost video cameras on the market that use a rolling shutter, but the better video cameras use a global shutter.

This is probably the worst problem with D7000 video. True videophiles will turn up their noses at a rolling shutter. They'll buy a dedicated video camera with three separate CCD sensors—one for each RGB color—and nice global shutters to avoid jellywobbles. And they'll pay several thousand dollars for the privilege of owning that equipment.

You, however, realize that the D7000 is primarily a very high-quality still camera with added video capabilities. Since video is combined with still-image capability, you'll have both with you when carrying your camera. You might be standing in a superstore parking lot one day when an alien spacecraft just happens to land. You'll get both still images and cool video from the same camera. So what if, in your excitement while running from the alien's heat ray, you get a few jellywobbles in your video? One of the rules for getting great video is having a video camera with you. With the D7000, you have one at all times—with no extra effort. You do keep your camera with you just in case, right?

My Recommendation: Try to hold your camera still to greatly reduce any jellywobble effects. Use a tripod when you can, or even a VR lens. Anything that helps stabilize the camera will give you much higher quality video.

11



My Conclusions

To conclude this chapter, I will ask a series of questions and then answer them (my opinion; yours may vary). Then I'll offer some advice on movie editing software.

How well does Movie mode work?

- It works quite well, is easy to use, and is always available when you have your Nikon D7000 with you.

What are the pros and cons of using the D7000 compared to using a regular video camera?

Pros:

- No need to carry another video camera and bag.
- Excellent image quality.
- Shallow depth of field for a cinematic look.
- Huge variety of lenses available for various effects.
- Picture Controls give the video an interesting look.
- Video clips are immediately usable on your computer.
- People don't know you are recording a video when you use the D7000.

Cons:

- CMOS rolling shutter causes skew, wobble, and partial exposure.
- Lack of detailed control over the camera's functions.
- Short 20-minute video clips.
- Limited storage on memory cards.

Can the D7000's Movie mode replace a dedicated video camera?

- Yes and no. The fact that it's always available when you have your camera with you means that you can record video when you otherwise couldn't. On the other hand, a dedicated video camera will record for hours and hours without stopping. And, since a dedicated video camera usually has a CCD sensor with a global shutter, you have no rolling shutter effects. You'll have to help me on this one. What do you think?

Note: There is a helpful document titled **Video Editing Software** available under the downloadable resources web page: <http://rockynook.com/NikonD7000>. Listed in the document are several good video editing applications you can download.



11

Speedlight Flash

12



Bluebird on Snowy Limb – Courtesy of Paul Ekman (*pdekman*)

Light is the Photographer's Friend!

Controlling light is the primary thing that separates excellent from not-so-excellent photographers. On beautiful, balmy summer evenings, the light wraps around the land and gives us that so-called golden hour that we crave. However, some days are rainy and some are dark and gloomy.

As photographers we want to take pictures. We don't want to stop just because the sun won't cooperate. We need light that we can take with us, and we want it to be available quickly. We need a Speedlight!

Fortunately, your D7000 has a built-in Speedlight (figure 12.1). The little pop-up unit that's built in to your camera is a Nikon Speedlight flash. That's Nikon's name for its flash units, large and small.

From the tiny pop-up flash on your camera to the flagship SB-900 flash, you have several choices. You can even create a wireless flash array using your camera, a commander unit, and several Speedlight flash units.

This type of setup is called the Nikon Creative Lighting System (CLS). We'll look at CLS later in the chapter. First let's examine some general flash information and explore how the D7000 uses flash. How can you determine which flash will work best for your style of shooting? Will the pop-up flash be enough with its limitations in range, or do you need more power to reach out and light up more distant subjects? How is the power output of a flash unit rated?

This chapter contains information that will help you use the camera's built-in flash, along with external Speedlight flash units. First, we'll look at how to rate the power output of a flash by examining the guide number. Next, we'll look at all the flash modes offered by the D7000. Finally, we'll consider how the camera can be put to use as a "Commander" in the Nikon Creative Lighting System (CLS), with the ability to control multiple groups, or banks, of external Speedlight flash units.



Figure 12.1 – Nikon D7000 with pop-up flash open

12



What Is a Guide Number?

The guide number (GN) for a flash unit measures how well it can light a subject at a specific ISO sensitivity and with a precise angle of view (wide angle versus telephoto). To put it simply, a higher guide number means the flash is more powerful, all other things being equal.

Be careful when you are deciding on an external flash unit to use, whether it is a Nikon Speedlight or an aftermarket unit. Simply comparing the GN is not enough. You must understand the settings on which the GN is based. Many flash units have zoom capability and will be able to light up subjects farther away when they are zoomed out. However, imagine buying a flash unit from a manufacturer who publishes the GN based on a longer zoom position and then comparing it to a different flash unit based on a shorter nonzoom position. The GN rating on the flash that is zoomed out would seem to be higher than the same unit not zoomed out. However, unless you are comparing flash unit GNs with exactly the same settings, it is truly like comparing apples to oranges. For instance, to get an exact comparison of GNs, you would have to know the following:

- Distance from flash head to the subject
- Aperture in use on your camera
- ISO sensitivity of your camera's image sensor
- Angle-of-view setting on the flash zoom head
- Actual angle of view your lens provides (must match flash head)
- Temperature of ambient air

In reality, the camera has little to do with figuring the GN other than providing an f-stop number and ISO sensitivity. So, how can you decide what GN is best without whipping out a scientific calculator? Just look at the flash unit specifications to see what the GN is based on. Here are the most important figures:

- Flash zoom angle-of-view setting (e.g., 18 mm or 105 mm)
- ISO sensitivity

If you see a flash unit advertised as GN 98, realize that this is not enough information to make a decision. In this instance, 98 is the GN. It represents the number of feet from the flash head to the subject (98 feet). In countries that use the metric system, an equivalent GN is 18, which is the number of meters from the flash head to the subject. That number by itself is simply incomplete. Don't buy a flash unit based solely on a GN like 98 or 100 or 111.

Let's think about this for a second. Let's say I'm a manufacturer who is desperate

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to sell you a flash unit. I might stretch things a little bit. I might say my Super-Duper flash unit has a GN of 98 (feet) or 18 (meters) and hope you won't ask about the settings I used to arrive at that number. Here is a comparison of two flash units with a so-called comparable guide number:

Super-Duper flash unit GN information:

- GN 98 (18)
- 80 mm zoom-head setting
- ISO 200 sensitivity

Nikon SB-400 flash unit GN information (real values):

- GN 98 (18)
- 35 mm zoom-head setting
- ISO 100 sensitivity

Both of the flash units have the same GN, so which one is really more powerful? The Nikon SB-400 will literally blow away the Super-Duper unit. Yet the Super-Duper manufacturer lists the same GN! The Super-Duper unit must have its zoom head set to 80 mm, a much narrower beam, and have twice the camera ISO sensitivity to equal the Nikon SB-400 unit. Mr. Super-Duper is hoping you won't check the fine print at the bottom of the specifications so you'll think his much less powerful unit equals the Nikon SB-400. Surprisingly, there are flash unit manufacturers who do exactly this.

What can you learn from this example? The GN itself is not enough to make a decision on which flash unit to use. You must know what the GN is based on in order to make an informed decision. Take your time when buying a flash unit. You're safe in sticking with Nikon Speedlights, since the ratings are well known and they're designed to support all the features of your D7000.

There are also excellent aftermarket flash units available from manufacturers like Vivitar, Sigma, Sunpak, Metz, Braun/Leitz, and others. Examine the underlying settings and not just the GN. What the GN is based on is as important as the actual number. For comparison purposes, the GN of the D7000's pop-up Speedlight is 39 (feet) or 12 (meters) at ISO 100. Nikon's flagship Speedlight, the SB-900, is 111.5 (feet) or 34 (meters) at ISO 100. Obviously, the larger external flash unit has a lot more power and can light up subjects that are farther away.

Now, let's examine the various flash modes found in the Nikon D7000 camera. Since I have no way of knowing which flash unit you'll be using, I'll write from the perspective of the pop-up flash. Almost everything mentioned next applies to the built-in flash and most Accessory shoe mounted Nikon-brand Speedlight units you are using, plus many Nikon-specific aftermarket flash units.

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Technical GN Information

The GN is based on a specific formula: $GN = \text{distance} \times f\text{-stop}$. It is based on the inverse-square law, which states that doubling the GN requires four times more flash power. So, a flash with a GN of 100 is four times more powerful than a flash with a GN of 50. The guide number represents an exposure constant for a flash unit. For example, a GN of 80 feet at ISO 100 means that a subject 20 feet away can be completely illuminated with an aperture of $f/4$ ($80 = 20 \times 4$) using a sensitivity of ISO 100. For the same guide number and an aperture of $f/8$, the light source should be 10 feet from the subject ($80 = 10 \times 8$). Fortunately, your camera and flash combination are capable of figuring the correct values for you when you use TTL mode.

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Flash Modes

(User's Manual – Page 143)

The built-in pop-up flash has two types of flash metering:

- ***i-TTL balanced fill flash*** – The flash fires in two stages. Nikon calls stage 1 monitor preflash. The built-in flash emits a series of almost invisible flashes before the main flash burst fires (stage 2). The preflashes allow the 1,005-pixel RGB flash sensor to examine all areas of the frame for reflectivity. The camera uses the Matrix meter and distance information from a D or G lens to calculate a flash output that is balanced between the main subject and the ambient lighting.
- ***Standard i-TTL*** – When the Spot meter is used, the camera automatically switches to standard i-TTL. This mode ignores the background and concentrates on whatever the camera's selected AF point is focused on. For the most accurate flash output for a specific subject, just set your camera to use its Spot meter and the flash will meter for the subject only.

In addition to the types of flash metering, the camera also has several Flash modes that affect how it controls light. We'll consider each of them shortly, but first let's talk about how the shutter blades work when the flash fires. This is basic information that will help you understand the Flash modes. To fully know what's happening when the flash fires, you must understand a little bit about the shutter curtains in your camera.



Your D7000 exposes the sensor to light for specific periods of time. This is controlled by the camera's shutter speed. The actual exposure is handled by two moving objects called curtains. The D7000 has two shutter curtains. You can see the front curtain in [figure 12.2](#) (red arrow). It's composed of several narrow blades and is in the closed position.

How do the curtains work? One curtain gets out of the way of the sensor to start the exposure, and the other curtain replaces it to stop the exposure. The first one is called

the front curtain and the second one is called the rear curtain. In this context, front and rear are not important as indicators of position but as indicators of which moves first and which moves second. The flash must fire when the first, or front, curtain is fully open and before the second, or rear, curtain starts closing. The time between the front curtain opening and the rear curtain closing is the actual shutter speed.

The whole sensor must be uncovered when the flash fires in normal Flash modes (non-Auto FP). If the shutter speed is too fast, the rear curtain will closely follow the front curtain and partially block the sensor when the flash fires. That's why the shutter speed is limited to a maximum of 1/250s on the D7000 when a flash is used. With faster shutter speeds, the sensor is always partially covered by one of the shutter curtains. If the flash fires while one of the curtains covers part of the sensor, then that part of the sensor will not get a proper exposure from the flash and there will be an underexposed black band in your image.

The whole point of the Flash modes is to determine at what point during shutter curtain movement the flash fires and whether it's the main source of light or if some ambient light is mixed in. Keep this information in mind as we discuss the Flash modes.

Be sure to read the upcoming sidebar called **Auto FP High-Speed Sync** because Auto FP affects the maximum shutter sync speed, allowing you to take it higher than 1/250s. Also, see the heading titled **e1 Flash Sync Speed** in the **Custom Setting Menu** chapter, where this mode is discussed in great detail.



Figure 12.2 – Nikon D7000 shutter assembly and front shutter curtain (red arrow)

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Figure 12.3 – (1) Flash mode button, (2) Main command dial, (3) Control panel flash mode readout

Here are the steps to select one of the Flash modes:

1. Hold down the **Flash mode button** on the front of your camera, just above the D7000 logo (figure 12.3, image 1). It has a lightning bolt arrow symbol on it.
2. Turn the **Main command dial** while watching the various modes change on the **Control panel** (figure 12.3, images 2 and 3).
3. Release the **Flash mode button** to lock in the **Flash mode**.

The five basic flash modes and how they work are described next. The camera will often combine these flash modes as you use different shooting modes on the Mode dial. See the list of shooting modes at the end of this section.

Auto FP High-Speed Sync

The D7000 has an additional mode that lets it exceed the normal flash sync speed of 1/250s. It is called Auto FP high-speed sync mode. Remember how normally both the front and rear shutter curtains must be out of the way before the flash fires? Auto FP high-speed sync mode lets you use shutter speeds all the way up to 1/8000s. At these speeds, the rear shutter curtain follows the front shutter curtain so closely that only a traveling narrow horizontal slit exposes the sensor at any given time.

When you select a sync speed faster than the normal 1/250s, the camera fires the flash in thousands of short pulses instead of one big flash. The pulses fire as the narrow shutter curtain slit moves across the face of the sensor. The faster the shutter speed, the less power the flash can manage. You must be able to depend on ambient light in addition to flash when using Auto FP high-speed sync mode, especially at higher shutter speeds. However, this lets you use your fast lenses (e.g., f/1.4, f/2.8) wide open while in direct sunlight, due to the very fast shutter speed.

You can expose properly with a very shallow depth of field due to a large aperture, even though the light is very bright. We covered this mode in detail in the chapter titled **Custom Setting Menu**, under the heading e1 Flash Sync Speed.

Auto

Auto flash mode is available only when you are using various SCENE modes. It lets the camera decide when and what type of flash to use. You can select this mode if you are unsure about which mode to use in a certain circumstance, and the camera will do its best to give you a well-exposed picture.

See the list at the end of this section to discover the other modes that are available when you are using the automatic SCENE modes.



Figure 12.4 – Auto flash in SCENE modes only

Fill Flash (Front-Curtain Sync)

In Fill flash (Front-curtain sync mode), the camera tries its best to balance the light if you're using a lens that has a CPU in it (figure 12.5). Older non-CPU lenses cause the camera to ignore the ambient light completely and use only the flash to expose the subject. A CPU lens, like an AF-S Nikkor G or D lens, balances ambient light and light from the flash equally and works to make the light look very natural.

If you use this correctly outdoors, it will be hard to tell that you were using flash, except for the catch light in your subject's eyes and the lack of damaging shadows. The flash simply fills in some extra light without overpowering the ambient light. In a situation where there is very little ambient light, the camera will use only the flash to get a correct exposure. It balances with ambient light only if there is enough ambient light.

There is a side effect to using this mode with slow shutter speeds. Fill flash simply causes the flash to fire as soon as the front shutter curtain is out of the way and before the rear shutter curtain starts closing. If there is some ambient light, and the shutter speed is long (like 1/2 second), and the subject is moving, you'll see a well-exposed subject with a blurry trail in front of it.

The flash correctly exposes the subject as soon as the front curtain gets out of the way, but the ambient light continues exposing the subject before the rear curtain closes. Since the subject was moving, you may see a ghostlike blur before or in front of the well-exposed moving subject in the picture. This can be seen at shutter speeds as fast as 1/60s if the ambient light is strong enough and the subject is moving.



Figure 12.5 – Front-curtain sync

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Red-Eye Reduction

Red-eye reduction is not really a flash mode (figure 12.6). It simply means that the AF-assist illuminator shines brightly in the face of your subject before the Fill flash fires. The intention is that the bright AF-assist illuminator will cause your subject's pupils to close somewhat and reduce the red-eye effect. It acts like you are using Fill flash (Front-curtain sync mode).



Figure 12.6 – Red-eye reduction

Slow Sync

Slow sync mode lets the camera use ambient light to make a good exposure and then fires the flash to add some extra light, rounding out the shadows or better exposing a foreground subject (figure 12.7). Use this mode in people shots outdoors or where you want ambient light to provide the primary exposure and the flash to add a sparkle to your subjects' eyes and remove dark shadows from their faces.



Figure 12.7 – Slow sync

This is closely related to Fill flash, except the ambient light is more important than the light from the flash. Be careful when using this mode indoors since it will expose for ambient light and only assist with some flash light. You can get some terrible ghosting and blurred handheld shots when using Slow sync indoors. Ambient light rules in this mode!

Rear-Curtain Sync

Rear-curtain sync is the opposite of Fill flash, or Front-curtain sync (figure 12.8). The flash waits to fire just before the rear curtain starts to close. The entire shutter speed time is just ending when the flash fires. This causes a ghosting effect for moving subjects in higher ambient light with slow shutter speeds.

When you press the Shutter-release button, the front curtain opens, ambient light starts hitting the sensor, and the sensor starts recording the subject. Just as the shutter's rear curtain is about to close, the flash fires, exposing the subject at its current position. The subject was fully exposed by the flash at the end of the shutter speed time, so the ambient light had time to register the subject before the flash fired, thereby making a blurred ghost behind or after the well-exposed but moving subject.



Figure 12.8 – Rear-curtain sync



List of Flash Modes by Shooting Mode

As mentioned previously, when you use the various shooting modes provided by the camera's Mode dial, such as P, S, A, M, SCENE, etc., the camera will allow you to use certain modes at certain times. The following list shows the shooting modes and available flash modes:

SCENE modes – Portrait, Child, Close Up, Party/indoor, Pet:

- Auto
- Auto + red-eye reduction

SCENE mode – Night portrait:

- Auto + slow sync + red-eye reduction
- Auto + slow sync

SCENE mode – Food:

- Fill flash (front curtain sync)

Shooting mode – Programmed auto (P) and Aperture-priority auto (A):

- Fill flash
- Red-eye reduction
- Slow sync + red-eye reduction
- Slow sync
- Rear curtain + slow sync

Shooting mode – Shutter-priority auto (S) and Manual (M):

- Fill flash
- Red-eye reduction
- Rear-curtain sync

Shooting mode – AUTO:

- Auto
- Auto + red-eye reduction

No Flash Mode

There is a final flash mode, if you want to call it that. Nikon calls it No flash mode or Off.

Figure 12.9 shows it on



Figure 12.9 – No flash mode (Off)



the Mode dial and Control panel. When you set this mode, the flash is disabled. Obviously No flash mode is not available when you use any of the other shooting mode selections on the Mode dial.

My Recommendation: I use Fill flash for normal, everyday flash. It balances ambient light with flash light. Switch to Spot metering mode when using Fill flash if you want extremely accurate exposures of a particular subject.

External Speedlight flash units offer modes like TTL BL, TTL BL FP, TTL FP, or just TTL. TTL stands for through the lens and represents an i-TTL mode (intelligent though the lens). BL stands for balanced. FP stands for Auto FP high-speed sync mode. Refer to your user's manual for your flash unit for exact details on how to switch between modes on the flash unit.

When I'm shooting outside (only) and want a great exposure of my subject's surroundings, along with the subject, I often use Slow sync mode. The only caveat is that you must be aware that slow shutter speeds will cause ghosting and blurring as the light falls.

I don't use the Red-eye reduction modes often because they seem to confuse people. They think the initial shine of the AF-assist illuminator is the flash firing and then look away just as the main flash fires. If you are going to use Red-eye reduction modes, you might want to tell your subject to wait for the main flash.

Rear-curtain sync creates a cool effect if you want to show a ghosted image stretching out behind your subject when you use slow shutter speeds. Rear-curtain sync is sometimes used by sports shooters in situations where there may be some blurring from fast movement in low light. It is much more acceptable to have a ghosted blur after the subject since it implies motion. Front-curtain sync makes the blur show up in front of the subject, which just plain looks weird.

I suggest experimenting with all of these modes. You'll want to use each of them at various times.

Now let's look into the Nikon CLS, which allows your camera to control multiple flash units in a wireless array.

Nikon Creative Lighting System (CLS)

(User's Manual – Pages 275–279)

CLS is an advanced wireless lighting technology that allows you to use your imagination in designing creative lighting arrangements. No wires are used since the CLS-compatible remote flash units are controlled by a commander device, or what Nikon refers to as a "master flash unit." You can use the Commander mode built into the D7000; an Accessory shoe-mounted commander, such as the SB-900, SB-800,



and SB-700 Speedlights; or the SU-800 Wireless Speedlight Commander unit. The SB-600 has only a remote mode, so it cannot be used as a commander unit.

We'll consider only the camera's built-in Commander mode in this chapter. I suggest buying a copy of *The Nikon Creative Lighting System* by Mike Hagen (published by Rocky Nook and Nikonians Press). It goes into excellent detail on how to use CLS with multiple banks of various external Nikon Speedlight flash units.

Using CLS, you can easily experiment with setups and flash output. You can obtain a visual preview of how things will look by pressing the Depth-of-field preview button, which will fire the pulsed modeling capability within Nikon Speedlights.

There is no need to calculate complex lighting ratios when you can control your flash banks right from the camera and see the results immediately. CLS simplifies the use of multiple flash-unit setups for portraiture, interiors, nature, or any situation where several Speedlights need to work in unison.

You can simply position the flash units where you'd like them to be and let CLS automatically calculate the correct exposure, or you can change the lighting ratios directly from the Custom Setting Menu > e3 Flash cntrl for built-in flash > Commander mode menu of your D7000.

Nikon's CLS is world-class in power and not too difficult to use. The Nikon D7000 camera contains everything you need to control a simple or complex CLS setup. Let's learn how to use it!

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How Does the D7000 Fit into the CLS Scheme?

In Commander mode, the camera functions as a controller for multiple Nikon Speedlight flash units. Although the professional-level Nikon D3/D3S/D3X requires the separate purchase of an Accessory shoe-mounted commander device, the D7000 body has full Nikon CLS technology built right into the camera.

You can use normal i-TTL flash technology with the camera's built-in flash or use Commander mode and the built-in flash to control up to two groups of an unlimited number of external Nikon Speedlight flash units. Nikon currently makes the powerful SB-900 flash unit, along with its slightly less powerful SB-700 and SB-600 brothers, and other smaller Speedlight units, such as the SB-400 or SB-R200.

Many people who use the D7000 have an external flash unit or two—usually the SB-900, SB-800 (now discontinued), SB-700, SB-600, or SB-400. The SB-R200 flash is designed to be used on various brackets available from Nikon and will work in conjunction with the bigger Speedlight flash units. The Nikon D7000 is happy to let you arrange professional lighting setups using these relatively inexpensive and very portable Speedlights. The cool thing about the D7000 is that it can serve as a CLS flash commander device or use Nikon's other CLS flash commander devices at will. You have great control with this fine camera!

What Is Commander Mode and How Does It Work?

Commander mode is controlled through a menu on your D7000. If you examine the Commander mode screen shown in figure 12.10, you'll note that you have controls for the built-in flash and two groups (A and B), or banks, of external flash units. You'll also see that you can set exposure compensation for either of these groups.

If the main flash is too bright, you can either move it farther away or dial its power down by setting compensation (Comp.) to underexpose a little. You can set Comp. in 1/3-stop increments, so you have very fine control of each group's flash output. You can experiment until you get the image just the way you want it. Sure, you can do things the old way and use a flash meter or get your calculator and figure out complex fill ratios. Or you can simply use CLS to vary your settings visually until the image is just right (figure 12.11).

Isn't it more fun to simply enter some initial settings into your Commander mode screen and then take a test shot? If it doesn't look right, change the settings and do it again. Within two or three tries you'll probably get it right, and you will have learned something about the performance

of your CLS. In a short time you'll have a feel for how to set the camera and flash units and will use your flash/camera combo with authority.

Note: If you leave Custom setting e4 Modeling flash set to the factory default of On, you can test fire the built-in modeling light of your single Speedlights—or all speedlights in Groups A and B—by pressing and holding the camera's Depth-of-field preview button.

Using Commander Mode

Let's start by putting your camera into Commander mode. We'll do that by changing Custom Setting Menu > Custom setting e3 to Commander mode (CMD). Look at figure 12.12 for the steps to set this option.



Fig. 12.10 – Commander mode



Figure 12.11 – J. Ramón Palacios used a Commander device and two SB-800 Speedlights to take this CLS photo



Since this section is about controlling multiple flash units, we'll have to change the settings in Commander mode, as shown in [figure 12.12](#), [image 4](#). We'll examine each of the settings available in Commander mode.

First, we'll consider TTL. It's the easiest to use since it allows you to set exposure compensation



Figure 12.12 – Setting the camera to Commander mode

for the built-in flash as well as each of your flash groups. Second, we'll briefly look at AA mode, which is an old-fashioned mode not often used by new photographers. Third, we'll look at M mode, since that gives you fine control of your flash from full power (1/1) to 1/128 power. Finally, we'll consider the -- (double-dash) mode, which prevents the camera's built-in flash from firing the main flash output but does not stop the necessary monitor preflashes or the firing of the external flash units.

When your camera is controlling external Speedlights using its built-in Commander mode, you must always raise the built-in flash on your D7000. The camera communicates with the external flash units during the monitor preflash cycle.

Always position the sensor windows on the external Speedlights where they will pick up the monitor preflashes from the built-in flash. Take particular care when you are not using a tripod.

Commander Mode Settings

Basically, the Mode fields on the Commander mode screen will display the selections in the following list. Use the Multi Selector to change the values, as shown in [figure 12.13](#). Here are the four Commander mode settings:

- TTL, or i-TTL mode
- AA, or Auto Aperture mode
- M, or Manual mode
- --, or double-dash mode

You'll find each mode in the Mode box shown in yellow in [figure 12.13](#). Use the Multi Selector to scroll up or down and select a mode. AA mode is not available for the Built-in flash, so you will see AA only in the Mode boxes following Groups A and B. Now, let's examine each mode in more detail:



- TTL mode** – The TTL setting allows you to use the full power of i-TTL technology. By leaving Mode set to TTL (as shown in figure 12.13) for the Built-in flash or Group A or B, you derive maximum flexibility and accuracy from all your flash units. In this mode, the Comp. setting will display exposure values from -3.0 EV to +3.0 EV, a full six-stop range of exposure compensation for each group of Speedlights. You can set the Comp. in 1/3 EV steps for very fine control.
- AA mode** – The AA mode is an older non-i-TTL technology included for people who are accustomed to using it. It is not available for the built-in Speedlight on the D7000 or for the SB-600. You can safely ignore the AA mode, unless you want to experiment with it. It may not provide as accurate a flash exposure as TTL mode since it is not based on the amazing i-TTL technology. Otherwise, it works pretty much the same as TTL mode.
- M mode** – This allows you to set different levels of flash output in 1/3 EV steps for the Built-in flash or the Speedlights in Group A or B. The settings you can put in the Comp. field are between 1/1 (full) and 1/128. The intermediate 1/3-stop settings are presented as decimals within the fractions. For example, 1/1.3 and 1/1.7 are 1/3 and 2/3 stops below 1/1 (full). Many people are used to working with flash units this way, so it seems more familiar to them. CLS is willing to oblige people who have experience with working manually.
- mode (double-dash mode)** – The built-in Speedlight will not fire the main flash burst in this mode. It will fire the monitor preflashes, since it uses them to determine exposure and communicate with the external flash groups. Be sure you always raise the camera's built-in flash in any of the Commander modes; otherwise, the external flash groups will not receive a signal and won't fire their flashes. When you set the Mode for Group A or B to double-dash (--) mode, that entire group of flashes will not fire any flash output. You can use this mode to temporarily turn off one of the flash groups for testing purposes.

Since the preflashes of the built-in flash always fire, be careful that they do not influence the lighting of your image. Use a smaller aperture, or move the camera farther away from your subject if the preflashes add unwanted light.

Setting the Channel (CH) for Communication

Look at figure 12.14, or your camera's Commander mode screen, and you'll notice that just below Group B there is a Channel (CH) selection. The number 3 that I



Fig. 12.13 – Commander mode



Fig. 12.14 – Comm. Channel



selected in the yellow box is the communication channel your D7000 will use to talk to the external flash groups (the factory default is 1). There are four channels available (1–4), just in case you happen to be working in the vicinity of another Nikon photographer who is also using Commander mode. By using separate channels, you won't interfere with each other.

Note: It is important to realize that all external flashes in all groups must be on the same channel. This involves setting up your individual flash units to respond on a particular channel. They might be in separate groups, but they must be on the same channel. Each external Speedlight flash will have its own method for selecting a Group and Channel. You'll need to read the user's manual for your flash unit.

What Are Monitor Preflashes?

When you press the Shutter-release button with the pop-up flash open, the camera's built-in Speedlight fires several brief preflashes and then fires the main flash burst. These preflashes fire whenever your camera is set to TTL mode, even if your D7000 is controlling multiple flash units through CLS. The camera can determine a very accurate exposure by lighting your subject with a preflash, adjusting the exposure, and then firing the main flash burst.

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Downloadable Resource on Flash Units

There is a downloadable PDF document accompanying this chapter called **Selecting a Nikon Speedlight Flash Unit** at <http://rockynook.com/NikonD7000>. It discusses today's available Nikon Speedlights.

My Conclusions

The Nikon D7000 gives you control over the world-class Nikon Creative Lighting System. Rocky Nook/Nikonians Press has an excellent book dedicated to this subject, **The Nikon Creative Lighting System** by fellow Nikonian Mike Hagen. I recommend that you buy a copy of Mike's book as an excellent way to increase your knowledge of the Nikon CLS.

Thank You!

I'd like to express my personal appreciation to you for buying this book and for sticking with me all the way to the end of it. I sincerely hope that it has been useful to you and that you'll recommend my books to your Nikon-using friends.

Keep on capturing time . . .

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Credits for Chapter Opening Images

Chapter 1 – Michael R. Goodman (*mrginhop*) – SnowCross Racer

Nikon D7000 with Nikkor 70-300mm f/4.5-5.6G lens, 1/2000s at f/9, ISO 200

The image was taken at an annual snowmobiler racing competition in the White Mountains of New Hampshire. I positioned myself quite close to the track and intentionally shot from a low angle to help accentuate the height these monster machines can reach.

Chapter 2 – Betty LaRue (*B LaRue*) - Hungry Northern Robin

Nikon D7000 with Nikkor 80-400mm VR lens at 400mm, 1/250s at f/7.1, ISO 320

Cedar Waxwings and Northern Robins were eating the small fruit from my tree. I used my D7000 and Nikkor 80-400 VR lens on a monopod, stood in the open garage door for cover, braced against the frame, and fired at the birds about 20 feet away. The tree was picked clean of fruit 45 minutes later.

Chapter 3 – Mikael Lorin (*mikeon*) – Determined Boy

Nikon D7000 with AF Nikkor 85mm f/1.8D lens, 1/125s at f/2, ISO 1250

This is a photo of my sister's oldest grandchild, living near Lidköping in western Sweden. Anton is a very active guy and came into the house very hungry. Normally he does not like to be photographed but at this moment he just wondered what I was doing as he ate. I sat with my camera on the other side of the table and got some good shots of him. Light from the kitchen lamp above and available light from windows behind provided lighting.

Chapter 4 – Dean Andersen (*DeanAZ*) – Hanging Out

Nikon D7000 with Nikkor 18-105mm f/3.5-5.6 lens, 1/500s at f/11, ISO 200

This was taken on my first outing with my new D7000 where I was looking to get some landscape photos. I saw some rock climbers high above me on Pinnacle Peak in Scottsdale, Arizona. I scrambled off the trail and up to their level and found a perch on the cliff. The sun broke through the clouds at just the right moment to set off the subject from the stormy background.

Chapter 5 – Richard Sandor (*rbsandor*) – Bison in Winter

Nikon D7000 with 70-200mm lens and TC 2.0, 1/160s at f/8, ISO 2000

In January 2011, I visited Yellowstone National Park. The weather that week was very cold and snowy. I took this shot to capture both the condition of the bison and the conditions bison face in this very harsh environment.

Chapter 6 – Jim Hammond (*hamjam*) – Bridge Over Waterfall Yosemite NP

Nikon D7000 with Sigma 10-20mm f/4.0-5.6 EX DC lens at 18mm, 3-image bracket at f/11, ISO 100. This image was taken on my tripod using a bracket of 3 images at f/11 ISO 100 at 18MM, rendered in Nik HDR Pro software.

Chapter 7 – Greg Jones (*gregor1*) – Glass on Black

Nikon D7000 with AF Nikkor 50mm f/1.8D, 1/60s @ f 2.5, ISO 100. The glass was put on a small table. Behind the table, I rigged a flat diffuser and taped a black paper wedge to the lens side of the diffuser. A single SB-600 Speedlight was mounted about two feet behind the diffuser and fired wirelessly in i-TTL mode.

Chapter 8 – Connor Holmes (*ConnerH*) – Iris Under Overcast

Nikon D7000 with Nikkor AF-S DX 18-200mm f/3.5-5.6 G ED VR II lens at 200mm, 1/50s at f/16, ISO 100, +0.3EV. I photographed this iris in my front garden on an overcast summer day in Sydney, Australia. My camera was mounted on a tripod, and the image was captured with shutter locked up and using a wireless remote.

Chapter 9 – Marcel Carey (*mcpianova*) – Yamaha Piano HDR

Nikon D7000 with Nikkor AF-S DX 18-200mm f/3.5-5.6 G ED VR II lens at 26mm, 3-image bracket at f/16, ISO 200. This was my first HDR trial. I was at a customer's house and borrowed his tripod to do this piano picture. I used 3 exposures (-2 > 0 > +2) that I then combined in Photoshop CS5 HDR.

Chapter 10 – John C. Gamble (*jgamble*) – Willet on the Wing

Nikon D7000 with Nikkor 300mm f/4 lens, 1/1000s at f/8, ISO 400

I shot this Willet in Canaveral National Seashore, New Smyrna Beach Florida. The lens was a Nikkor 300 f4 with TC14E II converter. I was photographing wading birds and this Willet went cruising by. I tracked the Willet handheld and autofocus picked it right up. I got two nice images out of six.

Chapter 11 – William Paul (*Biker Bill*) – Peacock Feathers

Nikon D7000 with Nikkor AF-S DX 18-200mm f/3.5-5.6 lens at 170mm, 1/30s at f/11, ISO 200
I took this picture of Peacock feathers at Flamingo Garden, 3750 South Flamingo Road, Davie/Fort Lauderdale, Florida.

Chapter 12 – Paul Ekman (*pdekman*) – Bluebird on Snowy Limb

Nikon D7000 with Nikkor 300mm f/2.8 ED lens at 420mm with a Nikon TC-14 II, 1/200s at f/5.6, ISO 125. What a treat to find these colorful birds amid snowy backgrounds. While photographing other subjects on a morning hike, I was surprised by several bluebirds that perched right next to me. I quickly changed camera settings and was able to capture some nice poses of the birds as they shared sips of water from a spot of melted snow.