

# Modern Photography Review

## Nikon F3: Successor to the Nikon F2 and F

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# modern tests

newest cameras, lenses & important accessories

## NIKON F3: SUCCESSOR TO NIKON F2 AND F

**MANUFACTURER'S SPECIFICATIONS:** Nikon F3 35mm single-lens reflex camera. Body No. 1200752. **LENS:** 50mm f/1.4 Nikkor in Nikon interchangeable AI bayonet mount, stops to f/16, focusing to 18 in. (0.45m), accepts 52mm accessories. **SHUTTER:** Electronically - controlled, quilted titanium foil focal plane with speeds from 8 to 1/2000 sec. plus B, X sync, electronic self-timer. **VIEWING:** Interchangeable eye-level prism with interchangeable focusing screen having central split-image rangefinder, micropism collar and full-area fine focusing. LCD panel shows shutter speeds set, indicates manual operation, over, under-exposure, aperture direct read out window, LED indicates flash ready, improper setting, under-exposure. **OTHER FEATURES:** Two 1.5-volt silver oxide batteries powered silicon photodiode circuit. Cell in mirror chamber measures center-weighted area of picture through lens for continuous light, and reflected from film surface for auto-exposure electronic flash, aperture-preferred (you set the aperture, the camera sets the shutter speed) auto exposure, ASA 12 to 6400, full manual override,  $\pm 2$ -stop auto-exposure compensation, memory hold button, electromagnetic shutter release with additional mechanical release, multiple-exposure provision, depth-of-field preview, mirror lock-up, provision for special dedicated flash units, accessory motor drive, removable back, viewfinder illuminator, auto setting of fast shutter speed for first-frame positioning. **PRICE:** \$1174.90 with 50mm f/1.4 Nikkor; \$1345 w/50mm f/1.2 Nikkor; \$1102.50 w/50mm f/1.8 Nikkor.

Despite major efforts over the past 20 years by competitors to wrest Nikon's crown, it remains the 35mm SLR relied upon by the vast majority of professional photographers. The reasons pros depend on Nikons are multiple, but perhaps can be boiled down as follows: They

need a rugged basic camera body to which can be fitted an incredible number of sturdy, high-caliber optics and accessories making the camera suitable for almost any assignment a pro might encounter, a dedication to slowest possible obsolescence, and a pro service and maintenance policy dedicated to keeping the pro in the field operational. (Serious amateurs



Raised vertical right-hand camera body grip was enthusiastically received by all Nikon F3 users and testers.

desirous of these points could also enjoy them—save the last.) The pro cameras in this series have been the F camera, introduced in 1959, and the F2, brought out in 1972. While both cameras appeared with various model designations based solely on their interchangeable prism metering capabilities, actually there have been only the F and F2 in terms of basic camera bodies. Each camera, F and F2, required a different motor drive, bulk film back and metering heads but did accept the same lenses and interchangeable viewing screens.

A camera manufacturer cannot live on pros alone, so beginning in 1960 with the Nikkorex and continuing with the Nikkorex Zoom of about the same vintage, the 1961 Nikkorex F and a whole slew of Nikkormats from 1965 to 1977, Nikon fulfilled the needs of amateurs not requiring the extensive features and accessories of the F or F2 but desirous of a Nikon-made camera which accepted Nikkor lenses. Most were rugged, serviceable cameras, although usually not as long-lived as the F and F2. Pros requiring a second body or a smaller and lighter camera than an F or F2 found the amateur-aimed cameras often more convenient than their

more sophisticated equipment. They therefore mixed and matched them and their lenses with their F cameras.

In 1977, for better or worse, Nikon took the questionable step of renaming all their cameras "Nikon," thereby blurring for many the distinction between pro- and amateur-oriented equipment. As a result we had the Nikon EL (now discontinued), the Nikon FM, Nikon FE and, lately, the Nikon EM.

Pros seeking a more updated, automated, and lighter

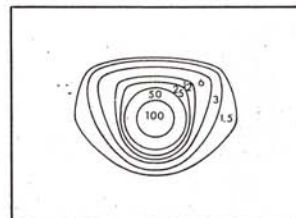
sequently sent up howls when the cameras simple couldn't deliver hundreds of rolls per week in all temperatures. What were they looking for? Primarily an automated compact camera like the Nikon FE with the accessory flexibility, reliability and motor driven capability of the F and F2, plus a metering and battery system capable of withstanding operation in low temperatures. This is precisely the demand, be it from pro or serious amateur, which Nikon set out to satisfy in the F3.

## What's New At A Glance: Nikon F3

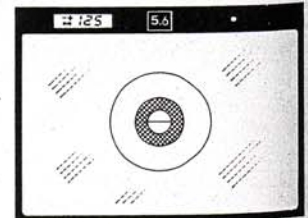
Quartz crystal-timed 8-1/2000 sec. shutter speeds with locked A and Y settings. Aperture preferred auto exposure.



All AI and modified AI Nikon mount lenses provide auto exposure at full aperture



Meter weighting diagram indicates much heavier stress in central area (80 percent) than was experienced with other Nikon cameras of past.



Viewfinder shows split-image rangefinder, micropism collar, primary meter weighting circle, all in center; above finder area is aperture readout window and at left, shutter speed LCD readout. LED, top right, only appears when dedicated flash is used.

camera than the now somewhat antiquated and cumbersome Nikon F2 turned to the various alternative Nikons and con-



While the F3 does have its own unique motor drive, finders, bulk film backs, and dedicated flash units, it has again preserved the photographer's most precious items from obsolescence—his lenses. All AI Nikkors work with full automation and convenience on the F3 and almost all non-AI lenses can be modified to AI specs. (And even those which Nikon claims are too old to modify can be adapted by some independent repairmen to give full AI features, except for aperture read-

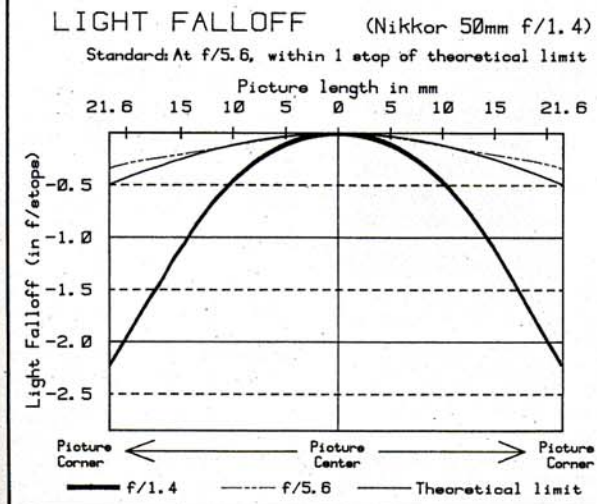
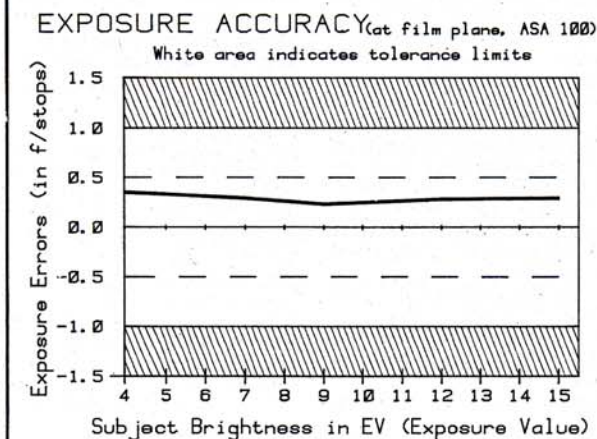
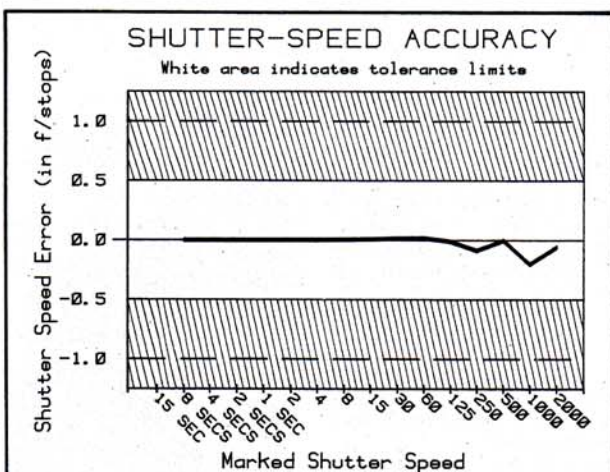
out in the finder.)

Our first visual impression of the F3 was of a handsomely designed (by renowned Italian automobile stylist Guigiaro), moderate sized (slightly larger than the Nikon FE), all-black SLR covered with the traditional Nikon pebble-grain leatherish-finish material. The matte finish metal is nicely counterpointed by a vertical, pencil thin red stripe near the right-hand side contoured handgrip. The F3 departs from Nikon practice (and that of just about every

other 35mm SLR) in attempting to shape the physical dimension of the camera body to the hands of the photographer. Thus, in addition to rounded edges, the right front side of the F3 has the mentioned protruding built-in handgrip covered with the fine-grained material, while the left end of the camera has an ever-so-slight incline. These, as we'll see, all contribute to making the F3 the easiest handling Nikon (or Nikkormat) ever.

In size, it is slightly larger than

the FE and 4 oz. heavier. If you were to compare it to a Nikon F with a plain non-metering prism, you would find the size approximately the same. The F3 body size is comparable to the F2, but the F2's Photomic meter prism head makes it far more bulky than the F3. In weight, the F3 is about 4 oz. lighter than the F2. Only a few controls are carried over in design and placement from the Nikon F2: the front lens release button, the depth-of-field preview button and concentric



## GENERAL PERFORMANCE

Checkpoints	Our Standard	As Tested
<b>FINDER:</b>		
Apparent viewing distance	Between infinity and 20 in. (0.5m)	39 in. (1.0m)
Apparent distance of shutter-speed scale	Between 2m (79 in.) and 0.7m (28 in.)	51 in. (1.3m)
Apparent distance of aperture scale	Same as above	31 in. (0.8m)
View area compared to film area	Vertically and horizontally more than 90%, less than 100%	Vertical: 98.8% Horizontal: 99.2%
Parallax error compared to film	Vertical: 0.24mm Horizontal: 0.18mm	Vertical: 0.2mm (up) Horizontal: 0.1mm (right)
Focusing accuracy at maximum aperture	Within depth of focus	No discrepancy
Image magnification	0.8X ± 0.1X	0.78X
<b>PICTURE SIZE:</b>	24 ± 0.6mm x 36 ± 0.9mm	24.2 x 36.2mm
<b>SHUTTER:</b>		
Curtain travel evenness	± 0.33 stop	0.07 stop
Camera insulation from sync	More than 7 megohms	Infinity
Sync contact efficiency	More than 60%	95%
Synchronizer delay time	X: within full opening	Okay
Shutter curtain bounce	Not allowed	None
Self-timer delay time	7-15 sec.	10 sec.
<b>LENS:</b>		
Focal length	50mm ± 5%	50.5mm
Maximum aperture	f/1.4 ± 5%	f/1.40
Distortion	± 2.5%	less than 1.0%
<b>CAMERA SIZE:</b>	Body: 5 1/8 in. wide, 3 13/16 in. high, 2 9/16 in. deep (149.2 x 97.0 x 65.5mm) Lens: 2 1/2 in. diam., 1 9/16 in. long (63.7 x 39.8mm)	
<b>WEIGHT:</b>	Body: 25 oz. (708g) with DE-2 finder and batteries Lens: 9 oz. (255g)	

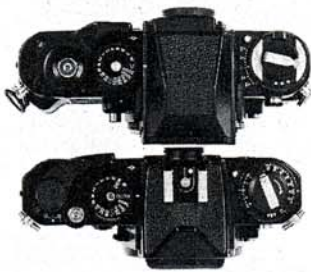
## Modern Tests Plugs In

Fastidious readers of "Modern Tests" will notice that the camera performance charts (left) look somewhat different this month. That's because each graph and every single letter and number appearing therein was drawn by a computer—or, to be more precise, a Hewlett-Packard 9872B graphics plotter controlled by our Digital Equipment Corporation PDP-11/20 based computer system and Hewlett-Packard 2647A graphics terminal. This new system obviously increases the accuracy of our printed test readouts while saving time and energy. However, its true significance is not to be found on the printed page, but in MODERN's test lab, where the changeover to computerized data acquisition and storage will enlarge our overall testing capability, enabling us to produce more, and more comprehensive, test reports than ever before.

In short, behind the jazzy space-age graphics is a sophisticated computer which handles and memorizes all quantifiable results. And where does that leave our exhaustive field testing and detailed subjective evaluations? Just where they've always been and belong—in the hands of knowledgeable editors.



## modern tests



Basic controls and their position on cameras are quite similar between Nikon F3 camera body (top) and Nikon FE camera (bottom).

rapid return mirror lock-up lever plus the rewind knob with folded rewind crank. The F3's contoured film- and shutter-advance lever is truly massive with a 30° off-camera rest position. You can wind in a single 140° stroke or in multiple strokes. At the hub of the wind lever is the threaded - for - cable - release electromagnetic shutter release. Its concave collar (the hub of the wind lever) is slightly below the level of the release button, so the ball of your finger fits nicely in the hollowed space atop the release. Adjacent to the shutter release is the shutter-speed dial, which looks and acts in a manner quite similar to that on the Nikon FE. For auto-exposure operation you set it at the green "A." For other than Nikon dedicated flash units there is an X sync setting of 1/80 sec. There is a white "T" for time exposures, red manual slow speed numerals from 8 to 1 sec. and white manual numerals from 1/2 to 1/2000 sec. (except for a red 1/60 sec. indicating the highest manual shutter speed that can be set for electronic flash). It's unusual to find a "T" setting on any 35mm SLR today. (The F had one, the F2 did not.) Ideally, a "T" set-



Setting shutter-speed dial at "A" position or marked speeds is quite similar to that on other auto-exposure Nikon cameras such as FE, EL2. To prevent accidental movement from "A" setting, you must push central hub to turn to manual speeds

ting opens the shutter on the first press of the release and closes it at the second pressing. On the F3 (and earlier Nikons), the shutter is closed by turning the shutter speed dial to another shutter speed. The "T" setting can be quite useful when making a prolonged exposure when you do not wish to maintain pressure on the release with the shutter set at B and you don't have a locking cable release. Both the "A" and "X" settings lock into place and can only be changed by pushing downwards on the center hub before turning it. All the rest are click-stopped. The dial has a heavily ribbed rubberish gripping ring.

The metering system and shutter release remain inoperative until the power switch lever



**Electromagnetic shutter-release button is gentle and smooth, is threaded for traditional tapered cable release. Pressure on shutter release turns on metering circuit for approximately 16 sec., after which it goes off automatically if pressure is not maintained or renewed.**

near the shutter-release collar is pushed forward uncovering a red "on" dot. This activates the electromagnetic shutter release. Slight pressure on the shutter release then turns on the metering circuit liquid-crystal-display shutter-speed-indicating panel in the viewfinder. The display will remain on for 16 sec. and then turn itself off to prevent drain on the batteries, unless pressure is renewed or maintained on the shutter-release button.

Looking through the viewfinder (whose entire area can easily be seen by eyeglass wearers), you will find the traditional Nikon K screen arrangement of a 3mm diameter split-image rangefinder, 1mm-wide microprism collar, 12mm-diameter metering area indicating circle and outer matte-Fresnel focusing area. Above the screen and to the left of the direct aperture readout window is the rectangular LCD panel. The approximate shutter speed

## LCD Finder Readouts: What Do They Mean?

In auto-exposure mode

125

Camera-selected shutter speed alone indicates correct exposure.

+ 2000

Top 1/2000 sec. speed and plus sign indicates overexposure.

- 8 -

Slowest 8-sec. speed and minus sign indicates underexposure.

In manual mode

M 125

User-selected speed with plus and minus signs shows correct exposure.

+ M 250

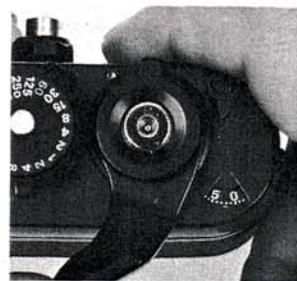
User-selected speed and plus sign indicates overexposure.

- M 50

User-selected speed and minus sign indicates underexposure.

to be set by the camera's auto-exposure circuitry appears as a digital black numeral on a white translucent panel—much like the numerals on an LCD watch.

We stress "approximate" since the metering circuit itself provides continuously variable auto shutter speeds from 8 sec. to 1/2000 sec. Thus, if fractional speeds such as 1/343 sec. or 4.63 seconds are needed, that's what the meter will require the shutter to provide. However, to minimize confusion, the LCD panel shows the nearest full, shutter speeds: 8, 4, 2, 1 second, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125, 1/250, 1/500, 1/1000 and 1/2000 sec. To make readings easy to follow so numerals do not change constantly, each numeral remains for at least 1/2 sec. even if the light level is changing swiftly. The metering system reacts virtually instantly in re-setting the shutter for new light levels. The panel shows full-sized numerals, so 1/250 sec. appears as 250. It indicates speeds of one full second or



Film-advance lever is well contoured, has 30° standoff angle and allows winding in either one or several throws. Total wind angle is 140°.

longer with a short hyphen following the numeral. Numerals without hyphens are all fractional. If a longer exposure than 8 sec. is required, a minus appears before the 8 sec. LCD numeral, meaning you'd better make a time exposure or use a larger lens aperture. If there is danger of over-exposure a plus appears in front of the 2000 numeral, meaning a smaller lens aperture or lower ASA film or a filter is required.

When the shutter-speed dial is set to manual speeds, an "M" appears before the numeral on the LCD panel. The panel then shows the quartz-timed manual shutter speed you set. If the speed you select is less than the meter suggests, a small minus appears above the M. If the speed is longer than the metered exposure, a plus appears above the M. When both a minus and plus appear above the M, your shutter speed choice has matched that of the meter. You can therefore vary your exposure from that suggested by the meter as many stops as required without taking your eye from the viewfinder. For instance, once you have matched your selection and that of the meter, you can underexpose by one f/stop by shifting either the shutter speed



At first, setting ASA index by pulling up narrowed ring seems difficult because of poor directions in instruction manual. However, lifting ring from fore and aft position, instead of from side to side, makes it quite easy—although it is slightly more difficult to see numerals while setting them.





Nikon F3 with motor drive, left, is far smaller, lighter and less expensive than comparative Nikon F2 with motor drive and necessary separate battery pack, right.



Too dark to see shutter speeds and apertures in viewfinder? Push viewfinder illuminator button and small lamp illuminates both indicators for you.

dial or aperture rims by one click stop lower. For two *f*/ stops, use two click stops lower. You can make bracketed exposures swiftly in this way.

There are two additional means of altering exposures. Should you wish to keep your camera on auto exposure, you can make a close-up reading of the subject and then press the exposure memory lock button on the front of the camera. The exposure as well as the reading on the LCD panel will remain locked as long as the button is held. You can then recompose your picture or return to camera position and shoot while maintaining the former reading.

Should you wish to make a number of auto exposures at a specific amount of under- or

With Nikon F3's official metering range of EV-1 to EV-18 at ASA 100, at full aperture, lowest shutter-speed range with various ASA films is given below. In practical field tests, however, we were able to well exceed this range (see text).

ASA speed	Slowest shutter speed
6400	1/60
3200 (4000)	1/30
1600	1/15
800	1/8
400	1/4
200 (160)	1/2
100 ( 80)	1
50 ( 64)	2
25	4
12	8

overexposure, such as when copying documents or shooting distant scenics, use the auto-exposure-compensation dial next to the rewind knob. Push in the dial lock and rotate the dial collar until the white dot on the collar matches the compensation needed. Compensation in locked click positions is available in 1/2 stops from -2 to +2 stops. There is no indicator in the finder to warn you that the auto-exposure compensation is being used, so you must remember to return the dial to zero when no longer needed.

Normally the illumination for the LCD panel is transmitted through a front translucent panel at the bottom front of the prism. A separate mirror reflecting system transmits the lens opening set from the lens aperture ring. However, if the picture taking area is dark it may be all but impossible to see these numerals. By pressing a small red button on the right side of the prism you turn on a small grain-of-wheat bulb which furnishes just enough light to illuminate both the aperture and LCD panel, a most welcome feature.

The metering system itself is quite unlike anything ever used before by Nikon. A single silicon cell sits at the bottom of the rapid return mirror chamber, pointing backwards and angled slightly upwards so it is pointed directly at the center of the film area. The mirror itself has a small central rectangle containing about 50,000 unsilvered oval holes which pass approximately 7 percent of the light hitting the mirror to a secondary hinged mirror resting at right angles to the main mirror.

The secondary mirror is actually made up of three sections, a central one with vertical lines and two wings with Fresnel patterns. They concentrate the light and redirect it to the silicon cell, which has its own two-element collecting lens.

The rectangular area on the rapid return mirror has no holes in the very center. Why? Because they would disturb the accuracy and ability of the split-

image rangefinder and micro-prism collar. Why are the tiny holes oval? Because the mirror is at an angle. Individual light beams entering the lens strike the mirror in an oval pattern. The rectangle, just barely visible to the naked eye when you take you lens off and peer at the mirror, can't be seen through the viewfinder. A comparison between the F2 and F3 does not reveal any appreciable loss of viewing brightness caused by the rectangle in the F3.

Unlike other Nikon metering systems, which provide a center-weighted metering pattern in which 60 percent of the sensitivity is located within the 12mm viewfinder circle, the F3 concentrates 80 percent within the circle, an increase often requested by professionals and serious amateurs.

The same silicon cell also provides auto exposure for electronic flash. When the rapid return mirror swings out of the way during the exposure, the cell measures the light reflected from the film surface itself during the flash exposure and regulates the flash's duration according to the illumination needed. (We'll go into this feature further when we discuss the F3's special flash units.) It's

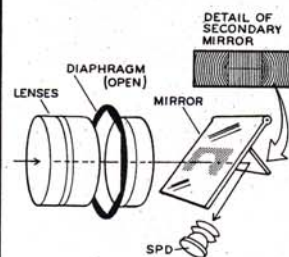
sufficient now to say that the F3 joins the Olympus OM-2N and Contax 139 in providing auto-flash exposure through the lens (or any optical accessory), thus giving the user the utmost in flash exposure accuracy and flexibility.

By locating the meter cell within the camera body, Nikon has obviated any future possibility of changing metering systems by merely changing systems by merely changing prisms—an F and F2 feature long argued pro and con. However, the inclusion of the cell within the camera allows a more compact camera design and eliminates the need for

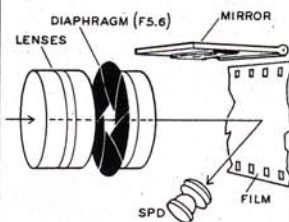


Memo holder on back of professional camera? Of course! They're just as liable to forget what film's inside as anyone.

### F3's Meter Systems: How Do They Work?



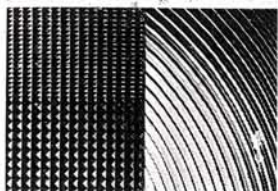
For continuous light measurement, subject light enters lens, is transmitted through rapid return mirror oval holes in silvered central rectangle and is then reflected by 4-piece secondary mirror hinged to back up rapid return mirror and is directed and concentrated on silicon photodiode at base of mirror chamber.



For electronic flash reading, mirror with secondary hinged mirror swings out of way. Light from subject is reflected from film surface itself directly to silicon photodiode which automatically adjusts duration of flash for proper exposure.



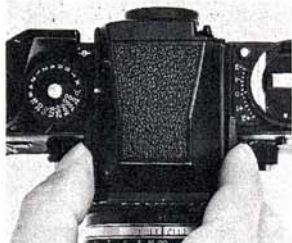
You can't see oval holes in F3's main mirror by just looking, but this backlit photomicrograph reveals part of the random, keyhole-shaped pattern.



Secondary mirror behind main mirror's holes has different surfaces to concentrate reflected light down to SLD cell at bottom of the mirror box.

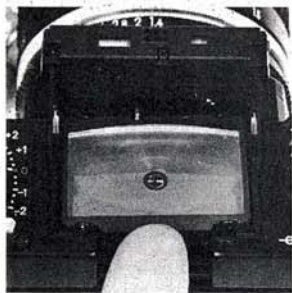


## modern tests



Prism is easily interchanged by pushing levers backwards and pulling upwards on prism housing.

various exposure compensations depending on the focusing screen used, but more important, provides metering no matter which of the many viewfinders is fitted to the camera.



No more turning camera upside down while pushing various buttons to remove interchangeable screens. Just put fingernail underneath tab and lift screen right out.

To load the F3, you push the camera back lock lever, at the rear of the rewind knob, to the right with your thumb while lifting the rewind knob. The camera back swings open. The interiors of the F2 and F3 are surprisingly alike, but the F3 has an additional film flattening roller near the film chamber,



One of few plastic parts in camera, multi-slotted take-up spool seems great improvement over Nikon's former ones.

more finely machined sprocket teeth on the sprocket wheel and what we felt was a vastly improved multi-slotted take-up spool which did prove easier to load. Two electrical contacts below the film plane are, we presume, for the forthcoming data back.

We were most surprised to find the interchangeable backs of the F2 and F3 to be nearly identical in features, contours and size save for a different matte black finish and pressure springs over the film chamber. Both have memo slots at the back into which you can insert a film box end. The backs between the F2 and F3 would almost be interchangeable save for a slightly different hinge pin arrangement and a few other minor points. This would lead us to believe that the forthcoming bulk film back for the F3 plus other rear accessories may be quite similar to, and perhaps even usable on, the F2's.

Film loads in the usual manner with the F3. However, once the back is closed and the slack



Two 1.5-volt silver oxide batteries in bottom clip usually power camera, but motor's own power takes over whenever MD-4 motor's attached.

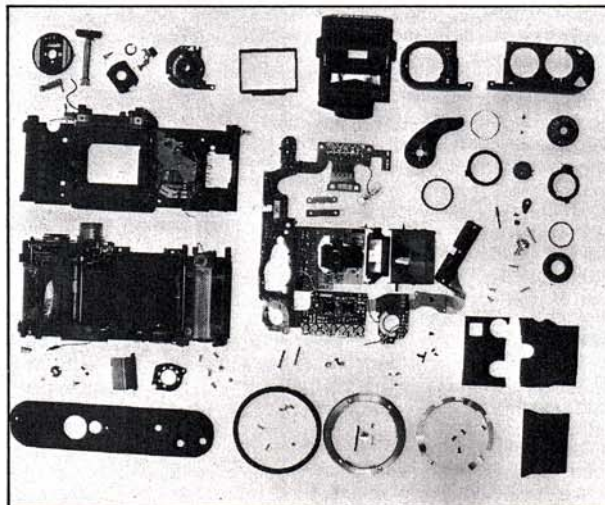
taken up with the rewind knob, it is far simpler to wind to the first exposure since the camera automatically sets the shutter speed to 1/80 sec. until the first exposure is reached. With other auto SLRs you usually must set the camera manually to a manual shutter speed to prevent the auto-exposure metering system

from setting long exposures during initial winding, particularly if you keep the lens cap on. When frame 1 is reached the camera automatically reverts to auto-exposure automation.

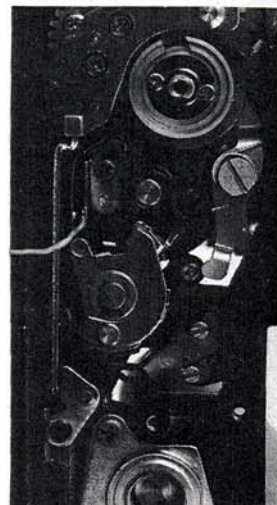
The frame counter is marked in blue against black with numerals at every five frames and dots in between. It has unusually good visibility. Directly in front of the frame counter, to the right of the film-wind hub is the multiple-exposure lever. After taking a first exposure, you flip it to the right and wind again. On the second wind the film does not advance nor does the film counter. After the exposure, the lever flips back to the off position.

The self-timer is electronic. To set it, you move a lever forward of the shutter-speed dial to the left, uncovering a red dot. When the shutter is wound and the release is pressed, the self-timer operates. At the front of the F3, a red LED pulses slowly for 8 sec. and then quickly for 2 sec. to warn the subject that the shutter is about to go off. The self-timer can be

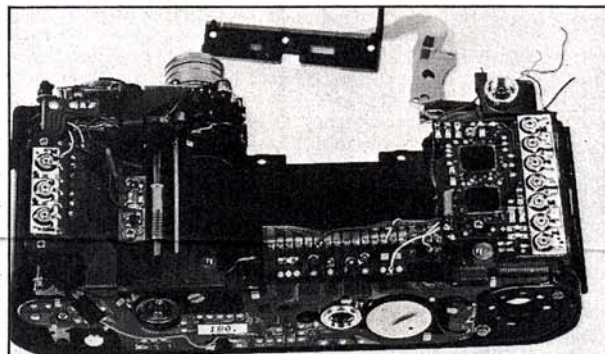
### Inside the Nikon F3: Simplicity equals ruggedness.



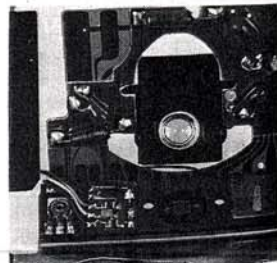
Stripped down to essentials, F3's body shows modular construction, fewer parts than previous pro SLRs. Electronics module (center) is housed neatly inside two-piece main body casting.



Film-wind mechanism is a rugged, durable assemblage of metal gears and levers.

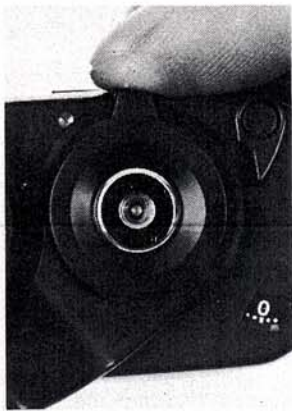


Remove front main body casting and you get a good look at F3's electronics layout. Accessibility for testing and calibration is excellent. LCD module is shown top center.



SPD cell behind circular lens is heart of F3's meter system, providing center-weighted continuous light readings via secondary mirror, dedicated auto flash exposures directly off film when mirrors are up.





Pushing power switch to right, uncovering red dot, turns on metering circuit and unlocks shutter release.



Heavy rubber interchangeable eyepiece protection ring is fine idea but kept falling off, could easily be lost. Tiny bit of glue carefully placed by user solved the problem.

overridden at any time by returning the self-timer lever to the "off" position. To eliminate any possibility that extraneous light might enter the viewfinder eyepiece and inflate the auto-exposure reading when using the self-timer (or whenever your eye isn't at the view finder eyepiece), the F3 has a built-in eyepiece blind. It can be closed by pushing a small lever to the left at the rear of the prism housing.

The depth-of-field preview button (also required for making closed-down-aperture exposure readings with auto-diaphragm, non-AI Nikkor lenses) operates in precisely the same manner as on the F2 and is, as on the F2, ideally situated for convenient operation. To lock the mirror up, you must push in on the button (as on the F2) while pushing the mirror lock up lever about 70° counter-clockwise.

Should a modern SLR need a lock-up mirror? The F3 certainly does need it to accommodate the special fisheye lenses which sit far back into the mirror chamber. How about freedom from mirror movement vibration for scientific photography such as high-powered photomicroscopy? It's our belief that, while vast strides have been made by SLR designers

using such vibration minimizers as air dampers, the utmost vibration-free situation can be created only with a mirror lock-up. In any event, whether you ever need it or not, it's there on the Nikon F3.

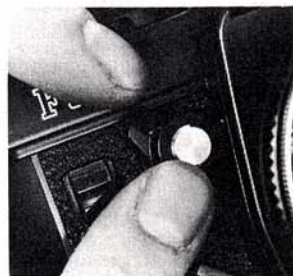
The F3 has a far simpler method of prism and focusing screen removal than the F or F2, which required the aid of a pointed instrument to push in an often recalcitrant release button on the back of the camera. With the F3, you just push a prism-release on either side of the prism levers to rear-facing position and the prism can be lifted directly off.

No more need you turn the Nikon upside down while pushing the release button to remove a focusing screen. A generous slot allows you to insert even a short fingernail beneath the lip of the focusing screen mount. The screen slides right out and can be held by the lip or mount edges. If you have no fingernails, a thin coin edge will do the trick. Twenty focusing screens, much the same in pattern as for the F and F2, are available for the F3; however, because of the different mounting system the screens are not interchangeable between the older cameras and the F3. Replacing the screens and finder is simply a case of pushing them back into place.

The interchangeable finders for the F3 also resemble those previously available for the F and F2 but also are not inter-



Eyepiece shutter lever at rear of prism prevents extraneous light from entering viewfinder during automatic exposures when your eye is not right up to eyepiece window.



Although many cameras, even for pros, have now eliminated mirror lock-up lever, Nikon F3 retains it for utmost in vibration-free pictures—as when shooting through microscopes or telescopes.



Batteries and/or electronic give out? You can still use F3 with mechanical shutter-release lever at 1/60 sec.

changeable with those for the older cameras. Operationally, the major difference between the F and F2 finders and those for the F3 is that you retain full metering capability and ability to view the apertures and shutter speeds through the new finders on the F3. Although they were not available at test time, a DA-2 Action Finder, DW-3 Waist Level Finder and a DW-4 6X Magnification Finder are expected soon.

The standard DE-2 finder, you will note from our General Performance Chart, has an actual image magnification of 0.78X. This is somewhat lower than we have measured on other Nikon cameras (the Nikon FE had 0.88X, for instance), but is in keeping with the Nikon F2 magnification. While a quick comparison between a camera such as the FE and F3 will show that the FE has a larger (greater magnification) image on which to focus and view, the F3 provides greater eye relief—allowing eyeglass wearers, as previously mentioned, to see not only the entire finder but the LCD panel and aperture readout window as well. If the photographer is wearing goggles or other eyewear, he will be able to view through the F3 more easily, although the image won't be as impressively big as with the non-professional cameras.

The DE-2 viewfinder accepts the same screw-in interchangeable corrective eyepieces as all the other Nikon cameras. The standard screw-in eyepiece of the F3, however, comes with a heavy rubberized outer ring to prevent eyeglass scratching and to increase comfort among non-eyeglass wearers. It easily peels off the eyepiece—too easily, we noted, and can become lost. We found that a slight touch of rubber cement on a few spots of the rubber ring's inner rim solved this problem nicely and yet allowed the ring to be removed and replaced on another eyepiece when required. The ring, however, will not fit the smaller-diameter eyepieces of the FE

and FM which enable the backs of these cameras to open for loading.

One of the major problems facing the manufacturers and users of SLRs today is that of battery failure. With the advent of the electronically-controlled cameras, it has been not only the metering systems which fail to operate when the batteries die but the entire camera. But fewer and fewer photographers, including professionals, are willing to depend solely on non-metering mechanical cameras and separate hand-held meters. Battery problems to date include poor contacts, sudden failure and inability to operate in low temperatures.

Nikon has taken all of these problems under consideration in designing the F3. The two 1.5-volt MS76 batteries suffer from all the standard problems of their breed. At 40° F their ability drops off and all but ends at freezing temperatures. The



Exposure memory lock button allows close-up metering to be done on auto exposure and also holds exposure indication in finder. It's handy, but not when motor drive is attached.



Auto-exposure-compensation dial is calibrated in 1/3 stops, has range of ± 2 f/stops with locking mechanism at each marked setting.



## modern tests



Ten-sec. blinking electronic self-timer LED is welcome, but can't be seen when motor is attached to camera.



Self-timer turn-on lever is quite similar to that of meter turn-on lever adjacent to it and can be mistaken for it by those not thoroughly familiar with the camera.

normal-temperature battery drain of the F3 is quite low, thanks to the LCD panel which uses only about 1/5 the amount of power of an LED digital display. Power drain is about 5 milliamps while the shutter requires some 17 milliamps. Compared to the Nikon FE, the Nikon F3 requires slightly more battery power. In normal use the batteries are supposed to last about a year, but it's been our experience in all SLRs that life is considerably shorter than that—and the more the camera is used, the shorter the battery life tends to be.

With all previous electro magnetic-shutter-release SLRs, dead batteries mean no camera operation. However, the F3 has a backup mechanical shutter release lever concentric with the exposure memory lock button. When pressed, it releases the shutter at a mechanical speed of 1/60 sec. whether batteries are operating or not. It also operates on the "T" setting for long exposures. While the meter will not be working under these circumstances, at least the owner can use the camera at any aperture he wishes with the 1/60 sec. or "T" settings.

With the professional in mind, Nikon has gone further.

Once the MD-4 motor drive is attached to the camera, the eight AA cells or nicad pack in the drive take over the powering of the camera's metering system and shutter. Although alkaline energizers function best between 32° and 100° F, they can operate down to -20° F, losing about 2/3 of their capacity. For photographers often working in low temperatures, Nikon has made available a nicad battery pack which replaces the 8 AA cell clip and can operate at -20° with greater facility.

Since many pros keep motor drives on their camera at all times—and the MD-4 motor is exceptionally small and light, a bit larger than some auto winders—Nikon has gone far to obviate battery failure for those who can afford it least—the professionals. Serious amateurs can do likewise, or carry extra, warm batteries. (We'll get to a more detailed analysis of the motor drive system later.)

The Nikon F3, as we've explained, is one of the few SLRs offering through-lens autoflash exposure measuring. All SLRs with any dedicated flash systems whatsoever have located the contacts for the special flash units within a hot shoe atop the prism. This would not prove feasible for the Nikon F3, since an interchangeable prism would make such an arrangement less than rigid and stable. Nikon elected instead to maintain their own type of accessory shoe at the base of the rewind knob and to locate the flash connections there. Such a placement isn't new for Nikon. Both the F and F2 had similar accessory shoe placements, but the F3 shoe platform is slightly wider and therefore not compatible with that of the F and F2. (An accessory coupler will be available, however, to allow F and F2 flash units to fit the F3 for regular non-coupled flash operation.)

Two specially coupling flash units have been made for the Nikon F3. The SB-12 (\$138) is a four-AA-cell unit, rectangular in shape and similar in outer dimensions to other Nikon flash units made for the F2 and FE cameras. It's 1 1/2 in. high, 4 in. long and 3 3/8 in. deep. The unit's swivelling foot slides backwards over the rewind knob of the F3. You then turn the outer foot collar of the flash unit clockwise, locking the unit in place. In our opinion, it locks more securely than any hot shoe unit atop any prism. The foot has three electrical contacts which connect with three at the front of the camera's hot shoe. The ASA set on the camera's film-speed dial is keyed into the flash mechanically by a lug attached to the ASA setting ring. The lug makes contact with a spring loaded finger in-



To make multiple exposures, flip multiple-exposure lever to right after first exposure and use wind lever. Multiple-exposure lever returns to off position after exposure is made as safety measure.

side the flash unit's locking collar. Although the camera's ASA setting range extends from 12 to 6400, the flash unit's only goes from ASA 25 to 400.

With the SB-12 flash unit turned on and the switch at the back set on A for automatic operation, a red flash ready LED will light within the finder in 8 sec. If it blinks instead of remaining steady, the ASA set is beyond the 25-400 range or the flash unit isn't attached to the camera correctly. When the flash unit is recycled, it automatically sets the camera to the correct X-sync speed of 1/80 sec. except at manual speeds of 1/30 sec. or lower where you might wish to use these slower speeds for combined existing light and autoflash.

Press the shutter release and the lens will close down to your pre-selected aperture. The camera's metering circuit will provide just the proper flash duration for correct exposure. If there has not been sufficient light for the exposure, the red LED will blink afterwards. If there has been enough light the unit will recycle and show the constant red LED when ready to fire again. A large dial atop the flash unit indicates the approximate distance ranges possible with each lens aperture and ASA index, so you can check it before you shoot.

The SB-12 provides upwards of 160 flashes per set of batteries (the closer the subject and larger the aperture, the more flashes, as in all energy-saving flash units). With ASA 25 film and an f/2 lens, the SB-12 has a range from about 3 to 20 ft. With ASA 400 film the range is upwards of 60 ft. Using small apertures the flash can be operated as close as 20 in. Regrettably, our ability to test the flash system was limited by the unavailability of the promised TTL connecting cord which will allow you to remove the SB-12 from the camera and place it

wherever you want for off-camera, angled, close-up or slide duplicating flash.

The SB-12 normally covers the angle of a 35mm lens adequately with slight edge falloff, but an accessory wide-angle adapter widens the beam angle to accommodate the angle of a 28mm lens. The unit can also be used manually. Its guide number is then 42 for ASA 25 and 160 for ASA 400 films. All guide numbers and autoflash distance ranges are slightly less when the wide-angle adapter is used. There appears to be no present plan to make an adapter allowing the SB-12 flash unit to be used on cameras other than the F3. In any case, it would have to be operated in the manual flash mode only if it were adaptable to other cameras. The SB-12 can be used off-camera manually, since it has a standard PC connection at the rear and can therefore be attached to the F3's PC terminal on the left front of the camera. Of course, you lose all autoflash features when it's used in this manner.

In addition to the SB-12, Nikon has created the SB-11 (\$290), a more powerful head-and-handle electronic flash unit with bounce head and eight-AA-cell capacity, which fastens to the camera via a bracket attached to the tripod socket. While it can be operated on cameras other than the F3 (since it has its own built-in sensor and accessory sensors), the TTL cord for this unit (which attaches over the rewind knob) was also unavailable at testing time. We thus decided to await the cord before reporting further on this unit.

While the metering system for continuous light has an 80 percent center-weighting within the 12mm finder measuring circle we were curious just what measuring area the cell used for electronic flash. Most sensors on autoflash units measure about 20 percent no matter the focal length of the lens used on the camera which, as we have explained in articles on autoflash, can lead to serious expo-



Threaded PC terminal allows all PC-connected flash units to be attached to Nikon F3 but, if you use this terminal, you do lose the advantages of Nikon's own dedicated automatic flash.

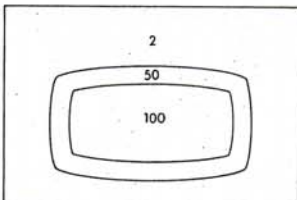




**SB-12 Nikon flash unit fits securely on F3, but must be removed in order to rewind film manually.**

sure errors. Our check of the F3 meter's flash sensitivity area indicated a pronounced center-weighting. The measuring area is in the form of a horizontal oval about 8mm high and 24mm long in the center of a 24 x 36mm frame. This should certainly contribute to far less error in auto exposure than the narrower beam of sensors built into most flash units. Of course, the F3's flash measuring covers the same area whether used with wide angles, normal or tele lenses, so you can easily determine whether your subject is within the measuring area.

The F3's through-lens measuring flash system as designed seems up to the best possible with today's technology. As with all through-lens metering flash units, we do wish there was a signal indicating over-



**Flash meter weighting diagram shows a bit less center-weighting than with continuous light.**

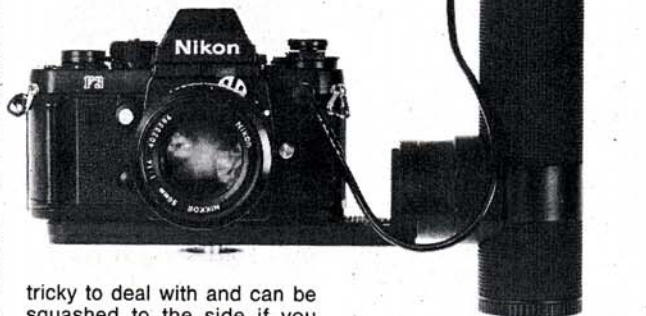
exposure when shooting close-ups, but no camera or flash system has such as yet.

We are now ready to examine the MD-4 motor drive. After the massiveness and complicated features of the MD-1 and MD-2 motor drives for the Nikon F2, it is hard to take the MD-4 for the F3 seriously. Adding but 2 7/16 in. in height and 25 oz. (with nicad pack) to the F3 (thanks largely to the use of micro-electronic circuitry not available when the F2 motors were designed), it resembles a winder more than a professional motor. But the MD-4 (\$380) has all the specifications for a pro motor, including speeds up to 6 fps and motor drive rewind plus many remote-

control possibilities. How well it lives up to them, we'll soon see.

The motor consists of a horizontal base with battery compartment and controls plus a vertical grip handle with control dial and electromagnetic release button. The battery clip, included, can be removed easily and almost instantaneously by sliding a small release catch on the right side of the motor. The plastic battery clip holds eight AA cells. (The MD-1 and MD-2 for the Nikon F2 required 10 cells in two separate battery compartments.) The spring coil terminals which hold the battery ends in place can be a little

**Need more power and flexibility than SB-12 flash? The SB-11 will give it to you. Alas, we were not able to test one with the camera at this time.**



tricky to deal with and can be squashed to the side if you aren't careful to insert the batteries away from the springs and only then press the ends against the springs. (Oddly the shorter, tighter coil springs on the MD-11 motor for the Nikon FE are easier to deal with.)

The alternate portable power source is the MN-2 Nicad battery unit (\$107) and its MH-2 Quick Charger (\$129). Using it, rather than AA cells, is a delight—not only in loading but also in performance, as we'll see. The MN-2 is an enclosed battery pack block which slips right into the end of the motor drive. The 4 3/4 x 2 3/8 x 2 1/8-in., 19-oz. charger is supplied with either a 220-volt or 110-volt AC cord (or both if you need them) and a permanently-attached, 6-ft. charging cord and plug. The MN-2 Nicad battery unit is charged by taking it out of the camera and plugging it into the charger. A green light on the charger glows when charging starts. When it's complete, a red light appears. Total charging time, according to our tests, is between two and three hours depending on how pooped the Nicad battery is.

To attach the motor to the F3, you unthread a cover on the bottom of the F3 which protects the rewind shaft. Why a cover for the rewind shaft? Because

the MD-4 motor, like the MD-1 and MD-2 motor for the F2 camera, provides motor drive rewind. The motor's rewind keying drive must enter the bottom of the F3 to make contact with the slotted key mechanism within the film-cartridge spool end. (Both the battery clip and Nicad pack have a neat spring-loaded storage compartment for the rewind shaft cover complete with ribbed releasing latch.)

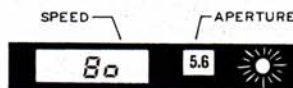
In order to avoid the neces-

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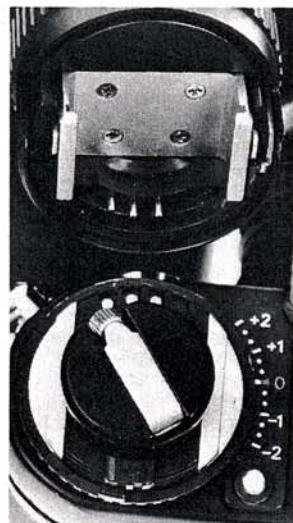
cause any film fogging. However, Nikon (and we) do advise putting the motor on or taking it off before film loading whenever possible.

Besides keying to the film spool, the rewind mechanism platform of the motor has six spring-loaded gold-plated electrical contacts. A seventh pin has been removed. Our query to Nikon concerning it brought the reply that the engineers had needed the extra pin on prototype motors but no longer did, and it was more trouble to remove it than to shear it off. The motor fits the F3 snugly after you fasten it to the camera tripod socket with the large, well knurled mounting screw knob that protrudes at both the front and back of the MD-4.

When attached, the motor forms virtually a contoured integral part of the camera, cleverly angling forward so camera and motor can stand firmly on a



**When dedicated flash unit is recycled completely, X-sync speed of 80 is indicated and LED lights. If LED blinks after exposure, light was insufficient for proper exposure.**



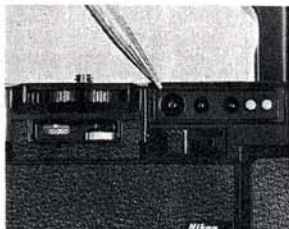
**Only flash units which have three contacts and fit over rewind knob hot shoe can make full use of Nikon F3 flash automation. Note mechanical ASA setting level lug which makes off-camera TTL cord design somewhat difficult.**



## modern tests



Camera plus motor handles well both horizontally and vertically, far more easily than Nikon F2 with its motor and battery pack. Convenience is quite similar to other cameras with simpler autowinders.



Rear of motor drive shows auto frame counter countdown setting wheel and window, LED battery power indicators and auto-rewind levers two electrical contacts provide auto-rewind halt with film leader outside of cartridge when special back is fitted to camera.

level surface and not pitch forward on its face like many another camera and motor. Interestingly, only one other SLR has adapted the same forward angling—Nikon's least expensive camera, the EM, with its auto winder.

The vertical winder grip (which Nikon calls "anatomical") has finger contours and studded, grippable surfaces to provide good comfort and convenience. Unlike the forward-angled release button on the MD-1 and MD-2 for the F2, the MD-4 has its release button directly atop the grip, which some users may not find as handy. We had a tendency to press the release with the edge of a finger rather than the ball. Undeniably it will simply be a matter of getting used to it. If you'd rather use the shutter release on the camera body, you can do it—but for single shots only. It will not operate for continuous bursts. If you do use the camera's release, the motor will wind only after you remove pressure from the release. When you use the MD-4 release button, the film is advanced immediately.

120

Irrespective of angled vs. non-angled release discussions, everyone will find the camera and motor combo easy to hold and handle, even with one hand and ideal with two—really no more difficult than other cameras with simple winders. But the MD-4 beats winders and motors on all other cameras and does it easily. The ring around the release button has three positions for lock, single shots and continuous run. At the back of the motor are a number of indicators and controls. Two LEDs serve as a battery check. When both light, you have over 50 percent power capacity, approximately. When only one lights, you are below 50 percent capacity approximately. When none light, your batteries have had it. One diode also lights during auto winding and remains on when the end of the film has been reached.

A frame counter indicates the number of frames you have left to shoot—if and when you want to use the counter. Turn the recessed knurled setting wheel until the orange dot appears in the counter window and you can override the frame counter. Set any specific number of frames 1 to 36 and the motor will automatically halt after the specified number of frames have been shot, whether in continuous or single-shot mode. When you finish the roll, push sideways on the right-hand part of the rewind lever. This presses in the camera's rewind button. Slide the left-hand rewind lever upwards and film rewinds by motor completely into the film cartridge. (If you prefer the film leader to remain outside the cartridge, you'll need the accessory MF-6 camera back [\$76] which cuts off power when the leader is still outside the cartridge.)

So much for the gee-whiz specifications. How does it all work? In our tests, every function matched expectations and specifications. With AA alkaline energizer cells, Nikon promised 3.8 frames with the rapid return mirror operating so you can view and focus, and 4 with it locked up. (In the mirror-up position, you must use the camera on manual shutter speeds.) In our tests, made with film in the camera, we calculated speeds of 3.82 and 4.18 respectively. With the Nicad battery unit, we really flew. Nikon listed speeds of 5.5 and 6 fps. We hit 5.6 and 6.1. In rewind, AA cells rewound a 36-exposure roll in 8 sec. while the Nicad pack cut it down to 4.7 sec. Whew! (Warning: In cold, dry weather, use of the motorized rewind may cause static electricity marks on the film. You must, instead, rewind by hand. With the motor attached, we found this can be a more pesky business since there is considerable drag



By angling the motor drive fully, Nikon was able to achieve an extremely well-balanced camera that can stand nicely, even on a flat surface with a rather heavy lens.



MD-4 release handle top has control for single-shot, continuous burst or lock position; however, top located button is not as convenient as it might be if angled forward.

caused by the motor rewind mechanism—like putting the top up on a motorized convertible car—but by hand.)

We were not able to test the MD-4 AC/DC converter, which will be available for those who would rather run the motor from a standard household or studio outlet. However, we did try to beat the game using eight Nicad AA cells in place of the eight alkaline energizers to see whether we would get performance closer to the Nicad pack unit. Performance was poorer than with regular AA alkaline cells. It's not too surprising since the Nicad battery unit packs 16.8 volts, whereas eight AA cells alkaline energizers have 12 volts and eight Nicads have but 10 volts.

Nikon specifies that the fully charged Nicad battery unit can drive 60 rolls of 36 exposures through the camera at the speeds given and 10 more at reduced speed. We tired after running through 50 but can vouch for speed maintenance. With alkaline energizers 60 rolls at speeds given are promised, with 80 more at reduced speeds. We'll vouch for 62 at

top speed but we didn't take the test further than that. Since Nikon has been right on target with its other specifications, there's ample reason to suspect you would reach a 140-roll total with a really fresh set of batteries. However, since it's doubtful that many photographers would shoot 140 rolls per film at one session and since batteries do deteriorate with age and when not removed from the camera (if not used often), we doubt if its really practical to try for 140 in tests. Results from any reader wishing to report on success or failure will be welcome.

You can use the much less expensive zinc carbon batteries instead of alkaline energizers. These will also give you 60 rolls at top speed, plus 40 more at reduced speed. With the vast difference in expense between alkaline and zinc carbon, zinc carbon would certainly seem more than adequate for most photographers.

The MD-4 far outdistances the MD-1 or -2 for the F2 camera, which only guaranteed 80 rolls total with alkaline energizers or 60 total with two Nicad units. The only feature which photographers may miss on the MD-4 is the variable firing speeds of the MD-1 and 2 which provide speeds of 1 to 5 fps set by dial. The MD-4 operates only at top speed at camera speeds of 1/125 sec. or over. At slower camera speeds, firing rate depends on the shutter speed. Top speed with mirror locked up on the MD-1 or -2 is 5 fps.

The MD-4 has terminals for remote control, external power and connection with a magazine back. We regretted the placement of the tripod socket on the far left rather than in the center. However, the battery chamber makes central placement impossible.

Taking into consideration the motor's ability to guarantee power for the camera meter and shutter, its compactness, con-



While it's not advisable to remove the motor drive from the camera when the camera is loaded, a spring-loaded light trap inside of film cartridge chamber does minimize danger of fogging (see text for fogging tests).





Eight AA cells fit in nicely designed battery clip to power MD-4 motor.



Alternative Nicad battery pack can be recharged in 3 hrs. and power entire camera even in cold temperatures.

venience, and the businesslike way it blazed through all our field tests, we give it top billing for desirability. For amateurs, the AA battery clip will probably deliver sufficient fps, but we can't imagine pros not having one Nicad pack in the camera and one in reserve. Noise level? The old MD-1 motor checked in at 66 db, while the new, quieter MD-4 measured 64 db. At 1/125 sec. the shutter noise of the F3, on the other hand, is infinitesimally greater than that of the F2—64 db versus 63 db. In short, for all practical purposes, both cameras are quieter than average.

Did the motor designers slip

up somewhere? Well, yes. The motor grip covers the self-timer LED. Perhaps you won't be using the motor/self-timer combination often, but we did come across a feature to make up for the minus. If you put the MD-4 on continuous firing and use the self-timer, the motor and self-timer act as an intervalometer, automatically making exposures every 10 seconds as long as you keep pressure on the release. Now there must be some good use for that.

In making our practical field tests with the F3, we were concerned about a number of warnings which appear in the F3 instruction book. The one that concerned us most lists the auto-exposure range possible based on its ASA 100 EV 1 to EV 18 exposure range. It's considerably more abbreviated than that of other SLRs we have tested. (The Olympus OM-2N, for instance, goes down to -6.5 EV!) The range limitation listed by Nikon indicates a slowest possible speed with ASA 100 film of 1 sec., and ¼ sec. with ASA 400 film. However, as with other Nikon cameras we have tested in the past, we feel the range warning can be exceeded in practice with impunity. With ASA 400 film we were able to get accurate readings in our practical film test down to 8 sec., and we exceeded the Nikon warnings similarly at other high ASA speeds. Cameras may vary in their abilities, so we'd suggest you check out your own camera if slow shutter speeds are to be required with high ASA index films.

Nikon warns that at temperatures below 14°F (-10°C) the LCD panel may get a bit sluggish and exhibit a slight delay in providing shutter-speed information. This is correct, but the camera does continue to function with near-immediate meter action as far as the actual exposure is concerned. The delay on the LCD panel proved to be very minute. We did test the F3 and Nicad battery pack at 0°F and found the camera operated properly as specified.

We didn't try to check Nikon's warning at the other end of the scale—that at tempera-

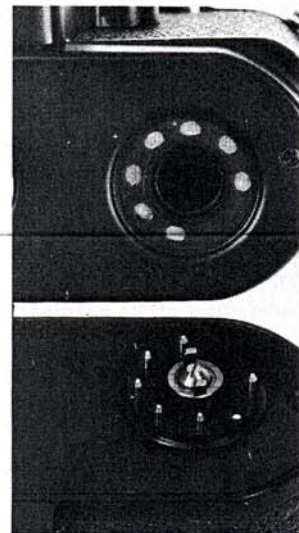
tures of 140°F the surface of the LCD panel may turn black and be illegible but would return to normal with the temperature. At 140°F most of MODERN's testers tend to black out and become illegible too. Nikon further warns, however, that prolonged exposure to such temperatures can damage the LCD so this, like other cameras, should not be left in the hot sun or in any car trunk with the sun blazing down upon it.

Nikon's last warning is that the LCD panel only has a life expectancy of 6 or 7 years, after which it loses contrast and becomes hard to read. Nikon promises, however, that the fee for replacement will be minimal.

So much for the warnings. The F3 performed admirably in all its field tests—indoors, outdoors, in daylight, with flash. We particularly like the ease with which we could read both shutter speeds and apertures in just a quick glance since they appear as numerals right next to each other. The LCD panel is a delight. You will note a slight darkening of the panel background when the lens metering prong passes in front of the light-gathering window. If it does annoy you, have the prong removed if you don't need it with older cameras. We did prefer the increased central weighting of the meter which all testers—and other photographers queried—felt gave all of us better knowledge of just what was being measured and consequently better control over the exposures. The motor was a hit with everyone—amateur and professional alike. Our test slides were of a quality to reflect the splendid shutter-speed and exposure accuracy revealed by our lab tests.

You might wonder why Nikon did not provide shutter-speed-preferred or programmed exposure automation. First, for pros using mirror teles and non-coupled optics, aperture-preferred automation is necessary. Adding shutter-speed automation would have complicated camera design and construction and might thus have lessened reliability. Secondly, adding other exposure automation modes would have required changes in the Nikon lens mount—changes which Nikon is reluctant to make in view of long term commitments to its present lens owners.

Structurally, the Nikon F3 has been built to the best professional standards. The body casting is in two parts, front and rear. After peeling the leather from the right and left front panels, we reached eight screws which hold the two castings together. Seven wires



Electric contacts around re-wind shaft provides all necessary camera interconnections including motor drive power to operate camera shutter and metering circuit. At least one contact is not now being used.

connect the front (which consists basically of the mirror box, faceplate and lens mount, memory hold button and self-timer LED) with the rear section (which has the shutter and wind mechanisms plus the flexible circuit board). Once the front is removed, it is an easy matter for a repairman to work on the camera's main operational parts.

The F3, we were told, has about ½ fewer parts than the F2. An examination of its interior confirms that there are fewer parts, although we did not attempt to disassemble an F2 and F3 completely down to the last screw to check Nikon's statement.

Continued on page 124

#### RESOLUTION

Nikkor 50mm f/1.4 no. 4023594 at 1:49 magnification			
f/no.	Center Lines/mm	Corner Lines/mm	
1.4	V. Good 49	Excellent 35	
2	V. Good 55	Good 39	
2.8	Good 62	Good 49	
4	V. Good 69	V. Good 55	
5.6	Excellent 76	Excellent 69	
8	Excellent 78	Excellent 69	
11	Excellent 69	Excellent 69	
16	V. Good 62	Excellent 55	

#### CONTRAST

Nikkor 50mm f/1.4 no. 4023594 at 30 lines/mm			
f/no.	Center %	Corner %	
1.4	Medium 51	Medium 24	
2	Low 52	Low 24	
2.8	Low 60	Low 35	
4	Medium 65	Low 42	
5.6	Medium 65	High 58	
8	Medium 64	Medium 55	
11	Medium 60	High 50	
16	Low 55	Medium 45	

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All mechanical switches, a problem area in electronically-controlled cameras were made of heavy gold-plated metal. There were fewer than we had expected. Electronic circuitry has evidently reduced the need for them. The wind mechanisms and shutter curtain drum have large multiple ball-bearing raceways which accounts for much of the camera's smooth action and should contribute to the F3's longevity in heavy use.

In summary, our interior examination leads us to believe that Nikon has put their engineering to the test—to build a rugged, reliable pro camera.

We did have some questions concerning the F3 that we could not answer. Why had Nikon elected to measure only flash from the film and not measure continuous illumination as well as had Olympus? Nikon's answer was in part that measurement off the first shutter curtain and film for continuous light was a patent belonging to another company. However, we think additionally that the 80 percent center-weighting of the F3 metering circuit would be very hard to duplicate and maintain if the meter had to read the film and/or the first shutter curtain depending on shutter speed. The Olympus meter sensitivity pattern is not as center-weighted and it does change with shutter speed, depending on whether the cells are reading the film and/or the shutter curtain.

We were also curious about Nikon's estimate of how rugged the F3 camera was. In terms that pros understand, minimum picture cycles before breakdown, just what was Nikon aiming at? We asked—and got an answer. The minimum number of shots is about 150,000. With other Nikons now in the line about half that many can be expected as a minimum. Let's see, that's 4,166.66. 36-exposure rolls of film, and half that amount for other cameras. You can all now apply your own shooting requirements to this as see how long it will be, at a minimum, before your F3 would need looking into. You should be shipping your camera in for a CLA (cleaning, lubrication and adjustment) every three years or so as an amateur or every year as a pro, which would be long before that number 150,000 comes up.

We feel that for the Nikon enthusiast the F3 represents a perfection in design, ability, construction, enjoyment and handling never before achieved. The LCD shutter-speed readout is superb. If the F3 does indeed reach its minimum goal of 150,000 exposures under the extremely variable conditions in which professionals will use it, then Nikon will be the first SLR to match or exceed the reliability of the all-mechanical cameras with which pros are parting with so reluctantly.

We have not described or analyzed the Nikon AI lens mount, which has now been standard for over two years on all Nikon cameras, since we have reported on it at its introduction and in subsequent "Modern Tests."

Tested with the Nikon F3 was the already available 50mm f/1.4 Nikkor, which we had not examined since our April 1979 "Modern Tests" of the Nikon EL2. Since that was an early example of the newer more compact 50mm f/1.4, we decided to do a retest.

**Optical bench analysis:** On axis at f/1.4

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the 50mm Nikkor showed a slight orange flare and very slight spherical aberration both of which were greatly reduced by f/2. All axial aberrations were virtually gone by f/5.6. Off axis, very slight red-blue lateral color and very slight high order coma were present. The coma was almost gone by f/8.

**Field test slides:** Our pictures showed flare to be extremely well controlled throughout. A slight softness was noticeable in scenes taken at f/1.4, but this improved at f/2 and our slides were very crisp and snappy by f/4. Overall, we'd rate this field performance as very good to excellent.

