

#### DIGITAL CAMERA



## User's Manual



Thank you for your purchase of a Nikon single-lens reflex (SLR) digital camera. To get the most from your camera, please be sure to read all instructions thoroughly and keep them where they will be read by all who use the product.

#### Symbols and Conventions

To make it easier to find the information you need, the following symbols and conventions are used:



This icon marks cautions; information that should be read before use to prevent damage to the camera.



This icon marks notes; information that should be read before using the camera.



This icon marks references to other pages in this manual.

Menu items, options, and messages displayed in the camera monitor are shown in **bold**.

#### **Camera Settings**

The explanations in this manual assume that default settings are used.

#### Help

Use the camera's on-board help feature for help on menu items and other topics. See page 18 for details.

#### Digitutor

"Digitutor", a series of "watch and learn" manuals in movie form, is available from the following website: http://www.nikondiaitutor.com/index eng.html

#### A For Your Safety

Before using the camera for the first time, read the safety instructions in "For Your Safety" (🕮 xviii–xix).

## Where to Find It

Find what you're looking for from: **Q** The Table of Contents ..... 📖 **Q** The Index..... 🕮 337 х 🔇 The Q&A Index..... 🕮 ii 🔇 Error Messages..... 🕮 322 Menu Options ..... 📖 🝳 Troubleshooting ..... 🕮 316 Q iv 🔂 Introduction  $\square$ 1 **Basic Photography and Playback** m 35 👿 Live View Photography m 49 Movie Live View 57  $\square$ P, S, A, and M Modes  $\square$ 73 User Settings: U1 and U2 Modes 81 m 💻 Release Mode  $\square$ 83 Image Recording Options m 89 **Focus** 97 SO ISO Sensitivity **III** 105 Exposure **109** White Balance III 115 🚾 Image Enhancement 📖 129 🗧 Flash Photography **III** 143 • Other Shooting Options III 151 More on Playback 📖 177 Connections **193** 🔳 Menu Guide 📖 207 Technical Notes **285** 

## Q&A Index

Find what you're looking for using this "question and answer" index.

Taking Photographs
Shooting Mode
Is there a quick and e
How do I quickly adju
Can I adjust shutter s
Cap Ladiust aporturo

T	aking Photographs	
	Shooting Modes and Framing Options	
	Is there a quick and easy way to take snapshots (m mode)?	35–39
	How do I quickly adjust settings for different scenes?	40-45
	Can I adjust shutter speed to freeze or blur motion (mode s)?	76
	Can I adjust aperture to blur backgrounds or bring them into focus (mode <b>A</b> )?	77
	How do I make long ("time") exposures (mode M)?	79
	Can I frame photos in the monitor (  live view photography)?	49
	Can I shoot movies (🐙 movie live view)?	57
	Can I join photographs taken at regular intervals to create a time- lapse movie?	168
	Release Modes	
	Can I take photos one at a time or in quick succession?	6, 83
	How do I take pictures with the self-timer or a remote control?	85
	Can I reduce shutter noise in quiet surroundings (quiet shutter-release)?	6, 83
	Pocus	
	Can I choose how the camera focuses?	97–100
	Can I choose the focus point?	101
	<b>Q</b> Exposure	
	Can I make photos brighter or darker?	112
	How do I preserve details in shadows and highlights?	137
	<b>Q</b> Using the Flash	
	Can I set the flash to fire automatically when needed?	
	How do I keep the flash from firing?	35, 143–147
	How do I avoid "red-eye"?	-
	Image Quality and Size	
	How do I take pictures for printing at large sizes?	93–95
	How can I get more pictures on the memory card?	- 93-95
V	iewing Photographs	
	<b>Q</b> Playback	
	How do I view photographs on the camera?	46, 177
	How do I view more information about a photo?	179–184
	Can I view photos in an automatic slide show?	213
	Can I view photos on a TV?	204–205
	Can I protect photos from accidental deletion?	188
	<b>Q</b> Deletion	
	How do I delete unwanted photos?	47, 189–191

|--|

	Retouching Photographs	
( and	How do I create retouched copies of photos?	261-279
JAP P	How do I remove "red-eye"?	264
	How do I make JPEG copies of RAW (NEF) photos?	271
	Can I overlay two NEF (RAW) photos to make a single image?	269–270
	Can I create a copy of a photo that looks like a painting?	275
	Can I trim movie footage on the camera or save movie stills?	69
	Menus and Settings	
	How do I use the menus?	18–20
	How do I display menus in another language?	27, 253
	How do I use the command dials?	12–16
	How do I keep the displays from turning off?	228
	How do I focus the viewfinder?	33
	Can I display a framing grid in the viewfinder or the monitor?	55, 62, 229
	How do I tell if the camera is level?	258
	How do I set the camera clock?	27, 253
	How do I format memory cards?	31, 250
	How do I restore default settings?	151, 214, 221
	How do I get help for a menu or message?	18, 322
	Connections	
	How do I copy photos to a computer?	193–195
	How do I print photos?	196–203
	Can I print the date of recording on my photos?	198, 203



Can I print the date of recording on my photos?	198, 203
aintenance and Optional Accessories	
What memory cards can I use?	333
What lenses can I use?	285
What optional flash units (Speedlights) can I use?	292
What other accessories are available for my camera?	297–298
What software is available for my camera?	297-296
What do I do with the supplied eyepiece cap?	86
How do I clean the camera?	300
Where should I take my camera for servicing and repairs?	

## **Menu Options**

### ▶ PLAYBACK MENU (□ 207)

Delete	Selected				
	Select date				
	All				
Playback folder	ND600	(default)			
•	All	<u> </u>			
	Current				
Hide image	Select/set				
	Select date				
	Deselect all?				
Playback display	Done				
options SD	Basic photo info				
	Focus point				
	Additional photo info	<u>с</u>			
	None (image only	/)			
	Highlights				
	RGB histogram				
	Shooting data				
	Overview				
Copy image(s)	Select source				
	Select image(s)				
	Select destination folder				
	Copy image(s)?				
Image review SD					
	Off	(default)			
After delete SD		(default)			
	Show previous				
	Continue as before				
Rotate tall SD					
	Off				
Slide show	Start				
	lmage type				
	Frame interval				
DPOF print order					

## SHOOTING MENU (C214)

		•	,	
<b>Reset shooting</b>	3	Yes		
menu		No		
Storage folder	•	Select folder by num	ber	
		Select folder from list		
File naming	SD	File naming		
Role played by	<u>,                                     </u>	Overflow	(default)	
card in Slot 2	SD	Backup		
		RAW Slot 1 - JPEG Slot 2		
Image quality	SD	NEF (RAW) + JPEG fine		
QUAL		NEF (RAW) + JPEG no	rmal	
		NEF (RAW) + JPEG ba	sic	
(🖽 93)		NEF (RAW)		
		JPEG fine		
		JPEG normal	(default)	
		JPEG basic		
Image size	SD	Large	(default)	
		Medium		
(= 95)		Small		
Image area	SD	Auto DX crop		
		Choose image area		
JPEG		Size priority	(default)	
compression	SD	Optimal quality		
NEF (RAW)		Туре		
recording	SD	NEF (RAW) bit depth		
White balance	SD	Auto	(default)	
		Incandescent		
<b>∞</b> + <b>−</b>		Fluorescent		
(🕮 115)		Direct sunlight		
		Flash		
		Cloudy		
		Shade		
		Choose color temp.		
		Preset manual		

#### SD

Items marked with a  $\mathfrak{W}$  icon can be saved to the memory card using the **Save/load settings** > **Save settings** option in the camera setup menu ( $\mathfrak{W}$  249). The saved settings can be copied to other D600 cameras by inserting the memory card into the camera and selecting **Save/load settings** > **Load settings**.

Set Picture		Standard	(default)	
Control	(13)	Neutral	(uerduit)	
	(JU)	Vivid		
		Monochrome		
		Portrait		
Mana and Diata		Landscape		
Manage Picture Control		Save/edit		
Control		Rename <sup>1</sup>		
		Delete <sup>1</sup>		
Auto distantian		Load/save		
Auto distortio		On		
		Off	(default)	
Color space	SD	sRGB	(default)	
		Adobe RGB		
Active	_	Auto		
D-Lighting <sup>2</sup>	SD	Extra high		
		High		
		Normal		
		Low		
		Off		
HDR (high		HDR mode		
dynamic range)		Exposure differential		
		Smoothing		
Vignette control		High		
Vignette cont				
Vignette cont	SD	Normal	(default)	
Vignette cont		Low	(default)	
Vignette cont			(default)	
Long exposur	SD	Low	(default)	
Long exposur NR	SD e	Low Off	(default) (default)	
Long exposur	SD e	Low Off On Off		
Long exposur NR	SD e SD	Low Off On Off		
Long exposur NR	SD e SD	Low Off On Off High	(default)	
Long exposur NR	SD e SD	Low Off On Off High Normal	(default)	
Long exposur NR	SD e SD SD	Low Off On Off High Normal Low	(default)	
Long exposur NR High ISO NR	SD e SD SD	Low Off On Off High Normal Low Off	(default)	
Long exposur NR High ISO NR ISO sensitivity settings	SD e SD SD	Low Off On Off High Normal Low Off ISO sensitivity	(default) (default)	
Long exposur NR High ISO NR ISO sensitivity	SD e SD SD	Low Off On Off High Normal Low Off	(default) (default)	
Long exposur NR High ISO NR ISO sensitivity settings	SD e SD SD	Low Off On Off High Normal Low Off ISO sensitivity	(default) (default)	
Long exposur NR High ISO NR ISO sensitivity settings (III 105) Remote control	50 e 50 50	Low Off On Off High Normal Low Off ISO sensitivity	(default) (default)	
Long exposur NR High ISO NR ISO sensitivity settings	SD e SD SD (SD SD	Low Off On Off High Normal Low Off ISO sensitivity Auto ISO sensitivity of	(default) (default) control (default)	
Long exposur NR High ISO NR ISO sensitivity settings (IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	SD e SD SD (SD SD	Low Off On Off High Normal Low Off ISO sensitivity Auto ISO sensitivity of Delayed remote	(default) (default) control (default)	
Long exposur NR High ISO NR ISO sensitivity settings (III 105) Remote control	SD e SD SD (SD SD	Low Off On Off High Normal Low Off ISO sensitivity Auto ISO sensitivity of Delayed remote Quick-response remote	(default) (default) control (default) ote	
Long exposur NR High ISO NR ISO sensitivity settings (III 105) Remote contr mode	SD e SD SD (SD SD	Low Off On Off High Normal Low Off ISO sensitivity Auto ISO sensitivity of Delayed remote Quick-response remote Remote mirror-up	(default) (default) control (default) ote	
Long exposur NR High ISO NR ISO sensitivity settings (C 105) Remote contr mode	SD e SD SD (SD SD	Low Off On Off High Normal Low Off ISO sensitivity Auto ISO sensitivity of Delayed remote Quick-response remo Remote mirror-up Multiple exposure m	(default) (default) control (default) ote	

Interval timer	Choose start time			
shooting	Now			
	Start time			
	Interval			
	Select no. of times×no. of			
	shots			
	Start			
Time-lapse	Start			
photography	Interval			
	Shooting time			
Movie settings	Frame size/frame rate			
	Movie quality			
	Microphone			
	Destination			

- 1 Not available if no custom Picture Controls are present.
- 2 Defaults to Off (modes P, S, A, M, 🖾, 💷, and 🔟) or Auto (other modes).

## CUSTOM SETTING MENU ( 219)

Res	et custom	Yes		
set	tings	No		
a A	utofocus		SD	
a1	AF-C priority	Release	(default)	
	selection	Focus		
a2	AF-S priority	Release		
	selection	Focus	(default)	
a3	Focus	5 (Long)		
	tracking with	4		
	lock-on	3 (Normal)	(default)	
		2		
		1 (Short)		
		Off		
a4	AF point	Auto	(default)	
	illumination	On		
		Off		
a5	Focus point	Wrap		
	wrap-around	No wrap	(default)	
аб	Number of	39 points	(default)	
focus points		11 points		
a7	Built-in AF-	On	(default)	
assist illuminator		Off		

bΝ	letering/expos	ure	SD	d S	hooting/displa	у	SD
b1	ISO sensitivity	1/3 step	(default)	d1	Веер	Volume	
	step value	1/2 step				Pitch	
b2	EV steps for	1/3 step	(default)	d2	Viewfinder	On	
	exposure	1/2 step			grid display	Off	(default)
	cntrl			d3	ISO display	Show ISO sensitivity	
b3	Easy exposure				and	Show ISO/Easy ISO	
	compensation				adjustment	Show frame count	(default)
		Off	(default)	d4	Screen tips	On	(default)
b4		φ 8 mm				Off	
	weighted area	φ 12 mm	(default)	d5	CL mode	5 fps	
	area	φ 15 mm			shooting	4 fps	
		φ 20 mm			speed	3 fps	(default)
		Average				2 fps	
b5	Fine-tune	Yes				1 fps	
	optimal	No	(default)	d6	d6 Max.	1–100	
	exposure				continuous		
c Ti	mers/AE lock		SD		release		
c1	Shutter-	On		d7	File number	On	(default)
	release	Off		sequence	Off		
	button AE-L				Reset		
c2	Standby timer	4 s	( , , , , , , , , , , , , , , , , , , ,	d8	display 19 LCD	Auto	(default)
		6 s	(default)			Manual	
		10 s		d9		On	
		30 s			illumination	Off	(default)
		1 min		d10	) Exposure delay mode	3 s	
		5 min				2 s	
		10 min				1 s	
		30 min				Off	(default)
		No limit		d11	Flash warning	On	(default)
c3	Self-timer	Self-timer delay				Off	
		Number of shots		d12	MB-D14	LR6 (AA alkaline)	(default)
		Interval between shots			battery type	HR6 (AA Ni-MH)	
c4	Monitor off	Playback				FR6 (AA lithium)	
	delay	Menus		d13	Battery order	Use MB-D14 batteries first	
		Information display					(default)
		Image review				Use camera battery f	irst
		Live view					
c5	Remote on	1 min	(default)				
	duration	5 min					
		10 min					
		15 min					

e B	racketing/flash	h	SD	f C	ontrols		SD
e1	Flash sync	1/250 s (Auto FP)		f2	Assign Fn	Preview	
	speed	1/200 s (Auto FP)			button	FV lock	
		1/200 s	(default)			AE/AF lock	
		1/160 s				AE lock only	
		1/125 s				AE lock (Hold)	
		1/100 s				AF lock only	
		1/80 s				AF-ON	
		1/60 s				Flash off	
e2	Flash shutter	1/60 s	(default)			Bracketing burst	
	speed	1/30 s				Active D-Lighting	
		1/15 s				+ NEF (RAW)	
		1/8 s				Matrix metering	
		1/4 s				Center-weighted mete	ering
		1/2 s				Spot metering	
		1 s				Framing grid	
		2 s					(default)
		4 s				Viewfinder virtual hor	izon
		8 s				MY MENU	
		15 s				Access top item in MY	MENU
		30 s				1 step spd/aperture	
e3	Flash cntrl for	TTL	(default)			Choose non-CPU lens	number
	built-in flash	Manual				Playback	
		Repeating flash				None	
		Commander mode		f3	Assign	Preview	(default)
e3	Optional	TTL	(default)		preview	FV lock	
	flash *	Manual			button	AE/AF lock	
e4	Exposure	Entire frame	(default)			AE lock only	
	comp. for	Background only				AE lock (Hold)	
	flash					AF lock only	
e5	Modeling	On	(default)			AF-ON	
	flash	Off				Flash off	
еб	Auto	AE & flash	(default)			Bracketing burst	
	bracketing	AE only				Active D-Lighting	
	set	Flash only				+ NEF (RAW)	
		WB bracketing				Matrix metering	
		ADL bracketing				Center-weighted mete	ering
e7	Bracketing	MTR > under > over	(default)			Spot metering	
	order	Under > MTR > over				Framing grid	
* D	isplayed only w	hen optional SB-400 f	lash unit is			Choose image area	
	tached.					Viewfinder virtual hor	izon
fCo	ontrols		(SD)			MY MENU	
f1	OK button	Select center focus p				Access top item in MY	MENU
	(shooting	Select center locus p	(default)			1 step spd/aperture	-
	(shooting mode)	Highlight active focu				Choose non-CPU lens	number
		Not used				Playback	
						-	
						None	

f Co	ontrols		SD
f4	Assign AE-L/	AE/AF lock	(default)
AF-L button	2	AE lock only	
		AE lock (Hold)	
		AF lock only	
		AF-ON	
		FV lock	
		None	
f5 Customize		Reverse rotation	
	command	Change main/sub	
	dials	Aperture setting	
		Menus and playback	
f6	Release	Yes	
	button to use dial	No	(default)
f7	Slot empty	Release locked	
	release lock	Enable release	(default)
f8	Reverse	+	
indicators	indicators	<b>-</b>	(default)
f9	Assign	AE/AF lock	(default)
	MB-D14	AE lock only	
	📾 button	AE lock (Hold)	
		AF lock only	
		AF-ON	
		FV lock	
		Same as Fn button	
a M	lovie		SD
g1	Assign Fn	Index marking	
9.	button	View photo shooting	info
		AE/AF lock	,
		AE lock only	
		AE lock (Hold)	
		AF lock only	
		AF-ON	
		None	(default)
g2	Assign	Index marking	(default)
gz	preview button	View photo shooting	, ,
		AE/AF lock	,
		AE lock only	
		AE lock (Hold)	
		AF lock only	
		AF IOCK ONLY AF-ON	
		None	
		None	

дN	lovie		SD
g3 Assign AE-L/ AF-L button	Assign AE-L/	Index marking	
	AF-L button	View photo shooti	ng info
	AE/AF lock	(default)	
	AE lock only		
	AE lock (Hold)		
	AF lock only		
		AF-ON	
		None	
g4 Assign shutter button	Assign	Take photos	(default)
		Record movies	

## ¥ SETUP MENU (□ 249)

Format memory	Slot 1
card	Slot 2
Save user	Save to U1
settings	Save to U2
Reset user	Reset U1
settings	Reset U2
Monitor	Auto
brightness	Manual (default)
Clean image	Clean now
sensor SD	Clean at startup/shutdown
Lock mirror up	Start
for cleaning <sup>1</sup>	
Image Dust Off	Start
ref photo	Clean sensor and then start
HDMI SD	Output resolution
	Device control
Flicker reduction	Auto (default)
SD	) 50 Hz
	60 Hz
Time zone and	Time zone
date SD	Date and time
	Date format
	Daylight saving time
Language SD	Čeština, Dansk, Deutsch,
	English, Español, Ελληνικά,
	Français, Indonesia, Italiano,
	Magyar, Nederlands, Norsk,
	Polski, Português (BR),
	Português (PT), Русский,
	Română, Suomi, Svenska,
	Тürkçe, Українська, عربي,
	中文 (繁體),中文 (简体),
	日本語, 한글, ภาษาไทย, हिन्दी

Image comme	nt	Done	
SD		Input comment	
		Attach comment	
Auto image		On (default)	
rotation	SD	Off	
Battery info		-	
Copyright		Done	
information	SD	Artist	
		Copyright	
		Attach copyright information	
Save/load		Save settings	
settings		Load settings	
GPS	SD	Standby timer	
		Position	
		Use GPS to set camera clock	
Virtual horizon		-	
Non-CPU lens		Done	
data	SD	Lens number	
		Focal length (mm)	
		Maximum aperture	
AF fine-tune		AF fine-tune (On/Off)	
		Saved value	
		Default	
		List saved values	
Eye-Fi upload	<sup>2</sup> SD	Slot 1	
		Slot 2	
Firmware vers	ion	_	

Firmware version –

- 1 Not available at battery levels of cm or below.
- 2 Available only with compatible Eye-Fi memory cards.

## 🛃 RETOUCH MENU (🕮 261)

D-Lighting	-
Red-eye	-
correction	
Trim	-
Monochrome	Black-and-white
	Sepia
	Cyanotype
Filter effects	Skylight
	Warm filter
	Red intensifier
	Green intensifier
	Blue intensifier
	Cross screen
	Soft

Color balance	-
Image overlay <sup>1</sup>	-
NEF (RAW)	-
processing	
Resize	Select image
	Choose destination
	Choose size
Quick retouch	-
Straighten	-
Distortion	Auto
control	Manual
Fisheye	-
Color outline	-
Color sketch	-
Perspective	-
control	
Miniature effect	-
Selective color	-
Edit movie	Choose start/end point
	Save selected frame
Side-by-side	-
comparison <sup>2</sup>	

- 1 Available only when **MENU** button is pressed and tab selected in menus.
- 2 Only available when ⊛ or ☑ (⊡) button is pressed to display retouch menu during full-frame playback.

## 🗟 MY MENU (🕮 280)

Add items SD	Playback menu
	Shooting menu
	Custom setting menu
	Setup menu
	Retouch menu
Remove items *	-
Rank items	-
Choose tab SD	My Menu
	Recent settings

\* Items can also be deleted by highlighting them in MY MENU and pressing the 面 () button twice.

## **Table of Contents**

Q&A Index	ii
Menu Options	iv
For Your Safety	
Notices	

### Introduction

Getting to Know the Camera	1
The Camera Body	
The Mode Dial	5
The Release-Mode Dial	6
The Control Panel	7
The Viewfinder	8
The Information Display	9
The Command Dials	12
The BM-14 Monitor Cover	17
Camera Menus	18
Using Camera Menus	
First Steps	21
, Charge the Battery	
Insert the Battery	
Attach a Lens	
Basic Setup	
Insert a Memory Card	
Format the Memory Card	
Adjust Viewfinder Focus	

## **Basic Photography and Playback**

-	_
-5	~
-	-

"Point-and-Shoot" Photography (and S Modes)	35
Step 1: Turn the Camera On	
Step 2: Select 🖀 or 🏵 Mode	
Step 3: Frame the Photograph	
Step 4: Focus	
Step 5: Shoot	

	67
••••••	

Creative Photography (Scene Modes)40
Z Portrait41
🖀 Landscape41
🔮 Child
💐 Sports41
🕏 Close Up42
🖪 Night Portrait42
🖬 Night Landscape42
🕸 Party/Indoor
🏶 Beach/Snow43
🛎 Sunset43
當 Dusk/Dawn43
🚀 Pet Portrait43
😫 Candlelight44
Blossom44
Autumn Colors44
<b>TI</b> Food44
📓 Silhouette45
🗈 High Key45
🔟 Low Key45
Basic Playback
Deleting Unwanted Photographs47

## Live View Photography

Focusing in Live View	51
The Live View Display: Live View Photography	53
The Information Display: Live View Photography	55
Manual Focus	55

## **Movie Live View**

Indices	60
The Live View Display: Movie Live View	61
The Information Display: Movie Live View	62
Image Area	63
Movie Settings	
Viewing Movies	67
Editing Movies	69
Trimming Movies	
Saving Selected Frames	72

#### 49

P: Programmed Auto	. 75
S: Shutter-Priority Auto	. 76
A: Aperture-Priority Auto	.77
M: Manual	. 78
Long Time-Exposures ( <b>M</b> Mode Only)	. 79

### User Settings: U1 and U2 Modes

Saving User Settings	
Recalling User Settings	
Resetting User Settings	
Resetting User Settings	

### **Release Mode**

Choosing a Release Mode	83
Self-Timer and Remote Control Modes	
Mirror up Mode	

### **Image Recording Options**

Image Area	
Image Quality and Size	
Image Quality	
Image Size	
Using Two Memory Cards	96

### Focus

ISO Sensitivity	105
Manual Focus	
Focus Lock	
Focus Point Selection	
AF-Area Mode	
Autofocus Mode	97
Autofocus	97

Auto ISO Sensitivity Control	107
------------------------------	-----

81

83

89

### Exposure

Metering	
Autoexposure Lock	
Exposure Compensation	

## White Balance

Fine-Tuning White Balance	
Choosing a Color Temperature	120
Preset Manual	

### Image Enhancement

Picture Controls	
Selecting a Picture Control	129
Modifying Picture Controls	131
Creating Custom Picture Controls	134
Sharing Custom Picture Controls	136
Preserving Detail in Highlights and Shadows	137
Active D-Lighting	137
High Dynamic Range (HDR)	139

### **Flash Photography**

Using the Built-in Flash	
Flash Mode	
Flash Compensation	
FV Lock	

## **Other Shooting Options**

Two-Button Reset: Restoring Default Settings	.151
Bracketing	.153
Multiple Exposure	.160
Interval Timer Photography	.164
Time-Lapse Photography	.168
Non-CPU Lenses	.172
The GP-1 GPS Unit	.175

115

## **More on Playback**

Full-Frame Playback	
Photo Information	
Thumbnail Playback	185
Calendar Playback	
Taking a Closer Look: Playback Zoom	187
Protecting Photographs from Deletion	
Deleting Photographs	
Full-Frame, Thumbnail, and Calendar Playback	
The Playback Menu	190

## Connections

### 193

207

Connecting to a Computer	
Before Connecting the Camera	193
Connecting the Camera	194
Printing Photographs	
Connecting the Printer	
Printing Pictures One at a Time	
Printing Multiple Pictures	
Creating a DPOF Print Order: Print Set	
Viewing Photographs on TV	

## Menu Guide

▶ The Playback Menu: Managing Images	
Playback Folder	207
Hide Image	208
Playback Display Options	209
Copy Image(s)	209
Image Review	
After Delete	
Rotate Tall	212
Slide Show	213
The Shooting Menu: Shooting Options	
Reset Shooting Menu	214
Storage Folder	
File Naming	
Auto Distortion Control	
Color Space	217
Vignette Control	218
Long Exposure NR (Long Exposure Noise Reduction)	
High ISO NR	

Custom Settings: Fine-Tuning Camera Settings	
Reset Custom Settings	
a: Autofocus	
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	
b: Metering/Exposure	
b1: ISO Sensitivity Step Value	
b2: EV Steps for Exposure Cntrl	
b3: Easy Exposure Compensation	225
b4: Center-Weighted Area	226
b5: Fine-tune Optimal Exposure	
c: Timers/AE Lock	
c1: Shutter-Release Button AE-L	
c2: Standby timer	
c3: Self-Timer	
c4: Monitor off Delay	
c5: Remote on Duration	
d: Shooting/Display	
d1: Beep	
d2: Viewfinder Grid Display	
d3: ISO Display and Adjustment	
d4: Screen Tips	
d5: CL Mode Shooting Speed	
d6: Max. Continuous Release	
d7: File Number Sequence	
d8: Information Display	
d9: LCD Illumination	
d10: Exposure Delay Mode	
d11: Flash Warning	
d12: MB-D14 Battery Type	
d13: Battery Order	
e: Bracketing/Flash	
e1: Flash Sync Speed	
e2: Flash Shutter Speed	
e3: Flash Cntrl for Built-in Flash	
e4: Exposure Comp. for Flash	
e5: Modeling Flash	
e6: Auto Bracketing Set	
e7: Bracketing Order	

f: Controls	241
f1: OK Button (Shooting Mode)	241
f2: Assign Fn Button	242
f3: Assign Preview Button	244
f4: Assign AE-L/AF-L Button	244
f5: Customize Command Dials	245
f6: Release Button to Use Dial	
f7: Slot Empty Release Lock	
f8: Reverse Indicators	
f9: Assign MB-D14 圈 Button	
g: Movie	247
g1: Assign Fn Button	
g2: Assign Preview Button	
g3: Assign AE-L/AF-L Button	
g4: Assign Shutter Button	
The Setup Menu: Camera Setup	
Format Memory Card	
Monitor Brightness	
Image Dust Off Ref Photo	
Flicker Reduction	
Time Zone and Date	
Language	
Image Comment	
Auto Image Rotation	
Battery Info	
Copyright Information	
Save/Load Settings	
Virtual Horizon	
AF Fine-tune	
Eye-Fi Upload	
Firmware Version	
The Retouch Menu: Creating Retouched Copies	
Creating Retouched Copies	
D-Lighting	
Red-Eye Correction	
Trim	
Monochrome	
Filter Effects	
Color Balance	
Image Overlay	
NEF (RAW) Processing	
Resize	
Quick Retouch	
Straighten	
Distortion Control	
Fisheye	
Color Outline	275

Color Sketch	
Perspective Control	
Miniature Effect	
Selective Color	
Side-by-side Comparison	
🗄 My Menu/🗐 Recent Settings	
Recent Settings	
5	

## **Technical Notes**

Compatible Lenses	285
Optional Flash Units (Speedlights)	292
The Nikon Creative Lighting System (CLS)	293
Other Accessories	297
Attaching a Power Connector and AC Adapter	299
Caring for the Camera	300
Storage	300
Cleaning	300
The Low-Pass Filter	301
"Clean Now"	
"Clean at Startup/Shutdown"	
Manual Cleaning	
Caring for the Camera and Battery: Cautions	306
Available Settings	309
Defaults	312
Exposure Program (Mode P)	315
Troubleshooting	316
Display	316
Shooting (All Modes)	317
Shooting ( <b>P, S, A, M</b> )	319
Playback	320
Miscellaneous	321
Error Messages	322
Specifications	326
Approved Memory Cards	
Memory Card Capacity	
Battery Life	
Index	
III IUCA	

## **For Your Safety**

To prevent damage to your Nikon product or injury to yourself or to others, read the following safety precautions in their entirety before using this equipment. Keep these safety instructions where all those who use the product will read them.

The consequences that could result from failure to observe the precautions listed in this section are indicated by the following symbol:

This icon marks warnings. To prevent possible injury, read all warnings before using this Nikon product.

#### **WARNINGS**

Keep the sun well out of the frame when shooting backlit subjects. Sunlight focused into the camera when the sun is in or close to the frame could cause a fire.

▲ Do not look at the sun through the viewfinder Viewing the sun or other strong light source through the viewfinder could cause permanent visual impairment.

▲ Using the viewfinder diopter adjustment control When operating the viewfinder diopter adjustment control with your eye to the viewfinder, care should be taken not to put your finger in your eye accidentally.

- ▲ Turn off immediately in the event of malfunction Should you notice smoke or an unusual smell coming from the equipment or AC adapter (available separately), unplug the AC adapter and remove the battery immediately, taking care to avoid burns. Continued operation could result in injury. After removing the battery, take the equipment to a Nikon-authorized service center for inspection.
- ▲ Do not use in the presence of flammable gas Do not use electronic equipment in the presence of flammable gas, as this could result in explosion or fire.

## ▲ Do not place the strap around the neck of an infant or child

Placing the camera strap around the neck of an infant or child could result in strangulation.

#### ⚠️ Keep out of reach of children

Failure to observe this precaution could result in injury. In addition, note that small parts constitute a chocking hazard. Should a child swallow any part of this equipment, consult a physician immediately.

#### ⚠️ Do not disassemble

Touching the product's internal parts could result in injury. In the event of malfunction, the product should be repaired only by a qualified technician. Should the product break open as the result of a fall or other accident, remove the battery and/or AC adapter and then take the product to a Nikon-authorized service center for inspection.

Do not remain in contact with the camera, battery, or charger for extended periods while the devices are on or in use

Parts of the device become hot. Leaving the device in direct contact with the skin for extended periods may result in lowtemperature burns.

## No not aim a flash at the operator of a motor vehicle

Failure to observe this precaution could result in accidents.

#### Avoid contact with liquid crystal

Should the monitor break, care should be taken to avoid injury due to broken glass and to prevent the liquid crystal from the monitor touching the skin or entering the eyes or mouth.

#### ⚠️ Observe caution when using the flash

- Using the camera with the flash in close contact with the skin or other objects could cause burns.
- Using the flash close to the subject's eyes could cause temporary visual impairment. Particular care should be observed when photographing infants, when the flash should be no less than one meter (39 in.) from the subject.

#### Observe proper precautions when handling batteries

Batteries may leak or explode if improperly handled. Observe the following precautions when handling batteries for use in this product:

- Use only batteries approved for use in this equipment.
- Do not short or disassemble the battery.
- Be sure the product is off before replacing the battery. If you are using an AC adapter, be sure it is unplugged.
- Do not attempt to insert the battery upside down or backwards.
- Do not expose the battery to flame or to excessive heat.
- Do not immerse in or expose to water.
- Replace the terminal cover when transporting the battery. Do not transport or store the battery with metal objects such as necklaces or hairpins.
- Batteries are prone to leakage when fully discharged. To avoid damage to the product, be sure to remove the battery when no charge remains.
- When the battery is not in use, attach the terminal cover and store in a cool, dry place.
- The battery may be hot immediately after use or when the product has been used on battery power for an extended period. Before removing the battery turn the camera off and allow the battery to cool.
- Discontinue use immediately should you notice any changes in the battery, such as discoloration or deformation.

- Observe proper precautions when handling the charger
  - Keep dry. Failure to observe this precaution could result in fire or electric shock.
  - Dust on or near the metal parts of the plug should be removed with a dry cloth. Continued use could result in fire.
  - Do not handle the power cable or go near the charger during thunderstorms. Failure to observe this precaution could result in electric shock.
  - Do not damage, modify, or forcibly tug or bend the power cable. Do not place it under heavy objects or expose it to heat or flame. Should the insulation be damaged and the wires become exposed, take the power cable to a Nikon-authorized service representative for inspection. Failure to observe this precaution could result in fire or electric shock.
  - Do not handle the plug or charger with wet hands. Failure to observe this precaution could result in electric shock.
  - Do not use with travel converters or adapters designed to convert from one voltage to another or with DC-to-AC inverters. Failure to observe this precaution could damage the product or cause overheating or fire.

#### ▲ Use appropriate cables

When connecting cables to the input and output jacks, use only the cables provided or sold by Nikon for the purpose to maintain compliance with product regulations.

#### ⚠ CD-ROMs

CD-ROMs containing software or manuals should not be played back on audio CD equipment. Playing CD-ROMs on an audio CD player could cause hearing loss or damage the equipment.

## Notices

- No part of the manuals included with this product may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form, by any means, without Nikon's prior written permission.
- Nikon reserves the right to change the specifications of the hardware and software described in these manuals at any time and without prior notice.

#### Notices for Customers in Canada CAUTION

This Class B digital apparatus complies with Canadian ICES-003.

- Nikon will not be held liable for any damages resulting from the use of this product.
- While every effort has been made to ensure that the information in these manuals is accurate and complete, we would appreciate it were you to bring any errors or omissions to the attention of the Nikon representative in your area (address provided separately).

#### ATTENTION

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

#### Notices for Customers in Europe

#### CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

This symbol indicates that electrical and electronic equipment is to be collected separately.



The following apply only to users in European countries:

- This product is designated for separate collection at an appropriate collection point. Do not dispose of as household waste.
- Separate collection and recycling helps conserve natural resources and prevent negative consequences for human health and the environment that might result from incorrect disposal.
- For more information, contact the retailer or the local authorities in charge of waste management.

This symbol on the battery indicates that the battery is to be collected separately.



The following apply only to users in European countries:

- All batteries, whether marked with this symbol or not, are designated for separate collection at an appropriate collection point. Do not dispose of as household waste.
- For more information, contact the retailer or the local authorities in charge of waste management.

#### Notices for Customers in the U.S.A.

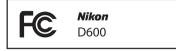
**Power Cable** 

**At voltages over AC 125 V (U.S.A. only)**: The power cable must be rated for the voltage in use, be at least AWG no. 18 gauge, and have SVG insulation or better with a NEMA 6P-15 plug rated for AC 250 V 15 A.

#### Federal Communications Commission (FCC) Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.



#### CAUTIONS Modifications

The FCC requires the user be notified that any changes or modifications made to this device that are not expressly approved by Nikon Corporation may void the user's authority to operate the equipment.

#### Interface Cables

Use the interface cables sold or provided by Nikon for your equipment. Using other interface cables may exceed the limits of Class B Part 15 of the FCC rules.

#### Notice for Customers in the State of California

**WARNING:** Handling the cord on this product may expose you to lead, a chemical known to the State of California to cause birth defects or other reproductive harm. *Wash hands after handling*.

Nikon Inc., 1300 Walt Whitman Road, Melville, New York 11747-3064, U.S.A. Tel.: 631-547-4200

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#### Disposing of Data Storage Devices

Please note that deleting images or formatting memory cards or other data storage devices does not completely erase the original image data. Deleted files can sometimes be recovered from discarded storage devices using commercially available software, potentially resulting in the malicious use of personal image data. Ensuring the privacy of such data is the user's responsibility.

Before discarding a data storage device or transferring ownership to another person, erase all data using commercial deletion software, or format the device and then completely refill it with images containing no private information (for example, pictures of empty sky). Be sure to also replace any pictures selected for preset manual ( $\Box$  121). Care should be taken to avoid injury when physically destroying data storage devices.

#### **AVC Patent Portfolio License**

This product is licensed under the AVC patent portfolio license for the personal and noncommercial use of a consumer to (i) encode video in compliance with the AVC standard ("AVC video") and/or (ii) decode AVC video that was encoded by a consumer engaged in a personal and non-commercial activity and/or was obtained from a video provider licensed to provide AVC video. No license is granted or shall be implied for any other use. Additional information may be obtained from MPEG LA, L.L.C. See http://www.mpegla.com

#### **Use Only Nikon Brand Electronic Accessories**

Nikon cameras are designed to the highest standards and include complex electronic circuitry. Only Nikon brand electronic accessories (including chargers, batteries, AC adapters, and flash accessories) certified by Nikon specifically for use with this Nikon digital camera are engineered and proven to operate within the operational and safety requirements of this electronic circuitry.

The use of non-Nikon electronic accessories could damage the camera and may void your Nikon warranty. The use of third-party rechargeable Li-ion batteries not bearing the Nikon holographic seal shown at right could interfere with normal

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operation of the camera or result in the batteries overheating, igniting, rupturing, or leaking.

For more information about Nikon brand accessories, contact a local authorized Nikon dealer.

#### **V** Use Only Nikon Brand Accessories

Only Nikon brand accessories certified by Nikon specifically for use with your Nikon digital camera are engineered and proven to operate within its operational and safety requirements. The USE OF NON-NIKON ACCESSORIES COULD DAMAGE YOUR CAMERA AND MAY VOID YOUR NIKON WARRANTY.

#### Servicing the Camera and Accessories

The camera is a precision device and requires regular servicing. Nikon recommends that the camera be inspected by the original retailer or a Nikon-authorized service representative once every one to two years, and that it be serviced once every three to five years (note that fees apply to these services). Frequent inspection and servicing are particularly recommended if the camera is used professionally. Any accessories regularly used with the camera, such as lenses or optional flash units, should be included when the camera is inspected or serviced.

#### Before Taking Important Pictures

Before taking pictures on important occasions (such as at weddings or before taking the camera on a trip), take a test shot to ensure that the camera is functioning normally. Nikon will not be held liable for damages or lost profits that may result from product malfunction.

#### Life-Long Learning

As part of Nikon's "Life-Long Learning" commitment to ongoing product support and education, continually-updated information is available on-line at the following sites:

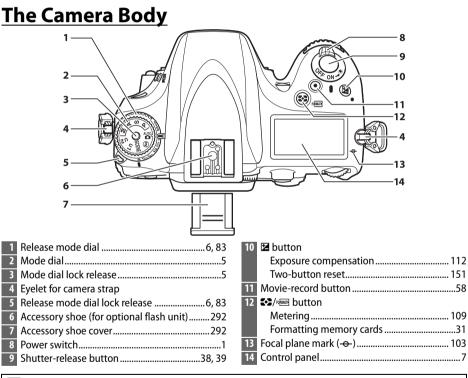
- For users in the U.S.A.: http://www.nikonusa.com/
- For users in Europe and Africa: http://www.europe-nikon.com/support/
- For users in Asia, Oceania, and the Middle East: http://www.nikon-asia.com/

Visit these sites to keep up-to-date with the latest product information, tips, answers to frequently-asked questions (FAQs), and general advice on digital imaging and photography. Additional information may be available from the Nikon representative in your area. See the following URL for contact information: *http://imaging.nikon.com/* 

# Introduction

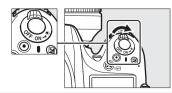
## **Getting to Know the Camera**

Take a few moments to familiarize yourself with camera controls and displays. You may find it helpful to bookmark this section and refer to it as you read through the rest of the manual.

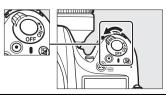


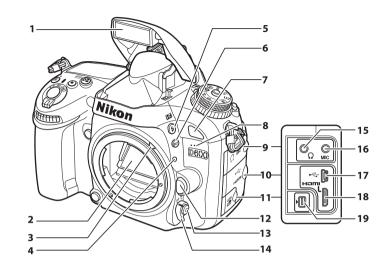
#### 🖉 The Power Switch

Rotate the power switch as shown to turn the camera on.



Rotate the power switch as shown to turn the camera off.





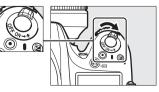
1	Built-in flash	143
2	Mirror	
3	Meter coupling lever	328
4	Lens mounting mark	26
5	≰/∰ button	
	Flash mode	143
	Flash compensation	148
6	BKT button	
	Bracketing	153, 156, 158
7	Infrared receiver (front)	
8	Built-in microphone	58, 65
9	Audio connector cover	61, 298

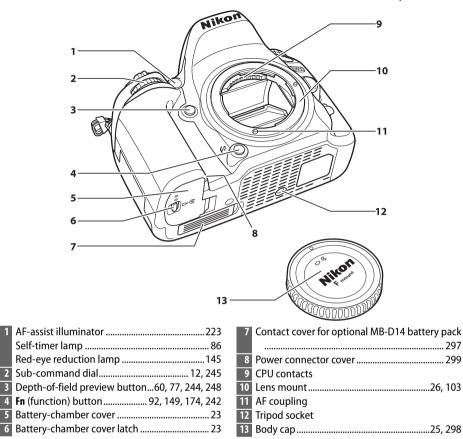
10	HDMI/USB connector cover 194, 196, 204
11	Cover for accessory terminal298
12	Lens release button
13	AF-mode button51, 98, 100
14	Focus-mode selector 97, 103
15	Headphone connector 61
16	Connector for external microphone 61
17	USB connector
	Connecting to a computer 194
	Connecting to a printer196
18	HDMI mini-pin connector204
19	Accessory terminal175, 298

#### LCD Illuminators

Rotating the power switch toward \* activates the standby timer and control panel backlight (LCD illuminator), allowing the display to be read in the dark. After the power switch is released and returns to the **ON** position, the illuminators will remain lit for six seconds while the standby timer is active or until the shutter is released or the power switch is rotated toward \* again.

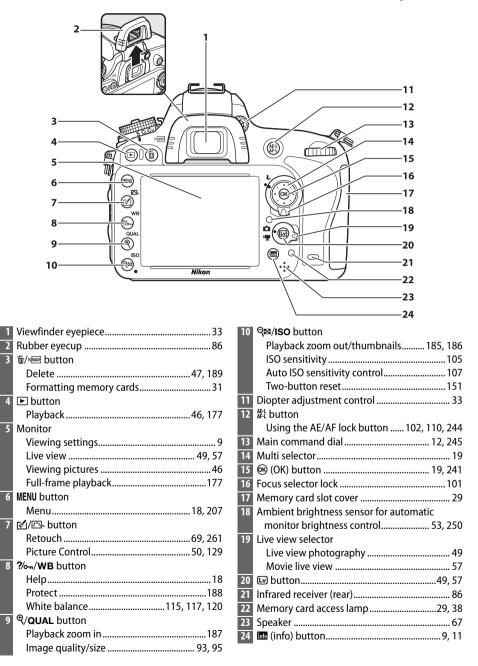
Power switch





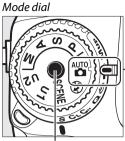
#### The Microphone and Speaker

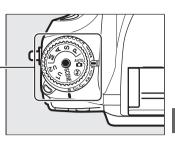
Do not place the microphone or speaker in close proximity to magnetic devices. Failure to observe this precaution could affect the data recorded on the magnetic devices.



## <u>The Mode Dial</u>

The camera offers the modes listed below. To choose a mode, press the mode dial lock release and rotate the mode dial.

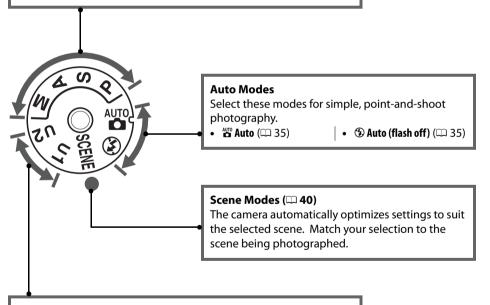




Mode dial lock release

#### P, S, A, and M Modes

- Select these modes for full control over camera settings.
- P—Programmed auto (CC 75)
- S—Shutter-priority auto (CD 76)
- A—Aperture-priority auto (CD 77)
- M Manual (🕮 78)



#### U1 and U2 Modes (🕮 81)

Store and recall customized shooting settings.

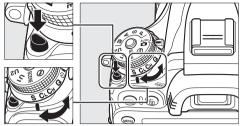
#### 🖉 Non-CPU Lenses

Non-CPU ( $\Box$  285) lenses can be used only in modes **A** and **M**. Selecting another mode when a non-CPU lens is attached disables the shutter release.

## The Release-Mode Dial

To choose a release mode, press the release mode dial lock release and turn the release mode dial to the desired setting (CII 83).

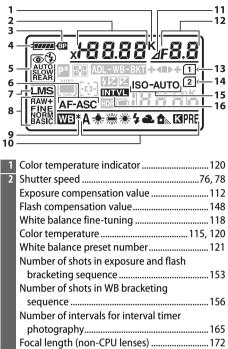
#### Release mode dial lock release

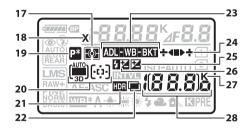


Release mode dial

Mode		le	Description
Current Curren	S	Single frame	One photograph is taken each time the shutter- release button is pressed.
	CL	Continuous low speed	The camera takes photographs at a slow rate while the shutter-release button is pressed.
	Сн	Continuous high speed	The camera takes photographs at a fast rate while the shutter-release button is pressed.
	Q	Quiet shutter-release	As for single-frame, except that camera noise is reduced.
	છે	Self-timer	Take pictures with the self-timer.
		Remote control	Take pictures with an optional ML-L3 remote control.
	Mup	Mirror up	Raise the mirror before taking photographs.

## The Control Panel





Metering	109
Flash sync indicator	234
Flexible program indicator	75
Auto-area AF indicator	
AF-area mode indicator	100
3D-tracking indicator	
HDR indicator	140
Multiple exposure indicator	161
	Flash sync indicator Flexible program indicator Auto-area AF indicator AF-area mode indicator 3D-tracking indicator HDR indicator

3	MB-D14 battery indicator	
4	Battery indicator	35
5	Flash mode	144
6	Autofocus mode	97
7	Image size	95
8	Image quality	93
	White balance fine-tuning indicator	
10	White balance	115
11	Aperture stop indicator	73, 288
12	Aperture (f-number)	77, 78
	Aperture (number of stops)	73, 288
	Bracketing increment	154, 156
	Number of shots in ADL bracketing	
	sequence	158
	Number of shots per interval	
	Maximum aperture (non-CPU lenses)	
	PC mode indicator	
13	Memory card indicator (Slot 1)	30, 96
14	Memory card indicator (Slot 2)	30, 96
15	ISO sensitivity indicator	105
	Auto ISO sensitivity indicator	108
16	Interval timer indicator	
	Time-lapse indicator	

23	Exposure and flash bracketing indicator 153
23	5
	WB bracketing indicator
	ADL bracketing indicator158
24	Bracketing progress indicator 153, 156, 158
25	Exposure compensation indicator 112
26	Flash compensation indicator148
27	"K" (appears when memory remains for over
	1000 exposures)36
28	Number of exposures remaining36
	Number of shots remaining before memory
	buffer fills
	ISO sensitivity 105
	Preset white balance recording indicator 122
	Active D-Lighting amount138
	Time-lapse recording indicator 170
	Manual lens number 174
	Capture mode indicator 195
	HDMI-CEC connection indicator

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3			10 7 8 9 11 12 13 x88.855₄₽8.8±
	▶••●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●●	14	16 17 18 20 21 22 15 19
C 2 Foc AF- 3 AF 4 Foc 5 Me 6 Aut 7 Shu Aut 8 Ap 9 Fla: 10 Exp 11 ISO 12 ISO Act	ming grid (displayed when of ustom Setting d2)		14       FV lock indicator       149         15       Flash sync indicator       234         16       Aperture stop indicator       73, 288         17       Exposure indicator       78         18       Low battery warning       12         19       Exposure and flash bracketing indicator       153         19       Exposure and flash bracketing indicator       156         ADL bracketing indicator       156         ADL bracketing indicator       156         20       Auto ISO sensitivity indicator       108         21       Number of exposures remaining       36         21       Number of shots remaining before memory buffer fills       38, 84, 334         Preset white balance recording indicator       112         Flash compensation value       114         22       "K" (appears when memory remains for over

#### No Battery

The Viewfinder

When the battery is totally exhausted or no battery is inserted, the display in the viewfinder will dim. This is normal and does not indicate a malfunction. The viewfinder display will return to normal when a fully-charged battery is inserted.

#### The Control Panel and Viewfinder Displays

The brightness of the control panel and viewfinder displays varies with temperature, and the response times of the displays may drop at low temperatures. This is normal and does not indicate a malfunction.

N.

## The Information Display

Press the **m** button to display shutter speed, aperture, the number of exposures remaining, AF-area mode, and other shooting information in the monitor.



info button

	P* x788.88 × 4F8.8	—8		
2		9		
2		-10 11		
-		-12		
2		-13		
2		-14		
2	0			
	19 18 17 16 15			
1	Shooting mode35,			
2	Flexible program indicator			
3	Flash sync indicator			
4	onatter speed minimum	'		
	Exposure compensation value			
	Flash compensation value	148		
	Number of shots in exposure and flash			
	bracketing sequence153			
Number of shots in WB bracketing				
	sequence			
	Focal length (non-CPU lenses)			
	Color temperature1			
5	· · · · · · · · · · · · · · · · · · ·			
6	Aperture stop indicator			
7	Aperture (f-number)			
	Aperture (number of stops)			
	Bracketing increment1	54, 155		
	Number of shots in ADL bracketing	150		
		158		
	Maximum aperture (non-CPU lenses)	1/4		

8	Release mode	6, 83
	Continuous shooting speed	229
9	Exposure indicator	78
	Exposure compensation display	112
	Bracketing progress indicator	
	Exposure and flash bracketing	153
	WB bracketing	156
10	HDR indicator	140
	HDR exposure differential	140
11	Camera battery indicator	35
12	MB-D14 battery type display	232
	MB-D14 battery indicator	232
13	"K" (appears when memory remains for o	ver
	1000 exposures)	36
14	Number of exposures remaining	36
	Time-lapse recording indicator	170
	Manual lens number	174
15	Fn button assignment	242
16	AE-L/AF-L button assignment	244
17	Remote control mode	85
18	Long exposure noise reduction indicator	218
19	Role played by card in slot 2	96
20	White balance	
	White balance fine-tuning indicator	118
21	Auto-area AF indicator	100
	Focus points indicator	101
	AF-area mode indicator	100
	3D-tracking indicator	100
22	5 1	93
23	Image size	95
24	Flash mode	144

25 26 27 28 29 30 31 32	32 ADL bracketing amount138
	33 Multiple exposure indicator
	34 "Beep" indicator
CLOCK COMMENT © ADL-BKT HH	35 Exposure compensation indicator112
48	36 Flash compensation indicator
	37 FV lock indicator
	38 Interval timer indicator
45 39	Time-lapse indicator 170
1 ISO 国 N 路台0FF □ N 回 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	39 GPS connection indicator
	40 Depth-of-field preview button assignment244
44 43 42 41 40	41 Vignette control indicator218
25 Image area indicator	42 Active D-Lighting indicator138
26 Metering	43 High ISO noise reduction indicator
27 Auto distortion control	44 Movie settings 65
28 "Clock not set" indicator	45 Autofocus mode
29 Image comment indicator	46 Eye-Fi connection indicator
30 Copyright information256	47 ISO sensitivity indicator105
31 Exposure and flash bracketing indicator153	ISO sensitivity105
WB bracketing indicator156	Auto ISO sensitivity indicator
ADL bracketing indicator	48 Picture Control indicator130

#### Turning the Monitor Off

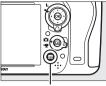
To clear shooting information from the monitor, press the **button** twice more or press the shutter-release button halfway. The monitor will turn off automatically if no operations are performed for about 10 seconds.

#### 🖉 See Also

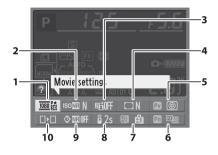
For information on choosing how long the monitor stays on, see Custom Setting c4 (**Monitor off delay**, D 228). For information on changing the color of the lettering in the information display, see Custom Setting d8 (**Information display**, D 231).

## **LE** Changing Settings in the Information Display

To change settings for the items listed below, press the  $\mathbf{m}$  button in the information display. Highlight items using the multi selector and press  $\mathbf{w}$  to view options for the highlighted item.



info button



1	Movie settings65
2	High ISO noise reduction218
3	Active D-Lighting137
4	Vignette control
5	Depth-of-field preview button assignment 244
6	Fn button assignment 242
7	AE-L/AF-L button assignment 244
8	Remote control mode85
9	Long exposure noise reduction218
10	Role played by card in Slot 296

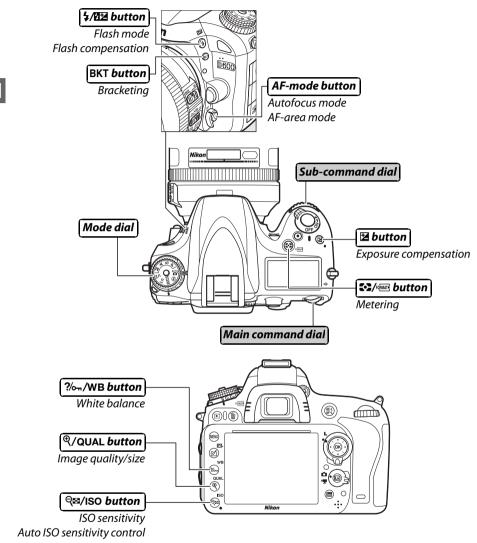
#### 🖉 Tool Tips

A tool tip giving the name of the selected item appears in the information display. Tool tips can be turned off using Custom Setting d4 (**Screen Tips**;  $\Box$  229).

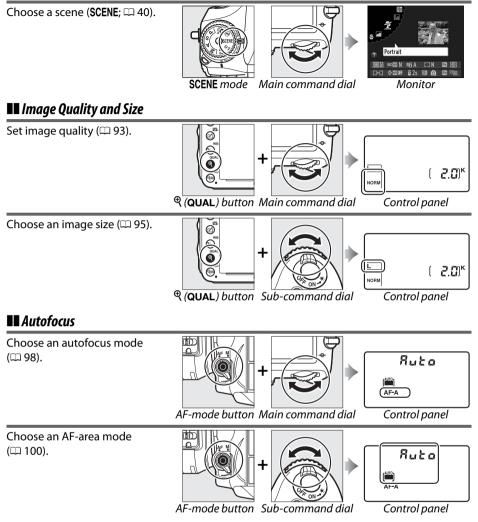


# The Command Dials

The main- and sub-command dials are used alone or in combination with other controls to adjust a variety of settings.

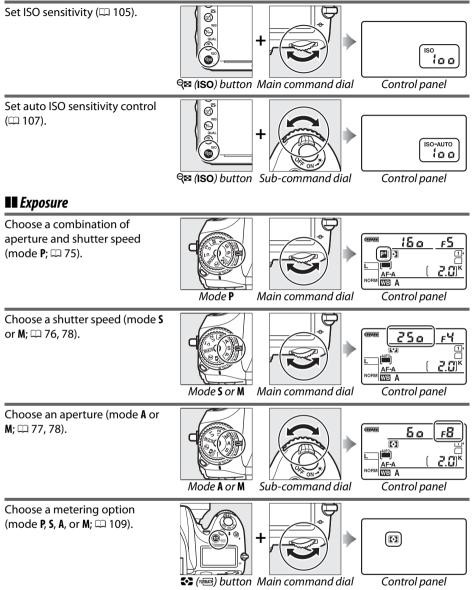


### Scene Mode

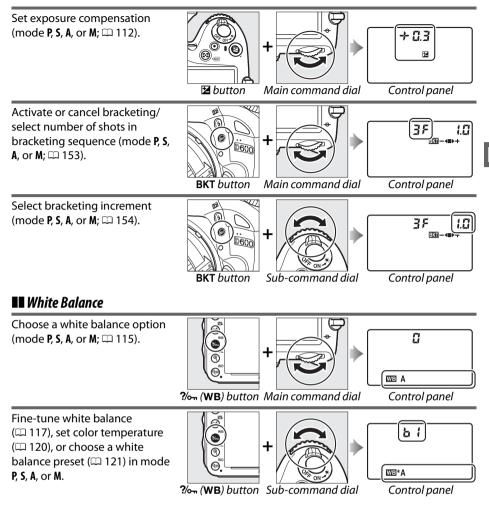


\*

#### II ISO Sensitivity



\*



### Flash Settings

Choose a flash mode (🕮 144). 0.0 123 0 12 6 .. D600 **4** (22) button Main command dial Control panel Set flash compensation (mode **P**, **S**, **A**, or **M**; □ 148). + 0.3 12H 0 + 5 K. Ø .. D600

🗲 (🖽) button

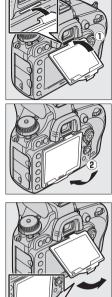
Sub-command dial

Control panel

# **The BM-14 Monitor Cover**

A clear plastic cover is provided with the camera to keep the monitor clean and protect it when the camera is not in use. To attach the cover, insert the projection on the top of the cover into the matching indentation above the camera monitor (①) and press the bottom of the cover until it clicks into place (2).

To remove the cover, hold the camera firmly and pull the bottom of the cover gently outwards as shown at right.

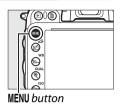


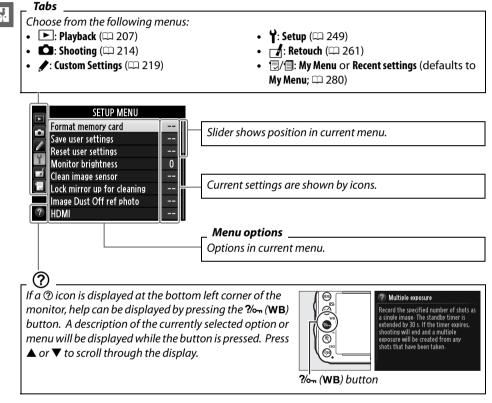


**N**.

# **Camera Menus**

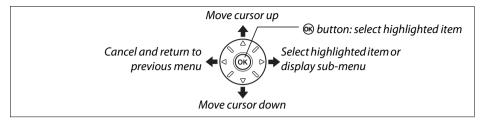
Most shooting, playback, and setup options can be accessed from the camera menus. To view the menus, press the MENU button.



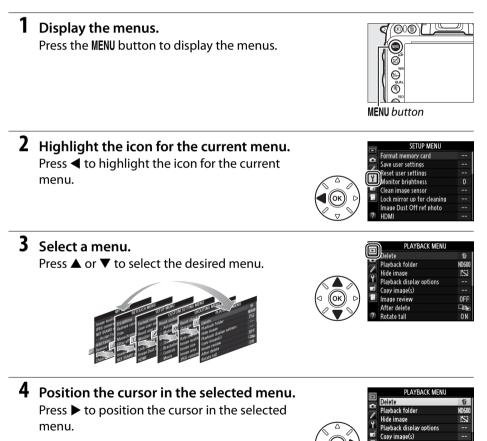


# Using Camera Menus

The multi selector and 🛞 button are used to navigate the camera menus.



Follow the steps below to navigate the menus.



lmage review After delete **6** Display options. Press ► to display options for the selected menu item.

#### 7 Highlight an option.

**8** Select the highlighted item.

Press  $\blacktriangle$  or  $\checkmark$  to highlight an option.

Off

- button. Note the following:
- Menu items that are displayed in gray are not currently available.

Press ® to select the highlighted item. To exit without making a selection, press the MENU

- While pressing > generally has the same effect as pressing , there are some cases in which selection can only be made by pressing  $\Theta$ .
- To exit the menus and return to shooting mode, press the shutter-release button halfway (CD 39).









nage review

Ωn Off

# **First Steps**

# **Charge the Battery**

The camera is powered by an EN-EL15 rechargeable Li-ion battery (supplied). To maximize shooting time, charge the battery in the supplied MH-25 battery charger before use. About 2 hours and 35 minutes are required to fully recharge the battery when no charge remains.

## **1** Connect the AC power cable.

Connect the power cable. The AC adapter plug should be in the position shown at right; do not rotate.

### **2** Remove the terminal cover.

Remove the terminal cover from the battery.

## **3** Insert the battery.

Place the battery in the battery bay as shown in the illustration on the charger.

## **4** Plug the charger in.

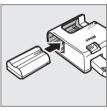
The **CHARGE** lamp will flash slowly while the battery charges.

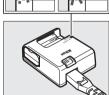
#### Charging the Battery

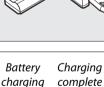
Charge the battery indoors at ambient temperatures between 5-35°C (41-95°F). The battery will not charge if its temperature is below 0°C (32°F) or above 60°C (140°F).

## **5** Remove the battery when charging is complete.

Charging is complete when the CHARGE lamp stops flashing. Unplug the charger and remove the battery.





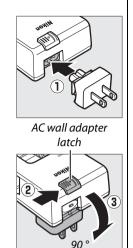






#### The AC Wall Adapter

Depending on the country or region of purchase, an AC wall adapter may also be supplied with the charger. To use the adapter, insert it into the charger AC inlet (①). Slide the AC wall adapter latch in the direction shown (②) and rotate the adapter 90 ° to fix it in the position shown (③). Reverse these steps to remove the adapter.



# **Insert the Battery**

Before inserting the battery, rotate the power switch to **OFF**.

#### Inserting and Removing Batteries

Always turn the camera off before inserting or removing batteries.

## **1** Open the battery-chamber cover.

Unlatch (1) and open (2) the battery-chamber cover.

## **2** Insert the battery.

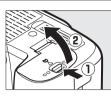
Insert the battery in the orientation shown (1), using the battery to keep the orange battery latch pressed to one side. The latch locks the battery in place when the battery is fully inserted (2).

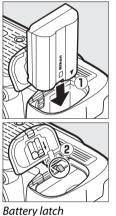
# **3** Close the battery-chamber cover.

#### Removing the Battery

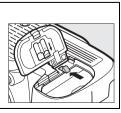
Turn the camera off and open the battery-chamber cover. Press the battery latch in the direction shown by the arrow to release the battery and then remove the battery by hand.











#### The Battery and Charger

Read and follow the warnings and cautions on pages xviii–xix and 306–308 of this manual. Do not use the battery at ambient temperatures below 0°C/32°F or above 40°C/104°F; failure to observe this precaution could damage the battery or impair its performance. Capacity may be reduced and charging times may increase at battery temperatures from 0°C/32°F to 15°C/59°F and from 45°C/113°F to 60°C/140°F.

If the **CHARGE** lamp flashes quickly (about eight times a second) during charging, confirm that the temperature is in the correct range and then unplug the charger and remove and reinsert the battery. If the problem persists, cease use immediately and take battery and charger to your retailer or a Nikon-authorized service representative.

Do not short the charger terminals; failure to observe this precaution could result in overheating and damage to the charger. Do not move the charger or touch the battery during charging. Failure to observe this precaution could in very rare instances result in the charger showing that charging is complete when the battery is only partially charged. Remove and reinsert the battery to begin charging again. Battery capacity may temporarily drop if the battery is charged at low temperatures or used at a temperature below the temperature at which it was charged. If the battery is charged at a temperature below 5 °C (41 °F), the battery life indicator in the **Battery info** ( $\square$  255) display may show a temporary decrease.

The battery may be hot immediately after use. Wait for the battery to cool before recharging.

The supplied power cable and AC wall adapter are for use with the MH-25 only. Use the charger with compatible batteries only. Unplug when not in use.

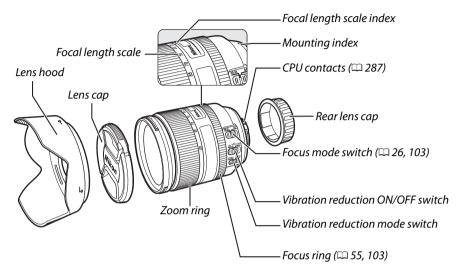
A marked drop in the time a fully charged battery retains its charge when used at room temperature indicates that it requires replacement. Purchase a new EN-EL15 battery.

#### EN-EL15 Rechargeable Li-ion Batteries

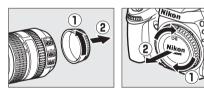
The supplied EN-EL15 shares information with compatible devices, enabling the camera to show battery charge state in six levels ( $\square$  35). The **Battery info** option in the setup menu details battery charge, battery life, and the number of pictures taken since the battery was last charged ( $\square$  255).

# <u>Attach a Lens</u>

Care should be taken to prevent dust from entering the camera when the lens is removed. The lens generally used in this manual for illustrative purposes is an AF-S NIKKOR 24-120mm f/4G ED VR.

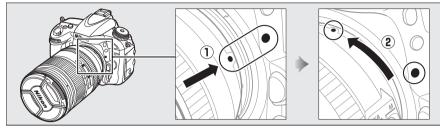


- **1** Turn the camera off.
- **2** Remove the rear lens cap and the camera body cap.



# **3** Attach the lens.

Keeping the mounting index on the lens aligned with the mounting index on the camera body, position the lens in the camera's bayonet mount (1). Being careful not to press the lens-release button, rotate the lens counter-clockwise until it clicks into place ((2)).



If the lens is equipped with an **A-M** or **M/A-M** mode switch, select **A** (autofocus) or **M/A** (autofocus with manual override).



#### Detaching the Lens

Be sure the camera is off when removing or exchanging lenses. To remove the lens, press and hold the lens release button (1) while turning the lens clockwise (2). After removing the lens, replace the lens caps and camera body cap.

#### CPU Lenses with Aperture Rings

In the case of CPU lenses equipped with an aperture ring (<sup>[]]</sup> 287), lock aperture at the minimum setting (highest f-number).

#### 🖉 Image Area

The DX format image area is automatically selected when a DX lens is attached ( $\square$  89).

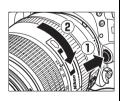




Image area

# **Basic Setup**

A language-selection dialog will be displayed the first time the camera is turned on. Choose a language and set the time and date. Photographs can not be taken until you have set the time and date.

# **1** Turn the camera on.

A language-selection dialog will be displayed.

## **2** Select a language.

Press  $\blacktriangle$  or  $\blacktriangledown$  to highlight the desired language and press  $\circledast$ .

## **3** Choose a time zone.

A time-zone selection dialog will be displayed. Press  $\blacktriangleleft$  or  $\triangleright$  to highlight the local time zone (the **UTC** field shows the difference between the selected time zone and Coordinated Universal Time, or UTC, in hours) and press M.

# 4 Choose a date format.

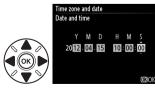
Press  $\blacktriangle$  or  $\blacktriangledown$  to choose the order in which the year, month, and day will be displayed. Press B to proceed to the next step.

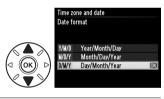
# **5** Turn daylight saving time on or off.

Daylight saving time options will be displayed. Daylight saving time is off by default; if daylight saving time is in effect in the local time zone, press  $\blacktriangle$  to highlight **On** and press **(B)**.

## **6** Set the date and time.

The dialog shown at right will be displayed. Press ◀ or ► to select an item, ▲ or ▼ to change. Press ⊛ to set the clock and exit to shooting mode.



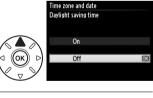




Language(LANG) <u>češti</u>na

Dansk Deutsch

English Español Ελληνικά Français Indonesia





#### Setting the Clock

Language and date/time settings can be changed at any time using the **Language** ( $\Box$  253) and **Time zone and date** ( $\Box$  253) options in the setup menu. The camera clock can also be synchronized with GPS devices ( $\Box$  175).

#### Interview Clock Battery

The camera clock is powered by an independent, rechargeable power source, which is charged as necessary when the main battery is installed or the camera is powered by an optional EP-5B power connector and EH-5b AC adapter ( $\Box$  297). Two days of charging will power the clock for about three months. If the camera displays a warning at startup stating that the clock is not set and a **EDER** icon flashes in the information display, the clock battery is exhausted and the clock has been reset. Set the clock to the correct time and date.

#### Interation Clock

The camera clock is less accurate than most watches and household clocks. Check the clock regularly against more accurate time pieces and reset as necessary.

The camera stores pictures on Secure Digital (SD) memory cards (available separately; 🕮 333). The camera has two memory card slots (Slot 1 and Slot 2); if you will be using only one memory card, insert it in Slot 1 (<sup>11</sup> 30).

# **1** Turn the camera off.

#### Inserting and Removing Memory Cards

Always turn the camera off before inserting or removing memory cards.

# **2** Open the card slot cover.

Slide the card slot cover out  $(\mathbf{1})$  and open the card slot (2).

## **3** Insert the memory card.

Holding the memory card as shown at right, slide it in until it clicks into place. The memory card access lamp will light for a few seconds.

#### Inserting Memory Cards

Inserting memory cards upside down or backwards could damage the camera or the card. Check to be sure the card is in the correct orientation. The card slot cover will not close if the card is not correctly inserted.

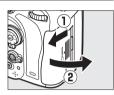
Close the memory card slot cover. If this is the first time the memory card will be used in the camera or the card has been formatted in another device, format the card as described on page 31.

#### Removing Memory Cards

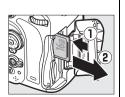
After confirming that the memory card access lamp is off, turn the camera off, open the memory card slot cover, and press the card in to eject it (1). The card can then be removed by hand (2).











#### 🖉 No Memory Card

If the camera is turned off with a charged EN-EL15 battery and no memory card inserted, (- *E* -) will be displayed in the control panel and viewfinder.

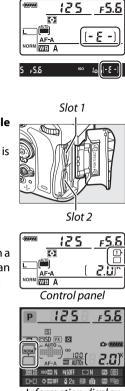
#### Using Two Memory Cards

Slot 1 is for the main card; the card in slot 2 plays a backup or secondary role. If the default setting of **Overflow** is selected for **Role played by card in Slot 2** ( $\square$  96) when two memory cards are inserted, the card in slot 2 will only be used when the card in slot 1 is full.

The control panel shows the slot or slots that currently hold a memory card (the example at right shows the icons displayed when a card is inserted in each slot). If the memory card is full or locked or an error has occurred, the icon for the affected card will flash ( $\square$  324).

#### Memory Cards

- Memory cards may be hot after use. Observe due caution when removing memory cards from the camera.
- Turn the power off before inserting or removing memory cards. Do not remove memory cards from the camera, turn the camera off, or remove or disconnect the power source during formatting or while data are being recorded, deleted, or copied to a computer. Failure to observe these precautions could result in loss of data or in damage to the camera or card.
- Do not touch the card terminals with your fingers or metal objects.
- Do not bend, drop, or subject to strong physical shocks.
- Do not apply force to the card casing. Failure to observe this precaution could damage the card.
- Do not expose to water, heat, high levels of humidity, or direct sunlight.
- Do not format memory cards in a computer.



Information display

# Format the Memory Card

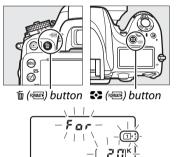
Memory cards must be formatted before first use or after being used or formatted in other devices.

#### Formatting Memory Cards

Formatting memory cards permanently deletes any data they may contain. Be sure to copy any photographs and other data you wish to keep to a computer before proceeding ( $\square$  193).

# **1** Turn the camera on.

2 Press the ín (mm) and So (mm) buttons. Hold the ín (mm) and So (mm) buttons down simultaneously until a flashing For (format) appears in the shutter-speed displays in the control panel and viewfinder. If two memory cards are inserted, the card in Slot 1 (m 30) will be selected; you can choose the card in Slot 2 by rotating the main command dial. To exit without formatting the memory card, wait until For stops flashing (about six seconds) or press any button other than the ín (mm) and So (mm) buttons.



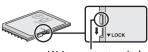
# 3 Press the í () and ᢒ () buttons again.

Press the  $\tilde{m}$  ( $\overline{m}$ ) and  $\mathfrak{S}$  ( $\overline{m}$ ) buttons together a second time while  $F_{\Omega, r}$  is flashing to format the memory card. Do not remove the memory card or remove or disconnect the power source during formatting.

When formatting is complete, the control panel and viewfinder will show the number of photographs that can be recorded at current settings.

#### Interpretended in the Write Protect Switch

SD memory cards are equipped with a write protect switch to prevent accidental loss of data. When this switch is in the "lock" position, the memory card can not be formatted and photos can not be deleted or recorded (a warning will be displayed in the monitor if you attempt to release the shutter). To unlock the memory card, slide the switch to the "write" position.



Write-protect switch

#### 🖉 See Also

See page 250 for information on formatting memory cards using the **Format memory card** option in the setup menu.

## 33

# **Adjust Viewfinder Focus**

The camera is equipped with diopter adjustment to accommodate individual differences in vision. Check that the display in the viewfinder is in focus before framing pictures in the viewfinder.

## **1** Turn the camera on.

Remove the lens cap and turn the camera on.

# **2** Focus the viewfinder.

Rotate the diopter adjustment control until the AF area brackets are in sharp focus. When operating the diopter adjustment control with your eye to the viewfinder, be careful not to put your fingers or fingernails in your eye.

#### Adjusting Viewfinder Focus

If you are unable to focus the viewfinder as described above, select single-servo autofocus (**AF-S**;  $\square$  97), single-point AF ( $\square$  99), and the center focus point ( $\square$  101), and then frame a high-contrast subject in the center focus point and press the shutter-release button halfway to focus the camera. With the camera in focus, use the diopter adjustment control to bring the subject into clear focus in the viewfinder. If necessary, viewfinder focus can be further adjusted using optional corrective lenses ( $\square$  297).



\*

# **Basic Photography and Playback**

# "Point-and-Shoot" Photography ( and ③ Modes)

This section describes how to take photographs in  $\frac{1}{100}$  (auto) mode, an automatic "point-and-shoot" mode in which the majority of settings are controlled by the camera in response to shooting conditions, and in which the flash will fire automatically if the subject is poorly lit. To take photographs with the flash off while leaving the camera in

--

control of other settings, rotate the mode dial to  $\mathfrak{G}$  to select auto (flash off) mode.

# Step 1: Turn the Camera On

# **1** Turn the camera on.

Remove the lens cap and turn the camera on. The control panel will turn on and the display in the viewfinder will light.

## **2** Check the battery level.

Check the battery level in the control panel or viewfinder.



Control panel *	Viewfinder *	Description				
( <i><b>F</b>FFF</i>	_	Battery fully charged.				
-	—					
- //4	—	Battery partially discharged.				
- 14	—					
4	4	Low battery. Charge battery or ready spare battery.				
تے (flashes)	(flashes)	Shutter release disabled. Charge or exchange battery.				

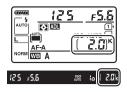
\* No icon displayed when camera is powered by optional EP-5B power connector and EH-5b AC adapter. - e appears in information display.

#### Image Sensor Cleaning

The camera vibrates the low-pass filter covering the image sensor to remove dust when the camera is turned on or off ( $\square$  301).

# **3** Check the number of exposures remaining.

The control panel and viewfinder show the number of photographs that can be taken at current settings (values over 1,000 are rounded down to the nearest hundred; e.g., values



# Step 2: Select 📸 or 🕃 Mode

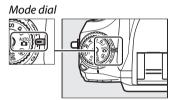
To shoot where use of a flash is prohibited, photograph infants, or capture natural lighting under low light conditions, rotate the mode dial to (3). Otherwise, rotate the mode dial to (3).



🕄 mode

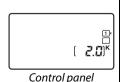


🛱 mode



#### Camera Off Display

If the camera is turned off with a battery and memory card inserted, the memory card icon and number of exposures remaining will be displayed (some memory cards may in rare cases only display this information when the camera is on).



# Step 3: Frame the Photograph

## **1** Ready the camera.

When framing photographs in the viewfinder, hold the handgrip in your right hand and cradle the camera body or lens with your left. Keep your elbows propped lightly against your torso for support and place one foot half a pace ahead of the other to keep your upper body stable. When framing photographs in portrait (tall) orientation, hold the camera as shown in the bottom of the three illustrations at right.

In (9) mode, shutter speeds slow when lighting is poor; use of a tripod is recommended.

# **2** Frame the photograph. Frame a photograph in the viewfinder with the main subject in the AF area brackets.

#### 🖉 Using a Zoom Lens

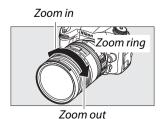
Use the zoom ring to zoom in on the subject so that it fills a larger area of the frame, or zoom out to increase the area visible in the final photograph (select longer focal lengths on the lens focal length scale to zoom in, shorter focal lengths to zoom out).











# **1** Press the shutter-release button halfway.

Press the shutter-release button halfway to focus. The active focus point will be displayed. If the subject is poorly lit, the flash may pop up and the AF-assist illuminator may light.



## 2 Check the indicators in the viewfinder. When the focus operation is complete, the infocus indicator (●) will appear in the viewfinder.

In-focus						
indicator	Description					
	Subject in focus.					
	Focus point is between camera and subject.					
◀	Focus point is behind subject.					
	Camera unable to focus using autofocus.					
(flashes)	See page 98.					

Focus point

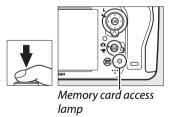
capacitv

indicator

While the shutter-release button is pressed halfway, the number of exposures that can be stored in the memory buffer ("r";  $\square$  84) will be displayed in the viewfinder.

# Step 5: Shoot

Smoothly press the shutter-release button the rest of the way down to release the shutter and record the photograph. The memory card access lamp next to the memory card slot cover will light while the photograph is being recorded to the memory card. Do not eject the memory card or remove or disconnect the power source until the lamp has gone out and recording is complete.



#### The Shutter-Release Button

The camera has a two-stage shutter-release button. The camera focuses when the shutterrelease button is pressed halfway. To take the photograph, press the shutter-release button the rest of the way down.



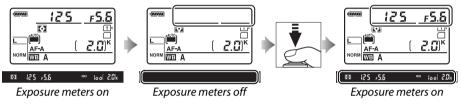




Shoot: press all the way down

#### The Standby Timer

The viewfinder and the control panel shutter speed and aperture displays will turn off if no operations are performed for about 6 seconds, reducing the drain on the battery. Press the shutter-release button halfway to reactivate the display. The length of time before the standby timer expires automatically can be selected using Custom Setting c2 (**Standby timer**,  $\square$  227).

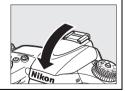


#### 🖉 The Built-in Flash

If additional lighting is required for correct exposure in **m** mode, the built-in flash will pop up automatically when the shutter-release button is pressed halfway. If the flash is raised, photographs can only be taken when the flash-ready indicator (**4**) is displayed. If the flash-ready indicator is not displayed, the flash is charging; remove your finger briefly from the shutter-release button and try again.

To save power when the flash is not in use, press it gently downward until the latch clicks into place.





125 ...51

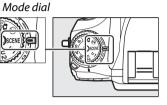
# **Creative Photography (Scene Modes)**

The camera offers a choice of "scene" modes. Choosing a scene mode automatically optimizes settings to suit the selected scene, making creative photography as simple as selecting a mode, framing a picture, and shooting as described on pages 35–39.



### SCENE Mode

To view the currently selected scene, rotate the mode dial to **SCENE** and press the **m** button. To choose another scene, rotate the main command dial.





Main command dial



Monitor

Portrait	Landscape	Child	Sports	Close up	Night portrait	Night Iandscape
Party/indoor	Beach/snow	Sunset	Dusk/dawn	Pet portrait	Candlelight	Blossom
	Autumn colors 😜	Food <b>"I</b>	Silhouette	High key []]]	Low key	

# Scene Modes

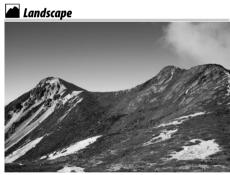


Use for portraits with soft, naturallooking skin tones. If the subject is far from the background or a telephoto lens is used, background details will be softened to lend the composition a sense of depth.





Use for snapshots of children. Clothing and background details are vividly rendered, while skin tones remain soft and natural.



Use for vivid landscape shots in daylight. The built-in flash and AF-assist illuminator turn off; use of a tripod is recommended to prevent blur when lighting is poor.

#### 💐 Sports



Fast shutter speeds freeze motion for dynamic sports shots in which the main subject stands out clearly. The built-in flash and AF-assist illuminator turn off. To take a sequence of shots, select continuous release mode ( $\square$  6, 83).

## 📽 Close Up



-1-

Use for close-up shots of flowers, insects, and other small objects (a macro lens can be used to focus at very close ranges). Use of a tripod is recommended to prevent blur.

#### 🔜 Night Landscape



Reduce noise and unnatural colors when photographing night landscapes, including street lighting and neon signs. The built-in flash and AF-assist illuminator turn off; use of a tripod is recommended to prevent blur.

#### 🔄 Night Portrait



Use for a natural balance between the main subject and the background in portraits taken under low light. Use of a tripod is recommended to prevent blur when lighting is poor.

🕅 Party/Indoor



Capture the effects of indoor background lighting. Use for parties and other indoor scenes.

#### **#** Beach/Snow



Capture the brightness of sunlight expanses of water, snow, or sand. The built-in flash and AF-assist illuminator turn off.



Preserves the colors seen in the weak natural light before dawn or after sunset. The built-in flash and AF-assist illuminator turn off; use of a tripod is recommended to prevent blur when lighting is poor.



Preserves the deep hues seen in sunsets and sunrises. The built-in flash and AFassist illuminator turn off; use of a tripod is recommended to prevent blur when lighting is poor. 😽 Pet Portrait



Use for portraits of active pets. The AFassist illuminator turns off.

#### Candlelight



----For photographs taken by candlelight. The built-in flash turns off; use of a tripod is recommended to prevent blur when lighting is poor.

🗣 Autumn Colors



Captures the brilliant reds and yellows in autumn leaves. The built-in flash turns off; use of a tripod is recommended to prevent blur when lighting is poor.



Blossom



Use for fields of flowers, orchards in bloom, and other landscapes featuring expanses of blossoms. The built-in flash turns off; use of a tripod is recommended to prevent blur when lighting is poor.

Food



Use for vivid photographs of food. Use of a tripod is recommended to prevent blur; the flash can also be used ( $\Box$  143).

🛋 Silhouette



Silhouette subjects against bright backgrounds. The built-in flash turns off; use of a tripod is recommended to prevent blur when lighting is poor.

Low Key



Use when shooting dark scenes to create dark, somber images that bring out highlights. The built-in flash turns off; use of a tripod is recommended to prevent blur when lighting is poor.





Use when shooting bright scenes to create bright images that seem filled with light. The built-in flash turns off.

--

# **Basic Playback**

# **1** Press the **button**.

A photograph will be displayed in the monitor. The memory card containing the picture currently displayed is shown by an icon.





NIKON D60

button

#### **2** View additional pictures. Additional pictures can be displayed by

pressing  $\blacktriangleleft$  or  $\blacktriangleright$ . To view additional information on the current photograph, press  $\blacktriangle$  and  $\bigtriangledown$  ( $\square$  179).

To end playback and return to shooting mode, press the shutter-release button halfway.

#### Image Review

When **On** is selected for **Image review** in the playback menu (<sup>(1)</sup> 212), photographs are automatically displayed in the monitor for a few seconds after shooting.

#### See Also

See page 178 for information on choosing a memory card slot.

# **Deleting Unwanted Photographs**

To delete the photograph currently displayed in the monitor, press the  $\widehat{m}$  ( $\overline{m}$ ) button. Note that photographs can not be recovered once deleted.

## 1 Display the photograph.

Display the photograph you wish to delete as described on the preceding page. The location of the current image is shown by an icon at the bottom left corner of the display.



## **2** Delete the photograph.

Press the  $\tilde{1}$  ( $\overline{1}$ ) button. A confirmation dialog will be displayed; press the  $\tilde{1}$  ( $\overline{1}$ ) button again to delete the image and return to playback. To exit without deleting the picture, press  $\blacktriangleright$ .



#### 🖉 Delete

To delete selected images (III 190), all images taken on a selected date (III 191), or all images in a chosen location on a selected memory card (III 190), use the **Delete** option in the playback menu.

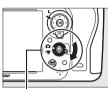
# Live View Photography

Follow the steps below to take photographs in live view.

# 1 Rotate the live view selector to **D** (live view photography).

## Cover the Viewfinder

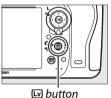
To prevent light entering via the viewfinder from interfering with exposure, remove the rubber eyecup and cover the viewfinder with the supplied DK-5 eyepiece cap before shooting ( $\square$  86).



Live view selector

## **2** Press the 🖾 button.

The mirror will be raised and the view through the lens will be displayed in the camera monitor. The subject will no longer be visible in the viewfinder.



**3** Position the focus point.

Position the focus point over your subject as described on page 51.

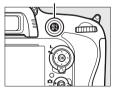
## 4 Focus.

Press the shutter-release button halfway to focus.

The focus point will flash green while the camera focuses. If the camera is able to focus, the focus point will be displayed in green; if the camera is unable to focus, the focus point will flash red (note that pictures can be taken even when the focus point flashes red; check focus in the monitor before shooting). Exposure can be locked by pressing the **壯 AE-L/AF-L** button (□ 110); focus locks while



能 AE-L/AF-L button



the shutter-release button is pressed halfway. In mode M, exposure can be adjusted with the assistance of an exposure indicator ( $\Box$  78).

Press the shutter-release button the rest of the way down to shoot. The monitor will turn off.

## **6** Exit live view mode.

Press the 🖾 button to exit live view mode.



### Ending Live View

Live view ends automatically if the lens is removed. Live view may also end automatically to prevent damage to the camera's internal circuits; exit live view when the camera is not in use. Note that the temperature of the camera's internal circuits may rise and noise (bright spots, randomly-spaced bright pixels, or fog) may be displayed in the following instances (the camera may also become noticeably warm, but this does not indicate a malfunction):

- The ambient temperature is high
- The camera has been used for extended periods in live view or to record movies

• The camera has been used in continuous release mode for extended periods If live view does not start when you press the 🖾 button, wait for the internal circuits to cool and then try again.

### Choosing a Picture Control (P, S, A, and M Modes Only)

Pressing ☑ (⊡) during live view displays a list of Picture Controls. Highlight the desired Picture Control and press ► to adjust Picture Control settings (□ 129).





🖄 (🖾) button

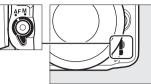
### Movies

Movie recording is not available during live view photography and pressing the movie-record button has no effect. Select movie live view (\$\Pi\$ 57) to shoot movies.

# Focusing in Live View

To focus using autofocus, rotate the focus-mode selector to **AF** and follow the steps below to choose autofocus and AF-area modes. For information on focusing manually, see page 55.

Focus-mode selector

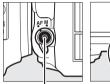


## **III** Choosing a Focus Mode

The following autofocus modes are available in live view:

Mode	Description
AF-S	<b>Single-servo AF</b> : For stationary subjects. Focus locks when shutter-release button is pressed halfway.
AF-F	<b>Full-time servo AF</b> : For moving subjects. Camera focuses continuously until shutter- release button is pressed. Focus locks when shutter-release button is pressed halfway.

To choose an autofocus mode, press the AF-mode button and rotate the main command dial until the desired mode is displayed in the monitor.







AF-mode button Main command dial

Monitor

## View Using Autofocus in Live View

Use an AF-S lens. The desired results may not be achieved with other lenses or teleconverters. Note that in live view, autofocus is slower and the monitor may brighten or darken while the camera focuses. The focus point may sometimes be displayed in green when the camera is unable to focus. The camera may be unable to focus in the following situations:

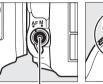
- The subject contains lines parallel to the long edge of the frame
- The subject lacks contrast
- The subject in the focus point contains areas of sharply contrasting brightness, or includes spot lighting or a neon sign or other light source that changes in brightness
- Flicker or banding appears under fluorescent, mercury-vapor, sodium-vapor, or similar lighting
- A cross (star) filter or other special filter is used
- The subject appears smaller than the focus point
- The subject is dominated by regular geometric patterns (e.g., blinds or a row of windows in a skyscraper)
- The subject is moving

## **III** Choosing an AF-Area Mode

The following AF-area modes can be selected in live view:

Mode	Description				
( <u>e</u> )	<b>Face-priority AF</b> : Use for portraits. The camera automatically detects and focuses on portrait subjects; the selected subject is indicated by a double yellow border (if multiple faces, up to a maximum of 35, are detected, the camera will focus on the closest subject; to choose a different subject, use the multi selector). If the camera can no longer detect the subject (because, for example, the subject has turned to face away from the camera), the border will no longer be displayed.				
C 3 WIDE	<b>Wide-area AF</b> : Use for hand-held shots of landscapes and other non-portrait subjects. Use the multi selector to move the focus point anywhere in the frame, or press <sup>®</sup> to position the focus point in the center of the frame.				
[c] Norm	<b>Normal-area AF</b> : Use for pin-point focus on a selected spot in the frame. Use the multi selector to move the focus point anywhere in the frame, or press <b>(B)</b> to position the focus point in the center of the frame. A tripod is recommended.				
Ð	<b>Subject-tracking AF</b> : Position the focus point over your subject and press <sup>®</sup> . The focus point will track the selected subject as it moves through the frame. To end tracking, press <sup>®</sup> again. Note that the camera may be unable to track subjects if they move quickly, leave the frame or are obscured by other objects, change visibly in size, color, or brightness, or are too small, too large, too bright, too dark, or similar in color or brightness to the background.				

To choose an AF-area mode, press the AF-mode button and rotate the sub-command dial until the desired mode is displayed in the monitor.





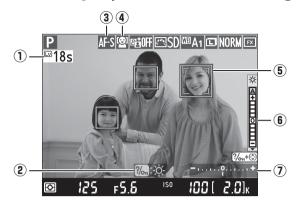
Sub-command

dial



Monitor

# The Live View Display: Live View Photography



ltem	Description		
① Time remaining	The amount of time remaining before live view ends automatically. Displayed if shooting will end in 30 s or less.	56	
② Guide	2) Guide A guide to the options available during live view photography.		
3 Autofocus mode The current autofocus mode.		51	
(4) AF-area mode	(4) AF-area mode The current AF-area mode.		
<b>(5)</b> Focus point The current focus point. The display varies with the option selected for AF-area mode.			
6 Monitor brightness indicator	Keeping the $\%$ ( <b>WB</b> ) button pressed, press $\blacktriangle$ or $\triangledown$ to adjust monitor brightness (note that monitor brightness has no effect on photographs taken with the camera). If <b>A</b> (auto) is selected, the camera will automatically adjust brightness in response to ambient lighting conditions as measured by the ambient brightness sensor when the monitor is on ( $\square$ 4).		
(1) Exposure indicator	Indicates whether the photograph would be under- or overexposed at current settings (mode <b>M</b> only).	78	

#### The Live View Display

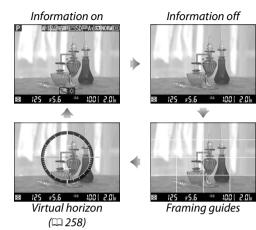
Although they will not appear in the final picture, jagged edges, color fringing, moire, and bright spots may appear in the monitor, while bright bands may appear in some areas with flashing signs and other intermittent light sources or if the subject is briefly illuminated by a strobe or other bright, momentary light source. In addition, distortion may occur if the camera is panned horizontally or an object moves at high speed through the frame. Flicker and banding visible in the monitor under fluorescent, mercury vapor, or sodium lamps can be reduced using **Flicker reduction** ( $\Box$  252), although they may still be visible in the final photograph at some shutter speeds. When shooting in live view mode, avoid pointing the camera at the sun or other strong light sources. Failure to observe this precaution could result in damage to the camera's internal circuitry.

#### 🖉 Exposure

Depending on the scene, exposure may differ from that which would be obtained when live view is not used. Metering in live view is adjusted to suit the live view display, producing photographs with exposure close to what is seen in the monitor. In **P**, **S**, **A**, and **M** modes, exposure can be adjusted by  $\pm 5$  EV ( $\square$  112). Note that the effects of values over +3 EV or under –3 EV can not be previewed in the monitor.

# The Information Display: Live View Photography

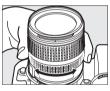
To hide or display indicators in the monitor during live view photography, press the button.



## **Manual Focus**

To focus in manual focus mode ( $\Box$  103), rotate the lens focus ring until the subject is in focus.

To magnify the view in the monitor up to about  $19 \times$  for precise focus, press the  $\mathfrak{P}$  (**QUAL**) button. While the view through the lens is zoomed in, a navigation window will appear in a gray frame at the bottom right corner of the display. Use the multi selector to scroll to areas of the frame not visible in the monitor (available only if wide- or normal-area AF is selected for AFarea mode), or press  $\mathfrak{P}$  (**ISO**) to zoom out.





♥ (QUAL) button



Navigation window

#### 🖉 Non-CPU Lenses

When using non-CPU lenses, be sure to enter the focal length and maximum aperture using the **Non-CPU lens data** option in the setup menu ( $\Box$  172). Non-CPU lenses can be used only in **A** and **M** modes ( $\Box$  73); aperture can be adjusted using the lens aperture ring.

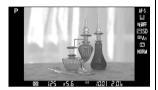
#### The Count Down Display

A count down will be displayed 30 s before live view ends automatically ( $\Box$  53; the timer turns red if live view is about to end to protect the internal circuits or, if an option other than **No limit** is selected for Custom Setting c4—**Monitor off delay** > **Live view**;  $\Box$  228—5 s before the monitor is due to turn off automatically). Depending on shooting conditions, the timer may appear immediately when live view is selected. Note that although the count down does not appear during playback, live view will still end automatically when the timer expires.

#### Lv

🖉 HDMI

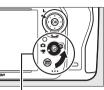
If the camera is attached to an HDMI video device during live view photography, the camera monitor will remain on and the video device will display the view through the lens as shown at right. If the device supports HDMI-CEC, select **Off** for the **HDMI** > **Device control** option in the setup menu ( $\square$  205) before shooting in live view.



# Movie Live View

Movies can be recorded in live view.

## 1 Rotate the live view selector to 🐙 (movie live view).



Live view selector

## **2** Press the 🖾 button.

The mirror will be raised and the view through the lens will be displayed in the camera monitor as it would appear in the actual movie, modified for the effects of exposure. The subject will no longer be visible in the viewfinder.



le button

### 🖉 The 🕅 Icon

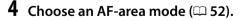
A 🔯 icon (🕮 61) indicates that movies can not be recorded.

#### Before Recording

Before recording, choose an aperture (modes **A** and **M** only,  $\square$  77, 78); you can also choose a Picture Control (modes **P**, **S**, **A**, and **M** only,  $\square$  129) or color space ( $\square$  217). In modes **P**, **S**, **A**, and **M**, white balance ( $\square$  115) can be set at any time by pressing the  $?\sim_{m}$  (**WB**) button and rotating the main command dial.

**3** Choose a focus mode ( $\Box$  51).







## 5 Focus.

Frame the opening shot and focus as described in Steps 3 and 4 on pages 49 (for more information on focusing in movie live view, see page 51). Note that the number of



subjects that can be detected in face-priority AF drops in movie live view.

#### 🖉 Exposure

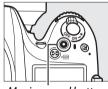
The following settings can be adjusted in movie live view:

	Aperture	Shutter speed	ISO sensitivity	Exposure compensation
P, S, A	—	—	—	<ul> <li>✓</li> </ul>
М	—	<b>v</b>	~	—
Other shooting modes	_	_	—	_

In mode **M**, ISO sensitivity can be set to values between 100 and Hi 2 and shutter speed to values between 1/25 s and 1/4,000 s (the slowest available shutter speed varies with the frame rate;  $\square$  65). In other modes, shutter speed and ISO sensitivity are adjusted automatically. If the result is over- or under-exposed, exit and restart movie live view.

## **6** Start recording.

Press the movie-record button to start recording. A recording indicator and the time available are displayed in the monitor. Exposure is set using matrix metering and can be locked by pressing the  $\pounds$  **AE-L/AF-L** button ( $\square$  110) or (in modes **P**, **S**, and **A**) altered by up to ±3 EV in steps of <sup>1</sup>/<sub>3</sub> EV using exposure compensation ( $\square$  112). In autofocus mode, focus can be locked by pressing the shutter-release button halfway.



Movie-record button Recording indicator



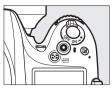
Time remaining

## 🖉 Audio

The camera can record both video and sound; do not cover the microphone on the front of the camera during movie recording. Note that the built-in microphone may record sounds made by the lens during autofocus or vibration reduction.

## 7 End recording.

Press the movie-record button again to end recording. Recording will end automatically when the maximum length is reached, or the memory card is full.



### 🖉 Maximum Length

The maximum length for individual movie files is 4 GB (for maximum recording times, see page 65); note that depending on memory card write speed, shooting may end before this length is reached ( $\square$  333).

## Taking Photographs

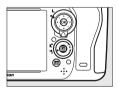
To take a photograph while recording is in progress, press the shutter-release button all the way down (if desired, shooting information display can be assigned to the **Fn**, depth-of-field preview, or **AE-L/AF-L** button and the button used to display camera still photography settings before shooting;  $\square$  247, 248). Movie recording will end (the footage recorded to that point will be saved) and the camera will return to live view. The photograph will be recorded at the current image area setting using a crop with an aspect ratio of 16 : 9. Photos will be taken with the flash off. Note that the exposure for photographs can not be previewed during movie live view; mode **P**, **S**, or **A** is recommended but accurate results can be achieved in mode **M** by using the **Fn**, depthof-field preview, or **AE-L/AF-L** button ( $\square$  247, 248), using the button to display shooting information and checking the exposure indicator. Exposure compensation for the photograph can be set to values between -5 and +5 EV, but only values between -3 and +3 can be previewed in the monitor (modes **P**, **S**, and **A**;  $\square$  112).

## The Count-Down Display

A count down will be displayed 30 s before live view ends automatically ( $\Box$  53). Depending on shooting conditions, the timer may appear immediately when movie recording begins. Note that regardless of the amount of recording time available, live view will still end automatically when the timer expires. Wait for the internal circuits to cool before resuming movie recording.

## **8** Exit live view mode.

Press the 🖾 button to exit live view mode.



# **Indices**

If Index marking is selected for Custom Setting g1 (Assign Fn button, III 247), g2 (Assign preview button, III 248), or g3 (Assign AE-L/AF-L button, IIII 248), you can press the button during recording to add indices that can be used to locate frames during editing and playback (IIII 68). Up to 20 indices can be added to each movie.



Index

#### 🖉 See Also

Frame size, microphone sensitivity, and card slot options are available in the **Movie settings** menu ( $\square$  65). Focus can be adjusted manually as described on page 55. The roles played by the ( $\square$ , **Fn**, depth-of-field preview, and ( $\blacksquare$  **AE-L/AF-L** buttons can be chosen using Custom Settings f1 (**OK button (shooting mode)**;  $\square$  241), g1 (**Assign Fn button**;  $\square$  247), g2 (**Assign preview button**;  $\square$  248), and g3 (**Assign AE-L/AF-L button**,  $\square$  248), respectively (the last three options also allow you to lock exposure without having to keep a button pressed). Custom Setting g4 (**Assign shutter button**;  $\square$  248) controls whether the shutter-release button can be used to start movie live view or to start and end movie recording.

## The Live View Display: Movie Live View



ltem	Description	
1) "No movie" icon	Indicates that movies can not be recorded.	_
(2) Headphone volume	Volume of audio output to headphones.	62
(3) Microphone sensitivity	Microphone sensitivity for movie recording.	62
(4) Sound level	Sound level for audio recording. Displayed in red if level is too high; adjust microphone sensitivity accordingly. Left (L) and right (R) channel indicators appear when optional ME-1 or other stereo microphone is used.	62
(movie live view)	The recording time available for movies.	58
6 Movie frame size	The frame size for movie recording.	65
Monitor brightness indicator	A monitor brightness indicator.	62
(8) Guide	A guide to the options available during movie live view.	62

#### **Using an External Microphone**

The optional ME-1 stereo microphone can be used to record sound in stereo or to avoid recording lens noise caused by autofocus (C 298).

#### Headphones

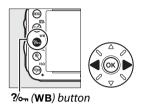
Third-party headphones can be used. Note that high sound levels may result in high volume; particular care should be taken when headphones are used.

## Adjusting Settings in the Live View Display

Microphone sensitivity, headphone volume, and monitor brightness can be adjusted as described below. Note that microphone sensitivity and headphone volume can not be adjusted during recording, and that brightness affects the monitor only ( $\square$  61); movies recorded with the camera are unaffected.

## **1** Highlight a setting.

Press and hold % (**WB**) and press  $\blacktriangleleft$  or  $\triangleright$  to highlight the indicator for the desired setting.



凜

## **2** Adjust the highlighted setting.

Keeping the % (**WB**) button pressed, press  $\blacktriangle$  or  $\triangledown$  to adjust the highlighted setting.



# **The Information Display: Movie Live View**

To hide or display indicators in the monitor during movie live view, press the **m** button.



Virtual horizon (C 258)

Information off





# Image Area

Regardless of the option selected for **Image area** in the shooting menu ( $\square$  89), all movies and photographs recorded in movie live view ( $\square$  57) have an aspect ratio of 16:9. Images recorded with **On** selected for **Image area** > **Auto DX crop** and a DX lens attached use a DX-based movie format, as do images recorded with **DX (24×16) 1.5×** selected for **Image area** > **Choose image area**. An FX-based movie format is used when **FX (36 × 24) 1.0×** is selected. A 🖾 icon is displayed when the DX-based movie format is selected.

#### Movie Live View Photographs

The following table shows the size of photographs taken in movie live view:

Image area	Option	Size (pixels)	Print size (cm/in.)*	
FX-based format	Large	6,016 × 3,376	50.9 × 28.6/20.1 × 11.3	
$(35.5 \times 20.0 \text{ mm})$	Medium	4,512 × 2,528	38.2 × 21.4/15.0 × 8.4	
(55.5 × 20.0 mm)	Small	3,008 × 1,688	25.5 × 14.3/10.0 × 5.6	
DX-based format	Large	3,936 × 2,224	33.3 × 18.8/13.1 × 7.4	
$(23.5 \times 13.2 \text{ mm})$	Medium	2,944 × 1,664	24.9 × 14.1/ 9.8 × 5.5	
(23.3 × 13.2 mm)	Small	1,968 × 1,112	16.7 × 9.4/ 6.6 × 3.7	
* Approximate size when printed at 300 dpi. Print size in inches equals image size in pixels				

divided by printer resolution in **d**ots **p**er inch (dpi; 1 inch = approximately 2.54 cm). Image quality is determined by the option selected for **Image quality** in the shooting menu ( $\square$  93).

### 🖉 HDMI

If the camera is connected to an HDMI device ( $\square$  204), the view through the lens will appear both in the camera monitor and on the HDMI device. The indicators that appear in the HDMI device during movie recording are shown at right. The camera monitor does not show the sound level or virtual horizon; indicators in the monitor and on the HDMI device can not be hidden or displayed using the  $\blacksquare$  button. To use



live view when the camera is connected to an HDMI-CEC device, select **Off** for **HDMI** > **Device control** in the setup menu ( $\square$  205).

## 🖉 Remote Cords

If **Record movies** is selected for Custom Setting g4 (**Assign shutter button**,  $\Box$  248), the shutter-release buttons on optional MC-DC2 remote cords ( $\Box$  298) can be used to start movie live view and to start and end movie recording.

## Recording Movies

Flicker, banding, or distortion may be visible in the monitor and in the final movie under fluorescent, mercury vapor, or sodium lamps or if the camera is panned horizontally or an object moves at high speed through frame (for information on reducing flicker and banding, see **Flicker reduction**,  $\Box$  252). Jagged edges, color fringing, moiré, and bright spots may also appear. Bright bands may appear in some areas of the frame with flashing signs and other intermittent light sources or if the subject is briefly illuminated by a strobe or other bright, momentary light sources. Failure to observe this precaution could result in damage to the camera's internal circuitry. Note that noise (randomly-spaced bright pixels, fog, or lines) and unexpected colors may appear if you zoom in on the view through the lens ( $\Box$  55) during movie live view.

Flash lighting can not be used during movie live view.

Recording ends automatically if the lens is removed, the mode dial is rotated, or a remote control release mode is selected.

Live view may end automatically to prevent damage to the camera's internal circuits; exit live view when the camera is not in use. Note that the temperature of the camera's internal circuits may rise and noise (bright spots, randomly-spaced bright pixels, or fog) may be displayed in the following instances (the camera may also become noticeably warm, but this does not indicate a malfunction):

- The ambient temperature is high
- The camera has been used for extended periods in live view or to record movies
- The camera has been used in continuous release mode for extended periods

If live view does not start when you press the 🖾 button, wait for the internal circuits to cool and then try again.

# **Movie Settings**

Use the Movie settings option in the shooting menu to adjust the following settings.

• Frame size/frame rate, Movie quality: Choose from the following options:

	Frame size/frame rate		Movie quality	Maximum length
	Frame size (pixels)	Frame rate *	Maximum bit rate (Mbps) (★ high quality/Normal)	(★ high quality/Normal)
1080 Pt / 1080 Pt	1920 × 1080	30p		
1080 P* / 1080 P	1920 × 1080	25p		20 min./ 29 min. 59 s
1080 pt / 1080 pt	1920 × 1080	24p	24/12	
720 pt / 720 p	1280× 720	60p		2911111. 393
720 pt / 720 p	1280× 720	50p		
720 ED / 720 ED	1280× 720	30p	12/ 8	29 min. 59 s/
720 pt / 720 pt	1280× 720	25p	12/ 0	29 min. 59 s

\* Listed value. Actual frame rates for 60p, 50p, 30p, 25p, and 24p are 59.94, 50, 29.97, 25, and 23.976 fps respectively.

- **Microphone**: Turn the built-in or optional ME-1 stereo microphones on or off or adjust microphone sensitivity. Choose **Auto sensitivity** to adjust sensitivity automatically, **Microphone off** to turn sound recording off; to select microphone sensitivity manually, select **Manual sensitivity** and choose a sensitivity.
- **Destination**: Choose the slot to which movies are recorded. The menu shows the time available on each card; recording ends automatically when no time remains.

	Movie settings				
	Destination				
•					
-	[1]	Slot 1			673
Ť	ш		04-		UN
∎ú	-	01h 24m	04S		
便	②	Slot 2			
		00h 00m	36s		

# 1 Select Movie settings.

Press the MENU button to display the menus. Highlight **Movie settings** in the shooting menu and press ►.



MENU button

## **2** Choose movie options.

Highlight the desired item and press  $\blacktriangleright$ , then highlight an option and press  $\circledast$ .



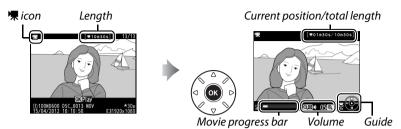
1030 計
HIGH
<b>⊉</b> A
Ē
11

#### **V** Frame Size and Rate

Frame size and rate affects the distribution and amount of noise (randomly-spaced bright pixels, fog, or bright spots).

# **Viewing Movies**

Movies are indicated by a  ${\bf R}$  icon in full-frame playback ( $\Box$  177). Press  ${\bf \circledast}$  to start playback.



The following operations can be performed:

То	Use	Description	
Pause		Pause playback.	
Play	œ	Resume playback when movie is paused or during rewind/ advance.	
Rewind/ advance		Speed increases with each press, from 2× to 4× to 8× to 16×; keep pressed to skip to beginning or end of movie (first frame is indicated by in top right corner of monitor, last frame by ). If playback is paused, movie rewinds or advances one frame at a time; keep pressed for continuous rewind or advance.	
Skip 10 s		Rotate the main command dial to skip ahead or back 10 s.	
Skip ahead/ back		Use sub-command dial to skip to next or previous index, or to skip to the last or first frame if the movie contains no indices.	
Adjust volume	଼ି୯ (QUAL)/ ବ୍≅ (ISO)	Press ♥ (QUAL) to increase volume, ♥≅ (ISO) to decrease.	
Trim movie	🗹 (🖂)	See page 69 for more information.	
Exit		] Exit to full-frame playback.	
Return to shooting mode	<b>V</b>	Press the shutter-release button halfway to exit to shooting mode.	

## 🖉 The 🖬 Icon

Movies with indices ( $\square$  60) are indicated by a  $\square$  icon in full-frame playback.

## 🖉 The 🕅 Icon

 ${\ensuremath{\mathbb N}}$  is displayed in full-frame and movie playback if the movie was recorded without sound.



# **Editing Movies**

Trim footage to create edited copies of movies or save selected frames as JPEG stills.

Option	Description
🛱 Choose start/end point	Create a copy from which the opening or closing footage has been removed.
Save selected frame	Save a selected frame as a JPEG still.

## **Trimming Movies**

To create trimmed copies of movies:

## **1** Display a movie full frame.

Press the  $\blacktriangleright$  button to display pictures full frame in the monitor and press  $\blacktriangleleft$  and  $\triangleright$  to scroll through pictures until the movie you wish to edit is displayed.



🖻 button

### 2 Choose a starting or end point. Play the movie back as described on page 67, pressing <sup>®</sup> to start and resume playback and ▼ to pause and pressing ◀ or ▶ or rotating the main or sub-command dials to locate the desired frame (□ 67). Your approximate position in the movie can be ascertained from the movie progress bar.

3 Display movie edit options. Press the ☑ (⊡) button to display movie edit options.





Movie progress bar



🗹 (🖾) button

## 4 Select Choose start/end point. Highlight Choose start/end point and press (ж).

The dialog shown at right will be displayed; choose whether the current frame will be the starting or end point of the copy and press ®.

## **5** Delete frames.

If the desired frame is not currently displayed, press  $\blacktriangleleft$  or  $\triangleright$  to advance or rewind (to skip to 10 s ahead or back, rotate the main command dial: to skip to an index, or to the first or last frame if the movie contains no indices, rotate the sub-

command dial). To switch the current selection from start point (1) to end point (**p**) or vice versa, press **?**/~ (**WB**).

Once you have selected the start point and/ or end point, press ▲. All frames before the selected start point and after the selected end point will be removed from the copy.

## **6** Save the copy.

Highlight one of the following and press ®:

- Save as new file: Save the copy to a new file.
- **Overwrite existing file**: Replace the original movie file with the edited copy.
- Cancel: Return to Step 5.
- Preview: Preview the copy.

Edited copies are indicated by a 🖾 icon in full-frame playback.











Fnd point





## Itrimming Movies

Movies must be at least two seconds long. If a copy can not be created at the current playback position, the current position will be displayed in red in Step 5 and no copy will be created. The copy will not be saved if there is insufficient space available on the memory card.

Copies have the same time and date of creation as the original.

#### 🖉 The Retouch Menu

Movies can also be edited using the **Edit movie** option in the retouch menu ( $\square$  261).



# **Saving Selected Frames**

To save a copy of a selected frame as a JPEG still:

View the movie and choose a frame. Play the movie back as described on page 67; your approximate position in the movie can be ascertained from the movie progress bar. Press ◀ or ► to rewind or advance and press ▼ to pause the movie at the frame you intend to copy.



2 Display movie edit options. Press the ☑ (⊡>) button to display movie edit options. Edit movie Edit movie Edit movie Save selected frame Cancel For (ET-2-) button

**3** Choose Save selected frame. Highlight Save selected frame and press ®.

4 Create a still copy. Press ▲ to create a still copy of the current frame.



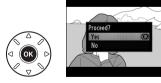


01n30s/10n30

Edit movie

## **5** Save the copy.

Highlight **Yes** and press <sup>(6)</sup> to create a finequality (<sup>(11)</sup> 93) JPEG copy of the selected frame. Movie stills are indicated by a <sup>[11]</sup> icon in full-frame playback.



### Save Selected Frame

JPEG movie stills created with the **Save selected frame** option can not be retouched. JPEG movie stills lack some categories of photo information (CL 179).

# P, S, A, and M Modes

**P**, **S**, **A**, and **M** modes offer different degrees of control over shutter speed and aperture.



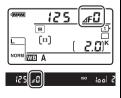
### Lens Types

When using a CPU lens equipped with an aperture ring ( $\Box$  287), lock the aperture ring at the minimum aperture (highest f-number). Type G lenses are not equipped with an aperture ring.

Non-CPU lenses can only be used in modes **A** (aperture-priority auto) and **M** (manual), when aperture can only be adjusted using the lens aperture ring. Selecting any other mode disables the shutter release.

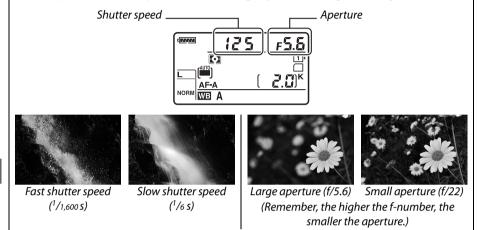
#### Non-CPU Lenses (🕮 285)

Use the lens aperture ring to adjust aperture. If the maximum aperture of the lens has been specified using the **Non-CPU lens data** item in setup menu ( $\square$  172) when a non-CPU lens is attached, the current f-number will be displayed in the viewfinder and control panel, rounded to the nearest full stop. Otherwise the aperture displays will show only the number of stops ( $\Delta F$ , with maximum aperture displayed as  $\Delta F G$ ) and the f-number must be read from the lens aperture ring.



#### Shutter Speed and Aperture

Two of the chief factors in determining exposure are shutter speed and aperture. By slowing shutter speed while increasing aperture, or increasing shutter speed while reducing aperture, you can achieve different effects while keeping exposure constant. Fast shutter speeds and large apertures freeze moving objects and soften background details, while slow shutter speeds and small apertures blur moving objects and bring out background details.

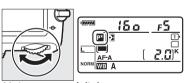


# P: Programmed Auto

In this mode, the camera automatically adjusts shutter speed and aperture according to a built-in program to ensure optimal exposure in most situations. This mode is recommended for snapshots and other situations in which you want to leave the camera in charge of shutter speed and aperture.

#### Flexible Program

In mode **P**, different combinations of shutter speed and aperture can be selected by rotating the main command dial while the exposure meters are on ("flexible program"). Rotate the dial to the right for large apertures (low f-numbers) that blur background details or fast shutter speeds that "freeze" motion. Rotate the dial to the left for small apertures (high



Main command dial

f-numbers) that increase depth of field or slow shutter speeds that blur motion. All combinations produce the same exposure. While flexible program is in effect, a indicator appears in the control panel. To restore default shutter speed and aperture settings, rotate the main command dial until the indicator is no longer displayed, choose another mode, or turn the camera off.

#### 🖉 See Also

See page 315 for information on the built-in exposure program. For information on activating the exposure meters, see "The Standby Timer" on page 39.

# S: Shutter-Priority Auto

In shutter-priority auto, you choose the shutter speed while the camera automatically selects the aperture that will produce the optimal exposure. Use slow shutter speeds to suggest motion by blurring moving subjects, fast shutter speeds to "freeze" motion.

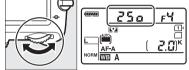


Fast shutter speed (1/1,600 s)

To choose a shutter speed, rotate the main command dial while the exposure meters are on. Shutter speed can be set to "x 2 a a" or to values between 30 s and 1/4,000 s.



Slow shutter speed (1/6 s)



Main command dial

#### 🖉 See Also

See page 323 for information on what to do if flashing "but b" or "--" indicator appears in the shutter-speed displays.

# A: Aperture-Priority Auto

In aperture-priority auto, you choose the aperture while the camera automatically selects the shutter speed that will produce the optimal exposure. Large apertures (low f-numbers) increase flash range ( $\Box$  147) and reduce depth of field, blurring objects behind and in front of the main subject. Small apertures (high f-numbers) increase depth of field, bringing out details in the background and foreground. Short field depths are generally used in portraits to blur background details, long field depths in landscape photographs to bring the foreground and background into focus.

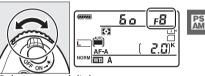


Large aperture (f/5.6)



Small aperture (f/22)

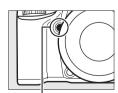
To choose an aperture between the minimum and maximum values for the lens, rotate the subcommand dial while the exposure meters are on.

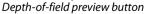


Sub-command dial

#### Depth-of-Field Preview

To preview the effects of aperture, press and hold the depth-of-field preview button. The lens will be stopped down to the aperture value selected by the camera (modes **P** and **S**) or the value chosen by the user (modes **A** and **M**), allowing depth of field to be previewed in the viewfinder.



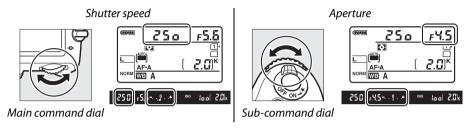


### Custom Setting e5—Modeling Flash

This setting controls whether the built-in flash and optional flash units such as the SB-910, SB-900, SB-800, SB-700, and SB-600 (D 293) will emit a modeling flash when the depth-of-field preview button is pressed. See page 241 for more information.

# <u>M: Manual</u>

In manual exposure mode, you control both shutter speed and aperture. While the exposure meters are on, rotate the main command dial to choose a shutter speed, and the sub-command dial to set aperture. Shutter speed can be set to "x 2 a a" or to values between 30 s and 1/4,000 s, or the shutter can be held open indefinitely for a long time-exposure ( $b_{11}$ ;  $b_{2}$ ,  $\Box$  79). Aperture can be set to values between the minimum and maximum values for the lens. Use the exposure indicators to check exposure.



#### AF Micro NIKKOR Lenses

*Provided that an external exposure meter is used*, the exposure ratio need only be taken into account when the lens aperture ring is used to set aperture.

#### The Exposure Indicator

If a shutter speed other than "bulb" or "time" is selected, the exposure indicator in the viewfinder shows whether the photograph would be under- or over-exposed at current settings. Depending on the option chosen for Custom Setting b2 (**EV steps for exposure cntrl**,  $\square$  224), the amount of under- or over-exposure is shown in increments of 1/3 EV or 1/2 EV (the illustrations below show the display in the viewfinder when **1/3 step** is selected for Custom Setting b2). If the limits of the exposure metering system are exceeded, the displays will flash.

Optimal exposure	Underexposed by <sup>1</sup> / <sub>3</sub> EV	Overexposed by over 2 EV
+	+	0 <b>+</b>

### 🖉 See Also

For information reversing the exposure indicators so that negative values are displayed on the right and positive values on the left, see Custom Setting f8 (**Reverse indicators**,  $\square$  246).

## Long Time-Exposures (M Mode Only)

Select the following shutter speeds for long timeexposures of moving lights, the stars, night scenery, or fireworks.

- Bulb (としこと): The shutter remains open while the shutter-release button is held down. To prevent blur, use a tripod or an optional MC-DC2 remote cord (ロ 298).
- Time (- -): Requires an optional ML-L3 remote control (C 298). Start the exposure by pressing the ML-L3 shutter-release button. The shutter remains open for thirty minutes or until the button is pressed a second time.

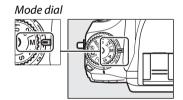


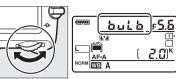
ength of exposure: 35. Aperture: f/25

## **1** Ready the camera.

Mount the camera on a tripod or place it on a stable, level surface. To prevent light entering via the viewfinder interfering with exposure, remove the rubber eyecup and cover the viewfinder with the supplied DK-5 eyepiece cap ( $\square$  86). To prevent loss of power before the exposure is complete, use a fully charged EN-EL15 battery or an optional EH-5b AC adapter and EP-5B power connector. Note that noise (bright spots, randomly-spaced bright pixels, or fog) may be present in long exposures; before shooting, choose **On** for **Long exposure NR** in the shooting menu ( $\square$  218).

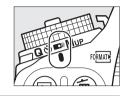
## **2** Rotate the mode dial to M.





Main command dial

For a shutter speed of "time" (- -), select remote control release mode ( $\square$  85) after choosing the shutter speed.



## **4** Open the shutter.

**Bulb**: After focusing, press the shutter-release button on the camera or optional remote cord all the way down. Keep the shutter-release button pressed until the exposure is complete.

Time: Press the ML-L3 shutter-release button all the way down.

## **5** Close the shutter.

**Bulb**: Take your finger off the shutter-release button.

**Time**: Press the ML-L3 shutter-release button all the way down. Shooting ends automatically after thirty minutes.

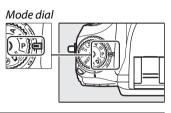
# User Settings: U1 and U2 Modes

Assign frequently-used settings to the **U1** and **U2** positions on the mode dial.

# Saving User Settings

## **1** Select a mode.

Rotate the mode dial to the desired mode.

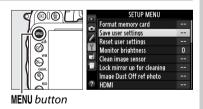


## **2** Adjust settings.

Make the desired adjustments to flexible program (mode **P**), shutter speed (modes **S** and **M**), aperture (modes **A** and **M**), exposure and flash compensation, flash mode, focus point, metering, autofocus and AF-area modes, bracketing, and settings in the shooting ( $\square$  214) and Custom Settings ( $\square$  219) menus (note that the camera will not store the options selected for **Storage folder**, **File naming**, **Image area**, **Manage Picture Control**, **Multiple exposure**, or **Interval timer shooting**).

## **3** Select Save user settings.

Press the MENU button to display the menus. Highlight **Save user settings** in the setup menu and press ►.



4 Select Save to U1 or Save to U2. Highlight Save to U1 or Save to U2 and press ▶.



### 5 Save user settings. Highlight Save settings and press ® to assign the settings selected in Steps 1 and 2 to the mode dial position selected in Step 4.

# **Recalling User Settings**

Simply rotate the mode dial to **U1** to recall the settings assigned to **Save to U1**, or to **U2** to recall the settings assigned to **Save to U2**.

# **Resetting User Settings**

To reset settings for **U1** or **U2** to default values:

**1** Select **Reset user settings**.

Press the **MENU** button to display the menus. Highlight **Reset user settings** in the setup menu and press ►.





## **3** Reset user settings. Highlight Reset and press ®.



00)



Cancel

SETUP MENU

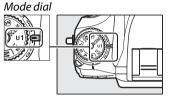
Format memory card

Save user settings Reset user settings

Monitor brightness Clean image sensor

Lock mirror up for cleaning Image Dust Off ref photo

n







# **Release Mode**

# **Choosing a Release Mode**

To choose a release mode, press the release mode dial lock release and turn the release mode dial to the desired setting.



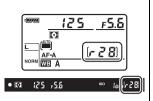
Mode	Description
S	Single frame: Camera takes one photograph each time shutter-release button is pressed.
CL	<b>Continuous low speed</b> : While shutter-release button is held down, camera records 1–5 frames per second. <sup>1</sup> Frame rate can be chosen using Custom Setting d5 ( <b>CL mode shooting speed</b> , $\square$ 229). Note that only one picture will be taken if the flash fires.
Сн	<b>Continuous high speed</b> : While shutter-release button is held down, camera records up to 5.5 frames per second. <sup>2</sup> Note that only one picture will be taken if the flash fires.
Q	Quiet shutter-release: As for single frame, except that mirror does not click back into place while shutter-release button is fully pressed, allowing user to control timing of click made by mirror, which is also quieter than in single frame mode. In addition, beep does not sound regardless of setting selected for Custom Setting d1 ( <b>Beep</b> ; III 228).
હ	<b>Self-timer</b> : Use self-timer for self-portraits or to reduce blurring caused by camera shake ( $\square$ 85).
	<b>Remote control</b> : Shutter is controlled using shutter-release button on optional ML-L3 remote control (CII 85).
Mup	<b>Mirror up</b> : Choose this mode to minimize camera shake in telephoto or close-up photography or in other situations in which the slightest camera movement can result in blurred photographs.
1 Aver	age frame rate with an EN-EL15 battery, continuous-servo AF, manual or shutter-priority

- 1 Average frame rate with an EN-EL15 battery, continuous-servo AF, manual or shutter-priority auto exposure, a shutter speed of <sup>1</sup>/<sub>200</sub> s or faster, remaining settings other than Custom Setting d5 at default values, and memory remaining in memory buffer.
- 2 Average frame rate with an EN-EL15 battery, continuous-servo AF, manual or shutter-priority auto exposure, a shutter speed of <sup>1</sup>/<sub>200</sub> s or faster, other settings at default values, and memory remaining in memory buffer.

Frame rate drops at slow shutter speeds or very small apertures (high f-numbers), when vibration reduction (available with VR lenses) or auto ISO sensitivity control is on ( $\Box$  105, 107), or when the battery is low.

#### The Memory Buffer

The camera is equipped with a memory buffer for temporary storage, allowing shooting to continue while photographs are being saved to the memory card. Up to 100 photographs can be taken in succession; note, however, that the frame rate will drop when the buffer is full (**r**00). The approximate number of images that can be stored in the buffer at current settings is shown in the exposure-count displays in the viewfinder and



control panel while the shutter-release button is pressed. The illustration at right shows the display when space remains in the buffer for about 28 pictures.

While photographs are being recorded to the memory card, the access lamp next to the memory card slot will light. Depending on shooting conditions and memory card performance, recording may take from a few seconds to a few minutes. *Do not remove the memory card or remove or disconnect the power source until the access lamp has gone out*. If the camera is switched off while data remain in the buffer, the power will not turn off until all images in the buffer have been recorded. If the battery is exhausted while images remain in the buffer, the shutter release will be disabled and the images transferred to the memory card.

#### 🖉 Live View

If a continuous release mode is used during live view photography ( $\Box$  49) or in movie live view ( $\Box$  57), photographs will be displayed in place of the view through the lens while the shutter-release button is pressed.

#### 🖉 See Also

For information on choosing the maximum number of photographs that can be taken in a single burst, see Custom Setting d6 (**Max. continuous release**, D 230). For information on the number of pictures that can be taken in a single burst, see page 334.

# **Self-Timer and Remote Control Modes**

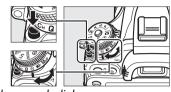
The self-timer and optional ML-L3 remote control (<sup>CD</sup> 298) can be used to reduce camera shake or for self-portraits.

### **1** Mount the camera on a tripod.

Mount the camera on a tripod or place the camera on a stable, level surface.

### **2** Select a release mode.

Press the release mode dial lock release and rotate the release-mode dial to ⓒ (self-timer) or ■ (remote control) mode.



Release mode dial

In remote control mode, the timing of the shutter release can be selected using the **Remote control mode** option in the shooting menu. After pressing the **MENU** button to display the menus, highlight **Remote control mode** in the shooting menu and press ▶ to display the following

00114 SHOOTING MENU Vignette control a Long exposure NR 0FF High ISO NR NORM ISO sensitivity setting mote control mode a 2s tiple exposure **OFF** erval timer shooting 0FF lapse photograph OFF

MENU button

options. Press the selector up or down to highlight an option and press ®.

	Option	Description		
2s Delayed remote		Shutter is released 2 s after ML-L3 shutter-release button is pressed.		
<b>Quick-response</b> Shutter is released when ML-L3 shutter-release button is pressed.				
e Remote ™ mirror-up		Press ML-L3 shutter-release button once to raise mirror, again to release shutter and take photograph. Prevents blur caused by camera moving when mirror is raised.		

#### Cover the Viewfinder

When taking photos without your eye to the viewfinder, remove the DK-21 rubber eyecup (①) and insert the supplied DK-5 eyepiece cap as shown (②). This prevents light entering via the viewfinder interfering with exposure. Hold the camera firmly when removing the rubber eyecup.

### **4** Take the photograph.

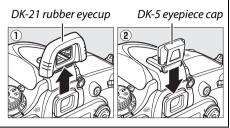
**Self-timer mode**: Press the shutter-release button halfway to focus, and then press the button the rest of the way down to start the

self-timer (note that the timer will not start if the camera is unable to focus or in other situations in which the shutter can not be released). The self-timer lamp will start to flash. Two seconds before the photograph is taken, the self-timer lamp will stop flashing. The shutter will be released ten seconds after the timer starts.

**Remote control mode**: From a distance of 5 m (16 ft) or less, aim the transmitter on the ML-L3 at either of the infrared receivers on the camera ( $\Box$  2, 4) and press the ML-L3 shutter-release button. *In delayed remote mode*, the self-timer lamp will light for about

two seconds before the shutter is released. *In quick-response remote mode*, the self-timer lamp will flash after the shutter has been released. *In remote mirror-up mode*, pressing the ML-L3 shutter-release button once raises the mirror; the shutter will be released and the self-timer lamp will flash after 30 s or when the button is pressed a second time. Note that the remote control can not be used to record movies; even if **Record movies** is selected for Custom Setting g4 (**Assign shutter button**,  $\square$  248), pressing the shutter-release button on the remote control will release the shutter and record a photograph.

To cancel shooting, select another release mode.







#### Before Using the Remote Control

Before using the remote control for the first time, remove the clear plastic battery-insulator sheet.

#### Vising the Built-in Flash

Before taking a photograph with the flash in **P**, **S**, **A**, **M**, or **†**1 modes, press the **‡** (**B2**) button to raise the flash and wait for the **‡** indicator to be displayed in the viewfinder ( $\Box$  143). Shooting will be interrupted if the flash is raised while remote control mode is in effect or after the self-timer has started. If the flash is required, the camera will only respond to the ML-L3 shutter-release button once the flash has charged. In auto or scene modes in which the flash pops up automatically, the flash will begin charging when remote control mode is selected; once the flash is charged, it will automatically pop up and fire when required. Note that only one photograph will be taken when the flash fires, regardless of the number of exposures selected for Custom Setting c3 (**Self-timer**;  $\Box$  227).

In flash modes that support red-eye reduction, the red-eye reduction lamp will light for about one second before the shutter is released. In delayed remote mode, the self-timer lamp will light for two seconds, followed by the red-eye reduction lamp which light for one second before the shutter is released.

#### Focusing in Remote Control Mode

The camera will not adjust focus in remote mirror-up mode or when continuous-servo autofocus is selected; note however that if any autofocus mode is selected, you can focus by pressing the camera shutter-release button halfway before shooting (pressing the button all the way down will not release the shutter). If auto- or single-servo autofocus is selected or the camera is in live view in delayed or quick-response remote mode, the camera will automatically adjust focus before shooting; if the camera is unable to focus in viewfinder photography, it will return to stand-by without releasing the shutter.

#### 🖉 Remote Mirror-up Mode

Metering is not performed in remote mirror-up mode. Photos can not be framed in the viewfinder while the mirror is raised.

### 🖉 buib

Time (bulb) exposures can not be recorded using the self-timer. A fixed shutter speed will be used if a speed of **bulk** is selected in mode **M**.

#### 🖉 See Also

For information on choosing the duration of the self-timer, the number of shots taken, and the interval between shots, see Custom Setting c3 (**Self-timer**;  $\square$  227). For information on choosing the length of time the camera will remain in stand-by mode waiting for a signal from the remote control, see Custom Setting c5 (**Remote on duration**;  $\square$  228). For information on controlling the beeps that sound when the self-timer and remote control are used, see Custom Setting d1 (**Beep**;  $\square$  228).

Choose this mode to minimize blurring caused by camera movement when the mirror is raised. Use of a tripod is recommended.

### **1** Select mirror up mode.

Press the release mode dial lock release and rotate the release mode dial to Mup.

#### Release mode dial

### **2** Raise the mirror.

Frame the picture, focus, and then press the shutter-release button the rest of the way down to raise the mirror.

#### Mirror Up

While the mirror is raised, photos can not be framed in the viewfinder and autofocus and metering will not be performed.

### **3** Take a picture.

Press the shutter-release button all the way down again to take a picture. To prevent blurring caused by camera movement, press the

shutter-release button smoothly, or use an optional remote cord ( $\square$  298). The mirror lowers when shooting ends.

#### 🖉 Mirror up Mode

A picture will be taken automatically if no operations are performed for about 30 s after the mirror is raised.

#### 🖉 See Also

For information on using the optional ML-L3 remote control for mirror-up photography, see page 85.







# Image Recording Options

# Image Area

Choose the aspect ratio and angle of view (image area). Thanks to the camera's FX format ( $35.9 \times 24$  mm) image sensor, you can choose from angles of view as wide as those supported by 35 mm (135) format film cameras, while automatically cropping pictures to the DX angle of view when using DX format lenses. See page 334 for information on the number of pictures that can be stored at different image area settings.

### Auto DX Crop

Choose whether to automatically select a DX crop when a DX lens is attached.

Option	Description	
	Camera automatically selects DX crop when DX lens is	
On	attached. If another lens is attached, the crop selected for	
	Choose image area will be used.	
Off	Crop selected for <b>Choose image area</b> is used.	



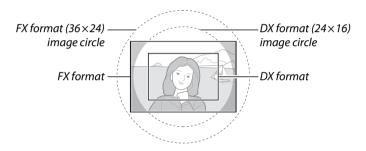
#### 🖉 DX Lenses

DX lenses are designed for use with DX format cameras and have a smaller angle of view than lenses for 35mm format cameras. If **Auto DX crop** is off and **FX (36×24) 1.0×** (FX format) is selected for **Choose image area** when a DX lens is attached, the edges of the image may be eclipsed. This may not be apparent in the viewfinder, but when the images are played back you may notice a drop in resolution or that the edges of the picture are blacked out.

#### L Choose Image Area

Choose the image area used when a non-DX lens is attached or a DX-lens is attached with **Off** selected for **Auto DX crop** ( $\square$  91).

Option	Description
FX (36×24) ☆ 1.0× (FX format)	Images are recorded in FX format using the full area of the image sensor $(35.9 \times 24.0 \text{ mm})$ , producing an angle of view equivalent to a NIKKOR lens on a 35 mm format camera.
DX (24×16) 1.5× (DX format)	An area at the center of the image sensor $23.5 \times 15.7$ mm is used to record pictures in DX format. To calculate the approximate focal length of the lens in 35mm format, multiply by 1.5.



lmage area

Auto DX crop

Choose image area

ON

**1 1 1** 

**D** 

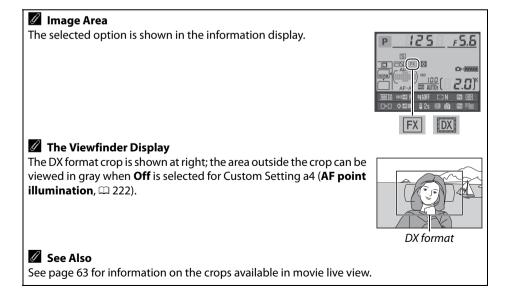


Image area can be set using the **Image area** option in the shooting menu or by pressing a control and rotating a command dial.

#### **II** The Image Area Menu

1 Select Image area in the shooting menu.

Press **MENU** to display the menus. Highlight **Image area** in the shooting menu ( $\square$  214) and press  $\blacktriangleright$ .



MENU button

#### 2 Choose an option. Highlight Auto DX crop or Choose image area and press ▶.



Image area Auto DX crop ON Choose image area 🔹 🕨

## **3** Adjust settings.

Choose an option and press B. The selected crop is displayed in the viewfinder ( $\square$  90).



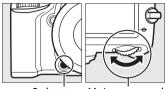
#### **L** Camera Controls

**1** Assign image area selection to a camera control.

Select **Choose image area** for a camera control in the Custom Settings menu ( $\square$  219). Image area selection can be assigned to the **Fn** button (Custom Setting f2, **Assign Fn button**,  $\square$  242) or the depth-of-field preview button (Custom Setting f3, **Assign preview button**,  $\square$  244).

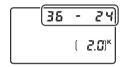
### **2** Use the selected control to choose an image area.

The image area can be selected by pressing the selected button and rotating the main or subcommand dial until the desired crop is displayed in the viewfinder ( $\square$  90).



Fn button Main command dial

The option currently selected for image area can be viewed by pressing the button to display the image area in the control panel, viewfinder, or information display. FX format is displayed as "36 - 24" and DX format as "24 - 16".



#### Auto DX Crop

The selected control can not be used to select image area when a DX lens is attached and **Auto DX crop** is on.

#### 🖉 Image Size

Image size varies with the option selected for image area ( $\square$  95).

# Image Quality and Size

Together, image quality and size determine how much space each photograph occupies on the memory card. Larger, higher quality images can be printed at larger sizes but also require more memory, meaning that fewer such images can be stored on the memory card ( $\square$  334).

## Image Quality

Choose a file format and compression ratio (image quality).

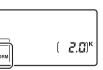
Option	File type	Description
NEF (RAW)	NEF	Raw data from the image sensor are saved directly to the memory card. Settings such as white balance and contrast can be adjusted after
		shooting.
JPEG fine		Record JPEG images at a compression ratio of roughly 1:4 (fine
		quality).*
JPEG normal	JPEG	Record JPEG images at a compression ratio of roughly 1:8 (normal
51 EG Hormur		quality).*
JPEG basic		Record JPEG images at a compression ratio of roughly 1:16 (basic quality).*
NEF (RAW)+		Two images are recorded, one NEF (RAW) image and one fine-quality
JPEG fine		JPEG image.
NEF (RAW)+	NEF/	Two images are recorded, one NEF (RAW) image and one normal-
JPEG normal	JPEG	quality JPEG image.
NEF (RAW)+	1	Two images are recorded, one NEF (RAW) image and one basic-quality
JPEG basic		JPEG image.

\* Size priority selected for JPEG compression.

Image quality can be set by pressing the  $\mathfrak{P}(\mathbf{QUAL})$  button and rotating the main command dial until the desired setting is displayed in the control panel.







(QUAL) button

Main command dial

Control panel



The following options can be accessed from the shooting menu. Press the **MENU** button to display the menus, highlight the desired option and press  $\triangleright$ .

#### **II** JPEG Compression

Choose the type of compression for JPEG images.

	Option	Description
٩.	Size priority	Images are compressed to produce relatively uniform file size.
	Optimal quality	Optimal image quality. File size varies with scene recorded.

#### ■ NEF (RAW) Recording > Type

Choose the type of compression for NEF (RAW) images.

	Option	Description
ONĪ	Lossless	NEF images are compressed using a reversible algorithm, reducing
	compressed	file size by about 20–40% with no effect on image quality.
ON≞	Compressed	NEF images are compressed using a non-reversible algorithm, reducing file size by about 35–55% with almost no effect on image quality.

#### **III** NEF (RAW) Recording > NEF (RAW) Bit Depth

Choose a bit depth for NEF (RAW) images.

Option	Description		
12-bit 12-bit NEF (RAW) images are recorded at a bit-depth of 12 bits.			
14-bit <b>14-bit</b>	NEF (RAW) images are recorded at a bit depth of 14 bits, producing files larger than those with a bit depth of 12 bits but increasing the color data recorded.		

#### 🖉 NEF (RAW) Images

NEF (RAW) images can be viewed on the camera or using software such as Capture NX 2 (available separately;  $\Box$  298) or ViewNX 2 (available on the supplied ViewNX 2 CD). Note that the option selected for image size does not affect the size of NEF (RAW) images; when viewed on a computer, NEF (RAW) images have the dimensions given for large ( $\Box$ -size) images in the table on page 95. JPEG copies of NEF (RAW) images can be created using the **NEF (RAW) processing** option in the retouch menu ( $\Box$  271).

#### NEF+JPEG

When photographs taken at settings of NEF (RAW) + JPEG are viewed on the camera with only one memory card inserted, only the JPEG image will be displayed. If both copies are recorded to the same memory card, both copies will be erased when the photo is deleted. If the JPEG copy is recorded to a separate memory card using the **Role played by card in Slot 2** > **RAW Slot 1—JPEG Slot 2** option, deleting the JPEG copy will not delete the NEF (RAW) image.

# Image Size

Image size is measured in pixels. Choose from **L** Large, **M** Medium, or **S** Small (note that image size varies depending on the option selected for **Image area**, **L** 89):

lmage area	Option	Size (pixels)	Print size (cm/in.)*
FX (36×24) 1.0×	Large	6,016 × 4,016	50.9 × 34.0/20.1 × 13.4
(FX  format)	Medium	4,512 × 3,008	38.2 × 25.5/15.0 × 10.0
(IX format)	Small	3,008 × 2,008	25.5 × 17.0/10.0 × 6.7
DX (24×16) 1.5×	Large	3,936 × 2,624	33.3 × 22.2/13.1 × 8.7
(DX format)	Medium	2,944 × 1,968	24.9×16.7/ 9.8× 6.6
(DA IOIIIat)	Small	1,968 × 1,312	16.7 × 11.1/ 6.6 × 4.4

\* Approximate size when printed at 300 dpi. Print size in inches equals image size in pixels divided by printer resolution in **d**ots **p**er inch (dpi; 1 inch=approximately 2.54 cm).

Image size can be set by pressing the  $\mathfrak{P}$  (**QUAL**) button and rotating the subcommand dial until the desired setting is displayed in the control panel.



#### The Shooting Menu Image size can also be adjusted using the Image size option in the shooting menu (C 214). Storage folder 100 File maning and in Slot 2000 Image analyze with the Image size option in the Reset shooting menu File maning and in Slot 2000 Image analyze maning and in Slot 2000 Image a

age area G compression

# **Using Two Memory Cards**

When two memory cards are inserted in the camera, you can use the **Role played by card in Slot 2** item in the shooting menu to choose the role played by the card in Slot 2. Choose from **Overflow** (the card in Slot 2 is used only when the card in Slot 1 is full), **Backup** (each picture is recorded twice, once to the card in Slot 1 and again to the card in Slot 2), and **RAW Slot 1—JPEG Slot 2** (as for **Backup**, except that the NEF/ RAW copies of photos recorded at settings of NEF/RAW + JPEG are recorded only to the card in Slot 1 and the JPEG copies only to the card in Slot 2).

#### "Backup" and "RAW Slot 1—JPEG Slot 2"

The camera shows the number of exposures remaining on the card with the least amount of memory. Shutter release will be disabled when either card is full.

#### Recording Movies

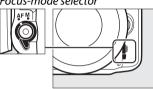
When two memory cards are inserted in the camera, the slot used to record movies can be selected using the **Movie settings** > **Destination** option in the shooting menu ( $\square$  65).

# Focus

This section describes the focus options available when photographs are framed in the viewfinder. Focus can be adjusted automatically (see below) or manually ( $\square$  103). The user can also select the focus point for automatic or manual focus ( $\square$  101) or use focus lock to focus to recompose photographs after focusing ( $\square$  102).

# Autofocus

To use autofocus, rotate the focus-mode selector to AF. Focus-mode selector



## <u>Autofocus Mode</u>

Choose from the following autofocus modes:

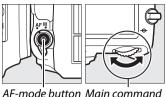
Mode	Description
AF-A	<b>Auto-servo AF</b> : Camera automatically selects single-servo autofocus if subject is stationary, continuous-servo autofocus if subject is moving.
AF-S	<b>Single-servo AF</b> : For stationary subjects. Focus locks when shutter-release button is pressed halfway. At default settings, shutter can only be released when in-focus indicator is displayed ( <i>focus priority</i> ; C 221).
AF-C	<b>Continuous-servo AF</b> : For moving subjects. Camera focuses continuously while shutter- release button is pressed halfway; if subject moves, camera will engage <i>predictive focus</i> <i>tracking</i> (C 100) to predict final distance to subject and adjust focus as necessary. At default settings, shutter can be released whether or not subject is in focus ( <i>release</i> <i>priority</i> ; C 221).

#### Predictive Focus Tracking

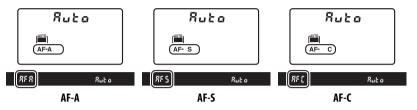
In **AF-C** mode or when continuous-servo autofocus is selected in **AF-A** mode, the camera will initiate predictive focus tracking if the subject moves toward or away from the camera while the shutter-release button is pressed halfway. This allows the camera to track focus while attempting to predict where the subject will be when the shutter is released.

DÐ

Autofocus mode can be selected by pressing the AFmode button and rotating the main command dial until the desired setting is displayed in the viewfinder or control panel.



AF-mode button Main command dial



#### Ø Getting Good Results with Autofocus

Autofocus does not perform well under the conditions listed below. The shutter release may be disabled if the camera is unable to focus under these conditions, or the in-focus indicator ( $\bigcirc$ ) may be displayed and the camera may sound a beep, allowing the shutter to be released even when the subject is not in focus. In these cases, focus manually ( $\square$  103) or use focus lock ( $\square$  102) to focus on another subject at the same distance and then recompose the photograph.



There is little or no contrast between the subject and the background.

**Example**: Subject is the same color as the background.

The focus point contains objects at different distances from the camera.

**Example**: Subject is inside a cage.

The subject is dominated by

regular geometric patterns.

**Example**: Blinds or a row of

windows in a skyscraper.



The focus point contains areas of sharply contrasting brightness.

**Example**: Subject is half in the shade.



Background objects appear larger than the subject.

**Example**: A building is in the frame behind the subject.

The subject contains many fine details.

**Example**: A field of flowers or other subjects that are small or lack variation in brightness.

#### 🖉 See Also

For information on using focus priority in continuous-servo AF, see Custom Setting a1 (**AF-C priority selection**,  $\square$  221). For information on using release priority in single-servo AF, see Custom Setting a2 (**AF-S priority selection**,  $\square$  221). See page 51 for information on the autofocus options available in live view or during movie recording.

# AF-Area Mode

Choose how the focus point for autofocus is selected.

- Single-point AF: Select the focus point as described on page 101; the camera will focus on the subject in the selected focus point only. Use with stationary subjects.
- **Dynamic-area AF**: Select the focus point as described on page 101. In **AF-A** and **AF-C** focus modes, the camera will focus based on information from surrounding focus points if the subject briefly leaves the selected point. The number of focus points varies with the mode selected:
  - 9-point dynamic-area AF: Choose when there is time to compose the photograph or when photographing subjects that are moving predictably (e.g., runners or race cars on a track).
  - **21-point dynamic-area AF**: Choose when photographing subjects that are moving unpredictably (e.g., players at a football game).
  - **39-point dynamic-area AF**: Choose when photographing subjects that are moving quickly and can not be easily framed in the viewfinder (e.g., birds).
- **3D-tracking**: Select the focus point as described on page 101. In **AF-A** and **AF-C** focus modes, the camera will track subjects that leave the selected focus point and select new focus points as required. Use to quickly compose pictures with subjects that are moving erratically from side to side (e.g., tennis players). If the subject leaves viewfinder, remove your finger from the shutter-release button and recompose the photograph with the subject in the selected focus point.



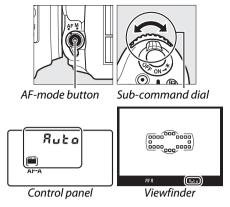




• Auto-area AF: The camera automatically detects the subject and selects the focus point. If a type G or D lens is used ( $\Box$  287), the camera can distinguish human subjects from the background for improved subject detection. The active focus points are highlighted briefly after the camera focuses; in AF-C mode or when continuous-servo autofocus is selected in AF-A mode, the main focus point remains highlighted after the other focus points have turned off.



AF-area mode can be selected by pressing the AF-mode button and rotating the subcommand dial until the desired setting is displayed in the viewfinder or control panel.



#### **3D-tracking**

When the shutter-release button is pressed halfway, the colors in the area surrounding the focus point are stored in the camera. Consequently 3D-tracking may not produce the desired results with subjects that are the same color as the background or that occupy a very small area of the frame.

#### 🖉 AF-Area Mode

AF-area mode is shown in the control panel and viewfinder.

AF-area mode Control panel		Viewfinder	AF-area mode	Control panel	Viewfinder
Single-point AF	5	5	39-point dynamic-area AF *	d39	639
9-point dynamic-area AF *	d 9	d 9	3D-tracking	36	3d
21-point dynamic-area AF <sup>*</sup>	d2 1	d2 (	Auto-area AF	Ruto	Ruto

\* Only active focus point is displayed in the viewfinder. Remaining focus points provide information to assist focus operation.

#### 🖉 Manual Focus

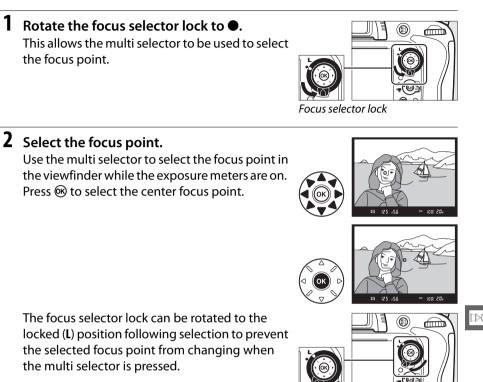
Single-point AF is automatically selected when manual focus is used.

#### 🖉 See Also

For information on adjusting how long the camera waits before refocusing when an object moves in front of the camera, see Custom Setting a3 (**Focus tracking with lock-on**,  $\square$  222). See page 52 for information on the autofocus options available in live view or during movie recording.

# **Focus Point Selection**

The camera offers a choice of 39 focus points that can be used to compose photographs with the main subject positioned almost anywhere in the frame.



#### 🖉 Auto-area AF

The focus point for auto-area AF is selected automatically; manual focus-point selection is not available.

#### 🖉 See Also

For information on choosing when the focus point is illuminated, see Custom Setting a4 (**AF point illumination**,  $\square$  222). For information on setting focus-point selection to "wrap around," see Custom Setting a5 (**Focus point wrap-around**,  $\square$  222). For information on choosing the number of focus points that can be selected using the multi selector, see Custom Setting a6 (**Number of focus points**,  $\square$  223). For information on changing the role of the 🛞 button, see Custom Setting f1, **OK button (shooting mode)**;  $\square$  241.

## **Focus Lock**

Focus lock can be used to change the composition after focusing, making it possible to focus on a subject that will not be in a focus point in the final composition. If the camera is unable to focus using autofocus (<sup>(1)</sup> 98), focus lock can also be used to recompose the photograph after focusing on another object at the same distance as vour original subject. Focus lock is most effective when an option other than autoarea AF is selected for AF-area mode ( $\Box$  99).

1 Focus.

Position the subject in the selected focus point and press the shutter-release button halfway to initiate focus. Check that the in-focus indicator (•) appears in the viewfinder.

## 2 Lock focus.

AF-A and AF-C focus modes: With the shutter-release button pressed halfway (1), press the # AE-L/AF-L button (2) to lock both focus and exposure (an **AE-L** icon will be displayed in the viewfinder). Focus will remain locked while the 結 AE-L/AF-L button is pressed, even if you later remove your finger from the shutter-release button.

AF-S focus mode: Focus locks automatically when the in-focus indicator appears, and remain locked until you remove your finger from the shutter-release button. Focus can also be locked by pressing the AFL AE-L/AF-L button (see above).

**3** Recompose the photograph and shoot. Focus will remain locked between shots if you keep the shutter-release button pressed halfway (AF-S) or keep the #L AE-L/AF-L button pressed, allowing several photographs in succession to be taken at the same focus setting.

Do not change the distance between the camera and the subject while focus lock is in effect. If the subject moves, focus again at the new distance.

#### See Also

See Custom setting c1 (Shutter-release button AE-L, D 226) for information on using the shutter-release button to lock exposure, Custom Setting f4 (Assign AE-L/AF-L button, 띠 244) for information on choosing the role played by the 鮓 AE-L/AF-L button.





群 AE-L/AF-L button





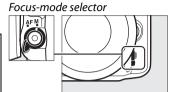
# **Manual Focus**

Manual focus is available for lenses that do not support autofocus (non-AF NIKKOR lenses) or when the autofocus does not produce the desired results (<sup>CD</sup> 98).

- AF-S lenses: Set the lens focus mode switch to M.
- **AF lenses**: Set the lens focus mode switch (if present) and camera focus-mode selector to **M**.

#### AF Lenses

Do not use AF lenses with the lens focus mode switch set to **M** and the camera focus-mode selector set to **AF**. Failure to observe this precaution could damage the camera or lens.



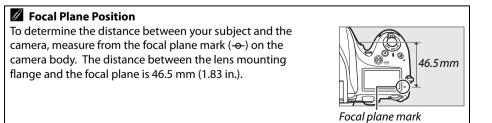
• Manual focus lenses: Set the camera focus-mode selector to M.

To focus manually, adjust the lens focus ring until the image displayed on the clear matte field in the viewfinder is in focus. Photographs can be taken at any time, even when the image is not in focus.

#### **II** The Electronic Rangefinder

If the lens has a maximum aperture of f/5.6 or faster, the viewfinder focus indicator can be used to confirm whether the subject in the selected focus point is in focus (the focus point can be selected from any of the 39 focus points). After positioning the subject in the selected focus point, press the shutter-release button

halfway and rotate the lens focus ring until the in-focus indicator ( $\bullet$ ) is displayed. Note that with the subjects listed on page 98, the in-focus indicator may sometimes be displayed when the subject is not in focus; confirm focus in the viewfinder before shooting.



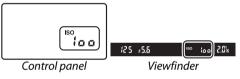
# IS **ISO** Sensitivity

"ISO sensitivity" is the digital equivalent of film speed. Choose from settings that range from ISO 100 to ISO 6400 in steps equivalent to <sup>1</sup>/<sub>3</sub> EV. Settings of from about 0.3 to 1 EV below ISO 100 and 0.3 to 2 EV above ISO 6400 are also available for special situations. Auto and scene modes also offer an **AUTO** option, which allows the camera to set ISO sensitivity automatically in response to lighting conditions. The higher the ISO sensitivity, the less light needed to make an exposure, allowing higher shutter speeds or smaller apertures.

ISO sensitivity can be adjusted by pressing the 역로 (ISO) button and rotating the main command dial until the desired setting is displayed in the control panel or viewfinder.



**♀** (ISO) button Main command dial



#### 🖉 AUTO

If the mode dial is rotated to **P**, **S**, **A**, or **M** after **AUTO** is selected for ISO sensitivity in another mode, the ISO sensitivity last selected in **P**, **S**, **A**, or **M** mode will be restored.

#### 🖉 Hi 0.3–Hi 2

The settings **Hi 0.3** through **Hi 2** correspond to ISO sensitivities 0.3–2 EV over ISO 6400 (ISO 8000–25600 equivalent). Pictures taken at these settings are more likely to be subject to noise (randomly-spaced bright pixels, fog, or lines).

#### 🖉 Lo 0.3–Lo 1

The settings **Lo 0.3** through **Lo 1** correspond to ISO sensitivities 0.3–1 EV below ISO 100 (ISO 80–50 equivalent). Use for larger apertures when lighting is bright. Contrast is slightly higher than normal; in most cases, ISO sensitivities of ISO 100 or above are recommended.

#### 🖉 The Shooting Menu

ISO sensitivity can also be adjusted using the **ISO sensitivity** settings option in the shooting menu ( $\Box$  214).



#### 🖉 See Also

For information on choosing the ISO sensitivity step size, see Custom Setting b1 (**ISO sensitivity step value**; <sup>(1)</sup> 224). For information on displaying ISO sensitivity in the control panel or adjusting ISO sensitivity without using the **R** (**ISO**) button, see Custom Setting d3 (**ISO display and adjustment**; <sup>(1)</sup> 229). For information on using the **High ISO NR** option in the shooting menu to reduce noise at high ISO sensitivities, see page 218.

# Auto ISO Sensitivity Control (P, S, A, and M Modes Only)

If **On** is selected for **ISO sensitivity settings** > **Auto ISO sensitivity control** in the shooting menu, ISO sensitivity will automatically be adjusted if optimal exposure can not be achieved at the value selected by the user (ISO sensitivity is adjusted appropriately when the flash is used).

#### 1 Select Auto ISO sensitivity control for ISO sensitivity settings in the shooting menu.

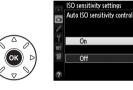
To display the menus, press the MENU button. Select ISO sensitivity settings in the shooting menu, highlight Auto ISO sensitivity control and press ▶.



**MENU** button

## 2 Select On.

Highlight **On** and press (if **Off** is selected, ISO sensitivity will remain fixed at the value selected by the user).



### **3** Adjust settings.

The maximum value for auto ISO sensitivity can be selected using **Maximum sensitivity** (the minimum value for auto ISO sensitivity is automatically set to ISO 100; note that if the value selected for **Maximum sensitivity** 

is lower than the value currently selected for **ISO sensitivity**, the value selected for **Maximum sensitivity** will be used). In modes **P** and **A**, sensitivity will only be adjusted if underexposure would result at the shutter speed selected for **Minimum shutter speed** (<sup>1</sup>/<sub>2000</sub>−1 s, or **Auto**; in modes **S** and **M**, ISO sensitivity will be adjusted for optimal exposure at the shutter speed selected by the user). If **Auto** (available only with CPU lenses; equivalent to <sup>1</sup>/<sub>30</sub> s when a non-CPU lens is used) is selected, the camera will choose the minimum shutter speed based on the focal length of the lens (auto shutter-speed selection can be finetuned by highlighting **Auto** and pressing **>**; for example, even faster values than those usually selected automatically by the camera can be used with telephoto lenses to reduce blur). Shutter speeds slower than the minimum value may be used if optimum exposure can not be achieved at the ISO sensitivity value selected for **Maximum sensitivity**. Press **®** to exit when settings are complete.



ISO

When **On** is selected, the viewfinder and control panel show **ISO-AUTO**. When sensitivity is altered from the value selected by the user, these indicators flash and the altered value is shown in viewfinder.



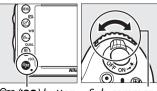
Control panel

#### Auto ISO Sensitivity Control

Noise (randomly-spaced bright pixels, fog, or lines) is more likely at higher sensitivities. Use the **High ISO NR** option in the shooting menu to reduce noise (see page 218). When a flash is used, the value selected for **Minimum shutter speed** is ignored in favor of the option selected for Custom Setting e1 (**Flash sync speed**,  $\square$  234). Note that ISO sensitivity may be raised automatically when auto ISO sensitivity control is used in combination with slow sync flash modes (available with the built-in flash and the optional flash units listed on page 293), possibly preventing the camera from selecting slow shutter speeds.

#### Turning Auto ISO Sensitivity Control On or Off

You can turn auto ISO sensitivity control on or off by pressing the est (ISO) button and rotating the subcommand dial. ISO-AUTO is displayed when auto ISO sensitivity control is on.



ବ୍ଞ (ISO) button

Sub-command dial



# Metering

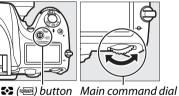
#### (P, S, A, and M Modes Only)

Choose how the camera sets exposure in P, S, A, and M modes (in other modes, the camera selects the metering method automatically).

Option	Description
	<b>Matrix</b> : Produces natural results in most situations. Camera meters a wide area of the frame and set exposure according to tone distribution, color, composition, and, with type G or D lenses ( $\square$ 287), distance information (3D color matrix metering II; with other CPU lenses, camera uses color matrix metering II, which does not include 3D distance information). With non-CPU lenses, camera uses color matrix metering if focal length and maximum aperture are specified using <b>Non-CPU lens data</b> option in setup menu ( $\square$ 173); otherwise camera uses center-weighted metering.
(0)	<b>Center-weighted</b> : Camera meters entire frame but assigns greatest weight to center area (if CPU lens is attached, size of area can be selected using Custom Setting b4, <b>Center-weighted area</b> , $\square$ 226; if non-CPU lens is attached, area is 12 mm in diameter). Classic meter for portraits; recommended when using filters with an exposure factor (filter factor) over 1×.*
Ū	<b>Spot</b> : Camera meters circle 4 mm (0.16 in.) in diameter (approximately 1.5% of frame). Circle is centered on current focus point, making it possible to meter off-center subjects (if non-CPU lens is used or if auto-area AF is in effect, camera will meter center focus point). Ensures that subject will be correctly exposed, even when background is much brighter or darker.*

\* For improved precision with non-CPU lenses, specify lens focal length and maximum aperture in Non-CPU lens data menu (CD 173).

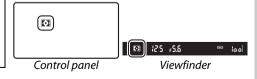
To choose a metering option, press the (Researching) button and rotate the main command dial until the desired setting is displayed in the viewfinder and control panel.





See Also

For information on making separate adjustments to optimal exposure for each metering method, see Custom Setting b5 (Fine-tune optimal exposure, 🕮 226).



# **Autoexposure Lock**

Use autoexposure lock to recompose photographs after using center-weighted metering and spot metering to meter exposure. Note that matrix metering will not produce the desired results.

### **1** Lock exposure.

Position the subject in the selected focus point and press the shutter-release button halfway. With the shutter-release button pressed halfway and the subject positioned in the focus point, press the  $\pounds$  **AE-L/AF-L** button to lock focus and exposure (if you are using autofocus, confirm that the  $\bullet$  in-focus indicator appears in the viewfinder).

While exposure lock is in effect, an **AE-L** indicator will appear in the viewfinder.



ᄹᆣ AE-L/AF-L button



2 Recompose the photograph. Keeping the ﷺ AE-L/AF-L button pressed, recompose the photograph and shoot.



#### 🖉 Metered Area

In spot metering, exposure will be locked at the value metered in a 4-mm (0.16 in.) circle centered on the selected focus point. In center-weighted metering, exposure will be locked at the value metered in a 12-mm circle in the center of the viewfinder.

#### Adjusting Shutter Speed and Aperture

While exposure lock is in effect, the following settings can be adjusted without altering the metered value for exposure:

Mode	Setting
Р	Shutter speed and aperture (flexible program; 🕮 75)
S	Shutter speed
Α	Aperture

The new values can be confirmed in the viewfinder and control panel. Note that metering can not be changed while exposure lock is in effect.

#### 🖉 See Also

If **On** is selected for Custom Setting c1 (**Shutter-release button AE-L**, <sup>囗</sup> 226), exposure will lock when the shutter-release button is pressed halfway. For information on changing the role of the **給 AE-L/AF-L** button, see Custom Setting f4 (**Assign AE-L/AF-L button**, <sup>囗</sup> 244).

# **Exposure Compensation**

(P, S, A, and M Modes Only)

Exposure compensation is used to alter exposure from the value suggested by the camera, making pictures brighter or darker. It is most effective when used with center-weighted or spot metering ( $\Box$  109). Choose from values between –5 EV (underexposure) and +5 EV (overexposure) in increments of <sup>1</sup>/<sub>3</sub> EV. In general, positive values make the subject brighter while negative values make it darker.





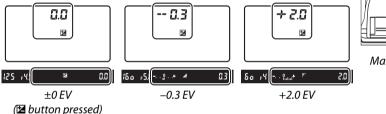


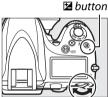
No exposure compensation





To choose a value for exposure compensation, press the button and rotate the main command dial until the desired value is displayed in the control panel or viewfinder.

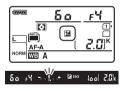




Main command dial

 $\mathbf{\overline{\mathbf{O}}}$ 

At values other than  $\pm 0.0$ , the 0 at the center of the exposure indicators will flash (modes **P**, **S**, and **A** only) and a **2** icon will be displayed in the control panel and viewfinder after you release the **2** button. The current value for exposure compensation can be confirmed in the exposure indicator by pressing the **2** button.



Normal exposure can be restored by setting exposure compensation to  $\pm 0$ . Exposure compensation is not reset when the camera is turned off.

#### 🖉 Mode M

In mode **M**, exposure compensation affects only the exposure indicator; shutter speed and aperture do not change.

#### 🖉 Using a Flash

When a flash is used, exposure compensation affects both flash level and exposure, altering the brightness of both the main subject and the background. Custom Setting e4 (**Exposure comp. for flash**,  $\Box$  240) can be used to restrict the effects of exposure compensation to the background only.

#### 🖉 See Also

For information on choosing the size of the increments available for exposure compensation, see Custom Setting b2 (**EV steps for exposure cntrl**,  $\square$  224). For information on making adjustments to exposure compensation without pressing the **Z** button, see Custom Setting b3 (**Easy exposure compensation**,  $\square$  225). For information on automatically varying exposure, flash level, white balance, or Active D-Lighting, see page 153.

# White Balance

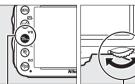
#### (P, S, A, and M Modes Only)

White balance ensures that colors are unaffected by the color of the light source. In modes other than P, S, A, and M, white balance is set automatically by the camera. Auto white balance is recommended for most light sources in **P**, **S**, **A**, and **M** modes, but other values can be selected if necessary according to the type of source:

Option		Colortemp.*	Description		
AUTO	Auto	3,500– 8,000 K	White balance is adjusted automatically. For best		
	Normal		results, use type G or D lens. If built-in or optional		
	Keep warm lighting colors	0,000 K	flash fires, results are adjusted for flash.		
*	Incandescent	3,000 K	Use under incandescent lighting.		
	🕷 Fluorescent		Use with:		
	Sodium-vapor lamps	2,700 K	• Sodium-vapor lighting (found in sports venues).		
	Warm-white fluorescent	3,000 K	Warm-white fluorescent lights.		
	White fluorescent	3,700 K	White fluorescent lights.		
	Cool-white fluorescent	4,200 K	Cool-white fluorescent lights.		
	Day white fluorescent	5,000 K	Daylight white fluorescent lights.		
	Daylight fluorescent	6,500 K	Daylight fluorescent lights.		
	High temp. mercury-vapor	7,200 K	High color temperature light sources (e.g.		
			mercury-vapor lamps).		
☀	Direct sunlight	5,200 K	Use with subjects lit by direct sunlight.		
4	Flash	5,400 K	Use with built-in or optional flash.		
2	Cloudy	6,000 K	Use in daylight under overcast skies.		
<b>D</b> //.	Shade	8,000 K	Use in daylight with subjects in the shade.		
K	Choose color temp.	2,500-	Choose color temperature from list of values		
		10,000 K	(🕮 120).		
DRE	Preset manual	_	Use subject, light source, or existing photograph as		
rne	r reset manuar		reference for white balance (🕮 121).		

\* All values are approximate and do not reflect fine-tuning (if applicable).

White balance is set by pressing the ?/~ (WB) button and rotating the main command dial until the desired setting is displayed in the control panel.





dial

	8		
A 500			

?/~ (WB) button Main command

Control panel

#### 🖉 The Shooting Menu

White balance can also be adjusted using the **White balance** option in the shooting menu ( $\Box$  214), which also can be used to fine-tune white balance ( $\Box$  117) or measure a value for preset white balance ( $\Box$  121). The **Auto** option in the **White balance** menu offers a choice of **Normal** and **Keep warm lighting colors**, which preserves the warm colors produced by incandescent lighting, while the **# Fluorescent** option can be used to select the light source from the bulb types.



#### 🖉 Studio Flash Lighting

Auto white balance may not produce the desired results with large studio flash units. Use preset white balance or set white balance to **Flash** and use fine tuning to adjust white balance.

#### 🖉 Color Temperature

The perceived color of a light source varies with the viewer and other conditions. Color temperature is an objective measure of the color of a light source, defined with reference to the temperature to which an object would have to be heated to radiate light in the same wavelengths. While light sources with a color temperature in the neighborhood of 5,000–5,500 K appear white, light sources with a lower color temperature, such as incandescent light bulbs, appear slightly yellow or red. Light sources with a higher color temperature appear tinged with blue. The camera white balance options are adapted to the following color temperatures:

- 業 (sodium-vapor lamps): 2,700 K
- ♣ (incandescent)/
   ₩ (warm-white fluorescent): 3,000 K
- 洲 (white fluorescent): 3,700 K
- 業 (cool-white fluorescent): 4,200 K
- 業 (day white fluorescent): 5,000 K

- 💥 (direct sunlight): **5,200 K**
- 🗲 (flash): 5,400 K
- 🕰 (cloudy): 6,000 K
- 洲 (daylight fluorescent): 6,500 K
- 業 (high temp. mercury-vapor): **7,200 K**
- 🏤 (shade): 8,000 K

#### 🖉 See Also

When **WB bracketing** is selected for Custom Setting e6 (**Auto bracketing set**,  $\square$  241), the camera will create several images each time the shutter is released. White balance will be varied with each image, "bracketing" the value currently selected for white balance ( $\square$  156).

# **Fine-Tuning White Balance**

White balance can be "fine-tuned" to compensate for variations in the color of the light source or to introduce a deliberate color cast into an image. White balance is fine-tuned using the **White balance** option in the shooting menu or by pressing the **?**~ (**WB**) button and rotating the sub-command dial.

#### **II** The White Balance Menu

# 1 Select a white balance option in the shooting menu.

To display the menus, press the **MENU** button. Select **White balance** in the shooting menu, then highlight a white balance option and press  $\blacktriangleright$ . If an option other than **Auto**.

press ▶. If an option other than Auto, MENU, Fluorescent, Choose color temp., or Preset

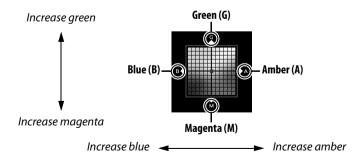
**MENU** button

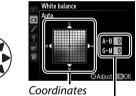
**manual** is selected, proceed to Step 2. If **Auto**, **Fluorescent**, or **Choose color temp.** is selected, highlight the desired setting and press ▶. For information on fine-tuning preset white balance, see page 125.

### **2** Fine tune white balance.

Use the multi selector to fine-tune white balance. White balance can be fine-tuned on the amber (A)–blue (B) axis and the green (G)–magenta (M) axis. The horizontal (amber-blue) axis corresponds to color temperature, with each increment equivalent to about 5 mired. The vertical

(green-magenta) axis has the similar effects to the corresponding color compensation (CC) filters.





Adjustment

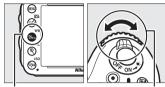
3 Press ®.

Press M to save settings and return to the shooting menu. If white balance has been fine-tuned, an asterisk (" $\bigstar$ ") will be displayed in the control panel.

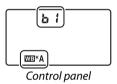
#### ■ The ?/∽¬ (WB) Button

At settings other than 🔀 (Choose color temp.) and PRE (Preset manual), the ‰ (WB) button can be used to fine-tune white balance on the amber (A)– blue (B) axis (□ 117; to fine-tune white balance when I or PRE is selected, use the shooting menu as described on page 117). Six settings in both directions are available; each increment is equivalent to about 5 mired (□ 119). Press the ‰ (WB) button and rotate the sub-command dial until the desired value is displayed in the control panel. Rotating the sub-command dial to the left increases the amount of amber (A). Rotating the sub-command dial to the right increases the amount of blue (B). At settings other than 0, an asterisk ("★") appears in the control panel.





י∕⊶ (WB) button Sub-command dial



#### White Balance Fine-Tuning

The colors on the fine-tuning axes are relative, not absolute. For example, moving the cursor to **B** (blue) when a "warm" setting such as  $\frac{1}{2}$  (incandescent) is selected for white balance will make photographs slightly "colder" but will not actually make them blue.

#### Color Temperature Fine-Tuning

When **Choose color temp.** is selected, you can view the color temperature while fine-tuning white balance.



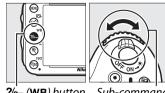
### 🖉 "Mired"

Any given change in color temperature produces a greater difference in color at low color temperatures than it would at higher color temperatures. For example, a change of 1000 K produces a much greater change in color at 3000 K than at 6000 K. Mired, calculated by multiplying the inverse of the color temperature by 10<sup>6</sup>, is a measure of color temperature that takes such variation into account, and as such is the unit used in color-temperature compensation filters. E.g.:

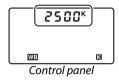
- 4000 K–3000 K (a difference of 1000 K)=83 mired
- 7000 K–6000 K (a difference of 1000 K)=24 mired

# **Choosing a Color Temperature**

When **I** (Choose color temp.) is selected for white balance, color temperature can be selected by pressing the ?/on (WB) button and rotating the sub-command dial. The color temperature is displayed in the control panel.



(**WB**) button Sub-command (ial



#### Choose Color Temperature

Note that the desired results will not be obtained with flash or fluorescent lighting. Choose **4** (Flash) or **#** (Fluorescent) for these sources. With other light sources, take a test shot to determine if the selected value is appropriate.

#### Interpretended Amplitude Amplitud

Color temperature can also be selected in the white balance menu. Note that the color temperature with the **?/~** (**WB**) button and the sub-command dial replaces the value selected in the white balance menu.



# Preset Manual

Preset manual is used to record and recall custom white balance settings for shooting under mixed lighting or to compensate for light sources with a strong color cast. The camera can store up to four values for preset white balance in presets d-1 through d-4. Two methods are available for setting preset white balance:

Method	Description
Direct measurement	Neutral gray or white object is placed under lighting that will be used in final photo and white balance measured by camera ( 121).
Copy from existing photograph	White balance is copied from photo on memory card ( $\square$ 124).

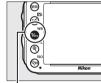
#### **II** Measuring a Value for White Balance

#### 1 Light a reference object.

Place a neutral gray or white object under the lighting that will be used in the final photograph. In studio settings, a standard gray panel can be used as a reference object. Note that exposure is automatically increased by 1 EV when measuring white balance; in mode **M**, adjust exposure so that the exposure indicator shows  $\pm 0 \pmod{78}$ .

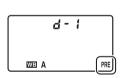
### **2** Set white balance to PRE (**Preset manual**).

Press the **?** (**WB**) button and rotate the main command dial until **PRE** is displayed in the control panel.



?/--- (WB) button





Main command dial

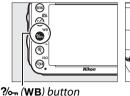
Control panel

#### Measuring Preset White Balance

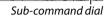
Preset manual white balance can not be measured during live view (
49, 57), while you are shooting an HDR photograph (
139) or multiple exposure (
160), or when **Record movies** is selected for Custom Setting g4 (**Assign shutter button**, 
248).

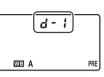
# **3** Select a preset.

Press the **%** (**WB**) button and rotate the sub-command dial until the desired white balance preset (d-1 to d-4) is displayed in the control panel.





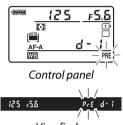




Control panel

# **4** Select direct measurement mode.

Release the **?**~ **(WB)** button briefly and then press the button until the **PRE** icon in the control panel starts to flash. A flashing **?**~  $\boldsymbol{\xi}$  will also appear in the viewfinder. The displays will flash for about six seconds.



Viewfinder

# **5** Measure white balance.

Before the indicators stop flashing, frame the reference object so that it fills the viewfinder and press the shutter-release button all the way down. The camera



will measure a value for white balance and store it in the preset selected in Step 3. No photograph will be recorded; white balance can be measured accurately even when the camera is not in focus.

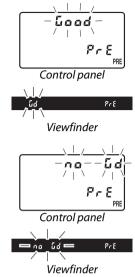
#### Protected Presets

If the current preset is protected ( $\square$  127), Pr  $\succeq$  will flash in the control panel and viewfinder if you attempt to measure a new value.

# **6** Check the results.

If the camera was able to measure a value for white balance, **Lood** will flash in the control panel for about six seconds, while the viewfinder will show a flashing **Ld**.

If lighting is too dark or too bright, the camera may be unable to measure white balance. A flashing **na Ld** will appear in the control panel and viewfinder for about six seconds. Press the shutter-release button halfway to return to Step 5 and measure white balance again.



#### Direct Measurement Mode

If no operations are performed while the displays are flashing, direct measurement mode will end in the time selected for Custom Setting c2 (**Standby timer**,  $\square$  227).

#### Selecting a Preset

Selecting **Preset manual** for the **White balance** option in the shooting menu displays the dialog shown at right; highlight a preset and press ®. If no value currently exists for the selected preset, white balance will be set to 5,200 K, the same as **Direct sunlight**.



#### **II** Copying White Balance from a Photograph

Follow the steps below to copy a value for white balance from an existing photograph to a selected preset.

 Select PRE (Preset manual) for White balance in the shooting menu.
 Press the MENU button and select White balance in the shooting menu. Highlight Preset manual and press ▶.



**MENU** button

# **2** Select a destination.

Highlight the destination preset (d-1 to d-4) and press  $\bigotimes$  (ISO).



Set (ISO) button

#### 3 Choose Select image. Highlight Select image and press ►.





**4** Highlight a source image. Highlight the source image.



**5** Press <sup>®</sup>.

Press M to copy the white balance value for the highlighted photograph to the selected preset. If the highlighted photograph has a comment (M 253), the comment will be copied to the comment for the selected preset.



μB

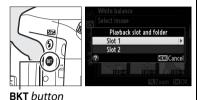
#### Choosing a Source Image

To view the image highlighted in Step 4 full frame, press and hold the  $\mathfrak{P}(\mathbf{QUAL})$  button.





To view images in other locations, hold the **BKT** button and press  $\blacktriangle$ . The dialog shown at right will be displayed; select the desired card and folder ( $\square$  178).



White balance Preset manual

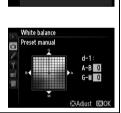
<mark>d–1</mark> Fine-tune Edit comment Select image

Protect d-1

#### Choosing a White Balance Preset

Press  $\blacktriangle$  to highlight the current white balance preset (d-1-d-4) and press  $\blacktriangleright$  to select another preset.

#### Fine-Tuning Preset White Balance The selected preset can be fine-tuned by selecting Fine-tune and adjusting white balance as described on page 117.



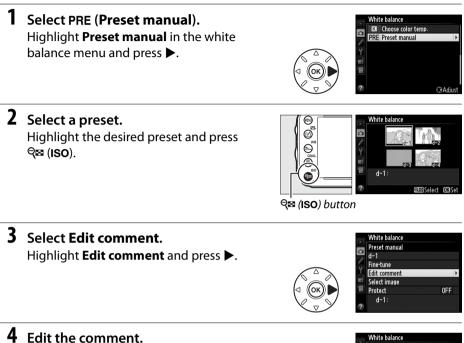
▶Change

0FF

ЫF

#### **Entering a Comment**

Follow the steps below to enter a descriptive comment of up to thirty-six characters for a selected white balance preset.



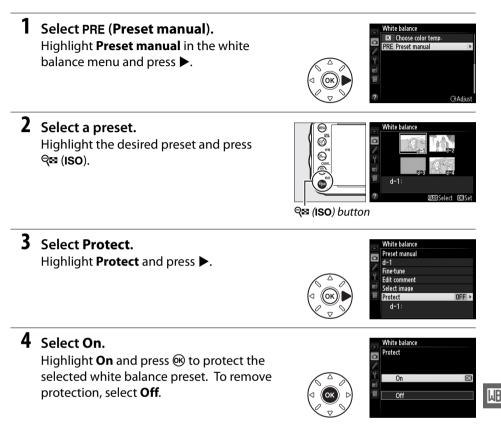
Edit the comment as described on page 135.



μB

#### **II** Protecting a White Balance Preset

Follow the steps below to protect the selected white balance preset. Protected presets can not be modified and the **Fine-tune** and **Edit comment** options can not be used.



# Image Enhancement

# **Picture Controls**

(P, S, A, and M Modes Only)

Nikon's unique Picture Control system makes it possible to share image processing settings, including sharpening, contrast, brightness, saturation, and hue, among compatible devices and software.

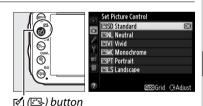
# **Selecting a Picture Control**

The camera offers a choice of preset Picture Controls. In **P**, **S**, **A**, and **M** modes, you can choose a Picture Control according to the subject or type of scene (in other modes, the camera selects a Picture Control automatically).

	Option	Description
مەرى	Standard	Standard processing for balanced results. Recommended for most
	Stanuaru	situations.
M	Neutral	Minimal processing for natural results. Choose for photographs that will later
<u>C</u> 3NL	Neutiai	be extensively processed or retouched.
NI	Vivid	Pictures are enhanced for a vivid, photoprint effect. Choose for photographs
<u>⊂</u> 3¥1	VIVIU	that emphasize primary colors.
⊡MC	Monochrome	Take monochrome photographs.
۳PT	Portrait	Process portraits for skin with natural texture and a rounded feel.
۳LS	Landscape	Produces vibrant landscapes and cityscapes.

# **1** Press 🗹 (⊡>).

A list of Picture Controls will be displayed.



2 Choose a Picture Control. Highlight the desired Picture Control and press ⊛.



100

#### Custom Picture Controls

Custom Picture Controls are created through modifications to existing Picture Controls using the **Manage Picture Control** option in the shooting menu (<sup>[]</sup> 134). Custom Picture Controls can be saved to a memory card for sharing among other cameras of the same model and compatible software (<sup>[]</sup> 136).

#### Interpretended Amplitude Control Indicator

The current Picture Control is shown in the information display when the **m** button is pressed.



Picture Control indicator

#### The Shooting Menu

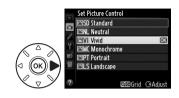
Picture Controls can also be selected using the **Set Picture Control** option in the shooting menu (<sup>CII</sup> 214).

	SHOOTING MENU	
	NEF (RAW) recording	
•	White balance	AUT01
<u>_</u>	Set Picture Control	⊡SD
Τ.	Manage Picture Control	
	Auto distortion control	0FF
1	Color space	sRGB
	Active D-Lighting	0FF
?	HDR (high dynamic range)	0FF

# **Modifying Picture Controls**

Existing preset or custom Picture Controls (D 134) can be modified to suit the scene or the user's creative intent. Choose a balanced combination of settings using **Quick adjust**, or make manual adjustments to individual settings.

#### Select a Picture Control. Highlight the desired Picture Control in the Picture Control list (□ 129) and press ►.



# **2** Adjust settings.

Press  $\blacktriangle$  or  $\lor$  to highlight the desired setting ( $\square$  132) and press  $\blacktriangleleft$  or  $\triangleright$  to choose a value. Repeat this step until all settings have been adjusted, or select **Quick adjust** to choose a preset combination of settings. Default settings can be restored by pressing the i ( $\bowtie$ ) button. Vivid eper Chick adjust Contrast Contrast Contrast Brightness Contrast Hue Reprint Contrast C

3 Press <sup>®</sup>.

**Modifications to Original Picture Controls** Picture Controls that have been modified from default settings are indicated by an asterisk ("**\***").



#### **III** Picture Control Settings

	•	
	Option	Description
Quick adjust		Choose from options between -2 and +2 to reduce or exaggerate the effect of the selected Picture Control (note that this resets all manual adjustments). For example, choosing positive values for <b>Vivid</b> makes pictures more vivid. Not available with <b>Neutral</b> or <b>Monochrome</b> Picture Controls.
Maı (all	Sharpening	Control the sharpness of outlines. Select <b>A</b> to adjust sharpening automatically according to the type of scene, or choose from values between <b>0</b> (no sharpening) and <b>9</b> (the higher the value, the greater the sharpening).
Manual adjustments (all Picture Controls)	Contrast	Select <b>A</b> to adjust contrast automatically according to the type of scene, or choose from values between <b>-3</b> and <b>+3</b> (choose lower values to prevent highlights in portrait subjects from being "washed out" in direct sunlight, higher values to preserve detail in misty landscapes and other low-contrast subjects).
	Brightness	Choose –1 for reduced brightness, +1 for enhanced brightness. Does not affect exposure.
Manual ad (non-monoc	Saturation	Control the vividness of colors. Select <b>A</b> to adjust saturation automatically according to the type of scene, or choose from values between <b>–3</b> and <b>+3</b> (lower values reduce saturation and higher values increase it).
Manual adjustments (non-monochrome only)	Hue	Choose negative values (to a minimum of $-3$ ) to make reds more purple, blues more green, and greens more yellow, positive values (up to $+3$ ) to make reds more orange, greens more blue, and blues more purple.
Manua (mono	Filter effects	Simulate the effect of color filters on monochrome photographs. Choose from <b>Off</b> , yellow, orange, red, and green ( <sup>[]]</sup> 133).
Manual adjustments (monochrome only)	Toning	Choose the tint used in monochrome photographs from <b>B&amp;W</b> (black-and-white), <b>Sepia</b> , <b>Cyanotype</b> (blue-tinted monochrome), <b>Red, Yellow, Green</b> , <b>Blue Green</b> , <b>Blue</b> , <b>Purple Blue</b> , <b>Red Purple</b> (🕮 133).

#### 🗹 "A" (Auto)

Results for auto sharpening, contrast, and saturation vary with exposure and the position of the subject in the frame. Use a type G or D lens for best results.

#### Custom Picture Controls

The options available with custom Picture Controls are the same as those on which the custom Picture Control was based.

Pressing the Q (ISO) button in Step 2 on page 131 displays a Picture Control grid showing the contrast and saturation for the selected Picture Control in relation to the other Picture Controls (only contrast is displayed when **Monochrome** is selected). Release the ♀ (ISO) button to return to the Picture Control menu.

The icons for Picture Controls that use auto contrast and saturation are displayed in green in the Picture Control grid, and lines appear parallel to the axes of the grid.

### Previous Settings

The line under the value display in the Picture Control setting menu indicates the previous value for the setting. Use this as a reference when adjusting settings.

### Filter Effects (Monochrome Only)

The options in this menu simulate the effect of color filters on monochrome photographs. The following filter effects are available:

Option Description γ Yellow Enhances contrast. Can be used to tone down the brightness of the sky in Orange landscape photographs. Orange produces more contrast than yellow, red 0 more contrast than orange. R Red G Green Softens skin tones. Can be used for portraits.

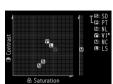
Note that the effects achieved with **Filter effects** are more pronounced than those produced by physical glass filters.

#### I Toning (Monochrome Only)

Pressing  $\mathbf{\nabla}$  when **Toning** is selected displays saturation options. Press  $\blacktriangleleft$  or  $\blacktriangleright$  to adjust saturation. Saturation control is not available when **B&W** (black-and-white) is selected

Monochrome **D** Sharpening Contrast Brightness Filter effects Toning Magazat Magazat Maga







# **Creating Custom Picture Controls**

The Picture Controls supplied with the camera can be modified and saved as custom Picture Controls.

1 Select Manage Picture Control in the shooting menu.

To display the menus, press the MENU button. Highlight Manage Picture Control in the shooting menu and press ►.



回C4 Unused 回C5 Unused 回C6 Unused 回C7 Unused

**MENU** button

2 Select Save/edit. Manage Picture Control û Highlight **Save/edit** and press ▶. Save/edit Load/save **3** Select a Picture Control. Manage Picture Control Choose Picture Control Highlight an existing Picture Control and SD Standard 🖾 NL Neutral press ▶, or press 🛞 to proceed to Step 5 to 3VI Vivid MC Monochro save a copy of the highlighted Picture PT Portrait Control without further modification. SLS Landscape 4 Edit the selected Picture Control. Ouick adjust See page 132 for more information. To Sharpening abandon any changes and start over from Contrast Brightness default settings, press the fig (resp.) button. Saturation Ние Press @ when settings are complete. 5 Select a destination. Manage Picture Control Save as Choose a destination for the custom Picture 🕾 C-1 Unused 🕾 C-2 Unused Control (C-1 through C-9) and press  $\blacktriangleright$ . 🕾 C-3 Unused

### **6** Name the Picture Control.

The text-entry dialog shown at right will be displayed. By default, new Picture Controls are named by adding a two-digit number (assigned automatically) to the name of the existing Picture Control; to use the default



name, proceed to Step 7. To move the cursor in the name area, hold the  $\Im$  (ISO) button and press  $\blacktriangleleft$  or  $\blacktriangleright$ . To enter a new letter at the current cursor position, use the multi selector to highlight the desired character in the keyboard area and press  $\circledast$ . To delete the character at the current cursor position, press the  $\widehat{m}$  ( $\widehat{m}$ ) button.

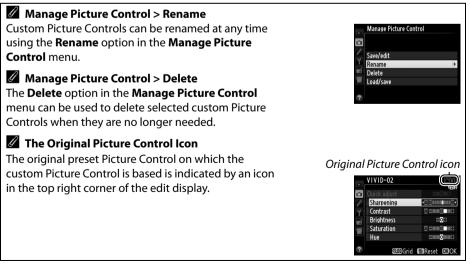
Custom Picture Control names can be up to nineteen characters long. Any characters after the nineteenth will be deleted.

# 7 Press (QUAL).

Press the <sup>€</sup> (**QUAL**) button to save changes and exit. The new Picture Control will appear in the Picture Control list.



♥ (QUAL) button

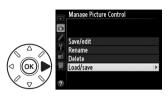


# **Sharing Custom Picture Controls**

Custom Picture Controls created using the Picture Control Utility available with ViewNX 2 or optional software such as Capture NX 2 can be copied to a memory card and loaded into the camera, or custom Picture Controls created with the camera can be copied to the memory card to be used in other D600 cameras and software and then deleted when no longer needed.

To copy custom Picture Controls to or from the memory card, or to delete custom Picture Controls from the memory card, highlight **Load/save** in the **Manage Picture Control** menu and press ►. The following options will be displayed:

- Copy to camera: Copy custom Picture Controls from the memory card to custom Picture Controls C-1 through C-9 on the camera and name them as desired.
- Delete from card: Delete selected custom Picture Controls from the memory card. The confirmation dialog shown at right will be displayed before a Picture Control is deleted; to delete the selected Picture Control, highlight Yes and press ®.
- **Copy to card**: Copy a custom Picture Control (C-1 through C-9) from the camera to a selected destination (1 through 99) on the memory card.





# Saving Custom Picture Controls

Up to 99 custom Picture Controls can be stored on the memory card at any one time. The memory card can only be used to store user-created custom Picture Controls. The preset Picture Controls supplied with the camera ( $\Box$  129) can not be copied to the memory card, renamed, or deleted.

The options in the **Manage Picture Control** menu apply only to the memory card in Slot 1. Custom Picture Controls can not be deleted from or copied to or from the card in Slot 2.

# Preserving Detail in Highlights and Shadows

# Active D-Lighting

(P, S, A, and M Modes Only)

Active D-Lighting preserves details in highlights and shadows, creating photographs with natural contrast. Use for high contrast scenes, for example when photographing brightly lit outdoor scenery through a door or window or taking pictures of shaded subjects on a sunny day. It is most effective when used with matrix metering ( $\Box$  109).



Active D-Lighting off



Active D-Lighting: 酯 A Auto

#### "Active D-Lighting" Versus "D-Lighting"

The **Active D-Lighting** option in the shooting menu adjusts exposure before shooting to optimize the dynamic range, while the **D-Lighting** option in the retouch menu optimizes dynamic range in images after shooting.

# **1** Select Active D-Lighting in the shooting menu.

To display the menus, press the MENU button. Highlight Active D-Lighting in the shooting menu and press ►.



MENU button

### **2** Choose an option.

Highlight the desired option and press <sup>(</sup>). If **昭 A Auto** is selected, the camera will automatically adjust Active D-Lighting according to shooting conditions (in mode **M**, however, **昭 A Auto** is equivalent to **昭 N Normal**).



#### Active D-Lighting

Active D-Lighting can not be used with movies. Noise (randomly-spaced bright pixels, fog, or lines) may appear in photographs taken with Active D-Lighting. Uneven shading may be visible with some subjects. Active D-Lighting can not be used at ISO sensitivities of Hi 0.3 or above.

#### 🖉 See Also

When **ADL bracketing** is selected for Custom Setting e6 (**Auto bracketing set**,  $\square$  241), the camera varies Active D-Lighting over a series of shots ( $\square$  158). For information on using the **Fn** button and main command dial to select an Active D-Lighting option, see page 242.

# <u>High Dynamic Range (HDR)</u>

Used with high-contrast subjects, High Dynamic Range (HDR) preserves details in highlights and shadows by combining two shots taken at different exposures. HDR is most effective when used with matrix metering ( $\Box$  109; with other metering methods and a non-CPU lens, an exposure differential of **Auto** is equivalent to about 2 EV). It can not be used to record NEF (RAW) images. Movie recording ( $\Box$  57), flash lighting, bracketing ( $\Box$  153), multiple exposure ( $\Box$  160), and time-lapse photography ( $\Box$  168) can not be used while HDR is in effect and a shutter speed of **bulk b** is not available.



First exposure (darker)



Second exposure (brighter)



Combined HDR image

Select HDR (high dynamic range).
 Press the MENU button to display the menus.
 Highlight HDR (high dynamic range) in the shooting menu and press ▶.



**MENU** button

100

#### 2 Select a mode. Highlight **HDR mode** and press **▶**.

Highlight one of the following and press .

- To take a series of HDR photographs, select 0NC On (series). HDR shooting will continue until you select Off for HDR mode.
- To take one HDR photograph, select On (single photo). Normal shooting will resume automatically after you have created a single HDR photograph.
- To exit without creating additional HDR photographs, select Off.

If On (series) or On (single photo) is selected, a mi icon will be displayed in the control panel.

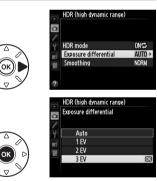
**3** Choose the exposure differential. To choose the difference in exposure between the two shots, highlight Exposure differential and press ►.

The options shown at right will be displayed. Highlight an option and press  $\infty$ . Choose higher values for high-contrast subjects, but note that choosing a value higher than required may not produce the desired results; if Auto is selected, the

camera will automatically adjust exposure to suit the scene.



20



WB /



HDR mode

HDR (high dynamic range)

OFF D





۵

4 Choose the amount of smoothing. To choose how much the boundaries between the two images are smoothed, highlight Smoothing and press ►.

The options shown at right will be displayed. Highlight an option and press . Higher values produce a smoother composite image. Uneven shading may be visible with some subjects.

# 5 Frame a photograph, focus, and shoot.

The camera takes two exposures when the shutter-release button is pressed all the way down. **Job** III will be displayed in the control panel and **Job Hdr** in the viewfinder while the images are combined; no photographs can be taken until recording is complete. Regardless of the option currently selected for release mode, only one photograph will be taken each time the shutter-release button is pressed.

If **On (series)** is selected, HDR will only turn off when **Off** is selected for **HDR mode**; if **On (single photo)** is selected, HDR turns off automatically after the photograph is taken. The **III** icon clears from the display when HDR shooting ends.

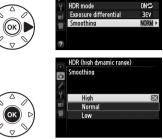
### Framing HDR Photographs

The edges of the image will be cropped out. The desired results may not be achieved if the camera or subject moves during shooting. Use of a tripod is recommended. Depending on the scene, shadows may appear around bright objects or halos may appear around dark objects; this effect can be reduced by adjusting the amount of smoothing.

#### Interval Timer Photography

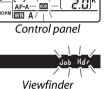
If **On (series)** is selected for **HDR mode** before interval timer shooting begins, the camera will continue to shoot HDR photographs at the selected interval (if **On (single photo)** is selected, interval timer shooting will end after a single shot).

#### .



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HDR (high dynamic range)



iob



# **Flash Photography**

# Using the Built-in Flash

The built-in flash has a Guide Number (GN) 12/39 (m/ft, ISO 100, 20 °C/68 °F) and provides coverage for the angle of view of 24 mm lens, or a 16 mm lens in DX format. It can be used not only when natural lighting is inadequate but to fill in shadows and backlit subjects or to add a catch light to the subject's eyes.

💵 Using the Built-in Flash: 🖀, 💈, 🤹, 🖏, 🖾, 💥, and 🦋 Modes

1 Choose a flash mode (🕮 144).

# **2** Take pictures.

The flash will pop up as required when the shutter-release button is pressed halfway, and fire when a photograph is taken. *If the flash does not pop up automatically, DO NOT attempt to raise it by hand. Failure to observe this precaution could damage the flash.* 



### ■ Using the Built-in Flash: P, S, A, M, and ¶ Modes

# **1** Raise the flash.

Press the 🕻 (🔂) button to raise the flash.

2 Choose a flash mode (P, S, A, and M modes only; 🕮 144).



# **3** Take pictures.

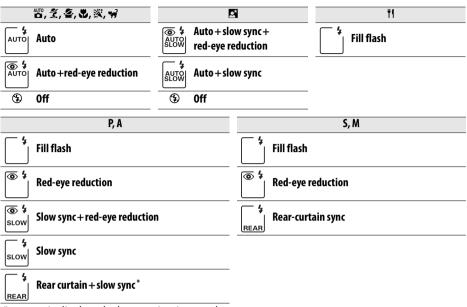
The flash will fire whenever a picture is taken.

#### 🖉 Metering

Select matrix or center-weighted metering to activate i-TTL balanced fill-flash for digital SLR. Standard i-TTL flash for digital SLR is activated automatically when spot metering is selected.

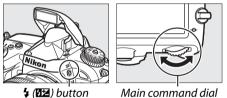
# Flash Mode

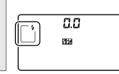
The flash modes available vary with shooting mode:



\* **SLOW** is displayed when setting is complete.

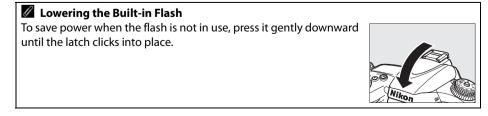
To choose a flash mode, press the **4** (**12**) button and rotate the main command dial until the desired setting is displayed in the control panel.





nd dial Co

Control panel



#### 🖉 Default Flash Modes

Default flash modes are shown below.

Mode	Default	Mode	Default
🖑 , Ž, Ž, V, V,	Auto	<u>.</u> *	Auto+slow sync
×	Auto+red-eye reduction	Ϋ1, Ρ, S, A, M	Fill flash

#### 🖉 Flash Modes

The flash modes listed on the previous page may combine one or more of the following settings, as shown by the flash mode icon:

- **AUTO (auto flash)**: When lighting is poor or subject is back lit, flash pops up automatically when shutter-release button is pressed halfway and fires as required.
- (red-eye reduction): Use for portraits. Red-eye reduction lamp lights before flash fires, reducing "red-eye."
- (for the second secon
- **SLOW** (slow sync): Shutter speed slows automatically to capture background lighting at night or under low light. Use to include background lighting in portraits.
- **REAR (rear-curtain sync)**: Flash fires just before shutter closes, creating a stream of light behind moving light sources (below at right). If this icon is not displayed, flash will fire as the shutter opens (front-curtain sync; the effect this produces with moving light sources is shown below at left).



Front-curtain sync



Rear-curtain sync

#### 🚺 The Built-in Flash

Use with lenses with focal lengths in FX format of 24–300 mm (16–300 mm in DX format;  $\Box$  288). Remove lens hoods to prevent shadows. The flash has a minimum range of 0.6 m (2 ft) and can not be used in the macro range of zoom lenses with a macro function. i-TTL flash control can be used at ISO sensitivities between 100 and 6400. At values over 6400, the desired results may not be achieved at some ranges or aperture settings.

If the flash fires in continuous release mode ( $\square$  83), only one picture will be taken each time the shutter-release button is pressed.

The shutter release may be briefly disabled to protect the flash after it has been used for several consecutive shots. The flash can be used again after a short pause.

#### Shutter Speeds Available with the Built-in Flash

The following shutter speeds are available with the built-in flash.

Mode	Shutter speed	Mode	Shutter speed
龄, P*, A*, Ž, 🗳, 💥, 🦋	<sup>1</sup> /200– <sup>1</sup> /60 S	<b>S</b> *	<sup>1</sup> / <sub>200</sub> -30 s
\$, 11	<sup>1</sup> /200– <sup>1</sup> /125 <b>S</b>	M *	<sup>1</sup> /200– <b>30 s, bu L b</b>
<b>5</b>	1/200-1 s		

\* Speeds as fast as <sup>1</sup>/<sub>4,000</sub> s are available with optional SB-910, SB-900, SB-800, SB-700, and SB-600 flash units when 1/250 s (Auto FP) or 1/200 s (Auto FP) is selected for Custom Setting e1 (Flash sync speed, □ 234). When 1/250 s (Auto FP) is selected, shutter speeds as fast as <sup>1</sup>/<sub>250</sub> s are available with the built-in flash.

#### Flash Control Mode

The camera supports the following i-TTL flash control modes:

- i-TTL balanced fill-flash for digital SLR: Flash emits series of nearly invisible preflashes (monitor preflashes) immediately before main flash. Preflashes reflected from objects in all areas of frame are picked up by 2,016-pixel RGB sensor and are analyzed in combination with range information from matrix metering system to adjust flash output for natural balance between main subject and ambient background lighting. If type G or D lens is used, distance information is included when calculating flash output. Precision of calculation can be increased for non-CPU lenses by providing lens data (focal length and maximum aperture; see III 172). Not available when spot metering is used.
- Standard i-TTL flash for digital SLR: Flash output adjusted to bring lighting in frame to standard level; brightness of background is not taken into account. Recommended for shots in which main subject is emphasized at expense of background details, or when exposure compensation is used. Standard i-TTL flash for digital SLR is activated automatically when spot metering is selected.

The flash control mode for the built-in flash can be selected using Custom Setting e3 (**Flash cntrl for built-in flash**,  $\square$  236). The information display shows the flash control mode for the built-in flash as follows:

	Flash sync	Auto FP (🕮 234)
i-TTL	ф Ттг	_
Manual	\$M	_
Repeating flash	\$ RPT	_
Commander mode	¢ CMD	CMD

#### 🖉 Aperture, Sensitivity, and Flash Range

Flash range varies with	sensitivity (ISO	equivalency) a	and anerture
i lasti latige valles with	Sensitivity (ISO	equivalency) a	and aperture.

	A	perture a	at ISO equ	uivalent	Rai	nge		
100	200	400	800	1600	3200	6400	m	ft
1.4	2	2.8	4	5.6	8	11	0.7–8.5	2ft 4in.–27ft 11in.
2	2.8	4	5.6	8	11	16	0.6–6.0	2ft–19ft 8in.
2.8	4	5.6	8	11	16	22	0.6-4.2	2ft–13ft 9in.
4	5.6	8	11	16	22	32	0.6–3.0	2ft–9ft 10in.
5.6	8	11	16	22	32	—	0.6–2.1	2ft–6ft 11in.
8	11	16	22	32	—	—	0.6–1.5	2ft–4ft 11in.
11	16	22	32	—	—	—	0.6–1.1	2ft–3ft 7in.
16	22	32	—	—	—	—	0.6–0.8	2ft–2ft 7in.

The built-in flash has a minimum range of 0.6 m (2 ft).

In mode **P**, the maximum aperture (minimum f-number) is limited according to ISO sensitivity, as shown below:

Maximum aperture at ISO equivalent of:							
100         200         400         800         1600         3200         6400							
2.8	3.5	4	5	5.6	7.1	8	

If the maximum aperture of the lens is smaller than given above, the maximum value for aperture will be the maximum aperture of the lens.

#### 🖉 See Also

See page 149 for information on locking flash value (FV) for a metered subject before recomposing a photograph.

For information on auto FP high-speed sync and choosing a flash sync speed, see Custom Setting e1 (**Flash sync speed**, <sup>(1)</sup> 234). For information on choosing the slowest shutter speed available when using the flash, see Custom Setting e2 (**Flash shutter speed**, <sup>(1)</sup> 235). For information on flash control and using the built-in flash in commander mode, see Custom Setting e3 (**Flash chtrl for built-in flash**, <sup>(1)</sup> 236).

See page 292 for information on using optional flash units.

4

# **Flash Compensation**

Flash compensation is used to alter flash output by from -3EV to +1EV in increments of 1/3 EV, changing the brightness of the main subject relative to the background. Flash output can be increased to make the main subject appear brighter, or reduced to prevent unwanted highlights or reflections.

Press the **4** (**112**) button and rotate the sub-command dial until the desired value is displayed in the control panel. In general, choose positive values to make the main subject brighter, negative values to make it darker.

At values other than  $\pm 0.0$ , a **52** icon will be displayed in the control panel and viewfinder after you release the **4** (**1**) button. The current value for flash compensation can be confirmed by pressing the 4 (22) button.

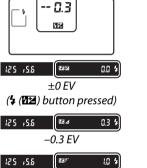
Normal flash output can be restored by setting flash compensation to  $\pm 0.0$ . Flash compensation is not reset when the camera is turned off.

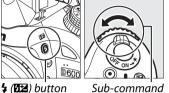
#### **Optional Flash Units**

Flash compensation is also available with optional SB-910, SB-900, SB-800, SB-700, SB-600, SB-400, and SB-R200 flash units. The SB-910, SB-900, SB-800, SB-700, and SB-600 also allow flash compensation to be set using the controls on the flash unit; the value selected with the flash unit is added to the value selected with the camera.

#### See Also

For information on choosing the size of the increments available for flash compensation, see Custom Setting b2 (EV steps for exposure cntrl, 🕮 224). For information on choosing how flash and exposure compensation combine, see Custom Setting e4 (Exposure comp. for flash, 🕮 240). For information on automatically varying flash level over a series of shots, see page 153.







dial

# FV Lock

This feature is used to lock flash output, allowing photographs to be recomposed without changing the flash level and ensuring that flash output is appropriate to the subject even when the subject is not positioned in the center of the frame. Flash output is adjusted automatically for any changes in ISO sensitivity and aperture.

To use FV lock:





# **2** Raise the flash.

In **P**, **S**, **A**, **M**, and **1** modes, the flash can be raised by pressing the **\$** (团团) button. In 習, 乏, 筌, 乙, 匹, 惑, and **%** modes, the flash will pop up automatically when required.



<sup>🕻 (🖽)</sup> button

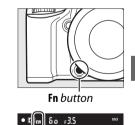
# **3** Focus.

Position the subject in the center of the frame and press the shutter-release button halfway to focus.



### **4** Lock flash level.

After confirming that the flash ready indicator (**\$**) is displayed in the viewfinder, press the **Fn** button. The flash will emit a monitor preflash to determine the appropriate flash level. Flash output will be locked at this level and FV lock icons (**P**1) will appear in the viewfinder.





### **5** Recompose the photograph.



### **6** Take the photograph.

Press the shutter-release button the rest of the way down to shoot. If desired, additional pictures can be taken without releasing FV lock.

# 7 Release FV lock.

Press the **Fn** button to release FV lock. Confirm that the FV lock icon (**ED**) is no longer displayed in the viewfinder.

#### V Using FV Lock with the Built-in Flash

FV lock is only available with the built-in flash when **TTL** is selected for Custom Setting e3 (**Flash cntrl for built-in flash**,  $\square$  236).

#### Using FV Lock with Optional Flash Units

FV lock is also available with optional flash units in TTL and (where supported) monitor preflash AA and monitor pre-flash A flash control modes. Note that when commander mode is selected for Custom Setting e3 (**Flash cntrl for built-in flash**,  $\square$  236), you will need to set the flash control mode for the master or at least one remote group to TTL or AA.

#### 🖉 Metering

The metering areas for FV lock when using optional flash unit are as follows:

Flash unit	Flash mode	Metered area
Stand-alone flash unit	i-TTL	5-mm circle in center of frame
Stand-alone hash unit	AA	Area metered by flash exposure meter
Used with other flash units	i-TTL	Entire frame
(Advanced Wireless Lighting)	AA	Area metered by flash exposure meter
(Advanced Wileless Lighting)	A (master flash)	

#### 🖉 See Also

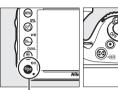
For information on using the depth-of-field preview or 結 **AE-L/AF-L** button for FV lock, see Custom Setting f3 (**Assign preview button**, 印 244) or Custom Setting f4 (**Assign AE-L/AF-L button**, 印 244).

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# **Other Shooting Options**

# Two-Button Reset: Restoring Default Settings

The camera settings listed below can be restored to default values by holding the **QE** (**ISO**) and **E** buttons down together for more than two seconds (these buttons are marked by a green dot). The control panel turns off briefly while settings are reset.



☑ button

ବ୍≊ (ISO) button

Option	Default	ш
Image quality	JPEG normal	93
Image size	Large	95
White balance	Auto > Normal	115
Fine tuning	A-B: 0, G-M: 0	117
HDR (high dynamic range)	Off <sup>1</sup>	139
ISO sensitivity settings		
ISO sensitivity		
Auto and scene modes	AUTO	105
P, S, A, M	100	105
Auto ISO sensitivity control	Off	107
Interval timer shooting	Off <sup>2</sup>	164
Autofocus (viewfinder)		
Autofocus mode	AF-A	97
AF-area mode		
\$7, ♀, ▮1, 益, Ⅲ, ◙	Single-point AF	
ै, <b>भ</b> रे	39-point dynamic-area AF	99
習, ③, Ž, 画, 奎, ⊠, , 淡, 論, 黨, 南, ♀, ♀, P, S, A, M	Auto-area AF	

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Option	Default	m
Autofocus (live view/movie)		
Autofocus mode	AF-S	51
AF-area mode		<u>.</u>
💐, 🔜, 🐝, 🖾, 💷, №, P, S, A, M	Wide-area AF	
S., T1	Normal-area AF	52
🕾, ⑤, 龙, 画, 奎, 图, 淡, 訥, 當, 富, 4, 辛, 🗣	Face-priority AF	
Focus point <sup>3</sup>	Center	101
Metering	Matrix	109
AE lock hold	Off	102, 110
Bracketing	Off	153
Picture Control settings <sup>4</sup>	Unmodified	129
Flash compensation	Off	148
Exposure compensation	Off	112
Exposure delay mode	Off	231
Flash mode		<u>.</u>

ato, 乏, 圣, <b>垠</b> , ¥	Auto		
×	Auto+red-eye reduction	144	
	Auto+slow sync	144	
τι, P, S, A, M	Fill flash		
FV lock	Off	149	
Multiple exposure	Off <sup>5</sup>	160	
Flexible program	Off	75	
+ NEF (RAW)	Off	242	

1 Exposure differential and smoothing are not reset.

2 If interval timer shooting is currently in progress, shooting will end. Starting time, shooting interval, and number of intervals and shots are not reset.

3 Focus point not displayed if auto-area AF is selected for AF-area mode.

4 Current Picture Control only.

5 If multiple exposure is currently in progress, shooting will end and multiple exposure will be created from exposures recorded to that point. Gain and number of shots are not reset.

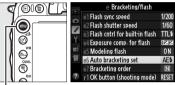
# Bracketing

Bracketing automatically varies exposure, flash level, **A**ctive **D**-Lighting (ADL), or white balance slightly with each shot, "bracketing" the current value. Choose in situations in which it is difficult to set exposure, flash level (i-TTL and, where supported, auto aperture flash control modes only; see pages 146, 236, and 294), white balance, or Active D-Lighting and there is not time to check results and adjust settings with each shot, or to experiment with different settings for the same subject.

#### **Exposure and Flash Bracketing**

To vary exposure and/or flash level over a series of photographs:

Select flash or exposure bracketing for Custom Setting e6 (Auto bracketing set) in the Custom Settings menu. To display the menus, press the MENU button. Select Custom Setting e6 (Auto bracketing set) in the Custom Settings menu, highlight an option, and press <sup>(R)</sup>. Choose AE & flash to vary both exposure and flash level, AE only to vary only exposure, or Flash only to vary only flash level.



MENU button



## **2** Choose the number of shots.

Pressing the **BKT** button, rotate the main command dial to choose the number of shots in the bracketing sequence and the order in which they will be taken.





**BKT** button

Main command dial



- 405-2

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- Number of shots - Bracketing progress indicator

Control panel

No. of shots	Bracketing progress indicator	Bracketing order
35	- <b>{B&gt;</b> ÷	Normal exposure, underexposure, overexposure
+ 2 5	∎⊳+	Normal exposure, overexposure
28	-48	Normal exposure, underexposure

**BKT** will be displayed in the viewfinder (see right); the control panel will show **III**.



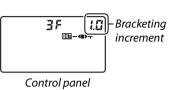
## **3** Select a bracketing increment.

Pressing the **BKT** button and rotate the sub-command dial to choose a bracketing increment.





Sub-command dial



### 🖉 See Also

For information on choosing the size of the increment, see Custom Setting b2 (**EV** steps for exposure cntrl,  $\square$  224). For information on choosing the order in which bracketing is performed, see Custom Setting e7 (**Bracketing order**,  $\square$  241).

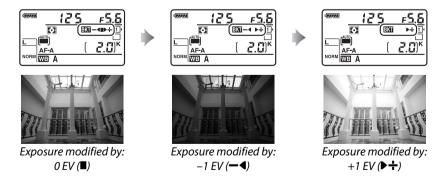
### **4** Frame a photograph, focus, and shoot.

The camera will vary exposure and/or flash level shot-byshot according to the bracketing program selected. Modifications to exposure are added to those made with



exposure compensation ( $\square$  112), making it possible to achieve exposure compensation values of more than 5 EV.

While bracketing is in effect, a bracketing progress indicator will be displayed in the control panel. A segment will disappear from the indicator after each shot: the  $\blacksquare$  segment when the unmodified shot is taken, the  $-\P$  segment when the shot with the negative increment is taken, and the  $\triangleright+$  segment when the shot with the positive increment is taken.



To cancel bracketing, press the **BKT** button and rotate the main command dial until the bracketing progress indicator and **SSM** icon are no longer displayed.

#### Exposure and Flash Bracketing

In continuous low speed and continuous high speed release modes, shooting will pause after the number of shots specified in the bracketing program have been taken. Shooting will resume the next time the shutter-release button is pressed. In self-timer mode, the camera will take the number of shots selected in Step 2 on page 153 each time the shutter-release button is pressed, regardless of the option selected for Custom Setting c3 (**Self-timer**) > **Number of shots** ( $\square$  227); the interval between shots is however controlled by Custom Setting c3 (**Self-timer**) > **Interval between shots**. In other modes, one shot will be taken each time the shutter-release button is pressed.

If the memory card fills before all shots in the sequence have been taken, shooting can be resumed from the next shot in the sequence after the memory card has been replaced or shots have been deleted to make room on the memory card. If the camera is turned off before all shots in the sequence have been taken, bracketing will resume from the next shot in the sequence when the camera is turned on.

#### Exposure Bracketing

The camera modifies exposure by varying shutter speed and aperture (mode P), aperture (mode S), or shutter speed (modes A and M). If On is selected for ISO sensitivity settings > Auto ISO sensitivity control ( $\square$  107) in modes P, S, and A, the camera will automatically vary ISO sensitivity for optimum exposure when the limits of the camera exposure system are exceeded; in mode M, the camera will first use auto ISO sensitivity control to bring exposure as close as possible to the optimum and then bracket this exposure by varying shutter speed.

#### **White Balance Bracketing**

The camera creates multiple copies of each photograph, each with a different white balance. For more information on white balance, see page 115.

1	Select white balance bracketing.
	Choose WB bracketing for Custom Setting e6 Auto
	bracketing set.

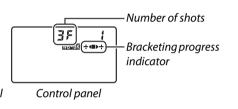
1	e6 A	uto bracketing set	
	AE\$	AE & flash	
Ŷ	AE	AE only	
- 1	\$	Flash only	
	WB	WB bracketing	OK
	瞄	ADL bracketing	
?			

### **2** Choose the number of shots.

Pressing the **BKT** button, rotate the main command dial to choose the number of shots in the bracketing sequence and the order in which they will be taken.







BKT button

Main command dial

**BKT** will be displayed in the viewfinder (see right); the control panel will show **mean**.

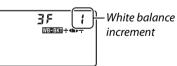


## **3** Select a white balance increment.

Pressing the **BKT** button, rotate the sub-command dial to choose from increments of 1 (5 mired;  $\Box$  119), 2 (10 mired), or 3 (15 mired). The **B** value indicates the amount of blue, the **A** value the amount of amber ( $\Box$  117).







BKT button

Sub-command dial

Control panel

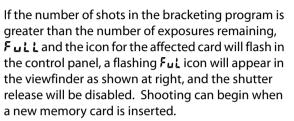
The bracketing programs with an increment of 1 are listed below.

Control panel		Bracketing progress indicator	No. of shots	Increment	Bracketing order
62F	1	÷∢∎	2	1B	0/1B
82F	1	∎⊳÷	2	1A	0/1A
35	1	+ <b>40</b> +	3	1A, 1B	0/1A/1B

balance fine-tuning.

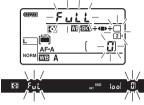
white balance adjustment made with white

4 Frame a photograph, focus, and shoot.



Each shot will be processed to create the number of





To cancel bracketing, press the **BKT** button and rotate the main command dial until the bracketing progress indicator and **WBBW** icon are no longer displayed.

#### White Balance Bracketing

White balance bracketing is not available at an image quality of NEF (RAW). Selecting **NEF** (RAW), NEF (RAW)+JPEG fine, NEF (RAW)+JPEG normal, or NEF (RAW)+JPEG basic cancels white balance bracketing.

White balance bracketing affects only color temperature (the amber-blue axis in the white balance fine-tuning display,  $\square$  117). No adjustments are made on the green-magenta axis.

In self-timer mode ( $\square$  85), the number of copies specified in the white-balance program will be created each time the shutter is released, regardless of the option selected for Custom Setting c3 (**Self-timer**) > **Number of shots** ( $\square$  227).

If the camera is turned off while the memory card access lamp is lit, the camera will power off only after all photographs in the sequence have been recorded.

#### ADL Bracketina

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The camera varies Active D-Lighting over a series of exposures. For more information on Active D-Lighting, see page 137.

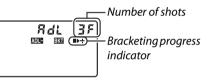


### **2** Choose the number of shots.

Pressing the **BKT** button, rotate the main command dial to choose the number of shots in the bracketing sequence. Choose two shots to take one photograph with Active D-Lighting off and another at the value currently selected for Active **D-Lighting** in the shooting menu (if Active D-Lighting is off, the second shot will be taken with Active D-Lighting set to **Auto**). Choose three shots to take a series of photographs with Active D-Lighting set to **Off**, **Normal**, and **High**.







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Main command dial

Control panel

BKT will be displayed in the viewfinder (see right); the control panel will show MILLING.

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#### 3 Frame a photograph, focus, and shoot. The camera will vary Active D-Lighting shot-by-shot according to the bracketing program selected. While bracketing is in effect, a bracketing progress indicator will be displayed in the control panel. A segment will disappear from the indicator after each shot: the ■ segment when the first shot is taken, the ▶ segment when the second shot is taken, and the + segment when the third shot (if applicable) is taken.





To cancel bracketing, press the **BKT** button and rotate the main command dial until the bracketing progress indicator and **DENSIGN** icon are no longer displayed.

#### ADL Bracketing

In continuous low speed and continuous high speed release modes, shooting will pause after the number of shots specified in the bracketing program have been taken. Shooting will resume the next time the shutter-release button is pressed. In self-timer mode, the camera will take the number of shots selected in Step 2 on page 158 each time the shutter-release button is pressed, regardless of the option selected for Custom Setting c3 (**Self-timer**) > **Interval between shots**. In other modes, one shot will be taken each time the shutter-release button is pressed.

If the memory card fills before all shots in the sequence have been taken, shooting can be resumed from the next shot in the sequence after the memory card has been replaced or shots have been deleted to make room on the memory card. If the camera is turned off before all shots in the sequence have been taken, bracketing will resume from the next shot in the sequence when the camera is turned on.

# **Multiple Exposure**

Follow the steps below to record a series of two or three exposures in a single photograph. Multiple exposures can make use of RAW data from the camera image sensor to produce colors noticeably superior to those in software-generated photographic overlays.

#### **II** Creating a Multiple Exposure

Multiple exposures can not be recorded in live view. Exit live view before proceeding. Note that at default settings, shooting will end and a multiple exposure will be recorded automatically if no operations are performed for 30 s.

#### Extended Recording Times

For an interval between exposures of more than 30 s, extend the meter-off delay using Custom Setting c2 (**Standby timer**,  $\Box$  227). The maximum interval between exposures is 30 s longer than the option selected for Custom Setting c2. If the monitor has turned off during playback or menu operations, shooting will end 30 s after the exposure meters turn off and a multiple exposure will be created from the exposures that have been recorded to that point.

# **1** Select **Multiple exposure** in the shooting menu.

Press the MENU button to display the menus. Highlight **Multiple exposure** in the shooting menu and press ►.



**MENU** button

# Highlight Multiple exposure mode and press **>**.

2 Select a mode.

Highlight one of the following and press .

- To take a series of multiple exposures, select 0NC On (series). Multiple exposure shooting will continue until you select Off for Multiple exposure mode.
- To take one multiple exposure, select On (single photo). Normal shooting will resume automatically after you have created a single multiple exposure.
- To exit without creating additional multiple exposures, select Off.

#### If On (series) or On (single photo) is

selected, a icon will be displayed in the control panel.

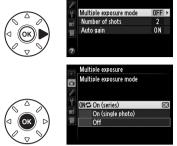
**3** Choose the number of shots. Highlight **Number of shots** and press ►.

Press  $\blacktriangle$  or  $\nabla$  to choose the number of exposures that will be combined to form a single photograph and press ®.

#### ..... 125 г**5**.8 0

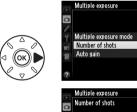
WB





Multiple exposure

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The following options will be displayed. Highlight an option and press  $\circledast$ .

- On: Gain is adjusted according to number of exposures actually recorded (gain for each exposure is set to <sup>1</sup>/<sub>2</sub> for 2 exposures, <sup>1</sup>/<sub>3</sub> for 3 exposures, etc.).
- **Off**: Gain is not adjusted when recording multiple exposure. Recommended if background is dark.

# 5 Frame a photograph, focus, and shoot.

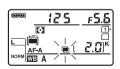
In continuous high-speed and continuous low-speed release modes ( $\square$  83), the camera records all exposures in a single burst. If **On** 

(series) is selected, the camera will continue to record multiple exposures while the shutter-release button is pressed; if **On (single photo)** is selected, multiple exposure shooting will end after the first photograph. In self-timer mode, the camera will automatically record the number of exposures selected in Step 3 on page 161, regardless of the option selected for Custom Setting c3 (**Self-timer**) > **Number of shots** ( $\square$  227); the interval between shots is however controlled by Custom Setting c3 (**Self-timer**) > **Interval between shots**. In other release modes, one photograph will be taken each time the shutter-release button is pressed; continue shooting until all exposures have been recorded (for information on interrupting a multiple exposure before all photographs are recorded, see page 163).

The icon will flash until shooting ends. If On (series) is selected, multiple exposure shooting will only end when Off is selected for multiple exposure mode; if On (single photo) is selected, multiple exposure

shooting ends automatically when the multiple exposure is complete. The icon clears from the display when multiple exposure shooting ends.







Multiple exposure

Number of shots

Auto gain

Multiple exposure mode

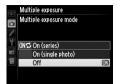
ONC.

2 0N

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#### II Interrupting Multiple Exposures

To interrupt a multiple exposure before the specified number of exposures have been taken, select **Off** for multiple exposure mode. If shooting ends before the specified number of exposures have been taken, a multiple exposure will be created from the exposures that have been recorded to that point. If **Auto gain** is on, gain will be adjusted to reflect the number of



exposures actually recorded. Note that shooting will end automatically if:

- A two-button reset is performed (D 151)
- The camera is turned off
- The battery is exhausted
- Pictures are deleted

#### Multiple Exposures

Do not remove or replace the memory card while recording a multiple exposure.

Multiple exposures can not be recorded in live view. Taking photographs in live view resets **Multiple exposure mode** to **Off**.

Noise (randomly-spaced bright pixels, fog, or lines) may appear in photographs taken with **Off** selected for auto gain (D 162).

The information listed in the playback photo information display (including metering, exposure, shooting mode, focal length, date of recording and camera orientation) is for the first shot in the multiple exposure.

#### Interval Timer Photography

If interval timer photography is activated before the first exposure is taken, the camera will record exposures at the selected interval until the number of exposures specified in the multiple exposure menu have been taken (the number of shots listed in the interval timer shooting menu is ignored). These exposures will then be recorded as a single photograph and interval timer shooting will end (if **On (single photo)** is selected for multiple exposure mode, multiple exposure shooting will also end automatically).

#### Other Settings

While a multiple exposure is being shot, memory cards can not be formatted and some menu items are grayed out and can not be changed.

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# **Interval Timer Photography**

The camera is equipped to take photographs automatically at preset intervals.

#### Before Shooting

Do not select self-timer ( $\circlearrowright$ ), remote ( $\blacksquare$ ), or **Mup** release mode when using the interval timer. Before beginning interval timer photography, take a test shot at current settings and view the results in the monitor.

Before choosing a starting time, select **Time zone and date** in the setup menu and make sure that the camera clock is set to the correct time and date ( $\square$  253).

Use of a tripod is recommended. Mount the camera on a tripod before shooting begins. To ensure that shooting is not interrupted, be sure the camera EN-EL15 battery is fully charged. If in doubt, charge the battery before use or use an EH-5b AC adapter and EP-5B power connector (available separately).

# **1** Select **Interval timer shooting** in the shooting menu.

Press the MENU button to display the menus. Highlight Interval timer shooting in the shooting menu and press ►.



**MENU** button

### **2** Choose a starting time.

Chose from the following starting triggers.

- To start shooting immediately, highlight Now and press ▶. Shooting begins about 3 s after settings are completed; proceed to Step 3.
- To choose a starting time, highlight Start time and press ▶ to display the start time options shown at right. Press ◄ or ▶ to highlight hours or minutes and press ▲ or ▼ to change. Press ▶ to continue.

### **3** Choose the interval.

Press  $\blacktriangleleft$  or  $\blacktriangleright$  to highlight hours, minutes, or seconds; press  $\blacktriangle$  or  $\blacktriangledown$  to change. Choose an interval longer than the time needed to take the number of shots selected in Step 4. If the interval is too short, the number of photos 
 Interval timer shooting

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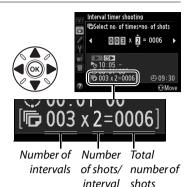
taken may be less than the total listed in Step 4 (the number of intervals multiplied by the number of shots per interval). Press ► to continue.





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4 Choose the number of intervals and number of shots per interval. Press ◄ or ▶ to highlight number of intervals or number of shots; press ▲ or ▼ to change. Press ▶ to continue.



# **5** Start shooting.

Highlight **On** and press (to return to the shooting menu without starting the interval timer, highlight **Off** and press (\*). The first series of shots will be taken at the specified starting time, or after about 3 s if **Now** was



selected for **Choose start time** in Step 2. Shooting will continue at the selected interval until all shots have been taken. Note that because the shutter speed, frame rate, and time needed to record images may vary from one interval to the next, the time between the end of one interval and the beginning of the next may vary. If shooting can not proceed at current settings (for example, if a shutter speed of **bulk b** is currently selected in manual exposure mode or the start time is in less than a minute), a warning will be displayed in the monitor.

#### V Out of Memory

If the memory card is full, the interval timer will remain active but no pictures will be taken. Resume shooting (D 167) after deleting some pictures or turning the camera off and inserting another memory card.

#### Cover the Viewfinder

To prevent light entering via the viewfinder interfering with exposure, remove the rubber eyecup and cover the viewfinder with the supplied DK-5 eyepiece cap (CD 86).

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#### Interval Timer Photography

Interval timer photography can not be combined with long time-exposures (bulb photography,  $\Box$  79) or live view ( $\Box$  49) or time-lapse ( $\Box$  168) photography and is not available in movie live view ( $\Box$  57) or when **Record movies** is selected for Custom Setting g4 (**Assign shutter button**,  $\Box$  248).

### 🖉 Release Mode

Regardless of the release mode selected, the camera will take the specified number of shots at each interval. In **C**<sub>H</sub> (continuous high speed) mode, photographs will be taken at a rate of up to 5.5 shots per second. In **S** (single frame) and **C**<sub>L</sub> (continuous low-speed) modes, photographs will be taken at the rate chosen for Custom Setting d5 (**CL mode shooting speed**,  $\Box$  229); in mode **Q**, camera noise will be reduced.

### 🖉 Bracketing

Adjust bracketing settings before starting interval timer photography. If exposure, flash, or ADL bracketing is active while interval timer photography is in effect, the camera will take the number of shots in the bracketing program at each interval, regardless of the number of shots specified in the interval timer menu. If white balance bracketing is active while interval timer photography is in effect, the camera will take one shot at each interval and process it to create the number of copies specified in the bracketing program.

### During Shooting

During interval timer photography, the **mm** icon in the control panel will flash. Immediately before the next shooting interval begins, the shutter speed display will show the number of intervals remaining, and the aperture display will show the number of shots remaining in the current interval. At other times, the number of intervals

remaining and the number of shots in each interval can be viewed by pressing the shutterrelease button halfway (once the button is released, the shutter speed and aperture will be displayed until the standby timer expires).

To view current interval timer settings, select **Interval timer shooting** between shots. While interval timer photography is in progress, the interval timer menu will show the starting time, the shooting interval, and the number of intervals and shots remaining. None of these items can be changed while interval timer photography is in progress.

Pictures can be played back and shooting and menu settings can be adjusted freely while interval timer photography is in progress. The monitor will turn off automatically about four seconds before each interval.



#### **II** Pausing Interval Timer Photography

Interval timer photography can be paused by:

- Pressing the 🐵 button between intervals
- Highlighting Start > Pause in the interval timer menu and pressing 🐵
- Turning the camera off and then on again (if desired, the memory card can be replaced while the camera is off)
- Selecting self-timer (☉), remote (■), or Mup release mode

To resume shooting:

### **1** Choose a new starting time.

Choose a new starting time as described on page 164.



val timer shooting

A 09:30

# **2** Resume shooting.

Highlight **Restart** and press **(B)**. Note that if interval timer photography was paused during shooting, any shots remaining in the current interval will be canceled.

#### II Interrupting Interval Timer Photography

Interval timer shooting will end automatically if the battery is exhausted. Interval timer photography can also be ended by:

- Selecting Start > Off in the interval timer menu
- Performing a two button reset (CD 151)
- Selecting Reset shooting menu in the shooting menu (C2 214)
- Changing bracketing settings (
  153)
- Terminating HDR (
  139) or multiple exposure shooting (
  163)

Normal shooting will resume when interval timer photography ends.

#### No Photograph

The camera will skip the current interval if any of the following situations persist for eight seconds or more after the interval was due to start: the photograph or photographs for the previous interval have yet to be taken, the memory buffer is full, or the camera is unable to focus in **AF-S** or when single-servo AF is selected in **AF-A** (note that the camera focuses again before each shot). Shooting will resume with the next interval.

# **Time-Lapse Photography**

The camera automatically takes photos at selected intervals to create a silent timelapse movie using the options currently selected for **Movie settings** in the shooting menu (<sup>[]</sup> 65).

#### Before Shooting

Before beginning time-lapse photography, take a test shot at current settings (framing the photo in the viewfinder for an accurate exposure preview) and view the results in the monitor. To record changes in brightness, choose manual exposure ( $\Box$  78); for consistent coloration, choose a white balance setting other than auto ( $\Box$  115). We recommend that you briefly switch to movie live view and check the current image area crop in the monitor ( $\Box$  57); note, however, that time-lapse photography is not available in live view.

Use of a tripod is recommended. Mount the camera on a tripod before shooting begins. To ensure that shooting is not interrupted, use an optional EH-5b AC adapter and EP-5B power connector or a fully-charged EN-EL15 battery.

# 1 Select Time-lapse photography in the shooting menu.

Press the MENU button to display the menus. Highlight **Time-lapse photography** in the shooting menu and press ►.



**MENU** button

### **2** Press ►.

Press ► to proceed to Step 3 and choose an interval and shooting time. To record a time-lapse movie using the default interval of 5 seconds and shooting time of 25 minutes, proceed to step 5.





ime-lapse photography

# **3** Choose the interval.

Press  $\blacktriangleleft$  or  $\triangleright$  to highlight minutes or seconds; press  $\blacktriangle$  or  $\lor$  to change. Choose an interval longer than the slowest anticipated shutter speed. Press  $\triangleright$  to continue.



đ

# **4** Select the shooting time.

Press  $\blacktriangleleft$  or  $\blacktriangleright$  to highlight hours or minutes; press  $\blacktriangle$  or  $\blacktriangledown$  to change. The maximum shooting time is 7 hours and 59 minutes. Press  $\triangleright$  to continue.



### **5** Start shooting.

Time-lapse photography starts after 3 s. The



camera takes photographs at the interval selected in Step 3 for the time selected in Step 4. The memory card access lamp lights while each shot is recorded; note that because shutter speed and the time needed to record the image to the memory card may vary from shot to shot, the interval between a shot being recorded and the start of the next shot may vary. Shooting will not begin if a time-lapse movie can not be recorded at current settings (for example, if the memory card is full, the interval or shooting time is zero, the interval is longer than the shooting time, or remote (**m**) release mode is selected).

When complete, time-lapse movies are recorded to the memory card selected for **Movie settings** > **Destination** ( $\square$  65).

đ

#### Time-Lapse Photography

Time-lapse is not available in live view ( $\Box$  49, 57), at a shutter speed of **b**<sub>1</sub> **L b** ( $\Box$  79), when bracketing ( $\Box$  153), High Dynamic Range (HDR,  $\Box$  139), multiple exposure ( $\Box$  160), or interval timer photography ( $\Box$  164) is active.

#### 🖉 Release Mode

Regardless of the release mode selected, the camera will take one shot at each interval. The self-timer can not be used. Time-lapse photography is not available in remote (
) release mode.

#### Calculating the Length of the Final Movie

The total number of frames in the final movie can be approximated by dividing the shooting time by the interval and rounding up. The length of the final movie can then be calculated by diving the number of shots by the frame rate selected for **Movie settings** > **Frame size/frame rate**. A 48 frame movie recorded at **1920** × **1080**; **24p**, for example, will be about two seconds long. The maximum length for movies recorded using time-lapse photography is 20 minutes.

#### Cover the Viewfinder

To prevent light entering via the viewfinder interfering with exposure, remove the rubber eyecup and cover the viewfinder with the supplied DK-5 eyepiece cap (C 86).

#### During Shooting

During time-lapse photography, a **main** icon will flash and the timelapse recording indicator will be displayed in the control panel. The time remaining (in hours and minutes) appears in the shutter-speed display immediately before each frame is recorded. At other times, the time remaining can be viewed by pressing the shutter-release

button halfway. Regardless of the option selected for Custom Setting c2 (**Standby timer**, 227), the standby timer will not expire during shooting.

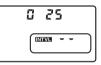
To view current time-lapse photography settings, press the **MENU** button between shots. While time-lapse photography is in progress, the time-lapse photography menu will show the interval and the time remaining. These settings can not be changed while time-lapse photography is in progress, nor can pictures be played back or other menu settings adjusted.

Length recorded/ maximum length



Memory card indicator

Frame size/ frame rate





#### II Interrupting Time-Lapse Photography

Time-lapse photography will end automatically if the battery is exhausted. The following will also end time-lapse photography:

- Selecting Start > Off in the Time-lapse photography menu
- Pressing the ® button between frames or immediately after a frame is recorded
- Turning the camera off
- Removing the lens
- Connecting a USB or HDMI cable
- Inserting a memory card into an empty slot
- Pressing the shutter-release button all the way down to take a photograph
- Selecting remote (■) release mode
- Selecting mode **U1** or **U2**, or selecting another mode after starting time-lapse photography in mode **U1** or **U2**

A movie will be created from the frames shot to the point where time-lapse photography ended. Note that time-lapse photography will end and no movie will be recorded if the power source is removed or disconnected or the destination memory card is ejected.

#### No Photograph

The camera will skip the current frame if it is unable to focus using single-servo autofocus (**AF-S** or single-servo autofocus selected for **AF-A**; note that the camera focuses again before each shot). Shooting will resume with the next frame.

#### 🖉 Image Review

The  $\square$  button can not be used to view pictures while time-lapse photography is in progress, but the current frame will be displayed for a few seconds after each shot if **On** is selected for **Image review** in the playback menu ( $\square$  212). Other playback operations can not be performed while the frame is displayed.

#### 🖉 See Also

For information on setting a beep to sound when time-lapse photography is complete, see Custom Setting d1 (**Beep**, D 228).

# **Non-CPU Lenses**

By specifying lens data (lens focal length and maximum aperture), the user can gain access to a variety of CPU lens functions when using a non-CPU lens.

If the focal length of the lens is known:

- Power zoom can be used with optional flash units (D 294)
- Lens focal length is listed (with an asterisk) in the playback photo info display

If the maximum aperture of the lens is known:

- The aperture value is displayed in the control panel and viewfinder
- Flash level is adjusted for changes in aperture if the flash unit supports AA (auto aperture) mode
- Aperture is listed (with an asterisk) in the playback photo info display

Specifying both the focal length and maximum aperture of the lens:

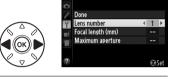
- Enables color matrix metering (note that it may be necessary to use centerweighted or spot metering to achieve accurate results with some lenses, including Reflex-NIKKOR lenses)
- Improves the precision of center-weighted and spot metering and i-TTL balanced fill-flash for digital SLR

The camera can store data for up to nine non-CPU lenses. To enter or edit data for a non-CPU lens:

Select Non-CPU lens data.
 Press the MENU button to display the menus.
 Highlight Non-CPU lens data in the setup menu and press ▶.



2 Choose a lens number. Highlight Lens number and press ◀ or ► to choose a lens number between 1 and 9.



Non-CPU lens data

3 Enter the focal length and aperture. Highlight Focal length (mm) or Maximum aperture and press ◀ or ► to edit the highlighted item. Focal length can be selected from values between 6 and 4,000 mm, maximum aperture from values between f/1.2 and f/22.



#### Focal Length Not Listed

If the correct focal length is not listed, choose the closest value greater than the actual focal length of the lens.

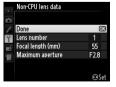
#### Teleconverters and Zoom Lenses

The maximum aperture for teleconverters is the combined maximum aperture of the teleconverter and the lens. Note that lens data are not adjusted when non-CPU lenses are zoomed in or out. The data for different focal lengths can be entered as separate lens numbers, or the data for the lens can be edited to reflect the new values for lens focal length and maximum aperture each time zoom is adjusted.

### 4 Select Done.

Highlight **Done** and press **(a)**. The specified focal length and aperture will be stored under the chosen lens number.





 Assign non-CPU lens number selection to a camera control. Select Choose non-CPU lens number for Custom Setting f2 (Assign Fn button, □ 242) or Custom Setting f3 (Assign preview button, □ 244).

**2** Use the selected control to choose the lens number. Press the selected button and rotate the main command dial until the desired lens number is displayed in the control panel.

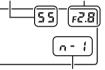




Fn button

Main command dial

Focal length Maximum aperture



Lens number

Control panel

đ

# The GP-1 GPS Unit

The GP-1 GPS unit (available separately) can be connected to the camera's accessory terminal ( $\square$  298) using the cable supplied with the GP-1, allowing information on the camera's current position to be recorded when photographs are taken. Turn the camera off before connecting the GP-1; for more information, see the GP-1 manual.

#### Setup Menu Options

The **GPS** item in the setup menu contains the options listed below.

• **Standby timer**: Choose whether the exposure meters turn off automatically when the GP-1 is attached.

Option	Description
	Exposure meters turn off automatically if no operations are performed for the time selected for Custom Setting c2 ( <b>Standby timer</b> , $\square$ 227; to allow the camera time to acquire GPS data, the delay is extended by up to one minute after the exposure meters are activated or the camera is turned on). This reduces the drain on the battery.
Disable	Exposure meters do not turn off while the GP-1 is connected.

- **Position**: This item is only available if the GP-1 is connected, when it displays the current latitude, longitude, altitude, and Coordinated Universal Time (UTC) as reported by the GP-1.
- Use GPS to set camera clock: Select Yes to synchronize the camera clock with the time reported by the GPS device.

#### Coordinated Universal Time (UTC)

UTC data is provided by the GPS device and is independent of the camera clock.

#### 🖉 The 🔤 Icon

Connection status is shown by the 🕮 icon:

- (static): Camera has established communication with GP-1. Photo information for pictures taken while this icon is displayed include an additional page of GPS data (
   183).
- (flashing): The GP-1 is searching for a signal. Pictures taken while the icon is flashing do not include GPS data.
- No icon: No new GPS data have been received from the GP-1 for at least two seconds. Pictures taken when the 
  icon is not displayed do not include GPS data.



đ

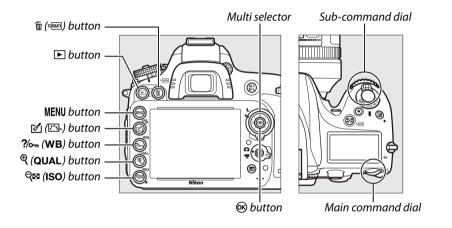
# **More on Playback**

# **Full-Frame Playback**

To play photographs back, press the 🕨 button. The most recent photograph will be displayed in the monitor.



button



#### 🖉 Rotate Tall

To display "tall" (portrait-orientation) photographs in tall orientation, select **On** for the **Rotate tall** option in the playback menu (CL 212).



#### 🖉 Image Review

When **On** is selected for **Image review** in the playback menu ( $\square$  212), photographs are automatically displayed in the monitor for about 4 s after shooting (because the camera is already in the correct orientation, images are not rotated automatically during image review). In continuous release mode, display begins when shooting ends, with the first photograph in the current series displayed.

То	Use	Description
View additional photographs		Press ► to view photographs in order recorded, ◄ to view photographs in reverse order.
View photo information		Press $\blacktriangle$ or $\blacktriangledown$ to view information about current photograph ( $\square$ 179).
View thumbnails	<b>ି୍≅ (ISO</b> )	See page 185 for more information.
Zoom in on photograph	<sup>⊕</sup> (QUAL)	See page 187 for more information.
Delete images	to (FORMATE)	Confirmation dialog will be displayed. Press í () again to delete photo.
Change protect status	<b>?/~</b> (WB)	To protect image, or to remove protection from protected image, press <b>?~</b> ( <b>WB</b> ) ( <sup>[]</sup> 188).
Return to shooting mode		Monitor will turn off. Photographs can be taken immediately.
Retouch photo or play movie	₫ (⊡)/®	Create retouched copy of current photograph ( $\square$ 261). If current picture is marked with 🐙 icon to show that it is a movie, pressing 🐵 starts movie playback ( $\square$ 67).

#### Choosing a Memory Card Slot

If two memory cards are inserted, you can select a card for playback by holding the **BKT** button and pressing  $\blacktriangle$  during fullframe or thumbnail playback. The dialog shown at right will be displayed; highlight the desired slot and press  $\blacktriangleright$  to list the folders on the selected card, then highlight a folder and press W to view the pictures in the highlighted folder. The same procedure can be used when selecting pictures for operations in the playback ( $\square$  207) and retouch ( $\square$  261) menus or when copying white balance from an existing photograph ( $\square$  125).



**BKT** button



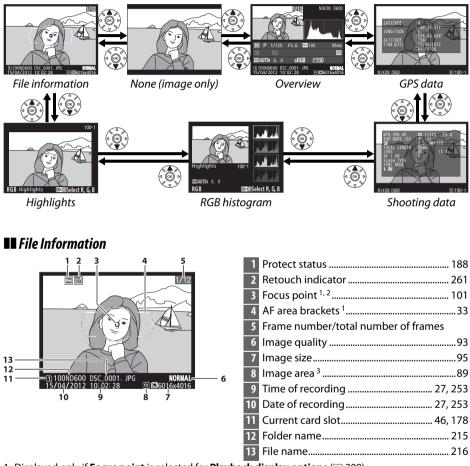
#### 🖉 See Also

For information on choosing how long the monitor will remain on when no operations are performed, see Custom Setting c4 (**Monitor off delay**,  $\square$  228).

►

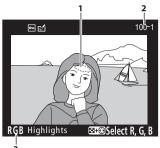
# Photo Information

Photo information is superimposed on images displayed in full-frame playback. Press  $\blacktriangle$  or  $\triangledown$  to cycle through photo information as shown below. Note that "image only", shooting data, RGB histograms, highlights, and overview data are only displayed if corresponding option is selected for **Playback display options** ( $\square$  209). GPS data are only displayed if a GPS device was used when the photo was taken.



- 1 Displayed only if Focus point is selected for Playback display options (© 209).
- 2 If photograph was taken using AF-S or with single-servo autofocus selected during AF-A, display shows point where focus first locked. If photograph was taken using AF-C or with continuous-servo autofocus selected during AF-A, focus point is only displayed if option other than auto-area AF was selected for AF-area mode and camera was able to focus.
- 3 Displayed in yellow if picture is in non-FX format (including DX-based movie format; 🕮 63, 89).

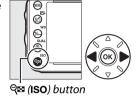
#### Highlights



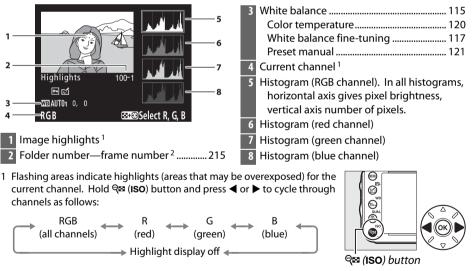
3 Current channel<sup>1</sup>

1 Flashing areas indicate highlights (areas that may be overexposed) for the current channel. Hold २ः (ISO) button and press ◄ or ► to cycle through channels as follows:





2 Displayed in yellow if picture is in non-FX format (including DX-based movie format; D 63, 89).



#### RGB Histogram

2 Displayed in yellow if picture is in non-FX format (including DX-based movie format; D 63, 89).

►

To zoom in on the photograph when the histogram is displayed, press  $\mathfrak{P}$  (QUAL). Use the  $\mathfrak{P}$  (QUAL) and  $\mathfrak{P}$  (ISO) buttons to zoom in and out and scroll the image with the multi selector. The histogram will be updated to show only the data for the portion of the image visible in the monitor.



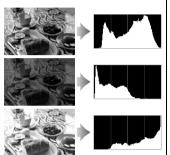
# 🖉 Histograms

Camera histograms are intended as a guide only and may differ from those displayed in imaging applications. Some sample histograms are shown below:

If the image contains objects with a wide range of brightnesses, the distribution of tones will be relatively even.

If the image is dark, tone distribution will be shifted to the left.

If the image is bright, tone distribution will be shifted to the right.



Increasing exposure compensation shifts the distribution of tones to the right, while decreasing exposure compensation shifts the distribution to the left. Histograms can provide a rough idea of overall exposure when bright ambient lighting makes it difficult to see photographs in the monitor.

### Shooting Data

<b>_ _ _</b>		
1       Implies         23       Implies         24       Implies         25       Implies         26       Implies         27       Implies         28       Implies         29       Implies         29       Implies         20       Implies         21       Implies         22       Implies         23       Implies         24       Implies         25       Implies         26       Implies         27       Implies         28       Implies         29       Implies         29       Implies         20       Implies         21       Implies         22       Implies         23       Implies         24       Implies         25       Implies         26       Implies         27       Implies         28       Implies         29       Implies         20       Implies         21       Implies         22       Implies         24       Implies	3 4 5 6 7	Focus mo Lens VR (v Flash type
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27 COMMENT CSPRING HAS COME.	17 18	Sharpenir Contrast
NIKON D600 🖂 100-1	19	Brightnes
	20	Saturation
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29 COPYRIGHT ;NIKON	21	
	22	Toning <sup>8</sup>
	22	High ISO r Long expo
	23	Active D-L
	23 24	HDR expo
NIKON D600 📧 100-1	24	HDR smoo
	25	Vignette c
1 Metering	26	Retouch h
Shutter speed74 Aperture	27	Image cor
2 Shooting mode	28	Name of p
ISO sensitivity <sup>1</sup>	29	Copyright

3		112
	Optimal exposure tuning <sup>2</sup>	
4	Focal length 172, 288,	
5	Lens data	
6	Focus mode97,	103
	Lens VR (vibration reduction) <sup>3</sup>	
7	Flash type143,	292
	Commander mode	
8	Flash mode	
9	Flash control 236, 294,	
	Flash compensation	148
10	Camera name	
11	Image area <sup>4</sup>	
12	Folder number—frame number <sup>4</sup>	
13	White balance	
	Color temperature	
	White balance fine-tuning	
	Preset manual	
14	Color space	
15	Picture Control	
16	Quick adjust <sup>5</sup>	
	Original Picture Control <sup>6</sup>	
17	Sharpening	
18	Contrast	
19	Brightness	
20	Saturation <sup>7</sup>	
	Filter effects <sup>8</sup>	
21	Hue <sup>7</sup>	
22	Toning <sup>8</sup> 132,	
22	High ISO noise reduction Long exposure noise reduction	
23	Active D-Lighting	
23 24	HDR exposure differential	
24	HDR smoothing	
25	Vignette control	
25 26	Retouch history	
20 27	Image comment	
	-	
28	Name of photographer <sup>9</sup>	
29	Copyright holder <sup>9</sup>	256

- 1 Displayed in red if photo was taken with auto ISO sensitivity control on.
- 2 Displayed if Custom Setting b5 (Fine-tune optimal exposure, 🗆 226) has been set to a value other than zero for any metering method.
- 3 Displayed only if VR lens is attached.
- 4 Displayed in yellow if picture is in non-FX format (including DX-based movie format; D 63, 89).
- 5 Standard, Vivid, Portrait, and Landscape Picture Controls only.
- 6 Neutral, Monochrome, and custom Picture Controls.
- 7 Not displayed with monochrome Picture Controls.
- 8 Monochrome Picture Controls only.
- 9 The fourth page of the shooting data is only displayed if copyright information was recorded with the photograph as described on page 256.

1 Latitude

2 Longitude

Altitude

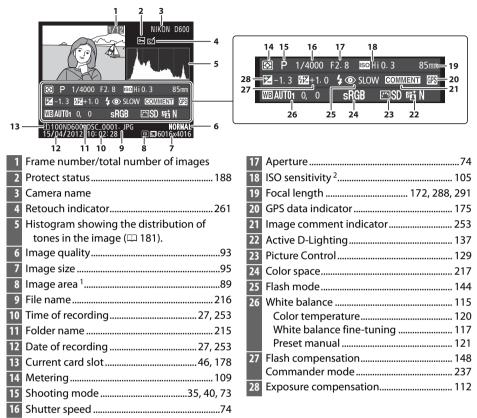
Coordinated Universal Time (UTC)

#### GPS Data\*



\* Data for movies are for start of recording.

#### **II** Overview Data



1 Non-FX formats (including DX-based movie format) displayed in yellow (D 63, 89).

2 Displayed in red if photo was taken with auto ISO sensitivity control on.

# **Thumbnail Playback**

To display images in "contact sheets" of four, nine, or 72 images, press the *Q*⊠ (ISO) button.



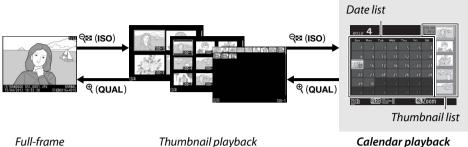
Thumbnail playback

Full-frame playback Calendar playback

То	Use	Description
Display more images	<b>୍ସ</b> ≅ (ISO)	Press 🕾 (ISO) to increase the number of images
	-	displayed.
Display fower images	<sup>⊕</sup> (QUAL)	Press $\mathfrak{P}(\mathbf{QUAL})$ to reduce the number of images
Display fewer images	۲ (QUAL)	displayed. When four images are displayed, press to view highlighted image full frame.
		Use multi selector to highlight images for full-frame
Highlight images		playback, playback zoom (🕮 187), deletion (🕮 189),
		or protection (🕮 188).
View highlighted image	ØК	Press 🐵 to display the highlighted image full frame.
Delete highlighted image	í (formaty)	See page 189 for more information.
Change protect status of highlighted image	<b>?∕∽</b> ⊓ (WB)	See page 188 for more information.
Return to shooting mode		Monitor will turn off. Photographs can be taken immediately.
Retouch photo	<b>(</b> E)	Create retouched copy of current photograph (🕮 69, 261).

# **Calendar Playback**

To view images taken on a selected date, press the 🕾 (ISO) button when 72 images are displayed.



Full-frame playback

Calendar playback

The operations can be performed depend on whether the cursor is in the date list or the thumbnail list:

То	Use	Description
Toggle between date	୍ଷ (ISO)	Press व्≊ (ISO) button in date list to place cursor in
list and thumbnail list		thumbnail list. Press again to return to date list.
Exit to thumbnail playback/Zoom in on	et (QUAL)	<ul> <li>Date list: Exit to 72-frame playback.</li> <li>Thumbnail list: Press and hold <sup>(a)</sup> (QUAL) button to zoom</li> </ul>
highlighted photo		in on highlighted picture.
Highlight dates/		• Date list: Highlight date.
Highlight images		Thumbnail list: Highlight picture.
Toggle full frame	(OK)	Date list: View pictures taken on selected date.
playback	Ŭ	Thumbnail list: View highlighted picture.
Delete highlighted	(FORMATE)	Date list: Delete all pictures taken on selected date.
photo(s)	<u> </u>	<ul> <li>Thumbnail list: Delete highlighted picture (     189).</li> </ul>
Change protect status of highlighted photo	?∕∽⊤ (WB)	See page 188 for more information.
Return to shooting mode		Monitor will turn off. Photographs can be taken immediately.
Retouch photo	🗹 (🕾)	Create retouched copy of photo highlighted in thumbnail list (🎞 69, 261).

# **Taking a Closer Look: Playback Zoom**

Press the  $\mathfrak{P}$  (**QUAL**) button to zoom in on the image displayed in full-frame playback or on the image currently highlighted in thumbnail playback. The following operations can be performed while zoom is in effect:

То	Use	Description
Zoom in or out	<sup>ଙ୍</sup> (QUAL)/ ିବ୍ ଅ (ISO)	Press $\P$ ( <b>QUAL</b> ) to zoom in to maximum of approximately 38 × (large images in 36 × 24/3 : 2 format), 28 × (medium images) or 19 × (small images). Press $\P$ ( <b>ISO</b> ) to zoom out. While photo is
View other areas of image		zoomed in, use multi selector to view areas of image not visible in monitor. Keep multi selector pressed to scroll rapidly to other areas of frame. Navigation window is displayed when zoom ratio is altered; area currently visible in monitor is indicated by yellow border.
Select faces		Faces (up to 35) detected during zoom are indicated by white borders in navigation window. Rotate sub- command dial to view other faces.
View other images		Rotate main command dial to view same location in other photos at current zoom ratio. Playback zoom is cancelled when a movie is displayed.
Change protect status	?‰ (WB)	See page 188 for more information.
Return to shooting mode		Monitor will turn off. Photographs can be taken immediately.
Retouch photo	🗹 (🖂)	Create retouched copy of current photograph (🕮 69, 261).

# **Protecting Photographs from Deletion**

In full-frame, zoom, thumbnail, and calendar playback, the **?~** (**WB**) button can be used to protect photographs from accidental deletion. Protected files can not be deleted using the **(mer)** button or the **Delete** option in the playback menu. Note that protected images *will* be deleted when the memory card is formatted (**C** 31, 250).

To protect a photograph:

#### **1** Select an image.

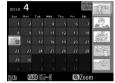
Display the image in full-frame playback or playback zoom or highlight it in the thumbnail list in thumbnail or calendar playback.



Full-frame playback



Thumbnail playback



Calendar playback

# 2 Press the ?/~ (WB) button.

The photograph will be marked with a me icon. To remove protection from the photograph so that it can be deleted, display the photograph or highlight it in the thumbnail list and then press the **?**/~ (**WB**) button.



?/ (WB) button

►

#### Removing Protection from All Images

To remove protection from all images in the folder or folders currently selected in the **Playback folder** menu, press the **?** (**WB**) and **(me)** buttons together for about two seconds during playback.

# **Deleting Photographs**

To delete the photograph displayed in full-frame playback or highlighted in the thumbnail list, press the **(merror)** button. To delete multiple selected photographs, all photographs taken on a selected date, or all photographs in the current playback folder, use the **Delete** option in the playback menu. Once deleted, photographs can not be recovered. Note that pictures that are protected or hidden can not be deleted.

# Full-Frame, Thumbnail, and Calendar Playback

Press the  $\hat{\mathbf{m}}$  ( $\mathbf{m}$ ) button to delete the current photograph.

### **1** Select an image.

Display the image or highlight it in the thumbnail list in thumbnail or calendar playback.

## **2** Press the **(marchine)** button.

A confirmation dialog will be displayed.









โข (ฅฅฅ) button

Full-frame playback

Thumbnail playback

Calendar playback (thumbnail list)

### **3** Press the **m** (**NMM**) button again.

To delete the photograph, press the  $\overline{10}$  ( $\overline{100}$ ) button. To exit without deleting the photograph, press the  $\blacktriangleright$  button.



甸 () button

►

#### 🖉 Calendar Playback

During calendar playback, you can delete all photographs taken on a selected date by highlighting the date in the date list and pressing the  $\widehat{m}$  () button ( $\square$  186).

#### 🖉 See Also

The **After delete** option in the playback menu determines whether the next image or the previous image is displayed after an image is deleted ( $\square$  212).

# <u>The Playback Menu</u>

The **Delete** option in the playback menu contains the following options. Note that depending on the number of images, some time may be required for deletion.

Option	Description
Selected	Delete selected pictures.
DATE Select date	Delete all pictures taken on a selected date (🕮 191).
ALL AII	Delete all pictures in the folder currently selected for playback (C 207). If two cards are inserted, you can select the card from which pictures will be deleted.

#### **II** Selected: Deleting Selected Photographs

# 1 Choose Selected for the Delete option in the playback menu.

Press the **MENU** button and select **Delete** in the playback menu. Highlight **Selected** and press ▶.



**MENU** button

### **2** Highlight a picture.

Use the multi selector to highlight a picture (to view the highlighted picture full screen, press and hold the ♥ (QUAL) button; to view images in other locations, hold the BKT button, press ▲, and select the desired card and folder as described on page 178).

3 Select the highlighted picture. Press the २ (ISO) button to select the highlighted picture. Selected pictures are marked by a m icon. Repeat steps 2 and 3 to select additional pictures; to deselect a

picture, highlight it and press  $\bigotimes$  (ISO).



ବ୍**ର୍ବ୍ଦ (ISO**) button



# **III** Select Date: Deleting Photographs Taken on a Selected Date

# 1 Choose Select date.

In the delete menu, highlight **Select date** and press  $\blacktriangleright$ .

# **2** Highlight a date.

Press  $\blacktriangle$  or  $\blacksquare$  to highlight a date.

To view the pictures taken on the highlighted date, press **Q** (ISO). Use the multi selector to scroll through the pictures, or press and hold **Q** (QUAL) to view the current picture full screen. Press **Q** (ISO) to return to the date list.

# **3** Select the highlighted date.

Press  $\blacktriangleright$  to select all pictures taken on the highlighted date. Selected dates are marked with a  $\square$  icon. Repeat steps 2 and 3 to select additional dates; to deselect a date, highlight it and press  $\blacktriangleright$ .



Delete

BBB Selected

DATE Select date



© Tonfirm

ବ୍ ାso) button



Delete all images taken on selected date?

No





# Connections

# **Connecting to a Computer**

This section describes how to use the supplied UC-E15 USB cable to connect the camera to a computer.

# **Before Connecting the Camera**

Before connecting the camera, install the software on the supplied ViewNX 2 CD. To ensure that data transfer is not interrupted, be sure the camera EN-EL15 battery is fully charged. If in doubt, charge the battery before use or use an EH-5b AC adapter and EP-5B power connector (available separately).

## Supplied Software

ViewNX 2 includes a "Nikon Transfer 2" function for copying pictures from the camera to the computer, where ViewNX 2 can be used to view and print selected images or to edit photographs and movies. For more information, see ViewNX 2 online help.

#### Supported Operating Systems

The supplied software can be used with computers running the following operating systems:

- Windows: Pre-installed versions of Windows XP, Windows Vista, Windows 7, and Windows 8; only 32-bit versions of Windows XP are supported.
- Macintosh: Mac OS X version 10.6, 10.7, or 10.8

See the websites listed on page xxiii for the latest information on supported operating systems.

#### Connecting Cables

Be sure the camera is off when connecting or disconnecting interface cables. Do not use force or attempt to insert the connectors at an angle. Close the camera connector cover when the connector is not in use.

#### **D**uring Transfer

Do not turn the camera off or disconnect the USB cable while transfer is in progress.

#### 🖉 Windows

To visit the Nikon website after installing ViewNX 2, select **All Programs** > **Link to Nikon** from the Windows start menu (Internet connection required).

M

# **Connecting the Camera**

Connect the camera using the supplied UC-E15 USB cable.

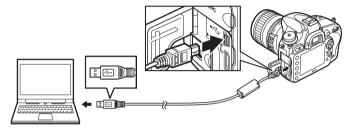
# **1** Turn the camera off.

# **2** Turn the computer on.

Turn the computer on and wait for it to start up.

# **3** Connect the USB cable.

Connect the USB cable as shown.



#### **USB** Hubs

Connect the camera directly to the computer; do not connect the cable via a USB hub or keyboard.

# **4** Turn the camera on.

# **5** Start Nikon Transfer 2.

If a message is displayed prompting you to choose a program, select Nikon Transfer 2.

#### Windows 7

If the following dialog is displayed, select Nikon Transfer 2 as described below.

- 1 Under Import pictures and videos, click Change program. A program selection dialog will be displayed; select Import file using Nikon Transfer 2 and click OK.

2 Double-click Import file.

# **6** Click Start Transfer.

At default settings, all the pictures on the memory card will be copied to the computer (for more information on using Nikon Transfer 2, start ViewNX 2 or Nikon Transfer 2 and select **ViewNX 2 Help** from the **Help** menu).



Start Transfer

7 Turn the camera off and disconnect the USB cable when transfer ends. Nikon Transfer 2 will close automatically when transfer is complete.

#### 🖉 Camera Control Pro 2

Camera Control Pro 2 software (available separately;  $\Box$  298) can be used to control the camera from a computer. When Camera Control Pro 2 is used to capture photographs and movies directly to the computer, the PC connection indicator (**P**  $\boldsymbol{\zeta}$ ) will appear in the control panel.

# **Printing Photographs**

Selected JPEG images can be printed on a PictBridge printer ( $\square$  332) connected directly to the camera.

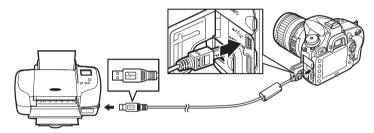
# **Connecting the Printer**

Connect the camera using the supplied UC-E15 USB cable.

# **1** Turn the camera off.

## **2** Connect the USB cable.

Turn the printer on and connect the USB cable as shown. Do not use force or attempt to insert the connectors at an angle.



#### **USB** Hubs

Connect the camera directly to the printer; do not connect the cable via a USB hub.

# **3** Turn the camera on.

A welcome screen will be displayed in the monitor, followed by a PictBridge playback display.



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#### Printing Via Direct USB Connection

Be sure the EN-EL15 battery is fully charged or use an optional EH-5b AC adapter and EP-5B power connector. When taking photographs to be printed via direct USB connection, set **Color space** to **sRGB** ( $\square$  217).

#### Selecting Photographs for Printing

NEF (RAW) photographs (
93) can not be selected for printing. JPEG copies of NEF (RAW) images can be created using the **NEF (RAW) processing** option in the retouch menu (
271).

#### 🖉 See Also

See page 325 for information on what to do if an error occurs during printing.

# Printing Pictures One at a Time

# **1** Select a picture.

Press  $\blacktriangleleft$  or  $\blacktriangleright$  to view additional pictures. Press the  $\P$  (**QUAL**) button to zoom in on the current frame ( $\square$  187; press  $\blacktriangleright$  to exit zoom). To view six pictures at a time, press the  $\P$  (**ISO**) button. Use the multi selector to highlight pictures, or press  $\P$ 



(QUAL) to display the highlighted picture full frame; to view images in other locations when thumbnails are displayed, hold the **BKT** button, press ▲, and select the desired card and folder as described on page 178.

## **2** Display printing options.

Press 🐵 to display PictBridge printing options.



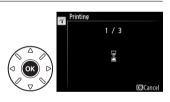
# **3** Adjust printing options.

Press  $\blacktriangle$  or  $\triangledown$  to highlight an option and press  $\blacktriangleright$  to select.

Option	Description			
Page size	Highlight a page size (only sizes supported by the current printer are listed) and press ® to select and exit to the previous menu (to print at the default page size for the current printer, select <b>Printer default</b> ).			
No. of copies	Press $\blacktriangle$ or $\blacksquare$ to choose number of copies (maximum 99), then press $\circledast$ to select and return to the previous menu.			
Border	This option is available only if supported by the printer. Highlight <b>Printer default</b> (use current printer settings), <b>Print with border</b> (print photo with white border), or <b>No border</b> and press <b>(B)</b> to select and exit to the previous menu.			
Time stamp	Highlight <b>Printer default</b> (use current printer settings), <b>Print time stamp</b> (print times and dates of recording on photos), or <b>No time stamp</b> and press <b>(Print times and exit to the previous menu.</b>			
Cropping	This option is available only if supported by the printer. To exit without cropping, highlight <b>No cropping</b> and press . To crop the current picture, highlight <b>Crop</b> and press ▶. Selecting <b>Crop</b> displays the dialog shown at right. Press (QUAL) to increase the size of the crop, (a) (ISO) to decrease. Position the crop using the multi selector and press . Note that print quality may drop if small crops are printed at large sizes.			

# **4** Start printing.

Select **Start printing** and press ® to start printing. To cancel before all copies have been printed, press ®.



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# Printing Multiple Pictures

#### **1 Display the PictBridge menu.** Press the **MENU** button in the PictBridge playback display (see Step 3 on page 196).



MENU button

# **2** Choose an option.

Highlight one of the following options and press  $\blacktriangleright$ .

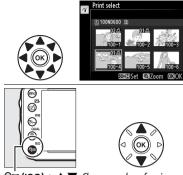
- Print select: Select pictures for printing.
- Select date: Print one copy of all the pictures taken on a selected date.
- **Print (DPOF)**: Print an existing print order created with the **DPOF print order** option in the playback menu (D 202). The current print order will be displayed in Step 3.
- Index print: To create an index print of all JPEG pictures (CD 93) on the memory card, proceed to Step 4. Note that if the memory card contains more than 256 pictures, only the first 256 images will be printed.



**3** Select pictures or choose a date. If you chose Print select or Print (DPOF) in Step 2. use the multi selector to scroll through the pictures on the memory card; to view images in other locations, hold the BKT button, press  $\blacktriangle$ , and select the desired card and folder as described on page 178. To display the current picture full screen, press and hold the 🕈 (QUAL) button. To select the current picture for printing, hold the  $\mathfrak{P} \cong (\mathbf{ISO})$  button and press  $\blacktriangle$ . The picture will be marked with a 凸 icon and the number of prints will be set to 1. Keeping the Q (ISO) button pressed, press ▲ or ▼ to specify the number of prints (up to 99; to deselect the picture, press  $\mathbf{\nabla}$  when the number of prints is 1). Continue until all the desired pictures have been selected.

#### If you chose Select date in Step 2, press ▲ or ▼

to highlight a date and press ► to toggle the highlighted date on or off. To view the pictures taken on the selected date, press **Q** (ISO). Use the multi selector to scroll through the pictures, or press and hold **QUAL**) to view the current picture full screen. Press **Q** (ISO) again to return to the date selection dialog.



 $\mathbb{R} = (ISO) + \mathbf{A} \mathbf{\nabla}$ : Choose number of copies



(QUAL) button: View photo full screen



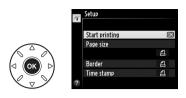




**Q □** (ISO) **button**: View photos for selected date



 $\sim$ 



# **5** Adjust printing options.

Choose page size, border, and time stamp options as described on page 198 (a warning will be displayed if the selected page size is too small for an index print).

# **6** Start printing.

Select **Start printing** and press ® to start printing. To cancel before all copies have been printed, press ®.



# **Creating a DPOF Print Order: Print Set**

The **DPOF print order** option in the playback menu is used to create digital "print orders" for PictBridge-compatible printers and devices that support DPOF.

1 Choose Select/set for the DPOF print order item in the playback menu. Press the MENU button and select DPOF print order in the playback menu. Highlight Select/set and press ► (to remove all photographs from the print order, select Deselect all?).





# **2** Select pictures.

Use the multi selector to scroll through the pictures on the memory card (to view images in other locations, hold the **BKT** button and press  $\blacktriangle$ ). To display the current picture in full screen, press and hold the  $\P$  (**QUAL**) button. To select the current picture for printing, hold the  $\P$  (**ISO**) button and press  $\bigstar$ . The picture will be marked with a  $\square$  icon and the number of prints will be set to 1. Keeping the  $\P$  (**ISO**) button pressed, press  $\bigstar$  or  $\triangledown$  to specify the number of prints (up to 99; to deselect the picture, press  $\blacktriangledown$  when the number of prints is 1). Continue until all the desired pictures have been selected.





 $\mathbb{R}$  (ISO) +  $\mathbb{A}$   $\mathbb{V}$ : Choose number of copies



(QUAL) button: View photo full screen

# **3** Display imprint options.

Press 🐵 to display data imprint options.





# **4** Select imprint options.

Highlight the following options and press ► to toggle the highlighted option on or off (to complete the print order without including this information, proceed to Step 5).

- **Print shooting data**: Print shutter speed and aperture on all pictures in print order.
- Print date: Print date of recording on all pictures in print order.

# **5** Complete the print order.

Highlight **Done** and press <sup>®</sup> to complete the print order.





#### DPOF Print Order

To print the current print order when the camera is connected to a PictBridge printer, select **Print (DPOF)** in the PictBridge menu and follow the steps in "Printing Multiple Pictures" to modify and print the current order ( $\Box$  199). DPOF print date and shooting data options are not supported when printing via direct USB connection; to print the date of recording on photographs in the current print order, use the PictBridge **Time stamp** option.

The **DPOF print order** option can not be used if there is not enough space on the memory card to store the print order.

NEF (RAW) photographs (
93) can not be selected using this option. JPEG copies of NEF (RAW) images can be created using the **NEF (RAW) processing** option in the retouch menu (
271).

Print orders may not print correctly if images are deleted using a computer or other device after the print order is created.

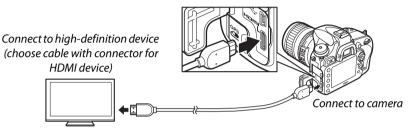
# Viewing Photographs on TV

A type C mini-pin High-Definition Multimedia Interface (HDMI) cable (available separately from commercial sources) can be used to connect the camera to high-definition video devices.

# **1** Turn the camera off.

Always turn the camera off before connecting or disconnecting an HDMI cable.

# **2** Connect the HDMI cable as shown.



- **3** Tune the device to the HDMI channel.
- **4** Turn the camera on and press the **▶** button. During playback, images will be displayed on the television screen.

#### Close the Connector Cover

Close the camera connector cover when the connectors are not in use. Foreign matter in the connectors can interfere with data transfer.

#### Television Playback

Use of an EH-5b AC adapter and EP-5B power connector (available separately) is recommended for extended playback. The TV will display images full screen if photo information is hidden during full-frame playback ( $\Box$  179). Note that the edges may not be visible when photographs are viewed on a television screen.

#### 🖉 Audio

Stereo sound recorded with optional ME-1 (C 298) stereo microphones plays in stereo when movies are viewed on HDMI devices using a camera connected via an HDMI cable (note that audio will not be played back over headphones connected to the camera). Volume can be adjusted using television controls; the camera controls can not be used.

## **HDMI** Options

The **HDMI** option in the setup menu ( $\Box$  249) controls output resolution and can be used to enable the camera for remote control from devices that support HDMI-CEC (High-Definition Multimedia Interface–Consumer Electronics Control, a standard that allows HDMI devices to be used to control peripherals to which they are connected).

#### **Output Resolution**

Choose the format for images output to the HDMI device. If **Auto** is selected, the camera will automatically select the appropriate format. Regardless of the option selected, **Auto** will be used for movie live view, movie recording, and playback.

#### **Device Control**

If **On** is selected for **HDMI** >**Device control** in the setup menu when the camera is connected to a television that supports HDMI-CEC and both the camera and television are on, the display shown at right will appear on the television and the television remote can be used in place of the camera multi selector and ® button during full-

frame playback and slide shows. If **Off** is selected, the television remote can not be used to control the camera.

#### HDMI and Live View

HDMI displays connected via an HDMI cable can be used for live view photography and movie live view ( $\square$  49, 57). During movie live view and movie recording HDMI output is adjusted according to the option selected for **Movie settings** > **Frame size/frame rate** in the shooting menu ( $\square$  65). Note that some HDMI devices may not support the selected setting; in this case, select **1080i (interlaced)** for **HDMI** > **Output resolution**. Movies may be output at a frame size smaller than that selected for **Frame size/frame rate** ( $\square$  65).

#### HDMI-CEC Devices

When the camera is connected to an HDMI-CEC device, [ [ will appear in the control panel in place of the number of exposures remaining.

#### Device Control

See the television manual for details.





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# Menu Guide

# ► The Playback Menu: Managing Images

To display the playback menu, press MENU and select the 🗩 (playback menu) tab.









MENU button

The playback menu contains the following options:

Option		Option	L L L L L L L L L L L L L L L L L L L
Delete	190	Image review	212
Playback folder	207	After delete	212
Hide image	208	Rotate tall	212
Playback display options	209	Slide show	213
Copy image(s)	209	DPOF print order	202

#### 🖉 See Also

Menu defaults are listed on page 312.

# **Playback Folder**

MENU button → ▶ playback menu

Choose a folder for playback (D 177):

Option	Description			
ND600	Pictures in all folders created with the D600 will be visible during playback.			
All	Pictures in all folders will be visible during playback.			
Current	Only pictures in the current folder will be visible during playback.			

## **Hide Image**

Hide or reveal pictures. Hidden pictures are visible only in the **Hide image** menu and can only be deleted by formatting the memory card.

Option	Description	
Select/set	Hide or reveal selected pictures.	
Select date	Selecting this option displays a list of dates. To hide all pictures taken on a date, highlight the date and press ►. Selected dates are marked by a ✓; to reveal all pictures taken on a selected date, highlight it and press ►. Press ∞ to complete the operation.	Select date ☑ 15/04/2012 ④ □ 16/04/2012 ↓ □ 18/04/2012 ↓ @SConfirm @30K
Deselect all?	Reveal all pictures.	

#### Protected and Hidden Images

Revealing a protected image will also remove protection from the image.

Follow the steps below to hide or reveal selected pictures.

# 1 Choose Select/set.

Highlight **Select/set** and press ►.





# **2** Select pictures.

Use the multi selector to scroll through the pictures on the memory card (to view the highlighted picture full screen, press and hold the <sup>@</sup> (**QUAL**) button; to view images in other locations as described on page 178, hold **BKT** and press ▲) and press **@** (**ISO**) to

 Image: Select/sel

 Image: Select/sele

 Image: Select/sele

 Image: Select/sele

 Image: Select/select/sel

 Image: Select/s

ବ୍ 🖻 (ISO) button

select the current picture. Selected pictures are marked by a 🖾 icon; to deselect a picture, highlight it and press र (ISO) again. Continue until all the desired pictures have been selected.

# 3 Press ®.

Press ® to complete the operation.

# **Playback Display Options**

Choose the information available in the playback photo information display (□ 179). Press ▲ or ▼ to highlight an option, then press beto select the option for the photo information display. A 🗸 appears next to selected items; to deselect, highlight and press  $\blacktriangleright$ . To return to the playback menu, highlight **Done** and press **(98)**.

#### Copy Image(s)

MENU button  $\rightarrow \mathbf{E}$  playback menu

Copy pictures from one memory card to another. This option is only available when two memory cards are inserted in the camera.

Option	Description
Select source	Choose card from which pictures will be copied.
Select image(s)	Select pictures to be copied.
Select destination folder	Select destination folder on remaining card.
Copy image(s)?	Copy selected pictures to specified destination.

# 1 Choose Select source.

Highlight **Select source** and press ▶.



Copy image(s)

# **2** Select the source card.

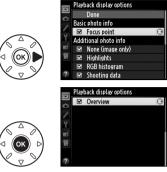
Highlight the slot for the card containing the images to be copied and press .





[î] **→** 

#### **MENU** button $\rightarrow \mathbf{E}$ playback menu



## 3 Choose Select image(s). Highlight Select image(s) and press ►.

- 4 Select the source folder. Highlight the folder containing the images to be copied and press ►.
- **5** Make the initial selection.

Before going on to select or deselect individual images, you can mark all or all protected images in the folder for copying by choosing **Select all images** or **Select protected images**. To mark only individually selected images for copying, choose **Deselect all** before proceeding.

# **6** Select additional images.

Highlight pictures and press ♀ (ISO) to select or deselect (to view the highlighted picture full screen, press and hold the ♥ (QUAL) button). Selected images are marked with a ✓. Press ⊛ to proceed to Step 7 when your selection is complete.

7 Choose Select destination folder. Highlight Select destination folder and press ▶.

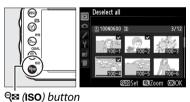


Copy image(s) Images selected by default

select image(s)

100ND600











8 Select a destination folder. To enter a folder number, choose Select folder by number, enter the number  $(\Box 215)$ , and press 0. If the folder with the selected number does not already exist, a new folder will be created

To choose from a list of existing folders, choose Select folder from list, highlight a folder, and press ®.

A confirmation dialog will be displayed; highlight Yes and press (%). Press (%) again to

exit when copying is complete.

Highlight **Copy image(s)?** and press **(%)**.

#### Copying Images

**9** Copy the images.

Images will not be copied if there is insufficient space on the destination card. Be sure the battery is fully charged before copying movies.

If the destination folder contains an image with the same name as one of the images to be copied, a confirmation dialog will be displayed. Select Replace existing image to replace the image with the image to be copied, or select Replace all to replace all existing images with the same names without further prompting. To continue without replacing the image, select Skip, or select Cancel to exit without copying any further images.

Protect status is copied with the images but print marking ( $\Box$  202) is not. Hidden images can not be copied.



:=







Copy image(s) Select folder by number

opy image(s) Select folder from list 100ND600

101ND600

102ND600 103ND600

🗀 1 0 2

(May

[fh[5

100 - 999





# Image Review

Choose whether pictures are automatically displayed in the monitor immediately after shooting. If **Off** is selected, pictures can only be displayed by pressing the **▶** button.

#### **After Delete**

Choose the picture displayed after an image is deleted.

Option	Description
□ 🕞 Show next	Display following picture. If deleted picture was last frame, previous picture will be displayed.
▶ ∎ Show previous	Display previous picture. If deleted picture was first frame, following picture will be displayed.
©∎⊇ Continue as before	If user was scrolling through pictures in order recorded, following picture will be displayed as described for <b>Show next</b> . If user was scrolling through pictures in reverse order, previous picture will be displayed as described for <b>Show previous</b> .

# **Rotate Tall**

MENU button 🔶 🖻 playback menu

Rotate tall

On

Off

Choose whether to rotate "tall" (portrait-orientation) pictures for display during playback. Note that because the camera itself is already in the appropriate orientation during shooting, images are not rotated automatically during image review.

Option	Description
	"Tall" (portrait-orientation) pictures are automatically rotated for display in the
On	camera monitor. Pictures taken with <b>Off</b> selected for <b>Auto image rotation</b> ( $\Box$ 254)
	will be displayed in "wide" (landscape) orientation.
Off	"Tall" (portrait-orientation) pictures are displayed in "wide" (landscape) orientation.





**MENU** button  $\rightarrow$   $\blacktriangleright$  playback menu

MENU button  $\rightarrow \square$  playback menu

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MENU button → ▶ playback menu

#### **Slide Show**

Create a slide show of the pictures in the current playback folder ( $\square$  207). Hidden images ( $\square$  208) are not displayed.

Option	Description			
Start Start slide show.				
lmaga tuna	Choose type of image displayed from Still images and movies, Still			
lmage type	images only, and Movies only.			
Frame interval	Choose how long each picture will be displayed.			

To start the slide show, highlight **Start** and press **(B)**. The following operations can be performed while the slide show is in progress:

To	Press	Description
Skip back/skip ahead		Press ◀ to return to previous frame, ► to skip to next frame.
View additional photo info		Change or hide photo info displayed (still images only;
Pause/resume	©Ƙ	Pause or resume slide show.
Raise/lower volume	<sup>କ୍</sup> (QUAL)/ ବ୍ୱ¤ (ISO)	Press ♥ (QUAL) during movie playback to increase volume, ♥☎ (ISO) to decrease.
Exit to playback menu	MENU	End slide show and return to playback menu.
Exit to playback mode	►	End show and return to playback mode.
Exit to shooting mode		Press shutter-release button halfway to return to shooting mode.

The dialog shown at right is displayed when the show ends. Select **Restart** to restart or **Exit** to return to the playback menu.



# The Shooting Menu: Shooting Options

To display the shooting menu, press MENU and select the 🗖 (shooting menu) tab.





SHOOTING MENU Storage folder 100 File naming menu --Reset shooting menu --Storage folder 100 File naming DSC Role played by card in Slot 2 CHU Image size CD Image area --P JPEG compression #2



**MENU** button

The shooting menu contains the following options:

Option		Option	
Reset shooting menu	214	Color space	217
Storage folder	215	Active D-Lighting	137
File naming	216	HDR (high dynamic range)	139
Role played by card in Slot 2	96	Vignette control	218
Image quality	93	Long exposure NR	218
Image size	95	High ISO NR	218
Image area	89	ISO sensitivity settings	105
JPEG compression	94	Remote control mode	85
NEF (RAW) recording	94	Multiple exposure	160
White balance	115	Interval timer shooting	164
Set Picture Control	129	Time-lapse photography	168
Manage Picture Control	134	Movie settings	65
Auto distortion control	217		

**Note**: Depending on camera settings, some items may be grayed out and unavailable. For information on the options available in each shooting mode, see page 309.

## **Reset Shooting Menu**

MENU button  $\rightarrow$  **C** shooting menu

Select **Yes** to restore shooting menu options to their default values (CII 312).

	Reset shooting menu	
Ď		
/ 9	Yes	OK
Ľ.	No	
	10	
?		

:=

Select the folder in which subsequent images will be stored.

#### Selecting Folders by Folder Number



# **2** Choose a folder number.

Press  $\blacktriangleleft$  or  $\triangleright$  to highlight a digit, press  $\blacktriangle$  or  $\triangledown$  to change. If a folder with the selected number already exists, a  $\Box$ ,  $\boxdot$ , or  $\boxdot$  icon will be displayed to the left of the folder number:

- 🗅 : Folder is empty.
- 🔄 : Folder is partially full.
- 🗎 : Folder contains 999 pictures or a picture numbered 9999. No further pictures can be stored in this folder.

The card on which the folder is stored is shown by the card slot icon in the top right corner of the Select folder by number dialog. The card used for new folders depends on the option currently selected for **Role played by card in slot 2** ( $\square$  96).

# **3** Save changes and exit.

Press I to complete the operation and return to the shooting menu (to exit without choosing the storage folder, press the MENU button). If a folder with the specified number does not already exist, a new folder will be created. Subsequent photographs will be stored in the selected folder unless it is already full.

#### Folder and File Numbers

If the current folder is numbered 999 and contains 999 pictures or a picture numbered 9999, the shutter-release will be disabled and no further photographs can be taken. To continue shooting, create a folder with a number less than 999, or select an existing folder with a number less than 999 and less than 999 images.

#### 🖉 Startup Time

Additional time may be required for camera startup if the memory card contains a very large number of files or folders.

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1 Choose Select folder from list. Highlight Select folder from list and press ►.



#### 2 Highlight a folder. Press ▲ or ▼ to highlight a folder.

#### **3** Select the highlighted folder. Press <sup>®</sup> to select the highlighted folder and return to the shooting menu. Subsequent photographs will be stored in the selected folder.

## **File Naming**

MENU button  $\rightarrow$  shooting menu

Photographs are saved using file names consisting of "DSC\_" or, in the case of images that use the Adobe RGB color space, "\_DSC", followed by a four-digit number and a three-letter extension (e.g., "DSC\_0001.JPG"). The **File naming** option is used to select three letters to replace the "DSC" portion of the file name. For information on editing file names, see page 135.

#### Æ Extensions

The following extensions are used: ".NEF" for NEF (RAW) images, ".JPG" for JPEG images, ".MOV" for movies, and ".NDF" for dust off reference data. In each pair of photographs recorded at image-quality settings of NEF (RAW)+JPEG, the NEF and JPEG images have the same file names but different extensions.

### **Auto Distortion Control**

Select **On** to reduce barrel distortion when shooting with wideangle lenses and to reduce pin-cushion distortion when shooting with long lenses (note that the edges of the area visible in the viewfinder may be cropped out of the final photograph, and that the time needed to process photographs before recording begins may increase). This option does not



apply to movies and is available only with type G and D lenses (PC, fisheye, and certain other lenses excluded); results are not guaranteed with other lenses. Before using auto distortion control with DX lenses, select **On** for **Auto DX crop** or choose an image area of **DX (24×16) 1.5×** (<sup>III</sup> 90); selecting other options may result in heavily cropped photographs or in photographs with severe peripheral distortion.

#### Retouch: Distortion Control

For information on creating copies of existing photographs with reduced barrel and pincushion distortion, see page 274.

## **Color Space**

MENU button  $\rightarrow$  **C** shooting menu

The color space determines the gamut of colors available for color reproduction. Choose **sRGB** for photographs that will be printed or used "as is," with no further modification. **Adobe RGB** has a wider color gamut and is recommended for images that will be extensively processed or retouched after leaving the camera.

#### 🖉 Color Space

Color spaces define the correspondence between colors and the numeric values that represent them in a digital image file. The sRGB color space is widely used, while the Adobe RGB color space is typically used in publishing and commercial printing. sRGB is recommended when taking photographs that will be printed without modification or viewed in applications that do not support color management, or when taking photographs that will be printed with ExifPrint, the direct printing option on some household printers, or kiosk printing or other commercial print services. Adobe RGB photographs can also be printed using these options, but colors will not be as vivid.

JPEG photographs taken in the Adobe RGB color space are DCF compliant; applications and printers that support DCF will select the correct color space automatically. If the application or device does not support DCF, select the appropriate color space manually. For more information, see the documentation provided with the application or device.

#### 🖉 Nikon Software

ViewNX 2 (supplied) and Capture NX 2 (available separately) automatically select the correct color space when opening photographs created with this camera.

#### **Vignette Control**

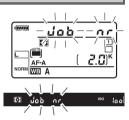
"Vignetting" is a drop in brightness at the edges of a photograph. **Vignette control** reduces vignetting for type G and D lenses (DX and PC lenses excluded). Its effects vary from lens to lens and are most noticeable at maximum aperture. Choose from **High**, **Normal**, **Low**, and **Off**.

#### 🖉 Vignette Control

Depending on the scene, shooting conditions, and type of lens, JPEG images may exhibit noise (fog) or variations in peripheral brightness, while custom Picture Controls and preset Picture Controls that have been modified from default settings may not produce the desired effect. Take test shots and view the results in the monitor. Vignette control does not apply to movies ( $\Box$  57), multiple exposures ( $\Box$  160), or DX-format images ( $\Box$  89).

## Long Exposure NR (Long Exposure Noise Reduction)

If **On** is selected, photographs taken at shutter speeds slower than 1 s will be processed to reduce noise (bright spots, randomly-spaced bright pixels, or fog). The time required for processing roughly doubles; during processing, "Jab nr" will flash in the shutter speed/aperture displays and pictures can not be taken (if the camera is turned off before processing is complete, the picture will be saved but noise reduction will not be performed). In continuous release



MENU button  $\rightarrow$  **C** shooting menu

mode, frame rates will slow and while photographs are being processed, the capacity of the memory buffer will drop. Long exposure noise reduction is not available during movie recording.

# **High ISO NR**

MENU button  $\rightarrow$  **C** shooting menu

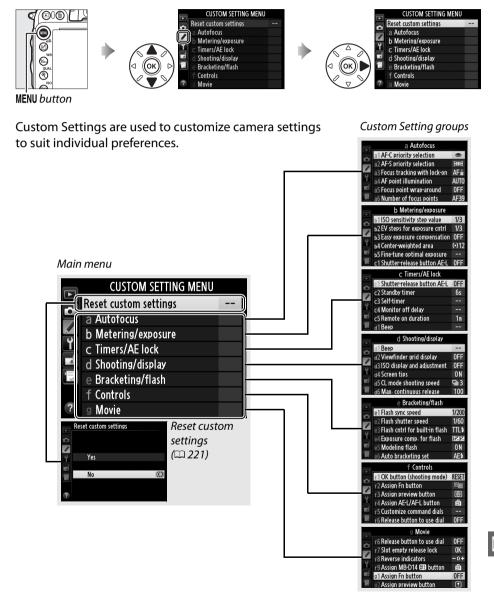
Photographs taken at high ISO sensitivities can be processed to reduce "noise."

Option	Description			
High	Reduce noise (randomly-spaced bright pixels, lines, or fog), particularly in			
Normal	photographs taken at high ISO sensitivities. Choose the amount of noise reduction			
Low	performed from <b>High</b> , <b>Normal</b> , and <b>Low</b> .			
Off	Noise reduction is only performed at ISO sensitivities of ISO 2500 and higher. The amount of noise reduction is less than the amount performed when <b>Low</b> is selected for <b>High ISO NR</b> .			

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# Custom Settings: Fine-Tuning Camera Settings

To display the Custom Settings menu, press MENU and select the *f* (Custom Settings menu) tab.



The following Custom Settings are available:

Custom Setting 📖				Custom Setting	m
Reset custom settings 22			d	Shooting/display	
a Autofocus			d9	LCD illumination	231
a1	AF-C priority selection	221	d10	Exposure delay mode	231
a2	AF-S priority selection	221	d11	Flash warning	231
a3	Focus tracking with lock-on	222	d12	MB-D14 battery type	232
a4	AF point illumination	222	d13		233
a5	Focus point wrap-around	222	е	Bracketing/flash	
аб	Number of focus points	223	e1	Flash sync speed	234
a7	Built-in AF-assist illuminator	223	e2	Flash shutter speed	235
b	Metering/exposure		e3	Flash cntrl for built-in flash	236
b1	ISO sensitivity step value	224	e4	Exposure comp. for flash	240
b2	EV steps for exposure cntrl	224	e5	Modeling flash	241
b3	Easy exposure compensation	225	eб	Auto bracketing set	241
b4	Center-weighted area	226	e7	Bracketing order	241
b5	b5 Fine-tune optimal exposure 226		f	Controls	
C	Timers/AE lock		f1	OK button (shooting mode)	241
c1	Shutter-release button AE-L	226	f2	Assign Fn button	242
с2	Standby timer	227	f3	Assign preview button	244
СЗ	Self-timer	227	f4	Assign AE-L/AF-L button	244
с4	Monitor off delay	228	f5	Customize command dials	245
c5	Remote on duration	228	f6	Release button to use dial	246
d	Shooting/display		f7	Slot empty release lock	246
d1	Веер	228	f8	Reverse indicators	246
d2	Viewfinder grid display	229	f9	Assign MB-D14 🔀 button	247
d3	ISO display and adjustment	229	g	Movie	
d4	Screen tips	229	g1	Assign Fn button	247
d5	CL mode shooting speed	229	g2	Assign preview button	248
d6	Max. continuous release	230	g3	Assign AE-L/AF-L button	248
d7	File number sequence	230	g4	Assign shutter button	248
d8	Information display	231			

**Note**: Depending on camera settings, some items may be grayed out and unavailable. For information on the options available in each shooting mode, see page 309. If settings in the current bank have been modified from default values ( $\square$  313), an asterisk will be displayed adjacent to the altered settings in the second level of the Custom Settings menu.

Select **Yes** to restore Custom Settings to their default values

# a: Autofocus

# a1: AF-C Priority Selection

When **AF-C** is selected for viewfinder photography ( $\Box$  97), this option controls whether photographs can be taken whenever the shutter-release button is pressed (*release priority*) or only when the camera is in focus (*focus priority*).

Option		Description
۲	Release	Photos can be taken whenever the shutter-release button is pressed.
[::::]	Focus	Photos can only be taken when the in-focus indicator ( $ullet$ ) is displayed.

Regardless of the option selected, focus will not lock when **AF-C** is selected for autofocus mode. The camera will continue to adjust focus until the shutter is released.

When **AF-S** is selected for viewfinder photography ( $\Box$  97), this option controls whether photographs can be taken only when the camera is in focus (*focus priority*) or whenever the shutter-release button is pressed (*release priority*).

Option		Description
۲	Release	Photos can be taken whenever the shutter-release button is pressed.
[::::]	Focus	Photos can only be taken when the in-focus indicator ( $ullet$ ) is displayed.

Regardless of the option selected, if the in-focus indicator (●) is displayed when **AF-S** is selected for autofocus mode, focus will lock while the shutter-release button is pressed halfway. Focus lock continues until the shutter is released.

Reset custom settings

Yes

No

MENU button  $\rightarrow$  Custom Settings menu

# MENU button 🔶 🖋 Custom Settings menu

a3: Focus Tracking with Lock-On MENU button -> / Custom Settings menu

This option controls how autofocus adjusts to sudden large changes in the distance to the subject when **AF-C** is selected or continuous-servo autofocus is selected when the camera is in **AF-A** mode for viewfinder photography ( $\square$  97).

Option		Description			
AF∎	5 (Long)				
AF≣	4	When the distance to the subject changes abruptly, the camera waits for the			
AF≞	3 (Normal)	specified period before adjusting the distance to the subject. This prevents the camera from refocusing when the subject is briefly obscured by objects passing through the frame.			
AF≞	2				
AF≞	1 (Short)				
	Off	The camera immediately adjusts focus when the distance to the subject changes. Use when photographing a series of subjects at varying distances in quick succession.			

## a4: AF Point Illumination

MENU button  $\rightarrow$  Custom Settings menu

Choose whether the active focus point is highlighted in red in the viewfinder.

Option	Description
Auto	The selected focus point is automatically highlighted as needed to establish contrast with the background.
On	The selected focus point is always highlighted, regardless of the brightness of the background. Depending on the brightness of the background, the selected focus point may be difficult to see.
Off	The selected focus point is not highlighted. The area outside the current crop is shown in grey ( <sup>[]]</sup> 90).

a5: Focus Point Wrap-Around

MENU button 🔿 🥒 Custom Settings menu

Choose whether focus-point selection "wraps around" from one edge of the viewfinder to another.

Option	Description			
Wrap	Focus-point selection "wraps around" from top to bottom, bottom to top, right to left, and left to right, so that, for example, pressing ▶ when a focus point at the right edge of the display is highlighted (①) selects the corresponding focus point at the left edge of the display (②).			
No wrap	The focus-point display is bounded by the outermost focus points so that, for example, pressing $\blacktriangleright$ when a focus point at the right edge of the display is selected has no effect.			

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Choose the number of focus points available for manual focus-point selection.

Option	Description	
AF39 39 points	Choose from the 39 focus points shown at right.	
AF11 11 points	Choose from the 11 focus points shown at right. Use for quick focus-point selection.	

Choose whether the built-in AF-assist illuminator lights to assist the focus operation when lighting is poor.

Option	Description				
On	<ul> <li>The AF-assist illuminator lights when lighting is poor (viewfinder photography only). AF-assist illumination is only available when both of the following conditions are met:</li> <li><b>AF-S</b> is selected for autofocus mode (<sup>CD</sup> 97) or single-servo autofocus is selected when the camera is in <b>AF-A</b> mode.</li> <li>Auto-area AF is chosen for AF-area mode (<sup>CD</sup> 99), or an option other than auto-area AF is chosen and the center focus point is selected.</li> </ul>				
0ff	The AF-assist illuminator does not light to assist the focus operation. The camera may not be able to focus using autofocus when lighting is poor.				

#### The AF-Assist Illuminator

The AF-assist illuminator has a range of about 0.5–3.0 m (1 ft 8 in.–9 ft 10 in.); when using the illuminator, use a lens with a focal length of 24-200 mm and remove the lens hood.

#### See Also

For information on the shooting modes in which AF-assist is available, see page 309. See page 290 for restrictions on the lenses that can be used with AF assist.

TTTTT



# b: Metering/Exposure

## b1: ISO Sensitivity Step Value

Select the increments used when making adjustments to ISO sensitivity. If possible, the current ISO sensitivity setting is maintained when the step value is changed. If the current setting is not available at the new step value, ISO sensitivity will be rounded to the nearest available setting.

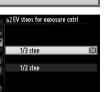
## b2: EV Steps for Exposure Cntrl

Select the increments used when making adjustments to shutter speed, aperture, exposure and flash compensation, and bracketing.

 The current
 1/3 step
 Image: Step

 SO sensitivity will
 1/2 step
 Image: Step
 Image: Step

 MENU button → Custom Settings menu



MENU button → 🖋 Custom Settings menu

ь1 ISO sensitivity step value

#### **b3: Easy Exposure Compensation** MENU button $\rightarrow$ Custom Settings menu

This option controls whether the  $\square$  button is needed to set exposure compensation ( $\square$  112). If **On (Auto reset)** or **On** is selected, the 0 at the center of the exposure display will flash even when exposure compensation is set to  $\pm 0$ .

Option	Description
On (Auto reset)	Exposure compensation is set by rotating one of the command dials (see note below). The setting selected using the command dial is reset when the camera turns off or the standby timer expires (exposure compensation settings selected using the 🖬 button are not reset).
On	As above, except that the exposure compensation value selected using the command dial is not reset when the camera turns off or the standby timer expires.
Off	Exposure compensation is set by pressing the 🖬 button and rotating the main command dial.

#### Change Main/Sub

The dial used to set exposure compensation when **On (Auto reset)** or **On** is selected for Custom Setting b3 (**Easy exposure compensation**) depends on the option selected for Custom Setting f5 (**Customize command dials**) > **Change main/sub** ( $\square$  245).

		Customize command dials > Change main/sub		
		Off	On	
Mode	P	Sub-command dial	Sub-command dial	
	S	Sub-command dial	Main command dial	
	A	Main command dial	Sub-command dial	
	М	N/A		

#### Show ISO/Easy ISO

Custom Setting b3 (**Easy exposure compensation**) can not be used with Custom Setting d3 (**Show ISO/Easy ISO**). Adjustments to either of these items reset the remaining item; a message is displayed when the item is reset.

When calculating exposure, center-weighted metering assigns the greatest weight to a circle in the center of the frame. The diameter ( $\phi$ ) of this circle can be set to 8, 12, 15, or 20 mm or to the average of the entire frame.

Note that unless **Average** is selected, the diameter is fixed at 12 mm when a non-CPU lens is used, regardless of the setting selected for **Non-CPU lens data** in the setup menu ( $\square$  172). When **Average** is selected, the average of the entire frame will be used for both CPU and non-CPU lenses.

# **b5: Fine-tune Optimal Exposure** MENU button → *J* Custom Settings menu

Use this option to fine-tune the exposure value selected by the camera. Exposure can be fine-tuned separately for each metering method by from +1 to -1 EV in steps of  $^{1}/_{6}$  EV.

#### **V** Fine-Tuning Exposure

Exposure fine-tuning is not affected by two-button resets. Note that as the exposure compensation (🗷) icon is not displayed, the only way to determine how much exposure has been altered is to view the amount in the fine-tuning menu. Exposure compensation (III 112) is preferred in most situations.

# c: Timers/AE Lock

# c1: Shutter-Release Button AE-L

If **On** is selected, exposure will lock when the shutter-release button is pressed halfway.



MENU button  $\rightarrow$  Custom Settings menu





-

MENU button 🔶 🖋 Custom Settings menu

# c2: Standby timer

Choose how long the camera continues to meter exposure when no operations are performed. The shutter-speed and aperture displays in the control panel and viewfinder turn off automatically when the timer expires.

Choose a shorter standby timer delay for longer battery life.

# c3: Self-Timer

Choose the length of the shutter release delay, the number of shots taken, and the interval between shots in self-timer mode.

- Self-timer delay: Choose the length of the shutter-release delay (
   85).
- Number of shots: Press ▲ and ▼ to choose the number of shots taken each time the shutter-release button is pressed.
- Interval between shots: Choose the interval between shots when the **Number of shots** is more than 1.

#### 

MENU button → *ℓ* Custom Settings menu

MENU button → *ℓ* Custom Settings menu

1

-3 Self-time

Self-timer delay

Number of shots

©10s 10 s ©20s 20 s

	Interval between shots	<u>ි0,5s</u>
(2)		
	c3 Self-timer	
0	Self-timer delay	
4	©2s 2s	
-í	©5s 5 s	

(5)10s ≥





#### c4: Monitor off Delay

Choose how long the monitor remains on when no operations are performed during playback (**Playback**; defaults to 10 s) and image review (**Image review**; defaults to 4 s), when menus (**Menus**; defaults to 1 minute) or information (**Information display**; defaults to 10 s) are displayed, or during live view and movie recording (**Live view**; defaults to 10 minutes). Choose a shorter monitor-off delay for longer battery life.

#### c5: Remote on Duration

Choose how long the camera will remain on stand-by in remote release mode ( $\square$  85). If no operations are performed for the selected period, remote shooting will end and the exposure meters will turn off. Choose shorter times for longer battery life. To reactivate remote control mode after the timer has expired, press the camera shutter-release button halfway.

# d: Shooting/Display

#### d1: Beep

Choose the pitch and volume of the beep that sounds when the camera focuses using single-servo AF (**AF-S** or when single-servo AF is selected for **AF-A**;  $\square$  97), when focus locks during live view photography, while the release timer is counting down in self-timer and delayed remote release modes ( $\square$  85), when a photograph is taken in quick-response remote or remote mirror-up mode ( $\square$  85), when time-lapse photography ends ( $\square$  168), or if you attempt to take a photograph when the memory card is locked ( $\square$  32). Note that a beep will not sound in movie live view ( $\square$  57) or quiet-shutter release mode (mode **G**;  $\square$  83), regardless of the option selected.

- Volume: Choose 3 (high), 2 (medium), 1 (low) or Off (mute).
   When an option other than Off is selected, ♪ appears in the information display.
- Pitch: Choose High or Low.



Þ Þ	c5 Re	mote on duration	
2		1 min 5 min	03
	10m	10 min 15 min	
0	IJ		



MENU button 🔿 🖋 Custom Settings menu

MENU button → ℓ Custom Settings menu

MENU button → *ℓ* Custom Settings menu

# d2: Viewfinder Grid Display

Choose On to display on-demand grid lines in the viewfinder for reference when composing photographs ( $\square$  8).

#### d3: ISO Display and Adjustment MENU button $\rightarrow$ Custom Settings menu

If Show ISO sensitivity or Show ISO/Easy ISO is selected, the control panel will show ISO sensitivity in place of the number of exposures remaining. If Show ISO/ Easy ISO is selected, ISO sensitivity can be set in modes P and S by rotating the subcommand dial or in mode A by rotating the main command dial. Select Show frame count to display the number of exposures remaining in the control panel.

d4: Screen Tips	MENU button 🔶 🖋 Custom Settings menu
Choose <b>On</b> to display tool tips for items se information display (口 11).	lected in the
d5: CL Mode Shooting Speed	MENU button 🔿 🖋 Custom Settings menu
Choose the maximum frame advance rate speed) mode (     83; during interval timer setting also determines the frame advance frame).	photography, this





MENU button → *ℓ* Custom Settings menu

[i]

The maximum number of shots that can be taken in a single burst in continuous mode can be set to any value between 1 and 100.

#### Intermediate Control Contro

Regardless of the option selected for Custom Setting d6, shooting will slow when the memory buffer fills (**r**00). See page 334 for more information on the capacity of the memory buffer.

# d7: File Number Sequence

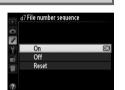
When a photograph is taken, the camera names the file by adding one to the last file number used. This option controls whether file numbering continues from the last number used when a new folder is created, the memory card is formatted, or a new memory card is inserted in the camera.

Option Description When a new folder is created, the memory card formatted, or a new memory card inserted in the camera, file numbering continues from the last number used or from the largest file number in the current folder, whichever is higher. If a photograph is 0n taken when the current folder contains a photograph numbered 9999, a new folder will be created automatically and file numbering will begin again from 0001. File numbering is reset to 0001 when a new folder is created, the memory card is formatted, or a new memory card is inserted in the camera. Note that a new folder is 0ff created automatically if a photograph is taken when the current folder contains 999 photographs. As for **On**, except that the next photograph taken is assigned a file number by adding one to the largest file number in the current folder. If the folder is empty, file Reset

# File Number Sequence

numbering is reset to 0001.

If the current folder is numbered 999 and contains either 999 photographs or a photograph numbered 9999, the shutter-release button will be disabled and no further photographs can be taken. Choose **Reset** for Custom Setting d7 (File number sequence) and then either format the current memory card or insert a new memory card.



MENU button → ℓ Custom Settings menu

MENU button  $\rightarrow$  / Custom Settings menu

#### d8: Information Display

If **Auto** (AUT0) is selected, the color of the lettering in the information display ( $\Box$  9) will automatically change from black to white or white to black to maintain contrast with the background. To always use the same color lettering, select Manual and choose Dark on light (B; black lettering) or Light on dark (W; white lettering). Monitor brightness will automatically be adjusted for maximum contrast with the selected text color

F 5.6

d9: LCD Illumination	MENU button 🔿 🍠
If <b>Off</b> is selected, the control panel ba	<b>.</b> .
will only light while the power switch i	

ard 🐮. If On is selected, the control panel will be illuminated whenever the standby timer is active (C 39). Select **Off** for increased battery life.

125

FX 💽

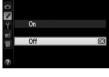
Dark on light

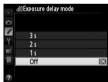
# d11: Flash Warning

d10: Exposure Delay Mode

If **On** is selected, the flash-ready indicator (**4**) will flash in the viewfinder if the flash is required to ensure optimal exposure.







button 🔿 🖋 Custom Settings menu

MENU button 🔶 🖈 Custom Settings menu

Light on dark

MENU button  $\rightarrow$  Custom Settings menu

#### d12: MB-D14 Battery Type

MENU button  $\rightarrow$  Custom Settings menu

To ensure that the camera functions as expected when the optional MB-D14 battery pack is used with AA batteries, match the option selected in this menu to the type of batteries inserted in the battery pack. There is no need to adjust this option when using EN-EL15 batteries.

Option	Description
₿LR6 L <b>R6 (AA alkaline)</b>	Select when using LR6 alkaline AA batteries.
ŪNi₩H HR6 (AA Ni-MH)	Select when using HR6 Ni-MH AA batteries.
₫FR6 FR6 (AA lithium)	Select when using FR6 lithium AA batteries.

#### Using AA Batteries

The capacity of AA batteries drops sharply at temperatures below 20 °C (68 °F) and varies with make and storage conditions; in some cases, batteries may cease to function before their expiry date. Some AA batteries can not be used; due to their performance characteristics and limited capacity, alkaline batteries have less capacity than some other types and should only be used if no alternative is available and then only at warmer temperatures. The camera shows the level of AA batteries as follows:

Control panel	Viewfinder	Description
477774	—	Batteries fully charged.
4		Low battery. Ready fresh batteries.
تے (flashes)	∎ے (flashes)	Shutter release disabled. Change batteries.

Choose whether the battery in the camera or the batteries in the battery pack are used first when an optional MB-D14 battery pack is attached. Note that if the MB-D14 is powered by an optional EH-5b AC adapter and EP-5B power connector, the AC adapter will be used regardless of the option selected.

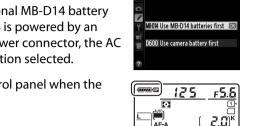
A 
 icon is displayed in the camera control panel when the batteries in the MB-D14 are in use.

#### The MB-D14 Battery Pack

The MB-D14 takes one EN-EL15 rechargeable Li-ion battery or six AA alkaline, Ni-MH, or lithium batteries (an EN-EL15 is supplied with the camera; AA batteries are available separately).

The information display shows the type of battery inserted in the MB-D14 as follows:

MB-D14 battery type display	Battery type	NORM	AUTO -	150	, C	ED:7///
E <b>L</b> 15 (77772)	EN-EL15 rechargeable Li-ion battery		AF-A			C.UJ
LR6/AA) d	AA batteries		jiso⊠⊒N  ©⊠⊒0FF			



MENU button  $\rightarrow$  Custom Settings menu

d13Battery order

Mei A

125

F 5.6

# e: Bracketing/Flash

#### e1: Flash Sync Speed

MENU button  $\rightarrow$  Custom Settings menu

#### This option controls flash sync speed.

Option	Description
1/250 s (Auto FP)	Auto FP high-speed sync is used when a compatible flash unit is attached ( $\Box$ 294). If the built-in flash or other flash units are used, shutter speed is set to $^{1}/_{250}$ s. When the camera shows a shutter speed of $^{1}/_{250}$ s in mode <b>P</b> or <b>A</b> , auto FP high-speed sync will be activated if the actual shutter speed is faster than $^{1}/_{250}$ s.
1/200 s (Auto FP)	Auto FP high-speed sync is used when a compatible flash unit is attached ( $\Box$ 294). If the built-in flash or other flash units are used, shutter speed is set to $^{1}/_{200}$ s. When the camera shows a shutter speed of $^{1}/_{200}$ s in mode <b>P</b> or <b>A</b> , auto FP high-speed sync will be activated if the actual shutter speed is faster than $^{1}/_{200}$ s.
1/200 s-1/60 s	Flash sync speed set to selected value.

#### Fixing Shutter Speed at the Flash Sync Speed Limit

To fix shutter speed at the sync speed limit in mode **S** or **M**, select the next shutter speed after the slowest possible shutter speed (30 s or bulb). An X (flash sync indicator) will be displayed in the viewfinder and control panel.

#### 🖉 Auto FP High-Speed Sync

Allows the flash to be used at the highest shutter speed supported by the camera, making it possible to choose the maximum aperture for reduced depth of field even when the subject is backlit in bright sunlight. The information display flash mode indicator shows "FP" when auto FP high-speed sync is active ( $\square$  295).

#### Auto FP High-Speed Sync

When **1/250 s (Auto FP)** or **1/200 s (Auto FP)** is selected for Custom Setting e1 (**Flash sync speed**,  $\square$  234), the built-in flash can be used at shutter speeds as fast as <sup>1</sup>/<sub>250 s</sub> or <sup>1</sup>/<sub>200</sub> s, while compatible optional flash units ( $\square$  294) can be used at any shutter speed (Auto FP High-Speed Sync).

Flash sync speed	1/250 s (	1/250 s (Auto FP) 1/200 s (Auto FP)		1/200 s		
Shutter speed	Built-in flash	Optional flash unit	Built-in flash	Optional flash unit	Built-in flash	Optional flash unit
From <sup>1</sup> /4,000 to but not including <sup>1</sup> /250 s	_	Auto FP	_	Auto FP	_	_
From <sup>1</sup> /250 to but not including <sup>1</sup> /200 s	Flash	sync *	_	Auto FP	_	_
<sup>1</sup> /200-30 s			Flash	sync		

\* Flash range drops as shutter speed increases. Flash range will nevertheless be greater than that obtained at the same speeds with Auto FP.

#### e2: Flash Shutter Speed

MENU button 🔿 🖋 Custom Settings menu

This option determines the slowest shutter speed available when using front- or rear-curtain sync or red-eye reduction in mode **P** or **A** (regardless of the setting chosen, shutter speeds can be as slow as 30 s in **S** and **M** modes or at flash settings of slow sync, slow rear-curtain sync, or red-eye reduction with slow sync). Options range from 1/60 s (**1/60 s**) to 30 s (**30 s**).



Ontion

ομιοπ	Description
TTL\$ TTL	Flash output is adjusted automatically in response to shooting
	conditions.
M‡ Manual	Choose the flash level (🕮 236). The camera does not emit monitor pre-
m≠ Manuai	flashes.
DDT4 Demosting flack	The flash fires repeatedly while the shutter is open, producing a strobe-
RPT <b>*</b> Repeating flash	light effect (CII 236).

units in one or more groups ( $\Box$  237).

Description

Use the built-in flash as a master flash controlling remote optional flash

Choose the flash mode for the built-in flash

e3: Flash Cntrl for Built-in Flash

#### Manual

Option

Output

Choose a flash level between Full and 1/128 (1/128 of full power). At full power, the built-in flash has a Guide Number of 12/39 (m/ft, ISO 100, 20°C/68°F).

#### Repeating Flash

CMD<sup>1</sup> Commander mode

The flash fires repeatedly while the shutter is open, producing a strobe-light effect. Press  $\blacktriangleleft$  or  $\triangleright$  to highlight the following options,  $\blacktriangle$  or  $\triangledown$  to change.

Description
Choose flash output (expressed as a fraction of full power).
Choose the number of times the flash fires at the selected
autout. Note that doe and an about or an about or and the

output. Note that depending on shutter speed and the Times option selected for Frequency, the actual number of flashes may be less than selected.

**Frequency** Choose how often the flash fires per second.

#### Flash Control Mode

The flash control mode for the built-in flash is shown in the information display (CD 146).



#### "Manual" and "Repeating Flash"

22 icons flash in the control panel and viewfinder when these options are selected.



#### 🖉 The SB-400

When an optional SB-400 flash unit is attached and turned on, Custom Setting e3 changes to **Optional flash**, allowing the flash control mode for the SB-400 to be selected from **TTL** and **Manual** (**Repeating flash** and **Commander mode** options are not available).

#### 🖉 "Times"

The options available for **Repeating Flash** > **Times** are determined by flash output.

Output	Options available for "Times"	Output	Options available for "Times"
1/4	2	1/32	2–10, 15
1/8	2–5	1/64	2–10, 15, 20, 25
1/16	2–10	1/128	2–10, 15, 20, 25, 30, 35

#### Commander Mode

Use the built-in flash as a master flash controlling one or more remote optional flash units in up to two groups (A and B) using advanced wireless lighting (<sup>[]</sup> 294).

Selecting this option displays the menu shown at right. Press  $\blacktriangleleft$  or  $\blacktriangleright$  to highlight the following options,  $\blacktriangle$  or  $\triangledown$  to change.

e3 Flash cntrl fo		ash
1	Mode	Comp.
P Built-in flash	TTL ÷	0
Group A	TTL	0
Group B	TTL	0
Channel	1 CH	
		OBOK

Option	Description
Built-in flash	Choose a flash mode for the built-in flash (commander flash).
TTL	i-TTL mode. Choose flash compensation from values between +3.0 and –3.0 EV in increments of $^{1}\!/_{3}$ EV.
М	Choose the flash level from values between 1/1 and 1/128 (1/128 of full power).
	The built-in flash does not fire, although remote flash units do. The built-in flash must be raised so that it can emit monitor pre-flashes.
Group A	Choose a flash mode for all flash units in group A.
TTL	i-TTL mode. Choose flash compensation from values between +3.0 and –3.0 EV in increments of $^{1}$ / <sub>3</sub> EV.
AA	Auto aperture (available only with compatible flash units; $\square$ 294). Choose flash compensation from values between +3.0 and -3.0 EV in increments of <sup>1</sup> / <sub>3</sub> EV.
M	Choose the flash level from values between 1/1 and 1/128 (1/128 of full power).
	The flash units in this group do not fire.
Group B	Choose a flash mode for all flash units in group B. The options available are the same as those listed for <b>Group A</b> , above.
Channel	Choose from channels 1–4. All flash units in both groups must be set to the same channel.

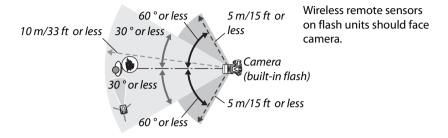
Follow the steps below to take photographs in commander mode.

1 Adjust settings for the built-in flash. Choose the flash control mode and output level for the built-in flash. Note that output level can not be adjusted in – – mode.	e3 Hash cntrl for built-in flash Commander mode Built-in flash Group A Group A Channel CH CMCCK
<b>2</b> Adjust settings for group A. Choose the flash control mode and output level for the flash units in group A.	e3 Flash cntrl for built-in flash Commander mode Mode Comp. Built-in flash <u>TTL</u> +0. 7 Group A <u>TTL</u> 0 Channel CH
<b>3</b> Adjust settings for group B. Choose the flash control mode and output level for the flash units in group B.	e3 Hash entri for built-in flash Commander mode Built-in flash TTL +0.7 Group A TTL -0.7 Group B U 1/4 = Channel 1 CH
<b>4</b> Select the channel.	e3 Hash critrl for built-in flash Commander mode Built-in flash TTL +0. 7 Group A TTL -0.7 Group B TTL -0.7 Group B TTL -0.7 Channel B = CH

5 Press ®.

# **6** Compose the shot.

Compose the shot and arrange the flash units as shown below. Note that the maximum distance at which the remote flash units can be placed may vary with shooting conditions.



# 7 Configure the remote flash units.

Turn all the remote flash units on, adjust group settings as desired, and set them to the channel selected in Step 4. See the flash unit instruction manuals for details.

# 8 Raise the built-in flash.

Press the **4** (**122**) button to raise the built-in flash. Note that even if – – is selected for **Built-in flash** > **Mode**, the built-in flash must be raised so that monitor preflashes will be emitted.

# **9** Frame the photograph, focus, and shoot.

After confirming that the camera flash-ready light and the flash-ready lights for all other flash units are lit, frame the photograph, focus, and shoot. FV lock (D 149) can be used if desired.

#### The Flash Sync Mode Display

**4** does not appear in the control panel flash sync mode display when – – is selected for **Builtin flash** > **Mode**.

#### Flash Compensation

The flash compensation value selected with the  $\frac{1}{2}$  (22) button and sub-command dial is added to the flash compensation values selected for the built-in flash, group A, and group B in the **Commander mode** menu. A 22 icon is displayed in the control panel and viewfinder when a flash compensation value other than  $\pm 0$  is selected for **Built-in flash** > **TTL**. The 22 icon flashes when the built-in flash is in mode **M**.

#### Commander Mode

Position the sensor windows on the remote flash units to pick up the light from the built-in flash (particular care is required if the camera is not mounted on a tripod). Be sure that direct light or strong reflections from the remote flash units do not enter the camera lens (in TTL mode) or the photocells on the remote flash units (AA mode), as this may interfere with exposure. To prevent timing flashes emitted by the built-in flash from appearing in photographs taken at short range, choose low ISO sensitivities or small apertures (high f-numbers) or use an optional SG-3IR infrared panel for the built-in flash. An SG-3IR is required for best results with rear-curtain sync, which produces brighter timing flashes. After positioning the remote flash units, take a test shot and view the results in the camera monitor.

Although there is no limit on the number of remote flash units that may be used, the practical maximum is three. With more than this number, the light emitted by the remote flash units will interfere with performance.

# e4: Exposure Comp. for Flash

MENU button 🔿 🖋 Custom Settings menu

Choose how the camera adjusts flash level when exposure compensation is used.

	Option	Description
42 Z	Enfire frame	Both flash level and exposure compensation are adjusted to modify exposure over the entire frame.
Z	Background only	Exposure compensation applies to background only.

#### e5: Modeling Flash

If **On** is selected when the camera is being used with the built-in flash or an optional CLS-compatible flash unit (2294), a modeling flash will be emitted when the camera depth-of-field preview button is pressed ( $\Box$  77). No modeling flash is emitted if **Off** is selected

#### e6: Auto Bracketing Set

Choose the setting or settings bracketed when auto bracketing ( $\Box$  153) is in effect. Choose AE & flash (AB) to perform both exposure and flash-level bracketing, AE only (AE) to bracket only exposure, Flash only (\$) to perform only flash-level bracketing, WB bracketing (WB) to perform white-balance bracketing (CD 156), or ADL bracketing (喵) to perform bracketing using Active D-Lighting (四 158). Note that white balance bracketing is not available at image quality settings of NEF (RAW) or NEF (RAW) + JPEG.

#### e7: Bracketing Order

At the default setting of **MTR > under > over** (🛯), exposure, flash, and white balance bracketing are performed in the order described on pages 153 and 156. If **Under** > **MTR** > **over** ( $\rightarrow$ +) is selected, shooting will proceed in order from the lowest to the highest value. This setting has no effect on ADL bracketing.

# f: Controls

f1: OK Button (Shooting Mode)

Choose the role played by the 
w button during shooting: selecting the center focus point (RESET Select center focus point), highlighting the active focus point (In: Highlight active focus point), or none (Not used).

MENU button  $\rightarrow$  Custom Settings menu

MENU button 🔿 🖋 Custom Settings menu



MENU button 🔿 🖋 Custom Settings menu

# f2: Assign Fn Button

#### **MENU** button $\rightarrow$ $\checkmark$ Custom Settings menu

Choose the role played by the **Fn** button.



Option		Description
6	Preview	Press the <b>Fn</b> button to preview depth of field (CC 77).
\$L	FV lock	Press the <b>Fn</b> button to lock flash value (built-in flash and compatible optional flash units only, III 149, 294). Press again to cancel FV lock.
A	AE/AF lock	Focus and exposure lock while the <b>Fn</b> button is pressed.
Æ	AE lock only	Exposure locks while the <b>Fn</b> button is pressed.
ā9	AE lock (Hold)	Exposure locks when the <b>Fn</b> button is pressed, and remains locked until the button is pressed a second time or the standby timer expires.
AF	AF lock only	Focus locks while the <b>Fn</b> button is pressed.
AF-ON	AF-ON	Pressing the <b>Fn</b> button initiates autofocus. The shutter-release button can not be used to focus.
٤	Flash off	The flash will not fire in photos taken while the <b>Fn</b> button is pressed.
BKT⊒ı	Bracketing burst	If the <b>Fn</b> button is pressed while exposure, flash, or ADL bracketing is active in single frame or quiet shutter-release mode, all shots in the current bracketing program will be taken each time the shutter-release button is pressed. If white balance bracketing is active or continuous release mode (mode <b>CH</b> or <b>CL</b> ) is selected, the camera will repeat the bracketing burst while the shutter-release button is held down.
B‡	Active D-Lighting	Press the <b>Fn</b> button and rotate the main command dial to adjust Active D-Lighting (D 137).
+[RAW]	+NEF (RAW)	If image quality is set to <b>JPEG fine</b> , <b>JPEG normal</b> , or <b>JPEG basic</b> , "RAW" will be displayed in the control panel and an NEF (RAW) copy will be recorded with the next picture taken after the <b>Fn</b> button is pressed (to record NEF/RAW copies with a series of photographs, keep the shutter-release button pressed halfway between shots). To exit without recording an NEF (RAW) copy, press the <b>Fn</b> button again.
Ø	Matrix metering	Matrix metering is activated while the <b>Fn</b> button is pressed.
0	Center- weighted metering	Center-weighted metering is activated while the <b>Fn</b> button is pressed.
·	Spot metering	Spot metering is activated while the <b>Fn</b> button is pressed.

	Option	Description
⊞	Framing grid	Press the <b>Fn</b> button and rotate the main command dial to turn the framing grid display in the viewfinder on or off (
FX	Choose image area	Press the <b>Fn</b> button and rotate a command dial to choose an image area ( $\square$ 89).
÷	Viewfinder virtual horizon	Press the <b>Fn</b> button to view a virtual horizon display in the viewfinder.
湿	MY MENU	Pressing the <b>Fn</b> button displays "MY MENU" (🕮 280).
Ր₪	Access top item in MY MENU	Press the <b>Fn</b> button to jump to the top item in "MY MENU." Select this option for quick access to a frequently-used menu item.
\$\$	1 step spd/ aperture	If the <b>Fn</b> button is pressed when the command dials are rotated, changes to shutter speed (modes <b>S</b> and <b>M</b> ) and aperture (modes <b>A</b> and <b>M</b> ) are made in increments of 1 EV, regardless of the option selected for Custom Setting b2 ( <b>EV steps for exposure cntrl</b> , <sup>CL</sup> 224).
Non-CPU	Choose non- CPU lens number	Press the <b>Fn</b> button and rotate a command dial to choose a lens number specified using the <b>Non-CPU lens data</b> option (CP 172).
Þ	Playback	Fn button performs same function as  ▶ button. Select when using a telephoto lens or in other circumstances in which it is difficult to operate the  ▶ button with your left hand.
	None	Pressing the button has no effect.

#### Viewfinder Virtual Horizon

When **Viewfinder virtual horizon** is selected for Custom Setting f2 (**Assign Fn button**), pressing the **Fn** button converts the exposure display in the viewfinder to a roll indicator. Press the button again to restore the indicator to its normal function.

	Camera tilted right	Camera level	Camera tilted left
Viewfinder	0 •iiiiiil · · ·		· · · 0

Note that the display may not be accurate when the camera is tilted at a sharp angle forward or back. For a display that shows both pitch and roll, use the **Virtual horizon** option in the setup menu ( $\Box$  258).

## **f3: Assign Preview Button**

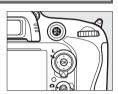
Choose the role played by the depth-of-field preview button. The options available are the same as for Assign Fn button (C 242). The default setting is **Preview**.

# f4: Assign AE-L/AF-L Button

Choose the role played by the ÆL AE-L/AF-L button.

0	ption	Description
A	AE/AF	Focus and exposure lock while the 結 AE-L/AF-L button is
AF	lock	pressed.
Â	AE lock only	Exposure locks while the 鮓 AE-L/AF-L button is pressed.
Å:	AE lock (Hold)	Exposure locks when the 結 AE-L/AF-L button is pressed, and remains locked until the button is pressed a second time or the standby timer expires.
ĀF	AF lock only	Focus locks while the 結 <b>AE-L/AF-L</b> button is pressed.
AFON	AF-ON	The 緝 <b>AE-L/AF-L</b> button initiates autofocus. The shutter- release button can not be used to focus.
ŧL	FV lock	Press the 結 <b>AE-L/AF-L</b> button to lock flash value (built-in flash and compatible optional flash units only, ロ 149, 294). Press again to cancel FV lock.
	None	Pressing the button has no effect.

MENU button  $\rightarrow$  Custom Settings menu



MENU button  $\rightarrow$  Custom Settings menu

This option controls the operation of the main and sub-command dials.

- Reverse rotation: Reverse the direction of rotation of the command dials when they are used to make adjustments to Exposure compensation and/or Shutter speed/aperture. Highlight options and press the multi selector right to select or deselect, then highlight Done and press <sup>®</sup>. This setting also applies to the command dials for the MB-D14.
- Change main/sub: If Off is selected, the main command dial controls shutter speed and the sub-command dial controls aperture. Select On (Mode A) to use the main command dial to select aperture in shooting mode A, On to use the main command dial to select aperture in modes A and M and the sub-command dial to select shutter speed in modes S and M. This setting also applies to the command dials for the MB-D14.





- Aperture setting: If Sub-command dial is selected, aperture can only be adjusted with the sub-command dial (or with the main command dial if **On** is selected for **Change main/sub**). If **Aperture ring** is selected, aperture can only be adjusted with the lens aperture ring and the camera aperture display will show aperture in increments of 1 EV (aperture for type G lenses is still set using the sub-command dial). Note that regardless of the setting chosen, the aperture ring must be used to adjust aperture when a non-CPU lens is attached.
- Menus and playback: If Off is selected, the multi selector is used to choose the picture displayed during full-frame playback, highlight thumbnails, and navigate menus. If On or On (image review excluded) is selected, the main command dial can be used to choose the picture displayed during full-frame playback, move the cursor left or right during thumbnail playback, and move the menu highlight bar up or down. The sub-command dial is used to display additional photo information in full-frame playback and to move the cursor up or down during thumbnail playback. Select On (image review excluded) to prevent the command dials from being used for playback during image review. While menus are displayed, rotating the sub-command dial right displays the sub-menu for the selected option, while rotating it left displays the previous menu. To make a selection, press ▶ or ⊛.

Selecting Yes allows adjustments that are normally made by holding the 🖾, 💈 (🖾), Re (ISO), R (QUAL), MB), AF-mode, R (mm), or BKT button and rotating a command dial to be made by rotating the command dial after the button is released (this also applies to the Fn and depth-of-field preview buttons if they have been assigned Active D-Lighting using Custom Setting f2, Assign Fn button, or Custom Setting f3, Assign preview button). Setting ends when any of the affected buttons is pressed again or the shutter-release button is pressed halfway. Except when No limit is selected for Custom Setting c2 Standby timer, setting will also end when the standby timer expires.

f7: Slot Empty Release Lock

MENU button 🔿 🖋 Custom Settings menu

Selecting **Enable release** allows the shutter to be released when no memory card is inserted, although no pictures will be recorded (they will however be displayed in the monitor in demo mode). If **Release locked** is selected, the shutter-release button is only enabled when a memory card is inserted in the camera.

**f8: Reverse Indicators** 

MENU button 🔿 🖋 Custom Settings menu

If -- is selected, the exposure indicators in the control panel, viewfinder, and information display are displayed with negative values on the left and positive values on the right. Select -- (+o-) to display positive values on the left and negative values on the right.

Choose the function assigned to the 鼪 AE-L/AF-L button on the optional MB-D14 battery pack.



	Option	Description
A	AE/AF lock	Focus and exposure lock while the MB-D14 ﷺ <b>AE-L/AF-L</b> button is pressed.
Ā	AE lock only	Exposure locks while the MB-D14 駐 AE-L/AF-L button is pressed.
Æ9	AE lock (Hold)	Exposure locks when the MB-D14 結 <b>AE-L/AF-L</b> button is pressed, and remains locked until the button is pressed a second time or the standby timer expires.
AF	AF lock only	Focus locks while the MB-D14 鮓 AE-L/AF-L button is pressed.
AF-ON	AF-ON	Pressing the MB-D14 鼪 <b>AE-L/AF-L</b> button initiates autofocus. The shutter- release button can not be used to focus.
۶L	FV lock	Press the MB-D14 結 <b>AE-L/AF-L</b> button to lock flash value (built-in flash and compatible optional flash units only, 印 149, 294). Press again to cancel FV lock.
Fn	Same as Fn button	The MB-D14

# g: Movie

# g1: Assign Fn Button

MENU button 🔶 🖋 Custom Settings menu

Choose the role played by the **Fn** button during movie live view (the default option is **None**).

	Option	Description
۰	Index marking	Press the button during movie recording to add an index at the current
		position (🕮 60). Indices can be used when viewing and editing movies.
	View photo	Press the button to display information on shutter speed, aperture, and
<b>Å</b> 8	shooting info	other photo settings in place of movie recording information. Press again
	shouling into	to return to the movie recording display ( $\square$ 59).
<b>A</b> ₽	AE/AF lock	Focus and exposure lock while the button is pressed.
ÅΞ	AE lock only	Exposure locks while the button is pressed.
<b>ക</b> ം	AE lock (Hold)	Exposure locks when the button is pressed, and remains locked until the
		button is pressed a second time or the standby timer expires.
ĀF	AF lock only	Focus locks while the button is pressed.
	AF-ON	Pressing the button initiates autofocus. The shutter-release button can
ALON		not be used to focus.
	None	Pressing the button has no effect.

247

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## g2: Assign Preview Button

Choose the role played by the depth-of-field preview button during movie live view. The options available are the same as for **Assign Fn button** ( $\Box$  247), except that the default setting is **Index marking**.

Choose the role played by the 群 AE-L/AF-L button during movie live view. The options available are the same as for **Assign Fn button** (□ 247), except that the default setting is **AE/AF lock**.

Choose the role played by pressing the shutter-release button when  $\mathbf{R}$  is selected with the live view selector.

Option	Description
Take photos	Press the shutter-release button all the way down to end movie recording and take a photograph with an aspect ratio of 16:9 (for information on image size, see page 63).
🖷 Record movies	Press the shutter-release button halfway to start movie live view. You can then press the shutter-release button halfway to focus (autofocus mode only) and press it all the way down to start or end recording. To end movie live view, press the 🖾 button. The shutter-release button on an optional remote cord (🕮 298) can be used to start movie live view and to start and end movie recording; the optional ML-L3 remote control, however, can not be used to record movies. In remote control (💷) mode, pressing the shutter-release button halfway does not start movie live view, while pressing the shutter-release button on the remote control releases the shutter to record a photograph and does not start or end movie recording.

#### Record Movies

When this option is selected, interval timer (
164) is not available and the shutter-release button can not be used during movie live view to record photographs, measure preset white balance, or record image dust off reference data. Select **Take photos** to use these options.

MENU button  $\rightarrow$  Custom Settings menu

MENU button  $\rightarrow$  Custom Settings menu

# **Y** The Setup Menu: Camera Setup

To display the setup menu, press **MENU** and select the **Y** (setup menu) tab.





SETUP MENU



MENU button

#### The setup menu contains the following options:

Option	<u> </u>	Option	L L L L L L L L L L L L L L L L L L L
Format memory card	250	Image comment	253
Save user settings	81	Auto image rotation	254
Reset user settings	82	Battery info	255
Monitor brightness	250	Copyright information	256
Clean image sensor	301	Save/load settings	257
Lock mirror up for cleaning <sup>1</sup>	303	GPS	175
Image Dust Off ref photo	251	Virtual horizon	258
HDMI	205	Non-CPU lens data	172
Flicker reduction	252	AF fine-tune	259
Time zone and date	253	Eye-Fi upload <sup>2</sup>	260
Language	253	Firmware version	260

1 Not available when battery is low.

2 Only displayed when compatible Eye-Fi memory card is inserted (D 260).

#### See Also

Menu defaults are listed on page 314.

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# Format Memory Card

To begin formatting, choose a memory card slot and select **Yes**. Note that formatting permanently deletes all pictures and other data on the card in the selected slot. Before formatting, be sure to make backup copies as required.

#### During Formatting

Do not turn the camera off or remove memory cards during formatting.

#### Two-Button Format

Memory cards can also be formatted by pressing the  $\overline{in}$  ( $\overline{im}$ ) and C ( $\overline{im}$ ) buttons for more than two seconds ( $\Box$  31).

# **Monitor Brightness**

MENU button → Y setup menu

Adjust the brightness of the monitor for playback, menus, and the information display.

Option	Description
	When the monitor is on, monitor brightness is automatically adjusted according to ambient lighting conditions. Care should be taken not to cover the ambient brightness sensor (
Manual	Press $\blacktriangle$ or $\blacksquare$ to choose monitor brightness. Choose higher values for increased brightness, lower values for reduced brightness.

#### 🖉 See Also

For information on adjusting monitor brightness in live view, see page 53.

Format memory card

**MENU** button  $\rightarrow$  **Y** setup menu

#### **Image Dust Off Ref Photo**

Acquire reference data for the Image Dust Off option in Capture NX 2 (available separately; for more information, see the Capture NX 2 manual).

**Image Dust Off ref photo** is available only when a CPU lens is mounted on the camera. A non-DX lens with a focal length of at least 50 mm is recommended. When using a zoom lens, zoom all the way in.

# 1 Choose a start option.

Highlight one of the following options and press . To exit without acquiring image dust off data, press MENU.

- **Start**: The message shown at right will be displayed and "rEF" will appear in the viewfinder and control panel displays.
- Clean sensor and then start: Select this option to clean the image sensor before starting. The message shown at right will be displayed and "rEF" will appear in the viewfinder and control panel displays when cleaning is complete.



# **2** Frame a featureless white object in the viewfinder.

With the lens about ten centimeters (four inches) from a well-lit, featureless white object, frame the object so that it fills the viewfinder and then press the shutter-release button halfway.

In autofocus mode, focus will automatically be set to infinity; in manual focus mode, set focus to infinity manually.

# **3** Acquire dust off reference data.

Press the shutter-release button the rest of the way down to acquire Image Dust Off reference data. The monitor turns off when the shutter-release button is pressed. Note that noise reduction will be performed if the subject is poorly lit, increasing recording times.

If the reference object is too bright or too dark, the camera may be unable to acquire Image Dust Off reference data and the message shown at right will be displayed. Choose another reference object and repeat the process from step 1.

#### M Image Sensor Cleaning

Dust off reference data recorded before image sensor cleaning is performed can not be used with photographs taken after image sensor cleaning is performed. Select **Clean sensor and then start** only if the dust off reference data will not be used with existing photographs.

#### M Image Dust Off Reference Data

The same reference data can be used for photographs taken with different lenses or at different apertures. Reference images can not be viewed using computer imaging software. A grid pattern is displayed when reference images are viewed on the camera.

# **Flicker Reduction**

 $MENU button \rightarrow \Upsilon setup menu$ 

Exposure settings are not

appropriate. Change exposure settings

and try again.

NDF

Image Dust Off ref photo

Reduce flicker and banding when shooting under fluorescent or mercury-vapor lighting during live view or movie recording. Choose **Auto** to allow the camera to automatically choose the correct frequency, or manually match the frequency to that of the local AC power supply.

#### Flicker Reduction

If **Auto** fails to produce the desired results and you are unsure as to the frequency of the local power supply, test both the 50 and 60 Hz options and choose the one that produces the best results. Flicker reduction may not produce the desired results if the subject is very bright, in which case you should try choosing a smaller aperture (higher f-number).

:=

Change time zones, set the camera clock, choose the date display order, and turn daylight saving time on or off ( $\Box$  27).

Option	Description		
Time zone	Choose a time zone. The camera clock is automatically set to the time in		
	the new time zone.		
Date and time	Set the camera clock. If the clock is not set, a flashing 🚥 icon will appear		
	in the information display.		
Date format	Choose the order in which the day, month, and year are displayed.		
Daylight saving time	Turn daylight saving time on or off. The camera clock will automatically be		
	advanced or set back one hour. The default setting is <b>Off</b> .		

# Language

Choose a language for camera menus and messages.

Add a comment to new photographs as they are taken. Comments can be viewed as metadata in ViewNX 2 (supplied) or Capture NX 2 (available separately; 🕮 298). The comment is also visible on the shooting data page in the photo information display (🖽 182).

- **Done**: Save changes and return to the setup menu.
- Input comment: Input a comment as described on page 135. Comments can be up to 36 characters long.
- Attach comment: Select this option to attach the comment to all subsequent photographs. Attach comment can be turned on and off by highlighting it and pressing  $\blacktriangleright$ .

lmage comment 9 Input comment



MENU button → ¥ setup menu

MENU button → ¥ setup menu

:=

# Auto Image Rotation

Photographs taken while **On** is selected contain information on camera orientation, allowing them to be rotated automatically during playback ( $\Box$  177) or when viewed in ViewNX 2 (supplied) or in Capture NX 2 (available separately;  $\Box$  298). The following orientations are recorded:







Camera rotated 90° counter-clockwise

Camera orientation is not recorded when **Off** is selected. Choose this option when panning or taking photographs with the lens pointing up or down.

#### 🖉 Rotate Tall

To automatically rotate "tall" (portrait-orientation) photographs for display during playback, select **On** for the **Rotate tall** option in the playback menu (<sup>CL</sup> 212).

View information on the battery currently inserted in the camera.



ltem	Description	
Charge	The current battery level expressed as a percentage.	
No. of shots	The number of times the shutter has been released with the current battery since the battery was last charged. Note that the camera may sometimes release the shutter without recording a photograph, for example when measuring preset white balance.	
Battery age	A five-level display showing battery age. 0 (I constrained by the state of the end of t	

#### The MB-D14 Battery Pack

The display for the MB-D14 battery pack is shown at right. If AA batteries are used, the battery level will be shown by a battery level icon; other items will not be displayed.



## **Copyright Information**

Add copyright information to new photographs as they are taken. Copyright information is included in the shooting data shown in the photo information display ( $\Box$  182) and can be viewed as metadata in ViewNX 2 (supplied) or in Capture NX 2 (available separately;  $\Box$  298).

- **Done**: Save changes and return to the setup menu.
- Artist: Enter a photographer name as described on page 135. Photographer names can be up to 36 characters long.
- **Copyright**: Enter the name of the copyright holder as described on page 135. Copyright holder names can be up to 54 characters long.
- Attach copyright information: Select this option to attach copyright information to all subsequent photographs.
   Attach copyright information can be turned on and off by highlighting it and pressing ▶.



#### Copyright Information

To prevent unauthorized use of the artist or copyright holder names, make sure that **Attach copyright information** is not selected and that the **Artist** and **Copyright** fields are blank before lending or transferring the camera to another person. Nikon does not accept liability for any damages or disputes arising from the use of the **Copyright information** option.

## Save/Load Settings

MENU button → ¥ setup menu

Select **Save settings** to save the following settings to the memory card in Slot 1 ( $\square$  96; if the card is full, an error will be displayed). Use this option to share settings among D600 cameras.

Menu	Option	Menu	Option
Playback	Playback display options	Custom	All Custom Settings except Reset
	Image review	settings	custom settings
	After delete		Clean image sensor
	Rotate tall		HDMI
	File naming		Flicker reduction
	Role played by card in Slot 2		Time zone and date (excepting
	Image quality		date and time)
	Image size	Setup	Language
	Image area	setup	Image comment
	JPEG compression		Auto image rotation
	NEF (RAW) recording		Copyright information
	White balance (with fine-tuning		GPS
	and presets d-1–d-4)		Non-CPU lens data
Shooting	Set Picture Control		Eye-Fi upload
	Auto distortion control	My Menu/	All My Menu items
	Color space	Recent	All recent settings
	Active D-Lighting	Settings	Choose tab
	Vignette control		
	Long exposure NR		
	High ISO NR		
	ISO sensitivity settings		
	Remote control mode		
	Movie settings		

Settings saved using this model of camera can be restored by selecting **Load settings**. Note that **Save/load settings** is only available when a memory card is inserted in the camera, and that the **Load settings** option is only available if the card contains saved settings.

#### Saved Settings

Settings are saved in a file named NCSETUPA. The camera will not be able to load settings if the file name is changed.

#### **Virtual Horizon**

Display roll and pitch information based on information from the camera tilt sensor. If the camera is tilted neither left nor right, the roll reference line will turn green, while if the camera is tilted neither forward nor back, the pitch reference line will turn green and a dot will appear in the center of the display. Each division is equivalent to 5°.



Camera level



Camera tilted left or right



Camera tilted forward or back

#### **V** Tilting the Camera

The virtual horizon display is not accurate when the camera is tilted at a sharp angle forward or back. If the camera is unable to measure tilt, the amount of tilt will not be displayed.

#### 🖉 See Also

For information on viewing a roll indicator in the viewfinder, see Custom Setting f2 (**Assign Fn button**; D 242, 243). For information on displaying a virtual horizon in live view, see pages 55 and 62.

# **AF Fine-tune**

Fine-tune focus for up to 12 lens types. AF tuning is not recommended in most situations and may interfere with normal focus; use only when required.

Option	Description			
AF fine-tune (On/Off)	<ul> <li>On: Turn AF tuning on.</li> <li>Off: Turn AF tuning off.</li> </ul>			
Saved value	Tune AF for the current lens (CPU lenses only). Press $\blacktriangle$ or $\blacktriangledown$ to choose a value between +20 and -20. Values for up to 12 lens types can be stored. Only one value can be stored for each type of lens.	Move focal point away Current from camera. value AF fine tune Saved value 24-120m F4 VR NO		
Default	Choose the AF tuning value used when no previously saved value exists for the current lens (CPU lenses only).	Move focal Previous point toward value camera.		
List saved	List previously saved AF tuning values. To delete a lens from the list, highlight the desired lens and press $\tilde{w}$ ( $\overline{m}$ ). To change a lens identifier (for example, to choose an identifier that is the same as the last two digits of the lens serial number to distinguish it from other lenses of the same type in light of the fact that <b>Saved value</b> can be used with only one lens of each type), highlight the desired lens and press $\blacktriangleright$ .			
values	The menu shown at right will be displayed; press ▲ to choose an identifier and press ⊛ to save changes exit.			

### AF Tuning

The camera may be unable to focus at minimum range or at infinity when AF tuning is applied.

#### 🖌 Live View

Tuning is not applied to autofocus during in live view (<sup>[]</sup> 53).

#### Saved Value

Only one value can be stored for each type of lens. If a teleconverter is used, separate values can be stored for each combination of lens and teleconverter.

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This option is displayed only when an Eye-Fi memory card (available separately from third-party suppliers) is inserted in the camera. Choose **Enable** to upload photographs to a preselected destination. Note that pictures will not be uploaded if signal strength is insufficient.

Observe all local laws concerning wireless devices and choose **Disable** where wireless devices are prohibited.

When an Eye-Fi card is inserted, its status is indicated by an icon in the information display:

- 🖹: Eye-Fi upload disabled.
- 중: Eye-Fi upload enabled but no pictures available for upload.
- 🗟 (static): Eye-Fi upload enabled; waiting to begin upload.
- (animated): Eye-Fi upload enabled; uploading data.
- The second second

#### 🗹 Eye-Fi Cards

Eye-Fi cards may emit wireless signals when **Disable** is selected. If a warning is displayed in the monitor ( $\square$  324), turn the camera off and remove the card.

See the manual provided with the Eye-Fi card, and direct any inquiries to the manufacturer. The camera can be used to turn Eye-Fi cards on and off, but may not support other Eye-Fi functions.

#### Supported Eye-Fi Cards

As of December 2011, the camera supports 8 GB SDHC Pro X2 Eye-Fi cards. Some cards may not be available in some countries or regions; consult the manufacturer for more information. Eye-Fi cards are for use only in the country of purchase. Be sure the Eye-Fi card firmware has been updated to the latest version.

#### 🖉 Using Eye-Fi Cards in Ad Hoc Mode

Additional time may be required when connecting using Eye-Fi cards that support ad hoc mode. Set Custom Setting c2 (**Standby timer**, <sup>CD</sup> 227) to 30 s or longer.

#### **Firmware Version**

MENU button → ¥ setup menu

View the current camera firmware version.



# **The Retouch Menu:** *Creating Retouched Copies*

To display the retouch menu, press MENU and select the 🛃 (retouch menu) tab.



MENU button

The options in the retouch menu are used to create trimmed or retouched copies of existing pictures. The retouch menu is only displayed when a memory card containing photographs is inserted in the camera (note that if the memory card is being used to store both RAW/NEF and JPEG copies of the same photographs as described on page 93, retouch other than **Image overlay** and **NEF (RAW) processing** apply only to the JPEG copies).

Option	m	Option	
🔁 D-Lighting	264	🐔 Straighten	274
Red-eye correction	264	<ul> <li>Distortion control</li> </ul>	274
🖌 Trim	265	🖾 Fisheye	274
Monochrome	266	😼 Color outline	275
Filter effects	267	🖾 Color sketch	275
📽 🖉 Color balance	268	Perspective control	275
🖻 Image overlay <sup>1</sup>	269	🍻 Miniature effect	276
Real NEF (RAW) processing	271	Selective color	277
🖬 Resize	272	🖾 Edit movie	69
C <sup>★</sup> Quick retouch	273	■•□ Side-by-side comparison <sup>2</sup>	279

1 Can only be selected by pressing MENU and selecting 🛃 tab.

2 Only available if <sup>®</sup> or <sup>™</sup> (<sup>™</sup>) is pressed in full-frame playback when a retouched image or original is displayed.

#### Retouching Copies

Most options can be applied to copies created using other retouch options, although with the exceptions of **Image overlay** and **Edit movie** > **Choose start/end point** each option can be applied only once (note that multiple edits may result in loss of detail). Options that can not be applied to the current image are grayed out and unavailable.

#### 🖉 Image Quality

Except in the case of copies created with **Trim**, **Image overlay**, **NEF** (**RAW**) **processing**, and **Resize**, copies created from JPEG images are the same size and quality as the original, while copies created from NEF (RAW) photos are saved as large fine-quality JPEG images. Size-priority compression is used when copies are saved in JPEG format.

# **Creating Retouched Copies**

To create a retouched copy:



# **2** Select a picture.

Highlight a picture and press M (to view the highlighted picture full screen, press and hold the M (**QUAL**) button; to view images in other locations as described on page 178, hold **BKT** and press  $\blacktriangle$ ).



#### 🖉 Retouch

The camera may not be able to display or retouch images created with other devices.

# **3** Select retouch options.

For more information, see the section for the selected item. To exit without creating a retouched copy, press **MENU**.



#### Monitor off Delay

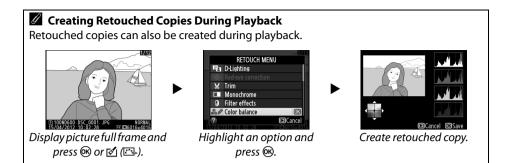
The monitor will turn off and the operation will be cancelled if no actions are performed for a brief period. Any unsaved changes will be lost. To increase the time the monitor remains on, choose a longer menu display time for Custom Setting c4 (**Monitor off delay**;  $\square$  228).

# 4 Create a retouched copy.

Press B to create a retouched copy. Retouched copies are indicated by a C icon.



:=



#### **D-Lighting**

D-lighting brightens shadows, making it ideal for dark or backlit photographs.

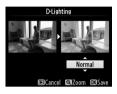


Before





Press  $\blacktriangle$  or  $\triangledown$  to choose the amount of correction performed. The effect can be previewed in the edit display. Press M to copy the photograph.



#### **Red-Eye Correction**

MENU button  $\rightarrow$  retouch menu

This option is used to correct "red-eye" caused by the flash, and is available only with photographs taken using the flash. The photograph selected for red-eye correction can be previewed in the edit display. Confirm the effects of red-eye correction and create a copy as described in the following table. Note that red-eye correction may not always produce the expected results and may in very rare circumstances be applied to portions of the image that are not affected by red-eye; check the preview thoroughly before proceeding.

То	Use	Description
Zoom in	ि (QUAL)	Press 🔍 (QUAL) to zoom in, 🖓 🖾 (ISO) to zoom
Zoom out	ବ୍≌ (ISO)	out. While photo is zoomed in, use multi selector to view areas of image not visible in
View other areas of image		monitor. Keep multi selector pressed to scroll rapidly to other areas of frame. Navigation window is displayed when zoom buttons or
Cancel zoom	Øß	multi selector is pressed; area currently visible in monitor is indicated by yellow border. Press ® to cancel zoom.
Create copy	œ	If the camera detects red-eye in the selected photograph, a copy will be created that has been processed to reduce its effects. No copy will be created if the camera is unable to detect red-eye.

Create a cropped copy of the selected photograph. The selected photograph is displayed with the selected crop shown in yellow; create a cropped copy as described in the following table.

To	Use	Description
Reduce size of crop	<b>ବ୍≅ (ISO</b> )	Press ♀¤ (ISO) to reduce the size of the crop.
Increase size of crop	<sup>⊕</sup> (QUAL)	Press $\mathfrak{P}(\mathbf{QUAL})$ to increase the size of the crop.
Change crop aspect ratio		Rotate the main command dial to switch between aspect ratios of 3 : 2, 4 : 3, 5 : 4, 1 : 1, and 16 : 9.
Position crop		Use multi selector to position the crop. Press and hold to move the crop rapidly to the desired position.
Create copy 🛞		Save the current crop as a separate file.

#### Trim: Image Quality and Size

Copies created from NEF (RAW) or NEF (RAW) + JPEG photos have an image quality ( $\square$  93) of JPEG fine; cropped copies created from JPEG photos have the same image quality as the original. The size of the copy varies with crop size and aspect ratio and appears at upper left in the crop display.

#### Viewing Cropped Copies

Playback zoom may not be available when cropped copies are displayed.





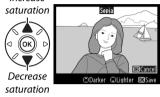
¥4480x2984

#### Monochrome

Copy photographs in **Black-and-white**, **Sepia**, or **Cyanotype** (blue and white monochrome).

Selecting **Sepia** or **Cyanotype** displays a preview of the selected image; press  $\blacktriangle$  to increase color saturation,  $\blacktriangledown$  to decrease. Press B to create a monochrome copy.





MENU button 🔿 🛃 retouch menu

## **Filter Effects**

Choose from the following filter effects. After adjusting filter effects as described below, press ® to copy the photograph.

Option	Description	
Skylight	Creates the effect of a skylight filter, making the picture less blue. The effect can be previewed in the monitor as shown at right.	Skylight
Warm filter	Creates a copy with warm tone filter effects, giving the copy a "warm" red cast. The effect can be previewed in the monitor.	ECancel OKSave
Red intensifier	Intensify reds ( <b>Red intensifier</b> ), greens ( <b>Green</b>	Red intensifier
Green intensifier	<b>intensifier</b> ), or blues ( <b>Blue intensifier</b> ). Press $\blacktriangle$ to increase the effect, $\blacktriangledown$ to decrease.	
Blue intensifier		Darker QLighter O3Save
Cross screen	<ul> <li>Add starburst effects to light sources.</li> <li>Number of points: Choose from four, six, or eight.</li> <li>Filter amount: Choose the brightness of the light sources affected.</li> <li>Filter angle: Choose the angle of the points.</li> <li>Length of points: Choose the length of points.</li> <li>Confirm: Preview the effects of the filter as shown at right. Press (QUAL) to preview the copy full frame.</li> <li>Save: Create a retouched copy.</li> </ul>	Cross screen Number of points
Soft	Add a soft filter effect. Press ▲ or ▼ to choose the filter strength.	Soft Normal Cancel ©Zcom C%Save

## **Color Balance**

#### MENU button $\rightarrow \square$ retouch menu

Use the multi selector to create a copy with modified color balance as shown below. The effect is displayed in the monitor together with red, green, and blue histograms ( $\square$  181) giving the distribution of tones in the copy.





#### 🖉 Zoom

To zoom in on the image displayed in the monitor, press <sup>®</sup>(QUAL). The histogram will be updated to show data only for the portion of the image displayed in the monitor. While the image is zoomed in, press ‰ (WB) to toggle back and forth between color balance and zoom. When zoom is selected, you can zoom in and out with the <sup>®</sup>(QUAL) and <sup>Q</sup>≅ (ISO) and scroll the image with the multi selector.



#### **Image Overlav**

Image overlay combines two existing NEF (RAW) photographs to create a single picture that is saved separately from the originals; the results, which make use of RAW data from the camera image sensor, are noticeably better than overlays created in an imaging application. The new picture is saved at current image guality and size settings; before creating an overlay, set image guality and size (
93, 95; all options are available). To create a NEF (RAW) copy, choose an image guality of **NEF (RAW)**.

Highlight Image overlay in the retouch menu and press ▶.

The dialog shown at right will be displayed, with Image 1 highlighted; press ® to display a list of the NEF pictures created with this camera.

## **2** Select the first image.

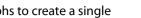
**1** Select Image overlay.

Use the multi selector to highlight the first photograph in the overlay. To view the highlighted photograph full frame, press and hold the QUAL button (to view images in other locations as described on page 178, hold

**BKT** and press  $\blacktriangle$ ). Press ( $\otimes$ ) to select the highlighted photograph and return to the preview display.

## **3** Select the second image.

The selected image will appear as **Image 1**. Highlight **Image 2** and press **(B)**, then select the second photo as described in Step 2.



MENU button  $\rightarrow \square$  retouch menu



lmage 1

RAW





Image 2

Preview



## 4 Adjust gain.

Highlight **Image 1** or **Image 2** and optimize exposure for the overlay by pressing  $\blacktriangle$  or  $\triangledown$  to select gain from values between 0.1 and 2.0. Repeat for the second image. The default value is 1.0; select 0.5 to halve gain or 2.0 to double it. The effects are visible in the **Preview** column.

## **5** Preview the overlay.

Press  $\blacktriangleleft$  or  $\triangleright$  to place the cursor in the **Preview** column and press  $\blacktriangle$  or  $\checkmark$  to highlight **Overlay**. Press  $\circledast$  to preview the overlay as shown at right (to save the overlay without displaying a preview, select **Save**). To return to Step 4 and select new photos or adjust gain, press  $\P$  (**ISO**).

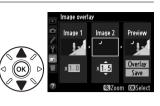
## **6** Save the overlay.

Press 
while the preview is displayed to save the overlay. After an overlay is created, the resulting image will be displayed full-frame in the monitor.

## 🖌 Image Overlay

Only NEF (RAW) photographs with the same image area and bit depth can be combined.

The overlay has the same photo info (including date of recording, metering, shutter speed, aperture, shooting mode, exposure compensation, focal length, and image orientation), and values for white balance and Picture Control as the photograph selected for **Image 1**. The current image comment is appended to the overlay when it is saved; copyright information, however, is not copied. Overlays saved in NEF (RAW) format use the compression selected for **Type** in the **NEF (RAW) recording** menu and have the same bit depth as the original images; JPEG overlays are saved using size-priority compression.









**D**-Lighting

Monochrome

Filter effects

Color balance

Red-eye correction <u>Trim</u>

RETOUCH MENU

 $\odot$ 

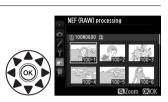
0

Create JPEG copies of NEF (RAW) photographs.

 Select NEF (RAW) processing. Highlight NEF (RAW) processing in the retouch menu and press ▶ to display a picture selection dialog listing only NEF (RAW) images created with this camera.

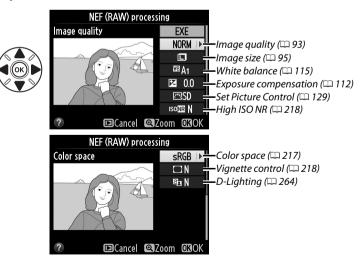
## **2** Select a photograph.

Highlight a photograph (to view the highlighted photograph full frame, press and hold the ♥ (QUAL) button; to view images in other locations as described on page 178, hold BKT and press ▲). Press to select the highlighted photograph and proceed to the next step.



## **3** Choose settings for the JPEG copy.

Adjust the settings listed below. Note that white balance and vignette control are not available with multiple exposures or pictures created with image overlay and that exposure compensation can only be set to values between -2 and +2 EV. The Picture Control grid is not displayed when Picture Controls are adjusted.



#### 4 Copy the photograph. Highlight EXE and press <sup>®</sup> to create a JPEG copy of the selected photograph (to exit without copying the photograph, press the MENU button).

Resize

Create small copies of selected photographs.

## 1 Select Resize.

To resize selected images, press **MENU** to display the menus and select **Resize** in the retouch menu.

## 2 Choose a destination.

If two memory cards are inserted, you can choose a destination for the resized copies by highlighting **Choose destination** and pressing ► (if only one card is inserted, proceed to Step 3).

The menu shown at right will be displayed; highlight a card slot and press B.

## 3 Choose a size. Highlight Choose size and press ►.

The options shown at right will be displayed; highlight an option and press  $\circledast$ .



0.6м 960x 640; 0.6 M 0.3м 640x 424; 0.3 M



RETOUCH MENU

MENU button  $\rightarrow \square$  retouch menu

Resize

Quick retouch Straighten

Color outline Color sketch Perspective cont

Distortion control Fisheye





#### 4 Choose pictures. Highlight Select image and press ►.

The dialog shown at right will be displayed; highlight pictures using the multi selector and press the  $\mathfrak{P}$  (ISO) button to select or deselect (to view the highlighted picture full screen, press and hold the  $\mathfrak{P}$  (QUAL) button; to view images in other locations as described on page 178, hold BKT and press  $\blacktriangle$ ). Selected pictures are marked by a  $\square$  icon. Press M when the selection is complete.

## **5** Save the resized copies.

A confirmation dialog will be displayed. Highlight **Yes** and press B to save the resized copies.

#### Viewing Resized Copies

Playback zoom may not be available when resized copies are displayed.

#### 🖉 Image Quality

Copies created from NEF (RAW) or NEF (RAW) + JPEG photos have an image quality ( $\square$  93) of JPEG fine; copies created from JPEG photos have the same image quality as the original.

## **Quick Retouch**

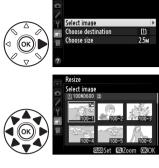
Create copies with enhanced saturation and contrast. D-Lighting is applied as required to brighten dark or backlit subjects.

Press  $\blacktriangle$  or  $\blacktriangledown$  to choose the amount of enhancement. The effect can be previewed in the edit display. Press M to copy the photograph.



Cancel @Zoom





#### Straighten

Create a straightened copy of the selected image. Press  $\blacktriangleright$  to rotate the image clockwise by up to five degrees in increments of approximately 0.25 degrees, < to rotate it counterclockwise (the effect can be previewed in the edit display; note that edges of the image will be trimmed to create a square copy). Press @ to copy the photograph, or press  $\mathbf{E}$  to exit to playback without creating a copy.

#### **Distortion Control**

Create copies with reduced peripheral distortion. Select Auto to let the camera correct distortion automatically and then make fine adjustments using the multi selector, or select Manual to reduce distortion manually (note that Auto is not available with photos taken using auto distortion control; see page 217). Press > to reduce barrel distortion, < to reduce pin-

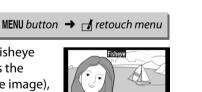
cushion distortion (the effect can be previewed in the edit display; note that greater amounts of distortion control result in more of the edges being cropped out). Press Ito copy the photograph, or press I to exit to playback without creating a copy. Note that distortion control may heavily crop or distort the edges of copies created from photographs taken with DX lenses at an image area setting of FX (36×24) 1.0×.

#### 🖉 Auto

Auto is for use only with pictures taken with type G and D lenses (PC, fisheye, and certain other lenses excluded). Results are not guaranteed with other lenses.

## Fisheye

Create copies that appear to have been taken with a fisheve lens. Press ▶ to increase the effect (this also increases the amount of that will be cropped out at the edges of the image), ◀ to reduce it. The effect can be previewed in the edit display. Press 🛞 to copy the photograph, or press 🗈 to exit to playback without creating a copy.





Manua

Straighten

MENU button  $\rightarrow \neg$  retouch menu

MENU button → r retouch menu



Create an outline copy of a photograph to use as a base for painting. The effect can be previewed in the edit display. Press left to copy the photograph.

**Color Sketch** 

Refore

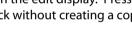
Create a copy of a photograph that resembles a sketch made with colored pencils. Press  $\blacktriangle$  or  $\triangledown$  to highlight **Vividness** or **Outlines** and press ◀ or ► to change. Vividness can be increased to make colors more saturated, or decreased for a washed-out, monochromatic effect, while outlines can be made thicker or thinner. Thicker outlines makes colors more

saturated. The results can be previewed in the edit display. Press M to copy the photograph, or press  $\mathbf{E}$  to exit to playback without creating a copy.

After

#### **Perspective Control**

Create copies that reduce the effects of perspective taken from the base of a tall object. Use the multi selector to adjust perspective (note that greater amounts of perspective control result in more of the edges being cropped out). The results can be previewed in the edit display. Press is to copy the photograph, or press **b** to exit to playback without creating a copy.









After



MENU button  $\rightarrow \dashv$  retouch menu





MENU button  $\rightarrow \neg$  retouch menu





## **Miniature Effect**

Create a copy that appears to be a photo of a diorama. Works best with photos taken from a high vantage point. The area that will be in focus in the copy is indicated by a yellow frame.

То	Press	Description
Choose orientation	ବ୍ଞ (ISO)	Press 🕾 (ISO) to choose orientation of area that is in focus.
Choose		If area of effect is in wide orientation, press ▲ or ▼ to position frame showing area of copy that will be in focus.
position		If area of effect is in tall orientation, press ◀ or to position frame showing area of copy that will be in focus.
Choose size		If area of effect is in wide orientation, press ◀ or ▶ to choose height.
		If area of effect is in tall orientation, press $\blacktriangle$ or $\blacktriangledown$ to choose width.
Preview copy	♥ (QUAL)	Preview copy.
Cancel	►	Exit to full-frame playback without creating copy.
Create copy	œ	Create copy.

Selective colo Edit movie

Selective color

RETOUCH MENU Miniature effect

Create a copy in which only selected hues appear in color.

1 Select Selective color. Highlight Selective color in the retouch menu and press b to display a picture selection dialog.

## **2** Select a photograph.

Highlight a photograph (to view the highlighted photograph full frame, press and hold the 🕈 (QUAL) button; to view images in other locations as described on page 178, hold **BKT** and press ▲). Press <sup>®</sup> to

select the highlighted photograph and proceed to the next step.

## **3** Select a color.

Use the multi selector to position the cursor over an object and press the ﷺ AE-L/AF-L button to select the color of the object as one that will remain in the final copy (the camera may have difficulty detecting unsaturated colors: choose a saturated color). To zoom in on the picture for precise

color selection, press ♥ (QUAL). Press ♥ (ISO) to zoom out.

#### **4** Highlight the color range.

Rotate the main command dial to highlight the color range for the selected color.

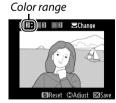






結 AE-L/AF-L button

Selected color



#### \_

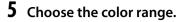
## **6** Select additional colors.

To select additional colors, rotate the main command dial to highlight another of the three color boxes at the top of the display and repeat Steps 3–5 to select another color. Repeat for a third color if desired. To

deselect the highlighted color, press for (), or press and hold for () to remove all colors.

## **7** Save the edited copy.

Press ® to copy the photograph.



Press  $\blacktriangle$  or  $\lor$  to increase or decrease the range of similar hues that will be included in the final photograph or movie. Choose from values between 1 and 7; note that higher values may include hues from other colors. The effect can be previewed in the edit display.







Change



## Side-by-side Comparison

Compare retouched copies to the original photographs. This option is only available if 🛞 or 🗹 (🖽) button is pressed to display the retouch menu when a copy or original is played back full frame.

**1** Select a picture. In full-frame playback, select a retouched copy (shown by a  $\mathbb{Z}^{1}$  icon) or a photograph that has been retouched and press ® or 🗹 (🖾).

#### 2 Select Side-by-side comparison. Highlight Side-by-side comparison and press ΘК).

from two source images using Image overlay, or

if the source has been copied multiple times,

**3** Compare the copy with the original. The source image is displayed on the left, the retouched copy on the right, with the options used to create the copy listed at the top of the display. Press ◀ or ► to switch between the source image and the retouched copy. To view the highlighted picture full frame, press and hold the <sup>⊕</sup> (**QUAL**) button. If the copy was created

> image сору

Retouched

press  $\blacktriangle$  or  $\nabla$  to view the other source images or copies. To exit to playback mode, press the 🖻 button, or press 🛞 to exit to playback with the highlighted image selected.

#### Side-by-side Comparisons

The source image will not be displayed if the copy was created from a photograph that was protected (III 188), is on a locked memory card, has since been deleted or hidden (III 208), or is on a card in a different slot from that used when the image was created.



Color outline Color sketch Perspective control

Miniature effect



Source







# 🗟 My Menu / 🗐 Recent Settings

To display My Menu, press MENU and select the 🗟 (My Menu) tab.

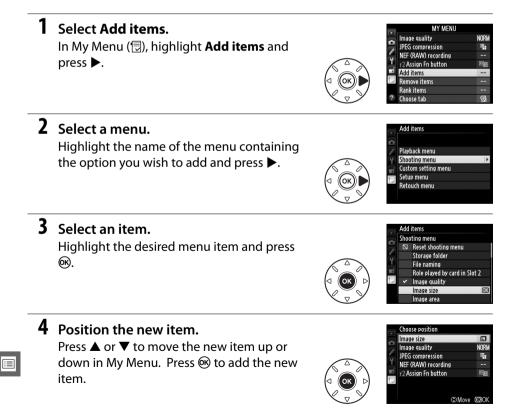


MENU button

The **My Menu** option can be used to create and edit a customized list of options from the playback, shooting, Custom Settings, setup, and retouch menus for quick access (up to 20 items). If desired, recent settings can be displayed in place of My Menu ( $\square$  283).

Options can be added, deleted, and reordered as described below.

#### **II** Adding Options to My Menu



## 5 Add more items.

The items currently displayed in My Menu are indicated by a check mark. Items indicated by a  $\square$  icon can not be selected. Repeat steps 1–4 to select additional items.



#### **II** Deleting Options from My Menu

## **1** Select **Remove items**.

In My Menu (,, highlight **Remove items** and press ►.

## **2** Select items.

Highlight items and press ► to select or deselect. Selected items are indicated by a check mark.

## **3** Select Done.

Highlight **Done** and press **℗**. A confirmation dialog will be displayed.

**4** Delete the selected items. Press ⊛ to delete the selected items.

#### Deleting Items in My Menu

To delete the item currently highlighted in My Menu, press the 面 () button. A confirmation dialog will be displayed; press 面 () again to remove the selected item from My Menu.



Remove items Done

M Image size





#### **II** Reordering Options in My Menu

## 1 Select Rank items.

In My Menu (,), highlight **Rank items** and press ►.

## 2 Select an item.

Highlight the item you wish to move and press  $\circledast$ .



Rank items Image quality NORM JPEG compression Ima NEF (RAW) recording --12 Assign Fn button Image CX3 Select items

## **3** Position the item.

Press  $\blacktriangle$  or  $\checkmark$  to move the item up or down in My Menu and press B. Repeat Steps 2–3 to reposition additional items.



⊕Move 0030K

NORM

-

## **4** Exit to My Menu.

Press the MENU button to return to My Menu.



Rank items

MENU button

## **Recent Settings**

To display the twenty most recently used settings, select **(a)** Recent settings for **(b)** My Menu > Choose tab.

## **1** Select Choose tab.

In My Menu (,), highlight **Choose tab** and press  $\blacktriangleright$ .



2 Select <sup>⊕</sup> Recent settings. Highlight <sup>⊕</sup> Recent settings and press <sup>⊛</sup>. The name of the menu will change from "MY MENU" to "RECENT SETTINGS."



Menu items will be added to the top of the recent settings menu as they are used. To view My Menu again, select 🗒 **My Menu** for 🗐 **Recent settings** > **Choose tab**.

#### Removing Items from the Recent Settings Menu

To remove an item from the recent settings menu, highlight it and press the 面 () button. A confirmation dialog will be displayed; press 面 () again to delete the selected item.

# 

# **Technical Notes**

Read this chapter for information on compatible accessories, cleaning and storing the camera, and what to do if an error message is displayed or you encounter problems using the camera.

# **Compatible Lenses**

Camera setting			Focus mode	Shooting mode		Metering system			
Ler	is/accessory	AF	M (with electronic rangefinder)	М	P S	A M	3D	0 Color	0
_	Type G or D AF NIKKOR <sup>2</sup> AF-S, AF-I NIKKOR	~	~	~	~	~	~	-	✓ <sup>3</sup>
CPU	PC-E NIKKOR series	—	✓ 5	~	✓ 5	✓5	✓ <sup>5</sup>	-	<b>✓</b> <sup>3,5</sup>
	PC Micro 85mm f/2.8D <sup>4</sup>	—	✓ 5	~	—	<b>✓</b> <sup>6</sup>	~	-	<b>✓</b> <sup>3,5</sup>
lenses	AF-S / AF-I Teleconverter <sup>7</sup>	~	<b>v</b>	~	~	~	~	-	✓3
<u> </u>	Other AF NIKKOR (except lenses for F3AF)	<b>✓</b> <sup>8</sup>	✓ 8	~	~	~	—	~	<b>✓</b> <sup>3</sup>
	AI-P NIKKOR	—	<b>√</b> <sup>9</sup>	~	~	~	—	~	✓3
_	AI-, AI-modified, NIKKOR or Nikon Series E lenses <sup>11</sup>	_	<b>√</b> <sup>9</sup>	~	_	✓ 12	_	✓ <sup>13</sup>	✓ 14
Non-	Medical-NIKKOR 120mm f/4	—	~	~	—	✓ 15	—	-	—
I-CPU	Reflex-NIKKOR	—	—	~	—	<b>✓</b> <sup>12</sup>	—	—	✓ <sup>14</sup>
	PC-NIKKOR	—	✓ 5	~	—	✓ 16	—	-	~
lenses	AI-type Teleconverter <sup>17</sup>	—	✓ <sup>18</sup>	~	—	✓ <sup>12</sup>	—	✓ <sup>13</sup>	✓ <sup>14</sup>
	PB-6 Bellows Focusing Attachment <sup>19</sup>	—	✓ <sup>18</sup>	~	—	✓ <sup>20</sup>	—	—	~
10	Auto extension rings (PK-series 11A, 12, or 13; PN-11)	—	✓ <sup>18</sup>	~	_	✓ <sup>12</sup>	—	_	~

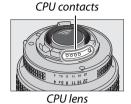
1 IX-NIKKOR lenses can not be used.

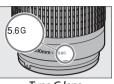
- 2 Vibration Reduction (VR) supported with VR lenses.
- 3 Spot metering meters selected focus point (<sup>CD</sup> 109).
- 4 The camera's exposure metering and flash control systems do not work properly when shifting and/or tilting the lens, or when an aperture other than the maximum aperture is used.
- 5 Can not be used with shifting or tilting.
- 6 Manual shooting mode only.
- 7 Can be used with AF-S and AF-I lenses only (C2 287). For information on the focus points available for autofocus and electronic rangefinding, see page 287.
- 8 When focusing at minimum focus distance with AF 80–200mm f/2.8, AF 35–70mm f/2.8, AF 28–85mm f/3.5–4.5 <New>, or AF 28–85mm f/3.5–4.5 lens at maximum zoom, in-focus indicator may be displayed when image on matte screen in viewfinder is not in focus. Adjust focus manually until image in viewfinder is in focus.
- 9 With maximum aperture of f/5.6 or faster.
- 10 Some lenses can not be used (see page 288).

- 11 Range of rotation for AI 80–200mm f/2.8 ED tripod mount is limited by camera body. Filters can not be exchanged while AI 200–400mm f/4 ED is mounted on camera.
- 12 If maximum aperture is specified using **Non-CPU lens data** (C 172), aperture value will be displayed in viewfinder and control panel.
- 13 Can be used only if lens focal length and maximum aperture are specified using **Non-CPU lens data** (© 172). Use spot or center-weighted metering if desired results are not achieved.
- 14 For improved precision, specify lens focal length and maximum aperture using **Non-CPU lens data** (© 172).
- 15 Can be used in manual mode M at shutter speeds slower than flash sync speed by one step or more.
- 16 Exposure determined by presetting lens aperture. In mode **A**, preset aperture using lens aperture ring before performing AE lock and shifting lens. In mode **M**, preset aperture using lens aperture ring and determine exposure before shifting lens.
- 17 Exposure compensation required when used with AI 28–85mm f/3.5–4.5, AI 35–105mm f/3.5–4.5, AI 35–135mm f/3.5–4.5, or AF-S 80–200mm f/2.8D. See teleconverter manual for details.
- 18 With maximum effective aperture of f/5.6 or faster.
- 19 Requires PK-12 or PK-13 auto extension ring. PB-6D may be required depending on camera orientation.
- 20 Use preset aperture. In mode **A**, set aperture using focusing attachment before determining exposure and taking photograph.
- PF-4 Reprocopy Outfit requires PA-4 Camera Holder.
- Noise in the form of horizontal lines may appear in movies taken with the following lenses at ISO sensitivities of 6400 or higher; use manual focus or focus lock.
  - AF-S Zoom Nikkor 24-85mm f/3.5-4.5G (IF)
  - AF-S DX Zoom-Nikkor 18-70mm f/3.5-4.5G IF-ED

#### Recognizing CPU and Type G and D Lenses

CPU lenses (particularly types G and D) are recommended, but note that IX-NIKKOR lenses can not be used. CPU lenses can be identified by the presence of CPU contacts, type G and D lenses by a letter on the lens barrel. Type G lenses are not equipped with a lens aperture ring.





Type G lens

• AF-S 300mm f/4D ED

AF-S 400mm f/2.8D ED II

• AF-I 400mm f/2.8D FD

• AF-S 500mm f/4D FD II

AF-S 600mm f/4D ED II

AF-S 600mm f/4D ED

• AF-I 600mm f/4D ED

• AF-S 500mm f/4D ED

• AF-I 500mm f/4D FD

AF-S NIKKOR 400mm f/2.8G FD VR

AF-S NIKKOR 500mm f/4G ED VR

AF-S NIKKOR 600mm f/4G FD VR

Aperture ring



Type D lens

#### The AF-S/AF-I Teleconverter

The AF-S/AF-I teleconverter can be used with the following AF-S and AF-I lenses:

- AF-S NIKKOR 70-200mm f/2.8G ED VR II
- AF-S VR 70-200mm f/2.8G ED
- AF-S 80-200mm f/2.8D ED
- AF-S VR Micro-Nikkor 105mm f/2.8G IF-ED\* AF-S 400mm f/2.8D ED
- AF-S NIKKOR 200mm f/2G ED VR II
- AF-S VR 200mm f/2G ED
- AF-S NIKKOR 200–400mm f/4G ED VR II
- AF-S VR 200–400mm f/4G ED
- AF-S NIKKOR 300mm f/2.8G ED VR II
- AF-S VR 300mm f/2.8G ED
- AF-S 300mm f/2.8D ED II
- AF-S 300mm f/2.8D ED
- AF-I 300mm f/2.8D ED
- \* Autofocus not supported.

#### 🖉 f/8 Autofocus Support

If the lens can be used with the AF-S/AF-I teleconverter and has a maximum aperture of f/4,

the apparent aperture will drop by two stops to f/8 when the lens is used with a TC-20E/TC-20E II/

TC-20E III teleconverter, or by one-and-a-half stops to f/6.8 when the lens is used with a TC-17E II. The focus points shown in the illustrations can be used for autofocus and electronic rangefinding when an AF-S teleconverter is attached. When used with TC-20E/TC-20E II/TC-20E III, focus data for focus points other than the center focus point are obtained from line sensors. Single point AF is used when 3D-tracking or auto-area AF is selected for AF-area mode ( $\square$  99); at maximum or combined apertures slower than f/5.6, the camera may not be able to focus on dark or low-contrast subjects.

	TC-17E II		TC-20E/ TC-20E II/ TC-20E III	
--	-----------	--	-------------------------------------	--

#### Lens f-number

The f-number given in lens names is the maximum aperture of the lens.

#### Compatible Non-CPU Lenses

When using non-CPU lenses and accessories, rotate the camera mode dial to A or M and set aperture using the lens aperture ring. In other modes, the shutter-release is disabled. Non-CPU lens data (CD 172) can be used to enable many of the features available with CPU lenses, including color matrix metering; if no data are provided, center-weighted metering will be used in place of color matrix metering, while if the maximum aperture is not provided, the camera aperture display will show the number of stops from maximum aperture and the actual aperture value must be read off the lens aperture ring.

#### Incompatible Accessories and Non-CPU Lenses

The following can NOT be used with the D600:

- TC-16AS AF teleconverter
- Non-Al lenses
- Lenses that require the AU-1 focusing unit PC 28mm f/4 (serial number 180900 or (400mm f/4.5, 600mm f/5.6, 800mm f/8, 1200mm f/11)
- Fisheye (6mm f/5.6, 7.5mm f/5.6, 8mm f/8, OP 10mm f/5.6)
- 2.1cm f/4
- Extension Ring K2
- 180–600mm f/8 ED (serial numbers 174041-174180)
- 360–1200mm f/11 ED (serial numbers 174031-174127)
- 200–600mm f/9.5 (serial numbers 280001– 300490)

# The Built-in Flash

- AF lenses for the F3AF (AF 80mm f/2.8, AF 200mm f/3.5 ED, AF Teleconverter TC-16)
- earlier)
- PC 35mm f/2.8 (serial numbers 851001– 906200)
- PC 35mm f/3.5 (old type)
- Reflex 1000mm f/6.3 (old type)
- Reflex 1000mm f/11 (serial numbers 142361-143000)
- Reflex 2000mm f/11 (serial numbers) 200111-200310)

The built-in flash can be used with CPU lenses with focal lengths of 24 mm (16 mm in DX format) to 300 mm, although in some cases the flash may be unable to entirely light the subject at some ranges or focal lengths due to shadows cast by the lens, while lenses that block the subject's view of the red-eye reduction lamp may interfere with red-eye reduction. Remove lens hoods to prevent shadows. The flash has a minimum range of 0.6 m (2 ft) and can not be used in the macro range of macro zoom lenses. The flash may be unable to light the entire subject with the following lenses at ranges less than those given below:

	Lens	Zoom position	Minimum distance without vignetting
	AF-S DX NIKKOR 10–24mm f/3.5–4.5G ED	18–24 mm	No vignetting
DX	AF-S DX Zoom-Nikkor 12–24mm f/4G IF-ED	18 mm	1.0 m/3 ft 3 in.
		20–24 mm	No vignetting

		Zoom position	Minimum distance without vignetting
	AF-S DX Zoom-Nikkor 17–55mm f/2.8G IF-ED	20 mm	2.0 m/6 ft 7 in.
	AF-5 DX 200m-Nikkor 17–55mm 1/2.8G IF-ED	24–55 mm	1.0 m/3 ft 3 in.
	AF-S DX NIKKOR 18–200mm f/3.5–5.6G ED VR II AF-S DX VR Zoom-Nikkor 18–200mm f/3.5–5.6G	18 mm	1.0 m/3 ft 3 in.
	IF-ED	24–200 mm	No vignetting
	AF-S DX NIKKOR 18–300mm f/3.5–5.6G ED VR	28 mm	1.0 m/3 ft 3 in.
	AT 5 DX MIRION 10-50011111/5.5-5.00 ED VI	50–300 mm	No vignetting
	AF-S NIKKOR 16–35mm f/4G ED VR	35 mm	1.5 m/4 ft 11 in.
	AF-S Zoom-Nikkor 17–35mm f/2.8D IF-ED	28 mm	1.5 m/4 ft 11 in.
		35 mm	No vignetting
	AF Zoom-Nikkor 18–35mm f/3.5–4.5D IF-ED	24 mm	1.0 m/3 ft 3 in.
		28–35 mm	No vignetting
[		24 mm	1.5 m/4 ft 11 in.
	AF Zoom-Nikkor 20–35mm f/2.8D IF	28 mm	1.0 m/3 ft 3 in.
		35 mm	No vignetting
[	AF-S NIKKOR 24mm f/1.4G ED	24 mm	1.0 m/3 ft 3 in.
	AF-S NIKKOR 24–70mm f/2.8G ED	35 mm	1.5 m/4 ft 11 in.
FX		50–70 mm	No vignetting
	AF-S VR Zoom-Nikkor 24–120mm f/3.5–5.6G	24 mm	1.0 m/3 ft 3 in.
	IF-ED	35–120 mm	No vignetting
[		24 mm	2.0 m/6 ft 7 in.
	AF-S NIKKOR 24–120mm f/4G ED VR	28 mm	1.0 m/3 ft 3 in.
		50–120 mm	No vignetting
[	AF-S Zoom-Nikkor 28–70mm f/2.8D IF-ED	28 mm	1.0 m/3 ft 3 in.
		50–70 mm	No vignetting
ĺ		28 mm	1.5 m/4 ft 11 in.
	AF-S NIKKOR 28–300mm f/3.5–5.6G ED VR	35 mm	1.0 m/3 ft 3 in.
		50–300 mm	No vignetting
ľ	PC-E NIKKOR 24mm f/3.5D ED *	24 mm	1.5 m/4 ft 11 in.

\* When not shifted or tilted.

When used with the AF-S NIKKOR 14–24mm f/2.8G ED, the flash will be unable to light the entire subject at all ranges.

The built-in flash can also be used with AI-S, AI-, AI-modified NIKKOR, Nikon Series E and non-CPU lenses with a focal length of 24–300mm. AI 50–300mm f/4.5, modified AI 50–300mm f/4.5, AI-S 50–300mm f/4.5 ED, and AI 50–300mm f/4.5 ED lenses must be used at a zoom position of 70 mm or above. With AI-S and AI 25–50mm f/4 ED lenses, the ranges above which vignetting will not occur are: 2.0 m (6 ft 7 in.) at a zoom position of 25 mm and 1.0 m (3 ft 3 in.) at a zoom position of 28 mm; vignetting will not occur at zoom positions of 35 mm or above.

Z

#### AF-Assist Illumination

AF-assist illumination is available with lenses with focal lengths of 24–200 mm. It can not however be used to assist the focus operation with the following lenses:

- AF-S NIKKOR 200mm f/2G FD VR II
- AF-S VR Zoom-Nikkor 200–400mm f/4G IF-FD

At ranges under 0.7 m (2 ft 4 in.), the following lenses may block the AF-assist illuminator and interfere with autofocus when lighting is poor: • AF Zoom Nikkor 24–120mm f/3.5–5.6D (IF)

- AF-S NIKKOR 16–35mm f/4G ED VR
- AF-S Zoom-Nikkor 17–35mm f/2.8D IF-ED
   AF-S NIKKOR 24–120mm f/4G ED VR
- AF-S DX Zoom-Nikkor 17–55mm f/2.8G IF-FD
   AF-S NIKKOR 28–300mm f/3.5–5.6G FD VR
- AF-S DX VR Zoom-Nikkor 18–200mm f/3.5-5.6G IF-FD
- AF Zoom-Nikkor 20–35mm f/2.8D IF
- AF Zoom-Nikkor 24–85mm f/2.8–4D IF
- AF-S NIKKOR 24–85mm f/3.5–4.5G ED VR

At ranges under 1.0 m (3 ft 3 in.), the following lenses may block the AF-assist illuminator and interfere with autofocus when lighting is poor:

- AF-S DX NIKKOR 18–200mm f/3.5–5.6G ED
   AF-S Zoom-Nikkor 28–70mm f/2.8D IF-ED VR II

AF-S VR Micro-Nikkor 105mm f/2.8G IF-ED

AF-S NIKKOR 200–400mm f/4G FD VR II

AE-S NIKKOB 300mm f/2 8G ED VB II

AF-S NIKKOR 35mm f/1.4G

f/4.5-5.6D

AF Micro-Nikkor 200mm f/4D IF-FD

AF Zoom Micro Nikkor FD 70–180mm

- AF-S NIKKOR 24–70mm f/2.8G ED
- AF-S VR Zoom-Nikkor 24–120mm f/3.5–5.6G IF-FD

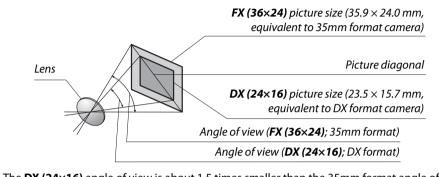
At ranges under 1.5 m (4 ft 11 in.), the following lenses may block the AF-assist illuminator and interfere with autofocus when lighting is poor:

- AF-S NIKKOR 14–24mm f/2.8G ED
- AF-S DX NIKKOR 18–300mm f/3.5–5.6G ED VR AF Zoom-Nikkor 80–200mm f/2.8D ED
- AF-S NIKKOR 70–200mm f/2.8G ED VR II
- AF-S DX NIKKOR 55–300mm f/4.5–5.6G ED VR
   AF-S Zoom-Nikkor 80–200mm f/2.8D IF-ED
- AF-S VR Zoom-Nikkor 70–200mm f/2.8G IF-FD

#### Calculating Angle of View

The D600 can be used with Nikon lenses for 35mm (135) format cameras. If **Auto DX crop** is on ( $\square$  90) and a 35mm format lens is attached, the angle of view will be the same as a frame of 35mm film (35.9 × 24.0 mm); if a DX lens is attached, the angle of view will automatically be adjusted to 23.5 × 15.7 mm (DX format).

If a 35 mm format lens is attached, the angle of view can be reduced by 1.5 × by turning **Auto DX crop** off and selecting **DX (24×16)**.



The **DX (24×16)** angle of view is about 1.5 times smaller than the 35mm format angle of view. To calculate the focal length of lenses in 35mm format when **DX (24×16)** is selected, multiply the focal length of the lens by about 1.5 (for example, the effective focal length of a 50mm lens in 35mm format would be 75 mm when **DX (24×16)** is selected).

#### M

# **Optional Flash Units (Speedlights)**

The camera supports the Nikon Creative Lighting System (CLS) and can be used with CLS-compatible flash units. Optional flash units can be attached directly to the camera accessory shoe as described below. The accessory shoe is equipped with a safety lock for flash units with a locking pin.

**1** Remove the accessory shoe cover.

**2** Mount the flash unit on the accessory shoe. See the manual provided with the flash unit for details. The built-in flash will not fire when an optional flash unit is attached.

#### The AS-15 Sync Terminal Adapter

When the AS-15 sync terminal adapter (available separately) is mounted on the camera accessory shoe, flash accessories can be connected via a sync terminal.

#### **V** Use Only Nikon Flash Accessories

Use only Nikon flash units. Negative voltages or voltages over 250 V applied to the accessory shoe could not only prevent normal operation, but damage the sync circuitry of the camera or flash. Before using a Nikon flash unit not listed in this section, contact a Nikon-authorized service representative for more information.

V

# The Nikon Creative Lighting System (CLS)

Nikon's advanced Creative Lighting System (CLS) offers improved communication between the camera and compatible flash units for improved flash photography.

#### **III** CLS-Compatible Flash Units

The camera can be used with the following CLS-compatible flash units:

• The SB-910, SB-900, SB-800, SB-700, SB-600, SB-400, and SB-R200:

	Flash unit							
Feature		<b>SB-910</b> <sup>1</sup>	<b>SB-900</b> <sup>1</sup>	SB-800	<b>SB-700</b> <sup>1</sup>	SB-600	<b>SB-400</b> <sup>2</sup>	SB-R200 <sup>3</sup>
Guide No. <sup>4</sup>	ISO 100	34/111	34/111	38/125	28/92	30/98	21/69	10/33
JUILE NO.	ISO 200	48/157	48/157	53/174	39/128	42/138	30/98	14/46

1 If a color filter is attached to the SB-910, SB-900, or SB-700 when AUT0 or \$ (flash) is selected for white balance, the camera will automatically detect the filter and adjust white balance appropriately.

- 2 Wireless flash control is not available with the SB-400.
- 3 Controlled remotely with built-in flash in commander mode or using optional SB-910, SB-900, SB-800, or SB-700 flash unit or SU-800 wireless Speedlight commander.
- 4 m/ft, 20 °C (68 °F), SB-910, SB-900, SB-800, SB-700, and SB-600 at 35 mm zoom head position; SB-910, SB-900, and SB-700 with standard illumination.
- SU-800 Wireless Speedlight Commander: When mounted on a CLS-compatible camera, the SU-800 can be used as a commander for remote SB-910, SB-900, SB-800, SB-700, SB-600, or SB-R200 flash units in up to three groups. The SU-800 itself is not equipped with a flash.

#### 🖉 Guide Number

To calculate the range of the flash at full power, divide the Guide Number by the aperture. For example, at ISO 100 the SB-800 has a Guide Number of 38 m or 125 ft (35 mm zoom head position); its range at an aperture of f/5.6 is  $38 \div 5.6$  or about 6.8 meters (or in feet,  $125 \div 5.6$  = approximately 23 ft 7 in.). For each twofold increase in ISO sensitivity, multiply the Guide Number by the square root of two (approximately 1.4).

/	Flash unit						Adva	nced Wir	eless Lig	hting	
						Mast	er/comn	nander		Remot	e
		SB-910				SB-910			SB-910		
		SB-900				SB-900			SB-900	SB-700	
Flash	mode/feature	SB-800	SB-700	SB-600	SB-400	SB-800	SB-700	SU-800 <sup>1</sup>	SB-800	SB-600	SB-R200
i-TTL	i-TTL balanced fill-flash for digital SLR	<b>√</b> <sup>2</sup>	<b>✓</b> <sup>3</sup>	✓ <sup>2</sup>	<b>√</b> <sup>3</sup>	~	~	~	~	~	~
AA	Auto aperture	<b>✓</b> <sup>4</sup>	-	—	—	✓ 5	—	✓ 5	<b>√</b> <sup>5</sup>	—	
A	Non-TTL auto	<b>✓</b> <sup>4</sup>	-	—	—	✓ 5	—	—	<b>√</b> <sup>5</sup>	—	
GN	Distance-priority manual	~	~	-	—	-	—	—	-	-	-
М	Manual	~	~	~	<b>√</b> <sup>6</sup>	~	~	~	~	~	~
RPT	Repeating flash	~	-	—	—	~	—	~	~	~	
Auto	FP High-Speed Sync <sup>7</sup>	~	<b>v</b>	~	—	~	~	~	<b>v</b>	~	~
FV loc	k	~	~	~	~	~	~	~	~	~	~
AF-as	sist for multi-area AF <sup>8</sup>	~	~	~	—	~	~	~	-	—	
Flash	Color Information Communication	~	~	~	~	~	~	—	-	—	
REAR	Rear-curtain sync	~	~	~	~	~	~	~	~	~	~
۲	Red-eye reduction	~	~	~	~	~	~	—	-	—	-
Powe	r zoom	~	~	~	—	~	~	—	-	—	

The following features are available with CLS-compatible flash units:

1 Only available when SU-800 is used to control other flash units. The SU-800 itself is not equipped with a flash.

2 Standard i-TTL flash for digital SLR is used with spot metering or when selected with flash unit.

3 Standard i-TTL flash for digital SLR is used with spot metering.

4 Selected with flash unit.

5 Auto aperture (AA) is used regardless of mode selected with flash unit.

6 Can be selected with camera.

7 Select 1/250 s (Auto FP) or 1/200 s (Auto FP) for Custom Setting e1 (Flash sync speed, 🕮 234).

8 CPU lens required.

#### Auto Aperture/Non-TTL Auto

Unless the focal length and maximum aperture are specified using the **Non-CPU lens data** option in the setup menu, choosing auto aperture (AA) when a non-CPU lens is attached automatically selects non-TTL auto (A).

V

#### **II** Other Flash Units

The following flash units can be used in non-TTL auto and manual modes.

Flash mode		SB-80DX, SB-28DX, SB-28, SB-26, SB-25, SB-24	SB-50DX <sup>1</sup>	SB-30, SB-27 <sup>2</sup> , SB-22S, SB-22, SB-20, SB-16B, SB-15	<b>SB-23, SB-29</b> <sup>3</sup> , <b>SB-21B</b> <sup>3</sup> , <b>SB-29S</b> <sup>3</sup>	
Α	Non-TTL auto	✓	—	<ul> <li>✓</li> </ul>	_	
м	Manual	<b>v</b>	~	<ul> <li>✓</li> </ul>	~	
555	Repeating flash	<b>v</b>		—		
REAR	Rear-curtain sync <sup>4</sup>	<b>v</b>	~	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>	

1 Select mode **P**, **S**, **A**, or **M**, lower built-in flash, and use optional flash unit only.

2 Flash mode is automatically set to TTL and shutter-release is disabled. Set flash unit to **A** (non-TTL auto flash).

3 Autofocus is available with AF-S VR Micro-Nikkor 105mm f/2.8G IF-ED and AF-S Micro NIKKOR 60mm f/2.8G ED lenses only.

4 Available when camera is used to select flash mode.

#### Flash Control Mode

The information display shows the flash control mode for optional flash units attached to the camera accessory shoe as follows:

	Flash sync	Auto FP (🕮 234)
i-TTL	¢	\$
Auto aperture (AA)		
Non-TTL auto flash (A)	\$ A	¢ A FP
Distance-priority manual (GN)	\$ GN	\$ GN FP
Manual	\$           	\$       
Repeating flash	¢ ≓∎ RPT	_
Advanced wireless lighting	¢ ≓∎ CMD	¢ CMD FP

#### Notes on Optional Flash Units

Refer to the Speedlight manual for detailed instructions. If the flash unit supports CLS, refer to the section on CLS-compatible digital SLR cameras. The D600 is not included in the "digital SLR" category in the SB-80DX, SB-28DX, and SB-50DX manuals.

If an optional flash unit is attached in shooting modes other than  $\mathfrak{G}$ , the flash will fire with every shot, even in modes in which the built-in flash can not be used. Note that optional flash units can not be used in movie live view ( $\square$  57) or while HDR is in effect ( $\square$  139).

i-TTL flash control can be used at ISO sensitivities between 100 and 6400. At values over 6400, the desired results may not be achieved at some ranges or aperture settings. If the flash-ready indicator flashes for about three seconds after a photograph is taken, the flash has fired at full power and the photograph may be underexposed.

When an SC-series 17, 28, or 29 sync cable is used for off-camera flash photography, correct exposure may not be achieved in i-TTL mode. We recommend that you select standard i-TTL flash control. Take a test shot and view the results in the monitor.

In i-TTL, use the flash panel or bounce adapter provided with the flash unit. Do not use other panels such as diffusion panels, as this may produce incorrect exposure.

The SB-910, SB-900, SB-800, SB-700, SB-600, and SB-400 provide red-eye reduction, while the SB-910, SB-900, SB-800, SB-700, SB-600, and SU-800 provide AF-assist illumination with the following restrictions:

- **SB-910 and SB-900**: AF-assist illumination is available with 17–135 mm AF lenses, however, autofocus is available only with the focus points shown at right.
- **SB-800, SB-600, and SU-800**: AF-assist illumination is available with 24–105 mm AF lenses, however, autofocus is available only with the focus points shown at right.
- **SB-700**: AF-assist illumination is available with 24– 135 mm AF lenses, however, autofocus is available only with the focus points shown at right.

17-1911111	20-10511111	100-13311111
24–34 mm	35–49 mm	50–105 mm

00000000000

24–135 mm

00000000000

Ö.

In mode **P**, the maximum aperture (minimum f-number) is limited according to ISO sensitivity, as shown below:

Maximum aperture at ISO equivalent of:						
100	200	400	800	1600	3200	6400
4	5	5.6	7.1	8	10	11
If the maximum aperture of the lens is smaller than given above, the maximum value for aperture will be the maximum aperture of the lens.						

# **Other Accessories**

At the time of writing, the following accessories were available for the D600.

Power sources	<ul> <li>Rechargeable Li-ion Battery EN-EL15 (<sup>CD</sup> 21, 23): Additional EN-EL15 batteries are available from local retailers and Nikon-authorized service representatives.</li> <li>Battery Charger MH-25 (<sup>CD</sup> 21): Recharge EN-EL15 batteries.</li> <li>Multi-Power Battery Pack MB-D14: The MB-D14 is equipped with a shutter-release button, #: AE/AF lock button, multi selector, and main- and sub-command dials for improved operation when taking photographs in portrait (tall) orientation. When attaching the MB-D14, remove the camera MB-D14 contact cover.</li> <li>Power Connector EP-5B, AC Adapter EH-5b: These accessories can be used to power the camera for extended periods (EH-5a and EH-5 AC adapters can also be used). The EP-5B is required to connect the camera to the EH-5b; see page 299 for details. Note that when the camera is used with an MB-D14, the EP-5B must be inserted into the MB-D14, not the camera. Do not attempt to use the camera with power connectors inserted into both the camera and MB-D14.</li> </ul>
Filters	<ul> <li>Filters intended for special-effects photography may interfere with autofocus or the electronic rangefinder.</li> <li>The D600 can not be used with linear polarizing filters. Use C-PL or C-PL II circular polarizing filters instead.</li> <li>Use NC filters to protect the lens.</li> <li>To prevent ghosting, use of a filter is not recommended when the subject is framed against a bright light, or when a bright light source is in the frame.</li> <li>Center-weighted metering is recommended with filters with exposure factors (filter factors) over 1 × (Y44, Y48, Y52, O56, R60, X0, X1, C-PL, ND2S, ND4, ND4S, ND8, ND8S, ND400, A2, A12, B2, B8, B12). See the filter manual for details.</li> </ul>
Viewfinder eyepiece accessories	<ul> <li>DK-20C Eyepiece Correction Lenses: Lenses are available with diopters of -5, -4, -3, -2, 0, +0.5, +1, +2, and +3 m<sup>-1</sup> when the camera diopter adjustment control is in the neutral position (-1 m<sup>-1</sup>). Use eyepiece correction lenses only if the desired focus can not be achieved with the built in diopter adjustment control (-3 to +1 m<sup>-1</sup>). Test eyepiece correction lenses before purchase to ensure that the desired focus can be achieved. The rubber eyecup can not be used with eyepiece correction lenses.</li> <li>Magnifying Eyepiece DK-21M: The DK-21M magnifies the view through the viewfinder by approximately 1.17 × (50 mm f/1.4 lens at infinity; -1.0 m<sup>-1</sup>) for greater precision when framing.</li> <li>Magnifier DG-2: The DG-2 magnifies the scene displayed in the center of the viewfinder for greater precision during focusing. Eyepiece adapter required (available separately).</li> <li>Eyepiece Adapter DK-22: The DK-22 is used when attaching the DG-2 magnifier.</li> <li>Right-Angle Viewing Attachment DR-6: The DR-6 attaches at a right angle to the viewfinder eyepiece, allowing the image in the viewfinder to be viewed at right angles to the lens (for example, from directly above when the camera is horizontal).</li> </ul>

V

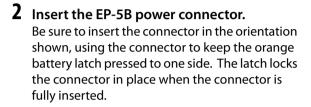
Software	<ul> <li>Capture NX 2: A complete photo editing package with such advanced editing features as selection control points and an auto retouch brush.</li> <li>Camera Control Pro 2: Control the camera remotely from a computer to record movies and photographs and save photographs directly to the computer hard disk.</li> </ul>	
	<b>Note</b> : Use the latest versions of Nikon software; see the websites listed on page xxiii for the latest information on supported operating systems. At default settings, Nikon Message Center 2 will periodically check for updates to Nikon software and firmware while you are logged in to an account on the computer and the computer is connected to the Internet. A message is automatically displayed when an update is found.	
Body cap	<b>Body Cap BF-1B/Body Cap BF-1A</b> : The body cap keeps the mirror, viewfinder screen, and low-pass filter free of dust when a lens is not in place.	
Remote controls	Wireless Remote Control ML-L3: The ML-L3 uses a 3 V CR2025 battery.	
Accessory terminal accessories	The D600 is equipped with an accessory terminal for <b>MC-DC2 remote cords</b> ( $\Box$ 79) and <b>GP-1 GPS units</b> ( $\Box$ 175), which connect with the $\blacktriangleleft$ mark on the connector aligned with the $\blacktriangleright$ next to the accessory terminal (close the camera connector cover when the terminal is not in use).	
Microphones	Stereo Microphone ME-1 (CD 61)	
Wireless mobile adapters	Wireless Mobile Adapter WU-1b: Supports two-way communication between the camera and smart devices running the Wireless Mobile Adapter Utility.	

## **Attaching a Power Connector and AC Adapter**

Turn the camera off before attaching an optional power connector and AC adapter.

## **1** Ready the camera.

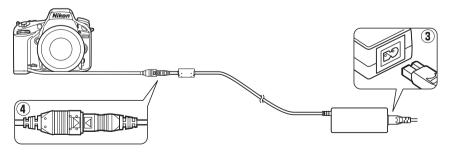
Open the battery-chamber (1) and power connector (2) covers.

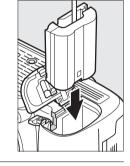


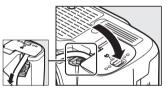
# **3** Close the battery-chamber cover. Position the power connector cable so that it passes through the power connector slot and close the battery-chamber cover.

### **4** Connect the AC adapter.

Connect the AC adapter power cable to the AC socket on AC adapter (③) and the EP-5B power cable to the DC socket (④). A - = icon is displayed in the monitor when the camera is powered by the AC adapter and power connector.







## **Caring for the Camera**

## <u>Storage</u>

When the camera will not be used for an extended period, replace the monitor cover, remove the battery, and store the battery in a cool, dry area with the terminal cover in place. To prevent mold or mildew, store the camera in a dry, well-ventilated area. Do not store your camera with naphtha or camphor moth balls or in locations that:

- are poorly ventilated or subject to humidities of over 60%
- are next to equipment that produces strong electromagnetic fields, such as televisions or radios
- are exposed to temperatures above 50 °C (122 °F) or below –10 °C (14 °F)

## <u>Cleaning</u>

Camera body	Use a blower to remove dust and lint, then wipe gently with a soft, dry cloth. After using the camera at the beach or seaside, wipe off sand or salt with a cloth lightly dampened in distilled water and dry thoroughly. <b>Important</b> : <i>Dust or other foreign matter inside the camera may cause damage not covered under warranty</i> .
Lens, mirror, and viewfinder	These glass elements are easily damaged. Remove dust and lint with a blower. If using an aerosol blower, keep the can vertical to prevent the discharge of liquid. To remove fingerprints and other stains, apply a small amount of lens cleaner to a soft cloth and clean with care.
Monitor	Remove dust and lint with a blower. When removing fingerprints and other stains, wipe the surface lightly with a soft cloth or chamois leather. Do not apply pressure, as this could result in damage or malfunction.

Do not use alcohol, thinner, or other volatile chemicals.

### Servicing the Camera and Accessories

The camera is a precision device and requires regular servicing. Nikon recommends that the camera be inspected by the original retailer or Nikon-authorized service representative once every one to two years, and that it be serviced once every three to five years (note that fees apply to these services). Frequent inspection and servicing are particularly recommended if the camera is used professionally. Any accessories regularly used with the camera, such as lenses or optional Speedlights, should be included when the camera is inspected or serviced.

## <u>The Low-Pass Filter</u>

The image sensor that acts as the camera's picture element is fitted with a low-pass filter to prevent moiré. If you suspect that dirt or dust on the filter is appearing in photographs, you can clean the filter using the **Clean image sensor** option in the setup menu. The filter can be cleaned at any time using the **Clean now** option, or cleaning can be performed automatically when the camera is turned on or off.

### "Clean Now"

# 1 Select Clean image sensor in the setup menu.

Press the MENU button to display the menus. Highlight **Clean image sensor** in the setup menu and press ►.



### 2 Select Clean now.

The camera will check the image sensor and then begin cleaning. This process takes about 10 seconds; during this time, **bu 5** flashes in the control panel and other operations can not be performed. Do not remove or disconnect the power source until cleaning is complete and **bu 5** is no longer displayed.







### Place the Camera Base Down Image sensor cleaning is most effective when the camera is placed base down as shown at right.



### **II** "Clean at Startup/Shutdown"

Choose from the following options:

	Option	Description
ش0NI	Clean at startup	The image sensor is automatically cleaned each time the camera is
	ciean at startup	turned on.
Ô0FF	Clean at	The image sensor is automatically cleaned during shutdown each time
	shutdown	the camera is turned off.
© °N	Clean at startup &	The image sensor is cleaned automatically at startup and at shutdown.
OFF	shutdown	The image sensor is cleaned automatically at startup and at shutdown.
	Cleaning off	Automatic image sensor cleaning off.

Select Clean at startup/shutdown.
 Display the Clean image sensor menu as described in Step 2 on the previous page.
 Highlight Clean at startup/shutdown and press ▶.

### **2** Select an option.

Highlight an option and press ®.





#### Image Sensor Cleaning

Using camera controls during startup interrupts image sensor cleaning. Image sensor cleaning may not be performed at startup if the flash is charging.

Cleaning is performed by vibrating the low-pass filter. If dust can not be fully removed using the options in the **Clean image sensor** menu, clean the image sensor manually ( $\square$  303) or consult a Nikon-authorized service representative.

If image sensor cleaning is performed several times in succession, image sensor cleaning may be temporarily disabled to protect the camera's internal circuitry. Cleaning can be performed again after a short wait.

Z

### Manual Cleaning

If foreign matter can not be removed from the low-pass filter using the **Clean image sensor** option in the setup menu ( $\square$  301), the filter can be cleaned manually as described below. Note, however, that the filter is extremely delicate and easily damaged. Nikon recommends that the filter be cleaned only by Nikon-authorized service personnel.

### **1** Charge the battery or connect an AC adapter.

A reliable power source is required when inspecting or cleaning the low-pass filter. Turn the camera off and insert a fully-charged EN-EL15 battery or connect an optional EP-5B power connector and EH-5b AC adapter. The **Lock mirror up for cleaning** option is only available in the setup menu at battery levels over **C**.

## **2** Remove the lens.

Turn the camera off and remove the lens.

## **3** Select Lock mirror up for cleaning.

Turn the camera on and press the MENU button to display the menus. Highlight Lock mirror up for cleaning in the setup menu and press ▶.



MENU button

### **4** Press <sup>™</sup>.

The message shown at right will be displayed in the monitor and a row of dashes will appear in the control panel and viewfinder. To restore normal operation without inspecting the low-pass filter, turn the camera off.



X

## 5 Raise the mirror.

Press the shutter-release button all the way down. The mirror will be raised and the shutter curtain will open, revealing the lowpass filter. The display in the viewfinder will

turn off and the row of dashes in the control panel will flash.

## **6** Examine the low-pass filter.

Holding the camera so that light falls on the low-pass filter, examine the filter for dust or lint. If no foreign objects are present, proceed to Step 8.

## **7** Clean the filter.

Remove any dust and lint from the filter with a blower. Do not use a blower-brush, as the bristles could damage the filter. Dirt that can not be removed with a blower can only be removed by Nikon-authorized service personnel. Under no circumstances should you touch or wipe the filter.

## **8** Turn the camera off.

The mirror will return to the down position and the shutter curtain will close. Replace the lens or body cap.









#### Use a Reliable Power Source

The shutter curtain is delicate and easily damaged. If the camera powers off while the mirror is raised, the curtain will close automatically. To prevent damage to the curtain, observe the following precautions:

- Do not turn the camera off or remove or disconnect the power source while the mirror is raised.
- If the battery runs low while the mirror is raised, a beep will sound and the self-timer lamp will flash to warn that the shutter curtain will close and the mirror will be lowered after about two minutes. End cleaning or inspection immediately.

#### Foreign Matter on the Low-Pass Filter

Nikon takes every possible precaution to prevent foreign matter from coming into contact with the low-pass filter during production and shipping. The D600, however, is designed to be used with interchangeable lenses, and foreign matter may enter the camera when lenses are removed or exchanged. Once inside the camera, this foreign matter may adhere to the low-pass filter, where it may appear in photographs taken under certain conditions. To protect the camera when no lens is in place, be sure to replace the body cap provided with the camera, being careful to first remove all dust and other foreign matter that may be adhering to the body cap. Avoid exchanging lenses in dusty environments.

Should foreign matter find its way onto the low-pass filter, clean the filter as described above, or have the filter cleaned by authorized Nikon service personnel. Photographs affected by the presence of foreign matter on the filter can be retouched using Capture NX 2 (available separately;  $\square$  298) or the clean image options available in some third-party imaging applications.

#### Å

## Caring for the Camera and Battery: Cautions

Do not drop: The product may malfunction if subjected to strong shocks or vibration.

**Keep dry**: This product is not waterproof, and may malfunction if immersed in water or exposed to high levels of humidity. Rusting of the internal mechanism can cause irreparable damage.

**Avoid sudden changes in temperature**: Sudden changes in temperature, such as those that occur when entering or leaving a heated building on a cold day, can cause condensation inside the device. To prevent condensation, place the device in a carrying case or plastic bag before exposing it to sudden changes in temperature.

**Keep away from strong magnetic fields**: Do not use or store this device in the vicinity of equipment that generates strong electromagnetic radiation or magnetic fields. Strong static charges or the magnetic fields produced by equipment such as radio transmitters could interfere with the monitor, damage data stored on the memory card, or affect the product's internal circuitry.

**Do not leave the lens pointed at the sun**: Do not leave the lens pointed at the sun or other strong light source for an extended period. Intense light may cause the image sensor to deteriorate or produce a white blur effect in photographs.

**Turn the product off before removing or disconnecting the power source**: Do not unplug the product or remove the battery while the product is on or while images are being recorded or deleted. Forcibly cutting power in these circumstances could result in loss of data or in damage to product memory or internal circuitry. To prevent an accidental interruption of power, avoid carrying the product from one location to another while the AC adapter is connected.

**Cleaning**: When cleaning the camera body, use a blower to gently remove dust and lint, then wipe gently with a soft, dry cloth. After using the camera at the beach or seaside, wipe off any sand or salt using a cloth lightly dampened in pure water and then dry the camera thoroughly. In rare instances, static electricity may cause LCDs to light up or go dark. This does not indicate a malfunction, and the display will soon return to normal.

The lens and mirror are easily damaged. Dust and lint should be gently removed with a blower. When using an aerosol blower, keep the can vertical to prevent discharge of liquid. To remove fingerprints and other stains from the lens, apply a small amount of lens cleaner to a soft cloth and wipe the lens carefully.

See "The Low-Pass Filter" (C 301, 303) for information on cleaning the low-pass filter.

Lens contacts: Keep the lens contacts clean.

**Do not touch the shutter curtain**: The shutter curtain is extremely thin and easily damaged. Under no circumstances should you exert pressure on the curtain, poke it with cleaning tools, or subject it to powerful air currents from a blower. These actions could scratch, deform, or tear the curtain.

**Storage**: To prevent mold or mildew, store the camera in a dry, well-ventilated area. If you are using an AC adapter, unplug the adapter to prevent fire. If the product will not be used for an extended period, remove the battery to prevent leakage and store the camera in a plastic bag containing a desiccant. Do not, however, store the camera case in a plastic bag, as this may cause the material to deteriorate. Note that desiccant gradually loses its capacity to absorb moisture and should be replaced at regular intervals.

To prevent mold or mildew, take the camera out of storage at least once a month. Turn the camera on and release the shutter a few times before putting it away.

Store the battery in a cool, dry place. Replace the terminal cover before putting the battery away.

**Notes on the monitor**: The monitor is constructed with extremely high precision; at least 99.99% of pixels are effective, with no more than 0.01% being missing or defective. Hence while these displays may contain pixels that are always lit (white, red, blue, or green) or always off (black), this is not a malfunction and has no effect on images recorded with the device.

Images in the monitor may be difficult to see in a bright light.

Do not apply pressure to the monitor, as this could cause damage or malfunction. Dust or lint on the monitor can be removed with a blower. Stains can be removed by wiping lightly with a soft cloth or chamois leather. Should the monitor break, care should be taken to avoid injury from broken glass and to prevent liquid crystal from the monitor touching the skin or entering the eyes and mouth.

Replace the monitor cover when transporting the camera or leaving it unattended.

**Batteries**: Batteries may leak or explode if improperly handled. Observe the following precautions when handling batteries:

- Use only batteries approved for use in this equipment.
- Do not expose the battery to flame or excessive heat.
- Keep the battery terminals clean.
- Turn the product off before replacing the battery.
- Remove the battery from the camera or charger when not in use and replace the terminal cover. These devices draw minute amounts of charge even when off and could draw the battery down to the point that it will no longer function. If the battery will not be used for some time, insert it in the camera and run it flat before removing it and storing it in a location with an ambient temperature of 15 to 25 °C (59 to 77 °F; avoid hot or extremely cold locations). Repeat this process at least once every six months.
- Turning the camera on or off repeatedly when the battery is fully discharged will shorten battery life. Batteries that have been fully discharged must be charged before use.
- The internal temperature of the battery may rise while the battery is in use. Attempting to charge the battery while the internal temperature is elevated will impair battery performance, and the battery may not charge or charge only partially. Wait for the battery to cool before charging.

- Continuing to charge the battery after it is fully charged can impair battery performance.
- A marked drop in the time a fully charged battery retains its charge when used at room temperature indicates that it requires replacement. Purchase a new EN-EL15 battery.
- Charge the battery before use. When taking photographs on important occasions, ready a spare EN-EL15 battery and keep it fully charged. Depending on your location, it may be difficult to purchase replacement batteries on short notice. Note that on cold days, the capacity of batteries tends to decrease. Be sure the battery is fully charged before taking photographs outside in cold weather. Keep a spare battery in a warm place and exchange the two as necessary. Once warmed, a cold battery may recover some of its charge.
- Used batteries are a valuable resource; recycle in accord with local regulations.

## **Available Settings**

The following table lists the settings that can be adjusted in each mode.

						ž,2,	<b>■</b> , ₹,			<b>*</b> m
			•	Р	S, A, M	\$ <b>₽,⊠</b> , ≋,¶	<b>國,於</b> , 當,論	**	≙, ⊅, €	조, H1, Lo
	Storage folder	- /	<i>v</i>	V	<i>v</i>	V	-,- V	<i>v</i>	· •	
	File naming <sup>1</sup>	V	~	V	· ·	V	~	V	V	· ·
	Role played by card in Slot 2 <sup>1</sup>	V	V	V	<b>V</b>	V	~	V	V	· ·
	Image quality <sup>1,2</sup>	V	V	V	~	V	~	V	~	<b>V</b>
	Image size <sup>1, 2</sup>	V	V	V	~	V	~	V	V	~
	Image area <sup>1</sup>	V	~	~	~	~	~	~	~	<b>v</b>
	JPEG compression <sup>1</sup>	V	~	~	~	~	~	~	~	<b>v</b>
	NEF (RAW) recording <sup>1</sup>	V	~	~	~	~	~	~	~	<b>v</b>
	White balance <sup>1, 2</sup>	_	_	~	~	_	_	_	_	
s	Set Picture Control <sup>1</sup>	—	_	~	~	—	—	—	—	—
Shooting menu	Auto distortion control <sup>1</sup>	~	~	~	~	~	~	~	~	<b>v</b>
ting	Color space <sup>1</sup>	~	~	~	~	~	~	~	~	~
me	Active D-Lighting <sup>1</sup>	3	3	<b>√</b> <sup>2</sup>	<b>√</b> <sup>2</sup>	<u>3</u>	3	3	3	
nu	HDR (high dynamic range) <sup>1, 2</sup>	_	_	~	~	—	—	_	—	
	Vignette control <sup>1</sup>		~	~	~	~	~	~	~	~
	Long exposure NR <sup>1</sup>	~	~	~	~	~	~	~	~	~
	High ISO NR <sup>1</sup>	~	~	~	~	~	~	~	~	~
	ISO sensitivity settings <sup>1, 2</sup>	<b>√</b> <sup>4</sup>	<b>√</b> <sup>4</sup>	~	~	<b>√</b> <sup>4</sup>	<b>√</b> <sup>4</sup>	<b>√</b> <sup>4</sup>	<b>√</b> <sup>4</sup>	✓4
	Remote control mode <sup>1</sup>	~	~	~	~	~	~	~	~	<b>v</b>
	Multiple exposure <sup>1, 2</sup>	—	—	~	~	—	—	—	—	—
	Interval timer shooting <sup>1</sup>	~	~	~	~	~	~	~	~	<b>v</b>
	Time-lapse photography <sup>1</sup>	~	~	~	~	~	~	~	~	<b>v</b>
	Movie settings <sup>1</sup>	~	~	~	~	~	~	~	~	<b>v</b>
	Autofocus mode (viewfinder)	<b>√</b> <sup>5</sup>	<b>✓</b> <sup>5</sup>	~	~	✓ 5	✓ 5	<b>√</b> <sup>5</sup>	<b>√</b> <sup>5</sup>	<b>✓</b> <sup>5</sup>
	AF-area mode (viewfinder)	<b>√</b> <sup>5</sup>	✓ 5	~	~	✓ 5	✓ 5	✓ 5	<b>√</b> <sup>5</sup>	✓ <sup>5</sup>
	AF mode (Live view/movie)	<b>√</b> <sup>5</sup>	✔ <sup>5</sup>	~	~	✓ 5	✓ 5	✔5	✓ 5	✓ 5
~	AF-area mode (Live view/movie)	✓ 5	✔ <sup>5</sup>	~	~	✓ 5	✓ 5	<b>√</b> <sup>5</sup>	✓ 5	✓ 5
Other settings	AE lock hold	~	~	~	<b>/</b>	~	~	~	~	<b>~</b>
er se	Flexible program	_		~	—			_		
Ť	Metering	—		~	~			—	—	
sbu	Exposure compensation	—	—	~	~	—	—	—	—	<u> </u>
2	Bracketing	_	—	~	<b>/</b>	_				
	Flash mode	✓ 5	—	~	<b>/</b>	✓ 5		✓ 5	_	
	Flash compensation	—		~	<b>/</b>			_		
	FV lock	~		~	<b>/</b>	~		~		<u> </u>

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			<b>(F)</b>	Р	C A M	<b>*</b> , <b>*</b> ,	<b>≅,%</b> , ≅,≊	د	≙, Ģ, €	≦, H ∎
-	a1: AF-C priority selection	• •	 ✓	r V	S, A, M	淡, 11 了	≡, <b>≡</b>	**	* /	
			~	V	~	~	~	~	~	~
	a2: AF-S priority selection a3: Focus tracking with lock-on		~	~	V V	~	V V	~	V V	~ ~
- L	a4: AF point illumination	<u> く く く く く く く く く く く く く く く く く く く</u>	~	V	~	~	~	~	V V	~
- L	•	~	~	V V	~ ~	V V	V V	~	V V	~ ~
- L-	a5: Focus point wrap-around	•		•				•		-
- L	a6: Number of focus points	~	<b>v</b>	~	~	~	~	~	~	~
- I.	a7: Built-in AF-assist illuminator	~	~	~	~	~	_	_	~	~
	b1: ISO sensitivity step value	~	~	~	~	~	~	~	~	~
- L	b2: EV steps for exposure cntrl	~	~	~	~	~	~	~	~	~
	b3: Easy exposure compensation			~	<b>/</b>		—		-	
	b4: Center-weighted area	—	_	~	~		—	—		
	b5: Fine-tune optimal exposure	~	~	~	~	~	~	~	~	~
	c1: Shutter-release button AE-L	~	~	~	~	~	~	~	~	~
•	c2: Standby timer	~	~	~	~	~	~	~	~	~
	c3: Self-timer	~	~	~	~	~	~	~	~	~
	c4: Monitor off delay	~	~	~	~	~	~	~	~	~
Curtan Catting 6	c5: Remote on duration	~	~	~	~	~	~	~	~	~
5	d1: Beep	~	~	~	~	~	~	~	~	~
	d2: Viewfinder grid display	~	~	~	~	~	~	~	~	~
ſ	d3: ISO display and adjustment	~	~	~	~	~	~	~	~	~
Ī	d4: Screen tips	~	~	~	~	~	~	~	~	~
Ī	d5: CL mode shooting speed	~	~	~	~	~	~	~	~	~
ľ	d6: Max. continuous release	~	~	~	~	~	~	~	~	~
ľ	d7: File number sequence	~	~	~	~	~	~	~	~	~
ŀ	d8: Information display	~	~	~	~	~	~	~	~	~
	d9: LCD illumination	~	~	~	~	~	~	~	~	~
ľ	d10: Exposure delay mode <sup>2</sup>	~	~	~	~	~	~	~	~	~
	d11: Flash warning		_	~	~	_	—	_	—	-
	d12: MB-D14 battery type	~	~	~	~	~	~	~	~	~
- L	d13: Battery order	~	~	~	~	~	~	~	~	~

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		AUTO	3	Р	S, A, M		™, #0, ≚, ¥	**	•, •, ¢	≝ ₪, <b>L</b> o
	e1: Flash sync speed	~	~	~	~	~	~	~	~	~
	e2: Flash shutter speed	—	—	~	~	—	—	—	—	—
	e3: Flash cntrl for built-in flash/				~					
	Optional flash									
	e4: Exposure comp. for flash	—	—	~	~	—	—	—	—	—
	e5: Modeling flash	—	—	~	~	—	—	—	—	—
	e6: Auto bracketing set	—	—	~	~	—	—	—	—	—
	e7: Bracketing order	—	—	~	~	—	—	—	—	—
ŝ	f1: OK button (shooting mode)	~	~	~	~	~	~	~	~	~
Custom Settings	f2: Assign Fn button	~	~	~	<b>v</b>	<b>/</b>	~	~	<b>v</b>	~
ŝ	f3: Assign preview button	~	~	~	~	~	~	~	~	~
Ē	f4: Assign AE-L/AF-L button	~	~	~	~	~	~	~	~	~
<b>b</b> se	f5: Customize command dials	~	~	~	~	~	~	~	~	~
	f6: Release button to use dial	~	~	~	~	~	~	~	~	~
	f7: Slot empty release lock	~	~	~	~	~	~	~	~	~
	f8: Reverse indicators	~	~	~	~	~	~	~	~	~
	f9: Assign MB-D14 🕮 button	~	~	~	~	~	~	~	~	~
	g1: Assign Fn button	~	~	~	<b>v</b>	~	<b>v</b>	~	<b>v</b>	~
	g2: Assign preview button	~	~	~	<b>v</b>	~	~	~	<b>v</b>	~
	g3: Assign AE-L/AF-L button	~	~	~	<b>v</b>	~	~	~	<b>v</b>	~
	g4: Assign shutter button	~	~	~	<b>v</b>	~	~	~	~	<b>v</b>

1 Reset with **Reset shooting menu** (C2 214).

2 Reset with two-button reset (D 151).

3 Fixed at Auto.

4 Auto ISO sensitivity control is not available.

5 Reset when mode dial is rotated to new setting.

6 Reset with **Reset custom settings** (<sup>[]</sup> 221).

## Defaults

The default settings for the options in the camera menus are listed below. For information on two-button resets, see page 151.

### **II** Playback Menu Defaults

Option	Default	
Playback folder	ND600	207
Image review	Off	212
After delete	Show next	212
Rotate tall	On	212

	Option	Default	
S	lide show		
Image type		Still images and movies	213
_	Frame interval	2 s	

### **II** Shooting Menu Defaults<sup>1</sup>

Ontion	Default		Ontion	Default	
Option			Option		
File naming	DSC	216	Vignette control	Normal	218
Role played by card in Slot 2	Overflow	96	Long exposure NR	Off	218
Image quality	JPEG normal	93	High ISO NR	Normal	218
lmage size	Large	95	ISO sensitivity settings		
lmage area			ISO sensitivity		
Auto DX crop	On	89	P, S, A, M	100	105
Choose image area	FX (36×24)	90	Other modes	Auto	
JPEG compression	Size priority	94	Auto ISO sensitivity control	Off	107
NEF (RAW) recording	I		Remote control mode	Delayed remote	85
Tune	Lossless		Multiple exposure <sup>2</sup>	I	
Туре	compressed	94	Multiple exposure mode	Off	160
NEF (RAW) bit depth	14-bit	1	Number of shots	2	161
White balance	Auto > Normal	115	Auto gain	On	162
Fine-tuning	A-B: 0, G-M: 0	117	Interval timer shooting	Reset <sup>3</sup>	164
Choose color temp.	5000 K	120	Time-lapse photography	Reset <sup>4</sup>	168
Preset manual	d-1	121	Movie settings		
Set Picture Control	Standard	129	Frame size/frame rate	1920×1080; 30p	
Auto distortion control	Off	217	Movie quality	High quality	
Color space	sRGB	217	Microphone	Auto sensitivity	65
Active D-Lighting	1		Destination	Slot 1	
P, S, A, M, 🛋, 🖽, 🔟	Off	127			
Other modes	Auto	137			
HDR (high dynamic range)	1	<u> </u>			
HDR mode	Off	140			
Exposure differential	Auto	140			
Smoothing	Normal	141			
		<u> </u>			

1 Default settings restored with **Reset shooting menu** (<sup>CD</sup> 214).

2 Reset shooting menu can not be selected while shooting is in progress.

3 Start time reset to **Now**, interval reset to 1 minute, number of intervals and number of shots reset to 1, and **Start** set to **Off**. Shooting ends when reset is performed.

4 Interval reset to 5 s, recording time to 25 minutes.

## **III** Custom Settings Menu Defaults \*

	-									
	Option	Default			Option	Default				
a1	AF-C priority selection	Release	221	d8	Information display	Auto	231			
a2	AF-S priority selection	Focus	221	d9	LCD illumination	Off	231			
a3	Focus tracking with lock-on	3 (Normal)	222	d10	Exposure delay mode	Off	231			
a4	AF point illumination	Auto	222	d11	Flash warning	On	231			
a5	Focus point wrap-around	No wrap	222	d12	MB-D14 battery type	LR6 (AA alkaline)	232			
аб	Number of focus points	39 points	223	d12	Battery order	Use MB-D14	233			
a7	Built-in AF-assist illuminator	On	223	uis	Dattery older	batteries first	255			
b1	ISO sensitivity step value	1/3 step	224	e1	Flash sync speed	1/200 s	234			
b2	EV steps for exposure cntrl	1/3 step	224	e2	Flash shutter speed	1/60 s	235			
b3	Easy exposure compensation	Off	225	e3	Flash cntrl for built-in flash/	TTL	236			
b4	Center-weighted area	ø 12 mm	226		Optional flash	116				
b5	Fine-tune optimal exposure			e4	Exposure comp. for flash	Entire frame	240			
	Matrix metering	0		e5	Modeling flash	On	241			
	Center-weighted metering	0	226	еб	Auto bracketing set	AE & flash	241			
	Spot metering	0		67	Bracketing order	MTR > under >	241			
c1	Shutter-release button AE-L	Off	226	67	bracketing order	over	241			
c2	Standby timer	6 s	227 f1 OK button (shooting mode)	227 f1 OK button (shooting mode) Se	227 f1 OK button (shooting mode) Sele	227 f1	227 f1 OK button (shooting mode) Selec	$\overline{227}$ f1 OK button (shooting mode) S	Select center focus	241
G	Self-timer	1	<u> </u>			point				
	Self-timer delay	10 s		f2		Choose image area	242			
	Number of shots	1	227	f3		Preview	244			
	Interval between shots	0.5 s		f4	_ · · J	AE/AF lock	244			
c4	Monitor off delay	1	<u> </u>	f5	Customize command dials					
	Playback	10 s				Exposure				
	Menus	1 min			Reverse rotation	compensation:				
	Information display	10 s	228			Shutter speed/				
	Image review	4 s				aperture:	245			
	Live view	10 min			Change main/sub	Off				
c5	Remote on duration	1 min	228		Aperture setting	Sub-command dial				
d1	Веер	1	L		Menus and playback	Off				
	Volume	Off			Release button to use dial	No	246			
	Pitch	High	228	f7	Slot empty release lock	Enable release	246			
d2	Viewfinder grid display	Off	229	f8		<b>-</b> •!+	246			
	ISO display and adjustment	Show frame count	229	f9	Assign MB-D14 🔀 button	AE/AF lock	247			
d4		On	229	g1	Assign Fn button	None	247			
	CL mode shooting speed	3 fps	229	g2	Assign preview button	Index marking	248			
	Max. continuous release	100	230	g3	5	AE/AF lock	248			
	File number sequence	On	230	g4	Assign shutter button	Take photos	248			

\* Default settings restored with **Reset custom settings** (C 221).

## Setup Menu Defaults

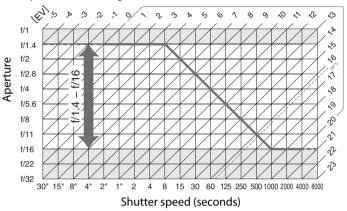
Option	Default		
Save user settings			
Save to U1	Shooting mode	81	
Save to U2	defaults to <b>P</b>	01	
Monitor brightness	Manual	250	
Manual	0	230	
Clean image sensor			
Clean at startup/shutdown	Clean at startup & shutdown	301	
HDMI			
Output resolution	on Auto		
Device control	On	_ 205	

Option	Default				
Flicker reduction	Auto	252			
Time zone and date					
Daylight saving time	Off	253			
Auto image rotation	On	254			
GPS					
Standby timer	Enable	175			
Use GPS to set camera clock	Yes	- 1/3			
Eye-Fi upload	Enable	260			

## **Exposure Program (Mode P)**

The exposure program for mode **P** is shown in the following graph:

ISO 100; lens with maximum aperture of f/1.4 and minimum aperture of f/16 (e.g., AF-S NIKKOR 50mm f/1.4G)



The maximum and minimum values for EV vary with ISO sensitivity; the above graph assumes an ISO sensitivity of ISO 100 equivalent. When matrix metering is used, values over  $16^{1}/_{3}$  EV are reduced to  $16^{1}/_{3}$  EV.

#### Å

## Troubleshooting

If the camera fails to function as expected, check the list of common problems below before consulting your retailer or Nikon-authorized service representative.

## <u>Display</u>

**Viewfinder is out of focus**: Adjust viewfinder focus or use optional eyepiece correction lenses (CII 33, 297).

Viewfinder is dark: Insert a fully-charged battery (C 21, 35).

**Displays turn off without warning**: Choose longer delays for Custom Setting c2 (**Standby timer**) or c4 (**Monitor off delay**) (227, 228).

**Control panel and viewfinder displays are unresponsive and dim**: The response times and brightness of these displays vary with temperature.

Fine lines are visible around active focus point or display turns red when focus point is highlighted: These phenomena are normal for this type of viewfinder and do not indicate a malfunction.

#### If the Camera Stops Responding

In extremely rare instances, the displays may not respond as expected and the camera may stop functioning. In most cases, this phenomenon is caused by a strong external static charge. Turn the camera off, remove and replace the battery, taking care to avoid burns, and turn the camera on again, or, if you are using an AC adapter (available separately), disconnect and reconnect the adapter and turn the camera on again. If the problem persists, contact your retailer or Nikon-authorized service representative.

V

#### Camera takes time to turn on: Delete files or folders.

#### Shutter-release disabled:

- Memory card is locked, full, or not inserted (29, 31).
- Built-in flash is charging (C 39).
- Camera is not in focus (C 38).
- Non-CPU lens is attached but camera is not in mode **A** or **M** ( $\square$  288).

Camera is slow to respond to shutter-release button: Select Off for Custom Setting d10 (Exposure delay mode; 231).

No photo taken when remote control shutter-release button is pressed:

- Replace battery in remote control (C 298).
- Choose remote control release mode (C 85).
- Flash is charging (CD 87).
- Time selected for Custom Setting c5 (**Remote on duration**,  $\Box$  228) has elapsed: press camera shutter-release button halfway.
- Bright light is interfering with remote.

#### Photos are out of focus:

- Rotate focus-mode selector to AF (C 97).
- Camera unable to focus using autofocus: use manual focus or focus lock (D 102, 103).

Focus does not lock when shutter-release button is pressed halfway: Use 結 AE-L/AF-L button to lock focus when AF-C is selected for focus mode or when photographing moving subjects in AF-A mode.

#### Can not select focus point:

- Unlock focus selector lock (CI 101).
- Auto-area AF or face-priority AF selected for AF-area mode: choose another mode.
- Camera is in playback mode (CII 177) or menus are in use (CII 207).
- Press shutter-release button halfway to turn monitor off or start standby timer (D 39).

Can not select AF-area mode: Manual focus selected (CD 55, 103).

**Only one shot taken each time shutter-release button is pressed in continuous release mode**: Continuous shooting is not available if built-in flash fires ( $\Box$  145).

Image size can not be changed: Image quality set to NEF (RAW) (CP 93).

Camera is slow to record photos: Turn long exposure noise reduction off (2218).

#### Noise (bright spots, randomly-spaced bright pixels, fog, or lines) appear in photos:

- Choose lower ISO sensitivity or use high ISO noise reduction (CII 105, 218).
- Shutter speed is slower than 1 s: use long exposure noise reduction (218).
- Turn Active D-Lighting off to avoid heightening the effects of noise (22 137).

#### AF-assist illuminator does not light:

- AF-assist lamp does not light if **AF-C** is selected for autofocus mode ( $\square$  97) or if continuousservo autofocus is selected when the camera is in **AF-A** mode. Choose **AF-S**. If an option other than auto-area AF is selected for AF-area mode, select center focus point ( $\square$  99, 101).
- The camera is currently in live view or a movie is being recorded.
- Off selected for Custom Setting a7 (Built-in AF-assist illuminator) (D 223).
- Illuminator has turned off automatically. Illuminator may become hot with continued use; wait for lamp to cool down.

**Smudges appear in photographs**: Clean front and rear lens elements. If problem persists, perform image sensor cleaning ( $\square$  301).

#### Sound is not recorded with movies: Microphone off is selected for Movie settings > Microphone.

#### The brightness of the image in the monitor differs from the exposure of photographs taken in live view:

- Center-weighted or spot metering is selected (
  109).
- The camera is in mode M.
- The subject is too bright or too dark.
- Active D-Lighting is in effect (CD 137).
- The photograph is a long time-exposure (2 79).
- The flash is used (D 143).

**Flicker or banding appears during live view or movie recording**: Choose an option for **Flicker reduction** that matches the frequency of the local AC power supply ( $\Box$  252).

**Bright bands appear during live view or movie recording:** A flashing sign, flash, or other light source with brief duration was used during live view or movie recording.

Menu item can not be selected: Some options are not available in all modes.

## Shooting (P, S, A, M)

#### Shutter-release disabled:

- Non-CPU lens is attached: rotate camera mode dial to **A** or **M** ( $\square$  288).
- Mode dial rotated to S after shutter speed of bu t b selected in mode M: choose new shutter speed (CD 76).

**Full range of shutter speeds not available**: Flash in use. Flash sync speed can be selected using Custom Setting e1 (**Flash sync speed**); when using compatible flash units, choose **1/250 s** (**Auto FP**) or **1/200 s** (**Auto FP**) for full range of shutter speeds ( $\square$  234).

#### Colors are unnatural:

- Adjust white balance to match light source (
  115).
- Adjust Set Picture Control settings (C 129).

Can not measure white balance: Subject is too dark or too bright (D 123).

Image can not be selected as source for preset white balance: Image was not created with D600 ( $\Box$  124).

#### White balance bracketing unavailable:

- NEF (RAW) or NEF+JPEG image quality option selected for image quality (22 93).
- Multiple exposure mode is in effect (D 163).

**Effects of Picture Control differ from image to image: A** (auto) is selected for sharpening, contrast, or saturation. For consistent results over a series of photos, choose another setting ( $\Box$  132).

Metering can not be changed: Autoexposure lock or movie live view is in effect (CD 57, 110).

**Exposure compensation can not be used**: Choose mode **P**, **S**, or **A** ( $\Box$  75, 76, 77).

Noise (reddish areas or other artifacts) appears in long time-exposures: Enable long exposure noise reduction ( $\Box$  218).

#### Z

## <u>Playback</u>

**NEF (RAW) image is not played back**: Photo was taken at image quality of NEF + JPEG (<sup>CLI</sup> 93).

Can not view pictures recorded with other cameras: Pictures recorded with other makes of camera may not be displayed correctly.

Message is displayed stating that no images are available for playback: Select All for Playback folder (© 207).

#### "Tall" (portrait) orientation photos are displayed in "wide" (landscape) orientation:

- Select **On** for **Rotate tall** (C 212).
- Photo was taken with **Off** selected for **Auto image rotation** (CII 254).
- Camera was pointed up or down when photo was taken (D 254).
- Photo is displayed in image review (2212).

#### Can not delete picture:

- Picture is protected: remove protection (
  188).
- Memory card is locked (C 32).

Can not retouch picture: Photo can not be further edited with this camera (D 262).

#### Can not change print order:

- Memory card is full: delete pictures (D 36, 189).
- Memory card is locked (C 32).

**Can not select photo for printing**: Photo is in NEF (RAW) format. Create JPEG copy using **NEF (RAW) processing** or transfer to computer and print using ViewNX 2 (supplied) or Capture NX 2 (available separately).

#### Picture is not displayed on TV:

- Choose correct video mode (CD 65) or output resolution (CD 205).
- HDMI (C 204) cable is not correctly connected.

#### Camera does not respond to remote control for HDMI-CEC television:

- Select **On** for **HDMI** > **Device control** in the setup menu (<sup>CD</sup> 205).
- Adjust HDMI-CEC settings for the television as described in documentation provided with the device.

**Can not transfer photos to computer**: OS not compatible with camera or transfer software. Use card reader to copy photos to computer ( $\Box$  193).

#### Photos are not displayed in Capture NX 2: Update to latest version (D 298).

**Image Dust Off option in Capture NX 2 does not have desired effect**: Image sensor cleaning changes the position of dust on the low-pass filter. Dust off reference data recorded before image sensor cleaning is performed can not be used with photographs taken after image sensor cleaning is performed. Dust off reference data recorded after image sensor cleaning is performed can not be used with photographs taken after image sensor cleaning is performed can not be used with photographs taken before image sensor cleaning is performed ( $\Box$  252).

**Computer displays NEF (RAW) images differently from camera**: Third-party software does not display effects of Picture Controls, Active D-Lighting, or vignette control. Use ViewNX 2 (supplied) or optional Nikon software such as Capture NX 2 (available separately).

## **Miscellaneous**

Date of recording is not correct: Set camera clock (C 27, 253).

**Menu item can not be selected**: Some options are not available at certain combinations of settings or when no memory card is inserted. Note that **Battery info** option is not available when camera is powered by an optional EP-5B power connector and EH-5b AC adapter ( $\square$  255).

#### Å

## **Error Messages**

This section lists the indicators and error messages that appear in the viewfinder, control panel, and monitor.

Indicator Control View- panel finder				
		Problem	Solution	m
	<b>. E</b> hes)	Lens aperture ring is not set to minimum aperture.	Set ring to minimum aperture (highest f-number).	26
44		Low battery.	Ready a fully-charged spare battery.	21
	_	<ul> <li>Battery exhausted.</li> <li>Battery can not be used.</li> <li>An extremely exhausted</li> </ul>	<ul> <li>Recharge or replace battery.</li> <li>Contact Nikon-authorized service representative.</li> <li>Replace the battery, or</li> </ul>	xxiii, 21,
(flashes)	(flashes)	rechargeable Li-ion battery or a third-party battery is inserted either in the camera or in the optional MB-D14 battery pack.	recharge the battery if the rechargeable Li-ion battery is exhausted.	23
Δ	F	No lens attached, or non-CPU lens attached without specifying maximum aperture. Aperture shown in stops from maximum aperture.	Aperture value will be displayed if maximum aperture is specified.	172
_	► ◀ (flashes)	Camera unable to focus using autofocus.	Change composition or focus manually.	98, 103
<b>۶-</b> (flas)	hes)	No lens attached.	<ul> <li>Attach non-IX Nikkor lens.</li> <li>If a CPU lens is attached, remove and reattach the lens.</li> </ul>	25, 285
		Non-CPU lens attached.	• Select mode <b>A</b> or <b>M</b> .	288

U

Indicator				
Control	View-			
panel	finder	Problem	Solution	Ш
(Exposure indicators and shutter speed or aperture display flash)		Subject too bright; photo will be overexposed.	<ul> <li>Use a lower ISO sensitivity</li> <li>In shooting mode:</li> <li>P Use optional ND filter</li> <li>S Increase shutter speed</li> <li>A Choose a smaller aperture</li> </ul>	105 297 76 77
			<ul><li>(higher f-number)</li><li>Use a higher ISO sensitivity</li><li>In shooting mode:</li></ul>	105
		Subject too dark; photo will be underexposed.	<ul> <li>P Use flash</li> <li>S Lower shutter speed</li> <li>A Choose a larger aperture (lower f-number)</li> </ul>	143 76 77
<b>لەت</b> flas)	<b>ដង</b> hes)	bu L b selected in mode S.	Change shutter speed or select mode <b>M</b> .	76, 78
- (flas	- hes)	selected in mode <b>S</b> .	Change shutter speed or select mode <b>M</b> .	76, 78
<b>៦៤5</b> ។ (flashes)	<b>b5                                    </b>	Images are being processed.	Wait until processing is complete.	_
<b>\$</b> (flashes)		If indicator flashes for 3s after flash fires, photo may be underexposed.	Check photo in monitor; if underexposed, adjust settings and try again.	177
Full	Ful	Memory insufficient to record further photos at current	<ul><li>Reduce quality or size.</li><li>Delete photographs.</li></ul>	93, 95 189
(flashes)			Insert new memory card.	29
Err (flashes)		Camera malfunction.	Release shutter. If error persists or appears frequently, consult Nikon-authorized service representative.	_

## V

Indicator				
Control				
Monitor	panel	Problem	Solution	
No memory card.	( <b>- E -</b> )	Camera cannot detect memory card.	Turn camera off and confirm that card is correctly inserted.	29
This memory card cannot be used. Card may be damaged. Insert another card.	[Rrd, Err (flashes)	<ul> <li>Error accessing memory card.</li> <li>Unable to create new folder.</li> </ul>	<ul> <li>Use Nikon-approved card.</li> <li>Check that contacts are clean. If card is damaged, contact retailer or Nikon-authorized service representative.</li> <li>Delete files or insert new memory card after copying important images to computer or other device.</li> </ul>	333 — 29, 189
ିଲ	[Rrd, Err (flashes)	Camera can not control Eye-Fi card.	<ul> <li>Check that Eye-Fi card firmware is up to date.</li> <li>Copy files on Eye-Fi card to a computer or other device and format card, or insert new card.</li> </ul>	260 29, 31, 193
Memory card is locked. Slide lock to "write" position.	СЯгd,  (flashes) СЯгd,	Memory card is locked (write protected).	Slide card write-protect switch to "write" position.	32
Not available if Eye-Fi card is locked.	Err (flashes)	Eye-Fi card is locked (write protected).	switch to write position.	
This card is not formatted. Format the card.	[ <b>F o r</b> ] (flashes)	Memory card has not been formatted for use in camera.	Format memory card or insert new memory card.	29, 31
Clock has been reset		Camera clock is not set.	Set camera clock.	27, 253
Failed to update flash unit firmware. Flash cannot be used. Contact a Nikon- authorized service representative.		Firmware for flash unit mounted on camera was not updated correctly.	Contact a Nikon-authorized service representative.	_
Unable to start live view. Please wait.	_	The internal temperature of the camera is high.		

Indicator				
Control				
Monitor	panel	Problem	Solution	
Folder contains no images.	—	No images on memory card or in folder(s) selected for playback.	Select folder containing images from <b>Playback folder</b> menu or insert memory card containing images.	29, 207
All images are hidden.	_	All photos in current folder are hidden.		
Cannot display this file.	_	File has been created or modified using a computer or different make of camera, or file is corrupt.	File can not be played back	
Cannot select this file.	—	Selected image can not be retouched.	Images created with other devices can not be retouched.	262
This movie cannot be edited.		The selected movie can not be edited.	<ul> <li>Movies created with other devices can not be edited.</li> <li>Movies must be at least two seconds long.</li> </ul>	— 71
Check printer.	_	Printer error.	Check printer. To resume, select <b>Continue</b> (if available).	196*
Check paper.		Paper in printer is not of selected size.	Insert paper of correct size and select <b>Continue</b> .	196*
Paper jam.		Paper is jammed in printer.	Clear jam and select <b>Continue</b> .	196*
Out of paper.		Printer is out of paper.	Insert paper of selected size and select <b>Continue</b> .	196*
Check ink supply.		Ink error.	Check ink. To resume, select <b>Continue</b> .	196*
Out of ink.		Printer is out of ink.	Replace ink and select <b>Continue</b> .	196*

\* See printer manual for more information.

## **Specifications**

## **III** Nikon D600 Digital Camera

Туре					
Туре	Single-lens reflex digital camera				
Lens mount	Nikon F mount (with AF coupling and AF contacts)				
Effective pixels					
Effective pixels	24.3 million				
Image sensor					
Image sensor	35.9 × 24.0 mm CMOS sensor (Nikon FX format)				
Total pixels	24.7 million				
Dust-reduction System	Image sensor cleaning, Image Dust Off reference data (optional				
	Capture NX 2 software required)				
Storage					
Image size (pixels)	• FX (36×24) image area				
	6,016 × 4,016 (ᡅ) 4,512 × 3,008 (₪) 3,008 × 2,008 (₪)				
	• DX (24×16) image area				
	3,936 × 2,624 (℡) 2,944 × 1,968 (ℕ) 1,968 × 1,312 (℡)				
	FX-format photographs taken in movie live view				
	6,016 × 3,376 ( <b>□</b> ) 4,512 × 2,528 ( <b>M</b> ) 3,008 × 1,688 ( <b>⑤</b> )				
	DX-format photographs in movie live view     2.026 v 2.026 v 1.112 (     )     2.044 v 1.664 (     )     1.068 v 1.112 (     )				
File format	3,936 × 2,224 (□)       2,944 × 1,664 (□)       1,968 × 1,112 (□)         • NEF (RAW): 12 or 14 bit, lossless compressed or compressed				
rne iormat					
	<ul> <li>JPEG: JPEG-Baseline compliant with fine (approx. 1 : 4), normal (approx. 1 : 8), or basic (approx. 1 : 16) compression (Size priority); Optimal</li> </ul>				
	<b>quality</b> compression available				
	• NEF (RAW)+JPEG: Single photograph recorded in both NEF (RAW) and				
	JPEG formats				
Picture Control System	Standard, Neutral, Vivid, Monochrome, Portrait, Landscape; selected				
	Picture Control can be modified; storage for custom Picture Controls				
Media	SD (Secure Digital) and UHS-I compliant SDHC and SDXC memory cards				
Double slot	Slot 2 can be used for overflow or backup storage or for separate storage				
	of copies created using NEF+JPEG; pictures can be copied between				
	cards.				
File system	DCF (Design Rule for Camera File System) 2.0, DPOF (Digital Print Order				
	Format), Exif (Exchangeable Image File Format for Digital Still Cameras)				
	2.3, PictBridge				
Viewfinder					
Viewfinder	Eye-level pentaprism single-lens reflex viewfinder				
Frame coverage	• FX (36×24): Approx. 100% horizontal and 100% vertical				
	DX (24×16): Approx. 97% horizontal and 97% vertical				
Magnification	Approx. $0.7 \times (50 \text{ mm f}/1.4 \text{ lens at infinity}, -1.0 \text{ m}^{-1})$				
Eyepoint	21 mm (-1.0 m <sup>-1</sup> ; from center surface of viewfinder eyepiece lens)				

Viewfinder						
Diopter adjustment	-3-+1 m <sup>-1</sup>					
Focusing screen	Type B BriteView Clear Matte Mark VIII screen with AF area brackets (framing grid can be displayed)					
Reflex mirror	Quick return					
Depth-of-field preview	Pressing depth-of-field preview button stops lens aperture down to value selected by user ( <b>A</b> and <b>M</b> modes) or by camera (other modes)					
Lens aperture	Instant return, electronically controlled					
Lens						
Compatible lenses	Compatible with AF NIKKOR lenses, including type G and D lenses (some restrictions apply to PC lenses) and DX lenses (using DX $24 \times 161.5 \times$ image area), AI-P NIKKOR lenses, and non-CPU AI lenses ( <b>A</b> and <b>M</b> modes only). IX NIKKOR lenses, lenses for the F3AF, and non-AI lenses can not be used.					
	The electronic rangefinder can be used with lenses that have a maximum aperture of f/5.6 or faster (the electronic rangefinder supports the center 7 focus points with lenses that have a maximum aperture of f/8 or faster and the center 33 focus points with lenses that have a maximum aperture of f/6.8 or faster)					
Shutter						
Туре	Electronically-controlled vertical-travel focal-plane shutter					
Speed	<sup>1</sup> / <sub>4000</sub> – 30 s in steps of <sup>1</sup> / <sub>3</sub> or <sup>1</sup> / <sub>2</sub> EV, bulb, time (requires optional ML-L3 remote control), X200					
Flash sync speed	$X = \frac{1}{200}$ s; synchronizes with shutter at $\frac{1}{250}$ s or slower (flash range drop at speeds between $\frac{1}{200}$ and $\frac{1}{250}$ s)					
Release						
Release mode	S (single frame), CL (continuous low speed), CH (continuous high speed), Q (quiet shutter-release), ⓒ (self-timer), ■ (remote control), MUP (mirror up)					
Frame advance rate	1–5 fps (CL) or 5.5 fps (CH)					
Self-timer	2 s, 5 s, 10 s, 20 s; 1–9 exposures at intervals of 0.5, 1, 2, or 3 s					
Remote release modes	Delayed remote, quick-response remote, remote mirror-up					
Exposure						
Metering	TTL exposure metering using 2,016-pixel RGB sensor					
Metering method	<ul> <li>Matrix: 3D color matrix metering II (type G and D lenses); color matrix metering II (other CPU lenses); color matrix metering available with non-CPU lenses if user provides lens data</li> <li>Center-weighted: Weight of 75% given to 12 mm circle in center of frame. Diameter of circle can be changed to 8, 15, or 20 mm, or weighting can be based on average of entire frame (non-CPU lenses use 12-mm circle or average of entire frame)</li> <li>Spot: Meters 4 mm circle (about 1.5% of frame) centered on selected focus point (on center focus point when non-CPU lens is used)</li> </ul>					
Range (ISO 100, f/1.4	Matrix or center-weighted metering: 0-20 EV					
lens, 20 °C/68 °F)	Spot metering: 2–20 EV					

V

Exposure	
Exposure meter	Complete ed CDU and AL
coupling	Combined CPU and AI
Mode	Auto (☆ auto;  auto (flash off)); scene ( for the protrait; and landscape;  schild;  sports; close up;  night portrait;  night landscape;  party/indoor;  beach/snow;  sunset; auts/dawn;  pet portrait;  candlelight;  blossom;  autumn colors;  fl food; silhouette;  high key;  low key); programmed auto with flexible program (P); shutter-priority auto (S); aperture-priority auto (A); manual (M);  U1 (user settings 1);  U2 (user settings 2)
Exposure compensation	-5 - +5 EV in increments of 1/3 or 1/2 EV
Exposure bracketing	2-3 frames in steps of <sup>1</sup> / <sub>3</sub> , <sup>1</sup> / <sub>2</sub> , <sup>2</sup> / <sub>3</sub> , 1, 2, or 3 EV
Flash bracketing	2-3 frames in steps of <sup>1</sup> / <sub>3</sub> , <sup>1</sup> / <sub>2</sub> , <sup>2</sup> / <sub>3</sub> , 1, 2, or 3 EV
White balance bracketing	2-3 frames in steps of 1, 2, or 3
ADL bracketing	2 frames using selected value for one frame or 3 frames using preset values for all frames
Exposure lock	Luminosity locked at detected value with #L AE-L/AF-L button
ISO sensitivity	ISO 100 – 6400 in steps of $1/3$ or $1/2$ EV. Can also be set to approx. 0.3, 0.5,
(Recommended	0.7, or 1 EV (ISO 50 equivalent) below ISO 100 or to approx. 0.3, 0.5, 0.7, 1,
Exposure Index)	or 2 EV (ISO 25600 equivalent) above ISO 6400; auto ISO sensitivity
	control available
Active D-Lighting	Auto, Extra high, High, Normal, Low, Off
Focus	
Autofocus	Nikon Multi-CAM 4800 autofocus sensor module with TTL phase detection, fine-tuning, 39 focus points (including 9 cross-type sensors; the center 33 points are available at apertures slower than f/5.6 and faster than f/8, while the center 7 focus points are available at f/8), and AF-assist illuminator (range approx. 0.5–3 m/1 ft 8 in.–9 ft 10 in.)
Detection range	-1 - +19 EV (ISO 100, 20 °C/68 °F)
Lens servo	<ul> <li>Autofocus (AF): Single-servo AF (AF-S); continuous-servo AF (AF-C); auto AF-S/AF-C selection (AF-A); predictive focus tracking activated automatically according to subject status</li> <li>Manual focus (M): Electronic rangefinder can be used</li> </ul>
Focus point	Can be selected from 39 or 11 focus points
AF-area mode	Single-point AF; 9-, 21-, or 39-point dynamic-area AF, 3D-tracking, auto-area AF
Focus lock	Focus can be locked by pressing shutter-release button halfway (single- servo AF) or by pressing 結 <b>AE-L/AF-L</b> button
Flash	
Built-in flash	營, 差, 肇, 郾, 国, 溪, 媛: Auto flash with auto pop-up P, S, A, M, †I: Manual pop-up with button release
Guide Number	Approx. 12/39, 12/39 with manual flash (m/ft, ISO 100, 20 °C/68 °F)
Flash control	<b>TTL:</b> i-TTL flash control using 2,016-pixel RGB sensor is available with built-in flash and SB-910, SB-900, SB-800, SB-700, SB-600, or SB-400; i-TTL balanced fill-flash for digital SLR is used with matrix and center-weighted metering, standard i-TTL flash for digital SLR with spot metering

Flash	
Flash mode	Auto, auto with red-eye reduction, auto slow sync, auto slow sync with
	red-eye reduction, fill-flash, red-eye reduction, slow sync, slow sync with
	red-eye reduction, rear-curtain with slow sync, rear-curtain sync, off;
	Auto FP High-Speed Sync supported
Flash compensation	-3 - +1 EV in increments of <sup>1</sup> / <sub>3</sub> or <sup>1</sup> / <sub>2</sub> EV
Flash-ready indicator	Lights when built-in flash or optional flash unit is fully charged; flashes
	after flash is fired at full output
Accessory shoe	ISO 518 hot-shoe with sync and data contacts and safety lock
<b>Nikon Creative Lighting</b>	Advanced Wireless Lighting supported with built-in flash, SB-910,
System (CLS)	SB-900, SB-800, or SB-700 as a master flash and SB-600 or SB-R200 as
	remotes, or SU-800 as commander; built-in flash can serve as master
	flash in commander mode; Auto FP High-Speed Sync and modeling
	illumination supported with all CLS-compatible flash units except
	SB-400; Flash Color Information Communication and FV lock supported
	with all CLS-compatible flash units
Sync terminal	AS-15 sync terminal adapter (available separately)
White balance	
White balance	Auto (2 types), incandescent, fluorescent (7 types), direct sunlight, flash,
	cloudy, shade, preset manual (up to 4 values can be stored), choose color
	temperature (2500 K–10000 K), all with fine-tuning
Live view	
Modes	Live view photography (still images), movie live view (movies)
Lens servo	Autofocus (AF): Single-servo AF (AF-S); full-time servo AF (AF-F)
	Manual focus (M)
AF-area mode	Face-priority AF, wide-area AF, normal-area AF, subject-tracking AF
Autofocus	Contrast-detect AF anywhere in frame (camera selects focus point
	automatically when face-priority AF or subject-tracking AF is selected)
Movie	
Metering	TTL exposure metering using main image sensor
Metering method	Matrix
Frame size (pixels) and	<ul> <li>1,920 × 1,080; 30 p (progressive), 25 p, 24 p</li> </ul>
frame rate	<ul> <li>1,280 × 720; 60 p, 50 p, 30 p, 25 p</li> </ul>
	Actual frame rates for 60 p, 50 p, 30 p, 25 p, and 24 p are 59.94, 50, 29.97,
	25, and 23.976 fps respectively; options support both $\star$ high and normal
	image quality
File format	MOV
Video compression	H.264/MPEG-4 Advanced Video Coding
Audia recording format	
	Linear PCM
	Linear PCM Built-in monaural or external stereo microphone; sensitivity adjustable Index marking, time-lapse photography

8-cm/3.2-in., approx. 921k-dot (VGA), low-temperature polysilicon TFT LCD with approx. 170 ° viewing angle, approx. 100% frame coverage, and
automatic monitor brightness control using ambient brightness sensor
Full-frame and thumbnail (4, 9, or 72 images or calendar) playback with
playback zoom, movie playback, photo and/or movie slide shows,
histogram display, highlights, photo information, GPS data display, and
auto image rotation
Hi-Speed USB
Type C mini-pin HDMI connector
Remote cord: MC-DC2 (available separately)
GPS unit: GP-1 (available separately)
Stereo mini-pin jack (3.5 mm diameter; plug-in power supported)
Stereo mini-pin jack (3.5 mm diameter)
Arabic, Chinese (Simplified and Traditional), Czech, Danish, Dutch,
English, Finnish, French, German, Greek, Hindi, Hungarian, Indonesian,
Italian, Japanese, Korean, Norwegian, Polish, Portuguese (Portugal and
Brazil), Romanian, Russian, Spanish, Swedish, Thai, Turkish, Ukrainian
One rechargeable Li-ion EN-EL15 battery
Optional MB-D14 multi-power battery pack with one rechargeable
Nikon EN-EL15 Li-ion battery or six AA alkaline, Ni-MH, or lithium
batteries
EH-5b AC adapter; requires EP-5B power connector (available separately)
<sup>1</sup> /4 in. (ISO 1222)
) Approx. 141 × 113 × 82 mm (5.6 × 4.4 × 3.2 in.)
Approx. 850 g (1 lb 14.0 oz) with battery and memory card but without
body cap; approx. 760 g (1 lb 10.8 oz; camera body only)
0–40 °C (+32–104 °F)
85% or less (no condensation)

 Unless otherwise stated, all figures are for a camera with a fully-charged battery operating at an ambient temperature of 20 °C (68 °F).

• Nikon reserves the right to change the specifications of the hardware and software described in this manual at any time and without prior notice. Nikon will not be held liable for damages that may result from any mistakes that this manual may contain.

MH-25 battery charger						
Rated input						
(in North America)	AC 120 V, 60 Hz, 0.2 A					
Rated input	AC 100–240 V, 50/60 Hz, 0.23–0.12 A					
(in other regions)	AC 100-240 V, 50/00 HZ, 0.25-0.12 A					
Rated output	DC 8.4 V/1.2 A					
Supported batteries	Nikon EN-EL15 rechargeable Li-ion batteries					
Charging time	Approx. 2 hours and 35 minutes at an ambient temperature of					
	25 °C (77 °F) when no charge remains					
<b>Operating temperature</b>	0–40 °C (+32–104 °F)					
Dimensions ( $W \times H \times D$ )	Approx. $91.5 \times 33.5 \times 71$ mm ( $3.6 \times 1.3 \times 2.8$ in.), excluding projections					
Length of power cable	Approx. 1.8 m/6 ft (U.S.A. and Canada) or 1.5 m/4.9 ft (other countries)					
Weight	Approx. 110 g (3.9 oz), excluding power cable and AC wall adapter					
EN-EL15 rechargeable Li	-ion battery					
Туре	Rechargeable lithium-ion battery					
Rated capacity	7.0 V/1,900 mAh					
	0-40 °C (+32-104 °F)					
Dimensions ( $W \times H \times D$ )	Approx. 40 × 56 × 20.5 mm (1.6 × 2.2 × 0.8 in.)					
Weight	Approx. 88 g (3.1 oz), excluding terminal cover					
Nikon reserves the righ	t to change the specifications of the hardware and software described in this					

Nikon reserves the right to change the specifications of the hardware and software described in this manual at any time and without prior notice. Nikon will not be held liable for damages that may result from any mistakes that this manual may contain.

### Supported Standards

- **DCF Version 2.0**: The Design Rule for Camera File Systems (DCF) is a standard widely used in the digital camera industry to ensure compatibility among different makes of camera.
- **DPOF**: Digital Print Order Format (DPOF) is an industry-wide standard that allows pictures to be printed from print orders stored on the memory card.
- **Exif version 2.3**: The camera supports Exif (Exchangeable Image File Format for Digital Still Cameras) version 2.3, a standard in which information stored with photographs is used for optimal color reproduction when the images are output on Exif-compliant printers.
- **PictBridge**: A standard developed through cooperation with the digital camera and printer industries, allowing photographs to be output directly to a printer without first transferring them to a computer.
- HDMI: High-Definition Multimedia Interface is a standard for multimedia interfaces used in consumer electronics and AV devices capable of transmitting audiovisual data and control signals to HDMI-compliant devices via a single cable connection.

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## **Approved Memory Cards**

The following SD memory cards have been tested and approved for use in the camera. Cards with class 6 or faster write speeds are recommended for movie recording. Recording may end unexpectedly when cards with slower write speeds are used.

	SD cards	SDHC cards <sup>2</sup>	SDXC cards <sup>3</sup>
SanDisk		4 GB, 8 GB, 16 GB, 32 GB	64 GB
Toshiba			04 00
Panasonic	2 GB <sup>1</sup>	4 GB, 6 GB, 8 GB, 12 GB, 16 GB, 24 GB, 32 GB	48 GB, 64 GB
Lexar Media	2 00 '	4 GB, 8 GB, 16 GB	
Platinum II		4 GB, 8 GB, 16 GB, 32 GB	-
Professional		4 GD, 8 GD, 10 GD, 32 GD	
Full-HD Video		4 GB, 8 GB, 16 GB	

1 Check that any card readers or other devices with which the card will be used support 2 GB cards.

2 Check that any card readers or other devices with which the card will be used are SDHC-compliant. The camera supports UHS-1.

3 Check that any card readers or other devices with which the card will be used are SDXC-compliant. The camera supports UHS-1.



Other cards have not been tested. For more details on the above cards, please contact the manufacturer.

## **Memory Card Capacity**

The following table shows the approximate number of pictures that can be stored on an 8 GB SanDisk Extreme Pro SDHC UHS-I card at different image quality ( $\square$  93), image size ( $\square$  95), and image area settings ( $\square$  89).

### **III** FX (36×24) Image Area<sup>\*</sup>

Image quality	Image size	File size <sup>1</sup>	No. of images <sup>1</sup>	Buffer capacity <sup>2</sup>
NEF (RAW), Lossless compressed, 12-bit	—	23.4 MB	190	22
NEF (RAW), Lossless compressed, 14-bit	—	29.2 MB	147	16
NEF (RAW), Compressed, 12-bit	_	20.7 MB	258	27
NEF (RAW), Compressed, 14-bit	_	25.4 MB	215	16
	Large	12.4 MB	506	57
JPEG fine <sup>3</sup>	Medium	7.4 MB	853	100
	Small	3.8 MB	1600	100
	Large	6.2 MB	1000	100
JPEG normal <sup>3</sup>	Medium	3.7 MB	1600	100
	Small	1.9 MB	3200	100
	Large	3.2 MB	1900	100
JPEG basic <sup>3</sup>	Medium	1.9 MB	3200	100
	Small	1.0 MB	6300	100

\* Includes images taken with non-DX lenses when **On** is selected for **Auto DX crop**.

### **III** DX (24×16) Image Area\*

Image quality	lmage size	File size <sup>1</sup>	No. of images <sup>1</sup>	Buffer capacity <sup>2</sup>
NEF (RAW), Lossless compressed, 12-bit	_	10.9 MB	426	62
NEF (RAW), Lossless compressed, 14-bit	—	13.4 MB	332	38
NEF (RAW), Compressed, 12-bit	_	9.7 MB	571	86
NEF (RAW), Compressed, 14-bit	_	11.7 MB	480	61
	Large	5.9 MB	1000	100
JPEG fine <sup>3</sup>	Medium	3.7 MB	1700	100
	Small	2.2 MB	2900	100
	Large	3.0 MB	2100	100
JPEG normal <sup>3</sup>	Medium	1.9 MB	3300	100
	Small	1.1 MB	5700	100
	Large	1.5 MB	4100	100
JPEG basic <sup>3</sup>	Medium	1.0 MB	6300	100
	Small	0.6 MB	10000	100

\* Includes images taken with DX lenses when **On** is selected for **Auto DX crop**.

1 All figures are approximate. File size varies with scene recorded.

2 Maximum number of exposures that can be stored in memory buffer at ISO 100. Drops if **Optimal quality** is selected for **JPEG compression** ( $\Box$  94), ISO sensitivity is set to Hi 0.3 or higher, or long exposure noise reduction or auto distortion control is on.

3 Figures assume JPEG compression is set to Size priority. Selecting Optimal quality increases the file size of JPEG images; number of images and buffer capacity drop accordingly.

#### ✓ d6—Max. Continuous Release (□ 230)

The maximum number of photographs that can be taken in a single burst can be set to any amount between 1 and 100.

## **Battery Life**

The number of shots that can be taken with fully-charged batteries varies with the condition of the battery, temperature, and how the camera is used. In the case of AA batteries, capacity also varies with make and storage conditions; some batteries can not be used. Sample figures for the camera and optional MB-D14 multi-power battery pack are given below.

CIPA standard<sup>1</sup>

One EN-EL15 battery (camera): Approximately 900 shots One EN-EL15 battery (MB-D14): Approximately 900 shots Six AA alkaline batteries (MB-D14): Approximately 450 shots

Nikon standard<sup>2</sup>
 One EN-EL15 battery (camera): Approximately 3900 shots
 One EN-EL15 battery (MB-D14): Approximately 3900 shots
 Six AA alkaline batteries (MB-D14): Approximately 1300 shots

- 1 Measured at 23 °C/73.4 °F (±2 °C/3.6 °F) with an AF-S NIKKOR 24–85mm f/3.5–4.5G ED VR lens under the following test conditions: lens cycled from infinity to minimum range and one photograph taken at default settings once every 30 s; flash fired once every other shot. Live view not used.
- 2 Measured at 20 °C/68 °F with an AF-S NIKKOR 24–85mm f/3.5–4.5G ED VR lens under the following test conditions: image quality set to JPEG basic, image size set to **M** (medium), shutter speed <sup>1</sup>/<sub>250</sub> s, shutter-release button pressed halfway for three seconds and focus cycled from infinity to minimum range three times; six shots are then taken in succession and monitor turned on for five seconds and then turned off; cycle repeated once standby timer expires.

The following can reduce battery life:

- Using the monitor
- Keeping the shutter-release button pressed halfway
- Repeated autofocus operations
- Taking NEF (RAW) photographs
- Slow shutter speeds
- Using a GP-1 GPS unit
- Using an Eye-Fi card
- Using a WU-1b wireless mobile adapter
- Using VR (vibration reduction) mode with VR lenses

To ensure that you get the most from rechargeable Nikon EN-EL15 batteries:

- Keep the battery contacts clean. Soiled contacts can reduce battery performance.
- Use batteries immediately after charging. Batteries will lose their charge if left unused.

## Index

#### Symbols

📅 (Auto mode)35, 36
(Auto (flash off) mode)35, 36
SCENE (Scene)40
💈 (Portrait)41
🖬 (Landscape)41
🗳 (Child)41
* (Sports)41
🕏 (Close up)42
S (Night portrait)42
🖬 (Night landscape)42
🗱 (Party/indoor)42
🏽 (Beach/snow)43
🖀 (Sunset)43
🛎 (Dusk/dawn)43
😽 (Pet portrait)43
(Candlelight)44
<ul> <li>(Blossom)</li></ul>
(Autumn colors)44
<b>†1</b> (Food)
الله (Silhouette)45
(High key)45
<ul> <li>Image: Construction of the second seco</li></ul>
P (Programmed auto)
<b>s</b> (Shutter-priority auto)
A (Aperture-priority auto)77
<b>M</b> (Manual)
<b>U1/U2</b>
<b>S</b> (Single frame)6, 83
<b>CL</b> (Continuous low speed) 6,83,
229
<b>CH</b> (Continuous high speed)6, 83 <b>Q</b> (Quiet shutter-release)6, 83
(Self-timer)
(Remote control)
MUP (Mirror up)6, 83, 88
(Face-priority AF)
[Wide-area AF)
🔛 (Normal-area AF)52
(Subject-tracking AF)
🖸 (Matrix)109
@ (Center-weighted)109, 226
• (Spot)109
AUTO (Auto flash)144, 145
(Red-eye reduction)144, 145
SLOW (Slow sync)144, 145
REAR (Rear-curtain sync)144, 145
(Exposure compensation)112
(Flash compensation) 148
🖭 (Flexible program)75
☑ (Live view) button49, 57
🖬 (Info) button9, 11
Switch 2

WB (White balance)	115
PRE (Preset manual)1	15, 121
BKT (Bracketing)1	53, 178
⑦ (Help)	18
• (Focus indicator)38, 1	02, 103
r (Memory buffer)	38, 84
4 (Flash-ready indicator)	39

#### Numerics

12-bit
14-bit
2,016-pixel RGB sensor146, 327
3D-tracking

#### A

AC adapter
Accessories
Accessory shoe 292
Accessory terminal 298
Active D-Lighting137, 158
Add items (My Menu)280
ADL bracketing
Adobe RGB
AE & flash (Auto bracketing set)
153, 241
AE lock110
AE only (Auto bracketing set).153,
241
<b>AE-L/AF-L</b> button .102, 110, 244, 248
AF 51–52, 97–102
AF area brackets8, 33
AF fine-tune259
AF point illumination222
AF-A 97
AF-area mode52, 99
AF-assist
AF-C97, 221
AF-F
AF-mode button 51, 52, 98, 100
AF-S51, 97, 221
After delete212
A-M mode switch26
Ambient brightness sensor 4, 53, 250
Angle of view291
Aperture
Aperture-priority auto 77
Aspect ratio
Assign AE-L/AF-L button244, 248
Assign Fn button242, 247
Assign MB-D14 🔀 button
Assign preview button244, 248
Assign shutter button248
Attaching the lens 25

Auto (White balance)115
Auto bracketing153, 241
Auto bracketing set241
Auto distortion control217
Auto DX crop 89, 91
Auto flash145
Auto FP high-speed sync. 234, 235
Auto image rotation254
Auto ISO sensitivity control 107
Auto-area AF99, 100
Autoexposure lock110
Autofocus 51-52, 97-102
Autofocus mode 51, 97
Auto-servo AF 97
Available settings

#### B

Backlight 2, 231
Backup (Role played by card in
Slot 2) 96
Battery21, 23, 35, 255, 331
Battery info255
Battery life
Battery order233
Battery pack232, 233, 247, 255, 297
Beep
Bit rate 65
Black-and-white (Monochrome)
266
Blue intensifier (Filter effects) 267
Body cap3, 25, 298
Border (PictBridge)198
Bracketing153, 241
Bracketing order241
Built-in AF-assist illuminator 223
Built-in flash
Bulb78, 79
Burst 162, 230, 242
C

Calendar playback 186 Camera Control Pro 2
Camera controls
Capture NX 2 94, 251, 253, 298
CEC
Center-weighted109, 226
Charging the battery21–22
Choose color temp. (White
balance)115, 120
Choose image area 90, 91
Choose start/end point 69
CL mode shooting speed229
Clean image sensor

V

Clock
Clock battery
Cloudy (White balance) 115
CLS293 Color balance268
Color outline
Color sketch
Color space217
Color temperature 115, 116, 120
Commander mode237
Compatible lenses
Compressed (Type) 94
Computer193
Connector for external
microphone2
Continuous high speed6, 83
Continuous low speed 6, 83, 229
Continuous release mode6, 83
Continuous-servo AF
Control panel7
Copy image(s)209
Copyright 182, 256
CPU contacts
CPU lens
Creative Lighting System
Cross screen (Filter effects) 267
Custom Settings
Customize command dials245
Cyanotype (Monochrome)
D
<u> </u>

### D

Date and time27, 253
Date format
Daylight saving time27, 253
DCF
Default settings 151, 214, 221, 312
Delayed remote (Remote control
mode) 85
Delete
Delete all images190
Delete current image
Delete selected images
Depth-of-field77
Depth-of-field preview button. 60,
77, 241, 244, 248
Destination (Movie settings) 65
Device control (HDMI) 205
Digital Print Order Format 199, 202, 332
Diopter adjustment control 33, 297
Direct sunlight (White balance)
115
Distortion control274
D-Lighting264
DPOF199, 202, 332

DPOF print order	202
DX (24 × 16) 1.5 ×	63, 90
DX format	89, 90
DX-based movie format	63
Dynamic-area AF	99, 100
E	

Easy exposure compensation225
Edit movie69
Electronic rangefinder103
EV steps for exposure cntrl 224
Exif
Exposure74, 109–113
Exposure bracketing 153, 241
Exposure comp. for flash
Exposure compensation112
Exposure delay mode231
Exposure differential140
Exposure indicator78
Exposure lock110
Exposure meters
Exposure program
External microphone 61, 65
Eye-Fi upload
F

### F

Focus indicator
Focus lock102
Focus mode 51, 97
Focus mode switch25, 26, 103
Focus point 38, 52, 99, 101, 103, 222, 223
Focus point wrap-around222
Focus tracking97, 222
Focus tracking with lock-on 222
Focusing screen
Focus-mode selector 51, 97
Format memory card31, 250
Frame interval (Slide show) 213
Frame size/frame rate
Framing guides 55, 62
Front-curtain sync145
Full-frame playback177
Full-time servo AF 51
FV lock149
FX (36 × 24) 1.0 × 90
FX format
FX-based movie format

### G

GP-1	
GPS	175, 183
GPS data	
Green intensifier (Fi	ter effects)
267	

### H

H.264329
HDMI 56, 64, 204, 332
HDMI mini-pin connector2
HDMI-CEC
Headphones61, 62
Help
Hi (Sensitivity)106
Hide image208
High definition 204, 332
High Dynamic Range (HDR) 139
High ISO NR218
Highlights 180, 209
Histogram 180, 181, 209
I

V

Index print199
In-focus indicator
Information9, 179
Information display9, 231
Interval timer shooting164
ISO display and adjustment 229
ISO sensitivity105, 107
ISO sensitivity settings 107
ISO sensitivity step value
i-TTL 143, 146, 237

#### J

JPEG	93
JPEG basic	93
JPEG compression	94
JPEG fine	93
JPEG normal	93

#### L

L (large)63, 95
Landscape (Set Picture Control) 129
129         Language       27, 253         LCD illumination       2, 231         Lens       25–26, 172, 259, 285         Lens cap       25         Lens focus ring       25, 55, 103         Lens mount       3, 26, 103         Live view       49–56, 57–64         Live view photography       49         Live view selector       49, 57
Lo (Sensitivity)
Lock mirror up for cleaning 303
Long exposure NR218
Lossless compressed (Type)94

#### Μ

M (medium)63, 95
Main command dial12
Manage Picture Control134
Manual
Manual (Flash cntrl for built-in
flash)236
Manual focus55, 103
Matrix
Max. continuous release230
Maximum aperture 103, 147, 296
Maximum sensitivity107
MB-D14 232, 233, 247, 255, 297
MB-D14 battery type232
Memory buffer38, 84
Memory card 29, 31, 250, 333, 334
Memory card capacity334
Metering109
Microphone
Miniature effect

Minimum shutter speed107
Minimum shutter speed
Mired119
Mirror
Mirror up6, 83, 88
Mode dial5
Mode dial lock release5
Modeling flash241
Monitor46, 49, 177, 250
Monitor brightness250
Monitor cover17
Monitor off delay228
Monitor pre-flash146, 149
Monochrome129, 266
Movie live view 57, 247-248
Movie quality (Movie settings) 65
Movie settings65
Movie-record button 58
Movies
Multiple exposure160
My Menu280

#### N

NEF (RAW)93, 94, 216, 271
NEF (RAW) bit depth 94
NEF (RAW) processing 271
NEF (RAW) recording 94
Neutral (Set Picture Control)129
Nikon Transfer 2193, 194
Non-CPU lens 172, 285, 288
Non-CPU lens data172
Normal-area AF 52
Number of focus points223
Number of shots

#### 0

OK button (shooting mode)241
Optimal quality (JPEG
compression) 94
Optional flash237, 292
Output resolution (HDMI) 205
Overflow (Role played by card in
Slot 2)
Overview data184
Р

Page size (PictBridge)	
Perspective control	
Photo information	179, 209
PictBridge	196, 332
Picture Controls	129, 131
Picture size	
Pitching	258
Playback	46, 177
Playback display option	ıs 209
Playback folder	207

Playback information179, 209
Playback menu
Playback slot and folder
Playback zoom
Portrait (Set Picture Control) 129
Power connector
Power switch1
Predictive focus tracking
Preset manual (White balance)
115, 121
Press the shutter-release button
all the way down
Press the shutter-release button
halfway 38, 39
Preview button77, 244, 248
Print (DPOF) 199
Print select
Printing196
Programmed auto
Protecting photographs
•

### Q

Quick retouch
Quick-response remote (Remote
control mode) 85
Quiet shutter-release6, 83

#### R

Rank items (My Menu)282 RAW Slot 1 - JPEG Slot 2 (Role
played by card in Slot 2)
Rear-curtain sync145
Recent settings
Red intensifier (Filter effects) 267
Red-eye correction
Red-eye reduction144, 145
Release button to use dial
Release mode6, 83
Release mode dial
Release mode dial lock release 6, 83
Remote control6, 83, 85, 298
Remote control mode
Remote cord79, 88, 298
Remote mirror-up (Remote
control mode)
Remote on duration
Remove items (My Menu)
Removing the lens from the
camera
Repeating flash
Reset 151, 214, 221
Reset custom settings
Reset shooting menu
Reset user settings
Resize272

Ľ

Restoring default settings151,
214, 221, 312
Retouch menu261
Reverse indicators246
RGB 180, 217
Role played by card in Slot 2 96
Rotate tall212

#### S

<b>S</b> (small)	63, 95
Save selected frame	69, 72
Save user settings	81
Save/load settings	257
Saving camera settings	257
Scene mode	40
Screen tips	
SD memory card 29, 31, 9	5, 333,
334	
Select date 191, 19	
Selective color	277
Self-timer 6, 83, 8	
Sensitivity 10	
Sepia (Monochrome)	
Set Picture Control	
Setup menu	
Shade (White balance)	
Shooting data	
Shooting menu	
Shutter speed	
Shutter-priority auto	
Shutter-release button 38, 3	9,102,
110, 226, 248	
Shutter-release button AE-L	
Side-by-side comparison	
Single frame	
Single-point AF	
Single-servo AF51, 9	
Size	
Size priority (JPEG compress 94	
Skylight (Filter effects)	267
Slide show	
Slot	
Slot empty release lock	
Slow sync 14	4, 145
Smoothing	
Soft (Filter effects)	
Speaker	
Speedlight	
Spot	
sRGB	
Standard (Set Picture Contro	
Standard i-TTL flash for digit	al SLR
146	

Storage folder	215
Straighten	274
Sub-command dial	12
Subject-tracking AF	52
T	

#### Time stamp (PictBridge) ......198 Time zone......27, 253 Time zone and date......27, 253 Toning ...... 132, 133 Trimming movies ...... 69 Tripod ......3 Two-button reset ......151 Type D lens ...... 285, 287 Type G lens ...... 285, 287 U

#### 

#### V

#### W

Warm filter (Filter effects)	267
WB115	5, 156
WB bracketing (Auto bracketi	ing
set) 156	i, 241
White balance 115	5, 156
Wide-area AF	52
Wireless mobile adapter	298

V

Standby timer...... 39, 175, 227 Start printing (PictBridge) 198, 201

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Printed in Thailand



6MB15211-04