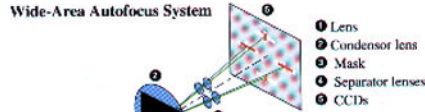


Nikon
N90s
FAST AND ACCURATE



Technology notes



CAM246

Nikon's CAM246 cross-type autofocus sensor module incorporates 246 CCD (Charge-Coupled Device) elements. The effective focus detection area is 7mm horizontal (the widest in the industry) and 3mm vertical. The cross-type configuration assures quick detection of even minute patterns and fast autofocus of subjects with horizontal or vertical details. CAM246's wider focus detection area also enables detection of even off-centered subjects. In addition, larger defocus amounts can be detected, thus making lens focusing movement smoother, faster and more precise. Vertical detection capability helps detect subjects with horizontal lines that are difficult to focus with the horizontal system. CAM246's CCD elements are continuous, without the dead spots found in other multi-segment focus detection systems.

Improved Focusing Speed

Autofocus software and mechanism have been improved for faster autofocus operation. AF operation time between each exposure is faster because (1) shorter mirror movement time has lessened the time before the next focus detection; (2) shutter charge time is shorter; and (3) an improved mechanism with a new coreless motor makes film advance speed faster. In addition, a new 2X faster CPU, 25% faster lens drive and new algorithms that are used to detect focus and operate the lens all add substantially to the N90s's faster performance.



3D Matrix Metering

With 3D Matrix Metering, the camera's computer analyzes the following data to determine exposure:

#1— **Brightness** data from each of eight segments (configured in various combinations)

#2— **Contrast** among segments

#3— **Distance Information** from the D-type Nikkor lens in use

#4— **Focus status** data from the camera's AF system (during composition and after recomposing with AF-lock)

On the basis of on these four types of data, the N90s's computer selects the most suitable algorithm to use for exposure calculations from many stored in the camera's memory. (Note: an algorithm is a set of procedures for solving a mathematical problem.)

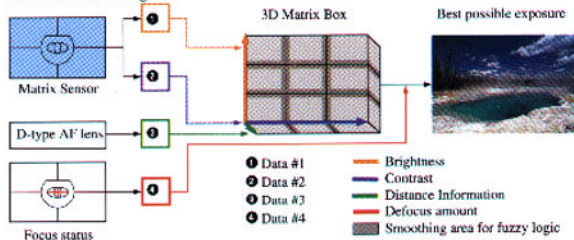
First, the computer calculates the exposure value for the scene in two ways: as an eight-segment pattern and as a five-segment pattern (center segments are regarded as one segment). Then both exposure values are combined to offer the best possible exposure according to Data #1, #2, #3 and #4.

Distance Information (#3) is used to balance the readings, for example, if the subject is close to the camera, the computer biases its calculations in favor of the five-segment reading: because when shooting a subject nearby, especially in extreme close-up photography, too much segmentation may mislead the meter because of the high magnifi-

Focus Tracking



3D Matrix Metering



cation ratio.

**8-segment Matrix Metering also works with a non-D-type AF or AI-P Nikkor lens, but without using Data #3.*

Finally, focus data (#4) determines if the subject is in the center of the frame or off-center. For example, if the amount of defocus detected is not great, the computer judges that the main subject is in the center and the information from the center-segments is appropriately weighted. If the defocus amount is large (out of focus), the computer judges that the main subject is not in the center (as when focus lock is used for recomposing off-center) and the information from the peripheral segments is weighted (based on their relative brightness and contrast). When Focus Lock is used, if the meter judges the scene to be strongly backlit or the main subject to be strongly illuminated against a dark background, data detected prior to recomposition is also considered for final evaluation.

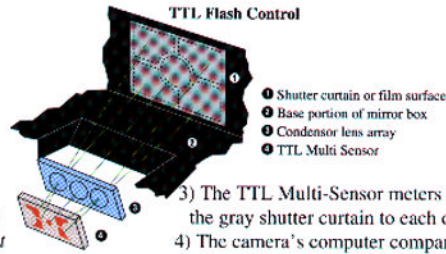
The foregoing also applies to manual focusing with Electronic Rangefinder.

In addition, fuzzy-logic algorithms are employed for smooth data processing and to prevent sudden changes of exposure in continuous shooting.

3D Multi-Sensor Balanced Fill-Flash

With the SB-28 or SB-27 AF Speedlight and D-type AF Nikkor lenses, the N90s uses the five-segment TTL Multi Sensor to its maximum potential—the ultimate in balanced fill-flash control. This is how it works:

- 1) The D-type Nikkor lens sends subject-to-camera distance information to the N90s.
- 2) The SB-28 or SB-27 fires a series of weak flashes, just after the mirror goes up but before the shutter moves, as a Monitor Pre-flash for the TTL Multi Sensor.



- 3) The TTL Multi-Sensor meters the light reflected from the gray shutter curtain to each of the five segments.
- 4) The camera's computer compares the amount of light actually metered by each segment of TTL Multi Sensor with the theoretical light amount calculated from the Distance Information from the lens, the guide number of the Monitor Pre-flash and the lens aperture in use.

5) The camera's computer analyzes and decides: i) which segment of the TTL Multi-Sensor to use for TTL flash control according to a relative reading of the reflected light amount, and ii) what amount of flash is necessary to balance with ambient light according to the exposure meter used, including 3D Matrix, Center-Weighted and Spot.

6) The shutter opens, the main flash fires and the camera's computer controls flash output based on data from 5).

This function ensures correct exposure even in difficult situations which ordinary methods cannot accommodate, that is, scenes that



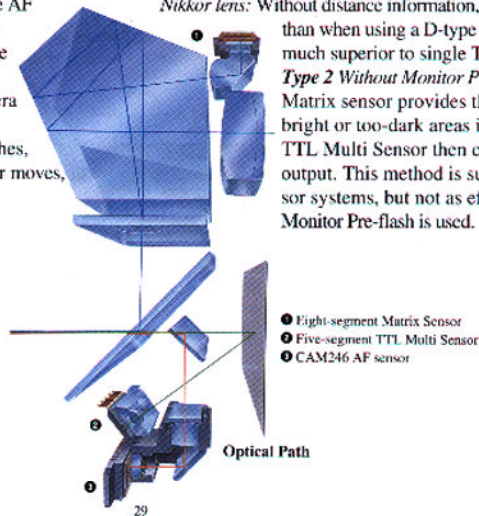
include a very reflective object such as a mirror, white wall, or something very close to the camera other than the main subject. It also accounts for the sun being part of the scene, the background being very distant and other similar conditions.

Multi-Sensor Balanced Fill-Flash

Type 1 With the SB-28 or SB-27 and a non-D-type AF or an AI-P Nikkor lens: Without distance information, computation is less refined

than when using a D-type lens. However, results are much superior to single TTL flash sensor systems.

Type 2 Without Monitor Pre-flash: The N90s's Matrix sensor provides the information on too-bright or too-dark areas included in the scene; the TTL Multi Sensor then controls the main flash output. This method is superior to single TTL sensor systems, but not as effective as when the Monitor Pre-flash is used.



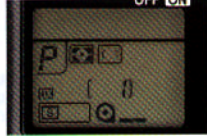
Controls



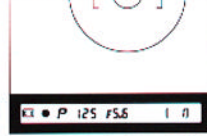
Body-Integral Motor Drive
Offers a choice of three firing modes—Single (S), Continuous Low (CL) and Continuous High (CH). Remote operation possible via the camera's 10-pin remote terminal.



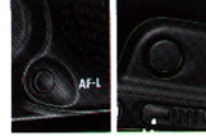
Command Input Control Dial
Your right-hand thumb comfortably operates this ergonomically designed dial which you can turn without taking your eye off the subject. Input your choice of exposure mode, shutter speed, metering system, flash sync mode and others with confidence.



Top Deck LCD Panel
Shows all vital information at a glance. Illuminated for dim light viewing, keeping you informed of current camera settings and operations.



Illuminated viewfinder LCD indicator
Most of the data displayed on the camera top's LCD panel is duplicated in the viewfinder's LCD indicator, which can be illuminated at the press of a button.



Autofocus Lock
Locks focus in either Continuous or Single Servo shooting, so you can first focus your subject, then re-frame the scene, vertically or horizontally.



Depth-of-field Preview Button
Lets you preview depth of field when you're using Aperture-Priority Auto or Manual exposure control.



Instant Reset
Pressing the reset and exposure compensation/reset button simultaneously for at least one second returns all camera settings automatically to factory-initial settings or, when the Custom Function of optional Nikon Photo Secretary for N90s/N90 (AC-PW-E) has been used, to your personalized selection of settings.



High-Eyepoint Finder
For more comfortable viewing, even when wearing eyeglasses. The focusing screen is interchangeable. A gray eyepiece shutter can be used to prevent light from coming in through the eyepiece.



Auto Film Operation
From film loading to ISO film speed setting, film advance and film rewind—all film operations are automatic and mistake-proof. Mid-roll rewind possible.



Manual ISO Film Speed Setting
Overrides otherwise automatic DX coding of the ISO rating of film in use. Choose any rating from 6 to 6400—useful for creative applications, such as intentional film speed boosting.

Specifications

- 1 Self-timer indicator LED
- 2 Shutter release button
- 3 Power switch
- 4 Focus area button
- 5 Command input control dial
- 6 LCD panel
- 7 Exposure compensation/reset button
- 8 Film rewind button
- 9 Accessory shoe
- 10 Metering system button
- 11 Film speed/film rewind button
- 12 Self-timer button
- 13 Film advance mode button
- 14 Flash sync mode button
- 15 Exposure mode button
- 16 Vari-Program button
- 17 Reset button
- 18 Sync terminal
- 19 10-pin remote terminal
- 20 Lens release button
- 21 Depth-of-field preview button
- 22 AF-L button
- 23 Focus mode selector
- 24 Camera back lock releases
- 25 Viewfinder/LCD panel illumination button
- 26 Eyepiece shutter lever
- 27 Viewfinder eyepiece
- 28 AF-L lever
- 29 Tripod socket
- 30 Battery holder lock screw

Type of camera Integral-motor autofocus 35mm single-lens reflex

Picture format 24 × 36mm [standard 35mm (135) film format]

Lens mount Nikon F mount

Lens Nikkor and Nikon lenses having Nikon F mount with some limitations; see chart on p. 21

Focus modes Autofocus, and Manual with Electronic Rangefinder

Autofocus area Wide and Spot selectable

Autofocus mode Single Servo AF with Focus-Priority and Continuous Servo AF with Release-Priority

Focus Tracking Automatically activated when subject moves

Autofocus detection system Nikon CAM246 autofocus module

Autofocus detection range Approx. EV -1 to 19 (at ISO 100)

Autofocus lock Possible once stationary subject is in focus in Single Servo AF; in Continuous Servo AF, focus can be locked with AF-L (autofocus lock) button

Electronic rangefinder Available in Manual focus mode with AF Nikkor or other AI-type Nikkor lens with a maximum aperture of f/5.6 or faster

Exposure metering Three built-in exposure meters — Matrix, Center-Weighted and Spot

Metering range (at ISO 100 with f/1.4 lens) EV -1 to 21 for Matrix and Center-Weighted metering; EV 3 to 21 for Spot metering

Exposure meter Activated by lightly pressing shutter release button; stays on for 8 sec., after finger leaves button

Exposure modes Programmed Auto (Auto-Multi Program and Vari-Program), Shutter-Priority Auto, Aperture-Priority Auto and Manual

Programmed Auto exposure control Camera sets both shutter speed and lens aperture automatically; Flexible Program possible in increments of 1/3 EV for shutter speed or of 1EV for aperture setting

Shutter-Priority Auto exposure control Aperture automatically selected to match manually set shutter speed; shutter speed can be set in 1/3 EV steps

Aperture-Priority Auto exposure control Shutter speed automatically selected to match manually set aperture

Manual exposure control Both aperture and shutter speed are set manually; shutter speed can be set in 1/3 EV steps

Vari-Program Seven kinds built in: Portrait Program, Portrait Program with Red-Eye Reduction, Hyperfocal Program, Landscape Program, Silhouette Program, Sport Program, and Close-Up Program; each has its own program line, and specific camera settings such as metering system, focus area, etc., are automatically selected

Exposure compensation With exposure compensation button; ±5 EV range, in 1/3 EV steps

Auto exposure lock By sliding AE Lock lever while meter is on

Shutter Electromagnetically controlled vertical-travel focal-plane shutter

Shutter release By motor trigger

Shutter speeds Lithium niobate oscillator-controlled speeds from 1/8000 to 30 sec. in 1/3 EV steps; electromagnetically controlled Bulb setting is provided

Viewfinder Fixed eyelevel penta-prism high-eyepoint type; 0.78× magnification with 50mm lens set at infinity; approx. 92% frame coverage

Eyepiece Shutter Provided

Focusing screen Nikon advanced B-type BriteView screen; interchangeable with E-type screen

Viewfinder information Focus area, focus indications, exposure mode, shutter speed, second mark for shutter speed slower than one second, aperture, electronic analog display, frame counter/exposure compensation value/Vari-Program, Flexible Program mark and exposure compensation mark are all shown in LCD readout; also shows flash recommended/ready light LED

LCD panel information Shutter speed, aperture, exposure mode, metering system, focus area, autofocus mark with focus-release-priority indication, Flexible Program mark, flash sync, film speed, DX mark, exposure compensation mark, frame counter/Vari-Program/exposure compensation value, Custom mark, film advance mode, film loading, film rewind, self-timer, battery power

Viewfinder/LCD panel illumination Viewfinder and LCD panel illuminated by pressing button

Film speed range ISO 25 to 5000 for DX-coded film; ISO 6 to 6400 can be manually set

Film speed setting At DX position, automatically set to ISO speed of

DX-coded film used; manual setting possible

Film loading Film automatically advances to first frame when shutter release button is depressed once

Film advance In single-frame \square shooting mode, film automatically advances one frame when shutter is released; in \square^H (continuous high) or \square^L (continuous low) shooting mode, shots are taken as long as shutter release button is depressed; in \square^H mode, shooting speed is approx. 4.3 fps, and in \square^L approx. 2.0 fps; in Focus Tracking, shooting speed is approx. 4.1 fps

Frame counter Additive type; counts back while film is being rewind

Self-timer Electronically controlled; timer duration selectable from 2 to 30 seconds in one-sec. increments; blinking LED indicates self-timer operation; cancelable

Depth-of-field preview button Provides visual verification of depth of field; can be previewed in Aperture-Priority Auto or Manual exposure mode

Reflex mirror Automatic, instant-return type

Camera back Hinged back; interchangeable with Nikon Multi-Control Back MF-26 or World Time Data Back MF-25

Accessory shoe Standard ISO-type hot-shoe contact; ready-light contact, TTL flash contact, monitor contact; Mount receptacle for Posi-Mount System is provided

Flash sync control Slow Sync, Rear-Curtain Sync and Red-Eye Reduction functions built-in

Flash synchronization In Programmed Auto or Aperture-Priority Auto, shutter operates from 1/250 to 1/60 sec. in normal sync or 1/250 to 30 sec. in slow sync; in Shutter-Priority Auto or Manual exposure mode, shutter fires at speed set, and when set from 1/250 to 1/8000 sec., shutter is automatically set to 1/250 sec.

TTL Multi Sensor 5-segment multi sensor used for TTL auto flash control

Automatic Balanced Fill-Flash with TTL Multi Sensor Possible when AF or AI-P Nikkor lens is used with Nikon Speedlight SB-28, SB-27, SB-23, SB-22s, etc.

Monitor Pre-flash Nikon Speedlight SB-28 or SB-27 fires Monitor Pre-flash(es) for TTL Multi Sensor when AI² or AI-P Nikkor lens is used

Flash recommended/ready light

No Speedlight attached: Lights up in green when flash is recommended
Speedlight attached: Lights up in red when Nikon dedicated Speedlight is ready to fire, or blinks to warn of insufficient light for correct exposure

Number of 36-exposure film rolls per set of fresh batteries—For autofocus operation using AF Zoom-Nikkor 28-70mm f/3.5-4.5D lens covering the full range from infinity (∞) to the closest distance and back to infinity (∞) before each shot, in Continuous Servo AF mode with film advance mode at \square^H and a shutter speed of 1/125 sec. or faster.

	At 68°F	At 14°F
AA-type alkaline* (LR6)	50	9
AA-type NiCd* (KRR-AA)	40	16
AA-type lithium* (FR6)	250	130
CR123A-type lithium** (with MB-10)	90	25

*N90s body only or when using MB-10 with standard MS-10 battery holder.

**When using MB-10 with optional MS-11 battery holder. Lithium batteries are useful especially when shooting at lower temperatures, however film advance speed may slow down.

Power source Four AA-type alkaline, NiCd or lithium* batteries; two CR123A-type lithium batteries also usable for Multi-Power Vertical Grip MB-10 with MS-11 battery holder attached

*ML-3 cannot be used when AA-type lithium batteries are used.

Battery power confirmation \blacksquare for sufficient power; \square indicates batteries are nearing exhaustion; blinking \square indicates batteries are just about exhausted; no indication mark appears when batteries are completely exhausted or improperly installed

Dimensions (W × H × D) Approx. 6.1 × 4.2 × 2.7 in.

Weight (without batteries) Approx. 26.6 oz.