TESTING ... TESTIN

THE ALL NEW TOPCON S U P E R D M

MODERN PHOTOGRAPHY's TEST REPORT

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newest cameras, lenses & important accessories

TOPCON SUPER DM WINDS ITSELF



MANUFACTURER'S SPECIFI-CATIONS: Topcon Super DM 35mm single-lens reflex. Body No. 7205171. LENS: 50mm f/1.4 **RE GN Topcor in interchange**able Topcon-Exakta bayonet mount with autoflash exposure mechanism, for guide numbers 32-250, apertures to f/16, focusing to 16 in. SHUTTER: Horizontal cloth focal-plane with speeds from 1 to 1/1000 sec. plus B, FP and MX sync. VIEWING: Interchangeable eye-level prism with interchangeable screens with central split-image surrounded by clear fine-focusing collar, full focusing fine-line Fresnel area. **OTHER FEATURES: Silver oxide** battery-powered CdS cells behind mirror slits measure contrast-adjusted full-frame area at maximum aperture, removable one-shot electric motor powered by four AA cells advances film, mirror lockup switch, selftimer. PRICE: \$727.45.

Don't you wish you could screw an in.-deep strip weighing 11½ oz. onto the bottom of your camera and convert it to electric motor drive? Well, if you own a Topcon Super D, you actually can, thereby converting your Super D into the subject of this test, the all-black only (at present) Topcon Super DM. But don't get the idea that this modestly-sized appendage will allow you to zip along at 4 frames per sec. and compete with more expensive motor-drive systems, such as the Topcon Motor Drive (\$456).

Topcon's Auto Winder simply takes the place of the traditional thumb - operated film - advance lever (though the manual lever, located in the usual place, is still available as an auxiliary film advance in case you run out of battery power). As you relax your finger pressure on the shutter button, the film is automatically advanced to the very next frame. It takes about 3/4 sec. per frame and is accompanied by an average decibel whir-that's it. If this one-at-a-time film advance strikes you as anticlimactic (or you think you've got the fastest lever-advance thumb in the West), just try to fire your SLR as rapidly as a DM Topconeer. As his camera rests serenely cradled against his cheek, yours will generally be jouncing around as you wind the film rapidly. In other words, Topcon's little auto-winding motor does increase most people's practical photographic firepower more than the bare specifications might indicate. If not quite an electric motor drive, it's considerably faster than a filmadvance lever, in most cases.

But before we start analyzing the motor, which turns out to be deceptively simple, let's take a fresh look at the rather unique camera it's attached to. Way back in 1963, Tokyo Optical Co. laid down the Topcon's basic design and, like Volkswagen, they've



DM's four-AA battery pack hinges down for easy handling.

stuck to it. This has allowed the engineers the luxury of continual refinement and, as a result, the Super DM is conspicuously devoid of rough edges and overhanging concepts.

The heart of the Topcon Super DM is the meter system. Its CdS cells are located behind a complex system of slits etched right into the mirror rather than placed at the sides of the prism, as in most behind-lens metered SLR's. So instead of measuring the light hitting the focusing screen, the DM reads the light passing directly through the lens, through the slits and onto the cells. Aside from the théoretical benefits of such a "straight through" system, there are also practical advantages: You can remove the prism for microscopic, telescopic, waist-level or other viewing systems without losing the meter, and you don't have to compensate the meter reading for light transmission differences among the various, interchangeable screen units.

Disadvantages of Topcon's behind-mirror meter? Etching precision slits and cramming meter cells within the narrow confines of a flipping mirror is comparatively expensive, and the slits are visible in the finder at small stop-down apertures (such as those encountered in copying and microscopy when you manually stop the lens down to f/8 or smaller). Perhaps the best proof of the Topcon meter's success is the reputation it has enjoyed among a wide range of scientific sticklers. The U.S. Navy, for example, has been sufficiently impressed with the Topcon's meter to have ordered several thousand Super D's.

Let's take a closer look at that unique metering system. First, we'll remove the lens from our Super DM by pushing inward on a tab on its left side and rotating it about 60° counterclockwise. As you look at the mirror slits through the open lens mount, you'll notice that the pattern consists of two distinct types-a small number of oblique coarse slits in a cross pattern (down the center vertically and about one-third of the way up the mirror horizontally) and four quadrants of finer slits toward the corners. also at oblique angles to the mirror edges. These two distinct types of slits allow incoming light to reach separate CdS meter cells-connected in parallelwhich are located in the out-offocus light path of the lens. In practice, this metering system gives the same readings as a fullarea averaging type. In other words, you can ordinarily meter accurately from camera position, but you should take close-up readings under contrasty lighting conditions. The central area of the mirror about one-third of the way up, however, is slitless in order to maintain finder brightness and eliminate unwanted line patterns that would otherwise be visible in the focusing screen at large apertures.

Now let's remount the lens and look through the finder. As you look straight through the eyepiece, you can't help noticing a small rectangular window just under the screen area, though you must shift your eye slightly downward to bring it clearly into view. It consists of a white rectangle with a pair of pincers in the center at the bottom, a white minus sign on the upper left, a white plus sign on the upper right, and a black "T"-shaped needle in the middle. Once you

set the ASA (25-1600) by pulling up and rotating the knurled shutter-speed dial collar and select a shutter speed, metering consists of rotating the knurled ¼-in.-wide aperture ring until the "T" is centered above the meter index notch. The translucent plastic light-collecting grid extends slightly upwards from the camera top and can therefore collect light coming from three sides as well as from directly above.

As a result, all meter data was clearly visible even under the most dismal shooting conditions, a definite plus for Topcon.



Frosted prism on top sheds light on meter index in finder.

We also checked the instruction booklet's assertion that the two pointed peaks of the metering index can be used to obtain halfstop under and overexposure increments. They can. According to our lab tests, setting the "T"shaped meter needle to coincide with the plus side peak provides almost exactly one-half stop overexposure, while the minus side peak gives one-third stop underexposure—well within tolerances.

Our only criticism concerns the apparent distance at which needle and index appear. The needle appears at a slightly closer viewing distance (41/2 ft.) than the viewing screen (6 ft.), while the index pincers are set at an appreciably closer distance (3 ft.). Aside from causing a minor visual accommodation problem, you must center your eye behind the finder to obtain precise meter readings. Once an eyeglass wearer centers his eye behind the finder, however, the entire frame is visible.

Obviously, you can also preselect the aperture and meter (by turning the shutter dial), or deliberately under or overexpose more than one-half stop by set-ting the "T" directly under the plus or minus sign. The disadvantage of using the former method is that you must remove the camera from eye-level to make sure you haven't metered in a non-hand-holdable shutter speed. But there's an alternative. Since the Topcon Super DM is one of the few current SLR's with a second metering readout window atop the camera (just to the right of the folding rewind crank), shutter-speed meters have the option of metering first and viewing and focusing later. The external meter window's primary function, however, is to permit facile metering at unusual angles (as in copying and scientific work

on a vertical stand).

How well does this sophisticated metering system perform in practice? Quite well, indeed, Our laboratory tests revealed a + 1/4 deviation from correct exposure at low and medium light levels, and a little over + 1/2 stop deviation at high light levels, such as those encountered outdoors on a sunny day. Our field tests confirmed this level of performance. Most of our test transparencies were saturated but slightly overexposed. Low-light performance was equally impressive; the DM reads within 1/4 f/stop of a known light source down to f/1.4 at 1/8 sec. on ASA 400 film. If you try to go any lower than 1/8 sec., however, a black bar moves into place over the meter index.

As long as our eyes are up at the finder, we may as well say a few words in praise of the DM's standard focusing screen. The 3mm-diameter, central split-im-



DM's mirror slits transmit light straight through lens to cells.

age rangefinder is split horizontally; it is unobtrusive and works very well with subjects containing clearly-defined oblique or vertical lines. For more amorphous subjects, the ground-glass collar surrounding the center also indicates the point of critical focus with very good precision. The rest of the focusing screen consists of a very fine-lined Fresnel pattern combined with a relatively coarse ground-glass texture. This enables you to focus fine detail to the edges of the field while retaining good overall screen brightness. When compared to coarser Fresnel-patterned screens in other SLR's, we found edges of the Topcon's screen slightly less bright, but easier to focus due to the absence of visible Fresnel rings.

There are a few additional innovations on the DM which we really should cover before we

dissect the motor's operation. The Super D and its predecessors have long been blessed with one of the most convenient systems of prism-and-screen-unit interchangeability around. To remove the prism, you just push down on a little chrome button to the left of the shutter-speed dial and slide the prism back out of its grooved slot. The screen lifts out easily by hooking even a chewed-up fingernail under the large tab at its rear and lifting upwards. The innovation comes in the form of the overhanging prism front adorned with the Topcon nameplate. Look under it and you'll see a squarish aperture, behind which is a mirror which reflects the large white-on-black apertures off the lens aperture ring into a little box just above the finder area. This system works extremely well. You can see the apertures clearly in virtual darkness as well as in bright sunlight, and you needn't shift your eye very much in order to do so. Our only gripe with Topcon's engineers is that they haven't yet devised a system to allow you to see shutter speeds in or around the finder area.

Rounding out the DM's innovations (most of which were introduced on late-model Topcon Super D's) are: a combined mirror lockup and diaphragm stopdown lever below the lens on the

Resolution Power

50mm f/1.4 Topcon No. 7205171 At 1:47 Magnification							
f/no.	Center Lines/mm		Corner Lines/mm				
1.4	Exc.	59	Exc.	42			
2	Exc.	66	V. Good	42			
2.8	Exc.	75	V. Good	42			
4	Exc.	84	Good	47			
5.6	Exc.	84	Good	53			
8	Exc.	84	V. Good	59			
11	Exc.	75	Exc.	66			
16	Exc.	66	Exc.	59			
Actual Focal Length: 51.8mm							

Image Contrast

50mm f/1.4 Topcon No. 7205171							
f/no.	Center Percentage		Corner Percentage				
1.4	Low	43	Low	20			
2	Medium	65	Low	22			
2.8	Medium	65	Low	32			
4	High	72	Low	40			
5.6	High	77	High	66			
8	High	74	High	68			
11	High	72.	High	62			
16	High	64	High	57			

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loaded diaphragm stop-down switch toward the upper left side of the lens is a Topcon feature of long standing), a twist lock around the front-mounted shutter-release button which can also lock the shutter open on B for long time exposures and, finally, autoflash exposures via the camera's normal lens, a "guide number" 50mm f/1.4 GN Topcor.

Operation of the GN lens is straightforward. Once you've ascertained the guide number of your non-automatic flash with whatever film you're using (32-250), set the focusing ring to infinity and direct your attention to the upper left quadrant of the lens, just to the left of the infinity mark. Here you'll find footage guide numbers emblazoned in orange-on-black. If you now set the lens to f/1.4, a textured black tab will appear just to the left of the quide numbers and to the right of the "GN" marked on the focusing ring. All you do to lock the lens in autoflash mode is turn the focusing ring until the proper orange number appears opposite the red indexing dot on the tab and slide the tab forward until it engages the focusing ring. The shooting aperture corresponding to your focusing distance will now automatically be set by the focusing action.

In flash tests conducted in both lab and field, this system worked well so long as we focused precisely on that part of the picture area we wanted properly exposed (which, after all, is the normal procedure). You're automatically warned most convincingly if you try to exceed the range of your flash-you can't focus the lens any farther. The advantage of this mechanical system over automatic electronic flash units is that you can always get the smallest aperture consistent with the correct exposure at any flash distance within the range. The Topcon's flash system uses a single PC-terminal connection on the camera's left side. It is adjusted for sync by turning the shutter dial. X sync is available at 1/60 sec. and slower, while FP bulbs sync at all speeds except 1/60 and 1/30, which are marked in orange on the shutter dial. M sync for other bulbs occurs at 1/125, 1/15 and slower.

Okay, the time has come to examine that motor in more detail. In appreciation of its one-shot-ata-time capabilities, Topcon doesn't call it a motor at all but, rather demurely, a Topcon Auto Winder. Whatever you call it, it's easy to install and remove from the camera

Grab the left-hand end of the appendage under your Topcon DM and pull smartly downward. What unhooks and hinges downwards is the battery pack, which has a capacity of four AA penlight cells. Unscrew the single coin-slotted mounting screw from the camera's tripod socket,

left side (the ordinary spring- unfasten the carrying strap from the chrome lug on the right side and lift the motor off-that's it. Aside from the aforementioned in.-wide strip added to the Topcon's underside, the only additional meter protrusion is a 2¾-in.-high, 1-in.-diameter cylinder which grows out of the motor's right front corner and extends upwards to the right of the self-timer with the motor mounted on the camera. While not the most anatomically contoured grip ever devised, it serves satisfactorily as a grab handle, particularly with the strap.

> On the motor's bottom are a sliding on-off switch and a red test button. With the former turned on, pressing in the latter causes a red test light on the motor's backside to light up if there are sufficiently energetic batteries in the battery compartment. The battery compartment



Autoflash tab at rear of lens barrel locks in guide numbers.

itself is a model of efficient simplicity. With the motor in pulleddown condition for removal, all you have to do to replace the batteries is pull outwards from the top on a hinged metal plate and then lift out the keyed plastic battery container, Reload it. following the diagram, reinsert it into the compartment, close the retaining plate and you're ready to reinstall the motor on the camera body.

Before you reinstall the motor, however, you'd better decide whether you want to use the meter. The Topcon's meter on-off switch is located on the bottom plate and once you mount the motor, you can't get to it. To mount the motor, just orient it properly and screw it in. The system is so foolproof that the motordrive lugs automatically mate with the slotted film-wind spindle during the first shot even if they're mismatched to begin with. There's an aperture on the motor's mounting plate for the traditional Topcon bottommounted, camera-back-opening twist lock and a rewind button extension nestled under the battery compartment hinge, so both these functions can be performed without removing the motor.

Finally, the moment of truth.



We've installed fresh batteries. checked them, screwed in the motor, refastened the grab strap and loaded the camera with film. Will it really fly? The answer is a resounding yes. With the strap over your knuckles, your index finger on the front-mounted shutter release and the rest of your fingers around the perfectly round grip, the Topcon DM fits comfortably and securely in your right hand. Raise the camera to eye-level horizontally with your left hand on the focusing ring and everything "falls readily to hand." Walk down the street with the strapped-on camera at your side



Topcon Auto Winder: World's most compact thumb saver.

and it feels like an extension of your hand. It's obvious that Topcon's engineers spend as much time field testing the DM as getting it sorted out on the drawing board. Oh, it's noisy alright, like all electric-motor SLR's, and the Topcon Super D's mirrorshutter noise level doesn't help the situation any. On the other hand, it's light (3 lb. 7 oz.) and relatively compact (51/8 x 33/4 x 41/8 in.) for a camera of its type. Shooting verticals with the DM is somewhat awkward and takes some getting used to but, on the whole, it's better than the vast majority of manual film-advance cameras we've tried for a rapid sequence of "on-the-spot" news photos (with or without flash) and most types of sports coverage. We were also quite impressed with the number of 36-exp. rolls of 35mm film we were able to run through the camera on a single load of four alkaline energizer batteries-over 30 rolls-which we attribute to an efficient circuit with very low current leakage.

Often, motors require extensive surgical adaptations or special "motor-drive" bodies to function properly. If you have a Topcon Super D, it is one of the former, but it requires only relatively minor surgery (the installation of one switch to close the film-advance circuit as you release the shutter button, plus one electrical contact) to effectively convert it into a DM. The operation itself costs about \$50. The Topcon Auto Winder is \$123.50.

that we were impressed by the diminished at f/2.8.

Super DM's mechanical and metering capabilities, you're correct. We're happy to report that the DM fared equally well in our other lab examinations. The conventional horizontal Leica-type cloth shutter was commendably accurate, varying less than 20 percent at all marked speeds. We were particularly impressed with a 10 percent deviation at 1/1000 sec. Another indication of the Topcon's scientific background is the percentages of the actual recorded scene seen in the viewfinder: 99 percent vertically and 95 percent horizontally (though we wish they were both equal at 97 percent). The only discrepancy we found in the Topcon's optically precise construction was that this border of recorded picture area not seen in the finder was not evenly distributed around the rectangular frame, but shifted .4mm downwards.

And now the final innovationin the lens focusing mount, of all places. In contrast to all other 35mm SLR's we've heard of, the DM's 50mm f/1.4 autoflash Topcor doesn't use helical focusing at all. Instead, a slotted spiral cam cut into the lens barrel accepts a matching peg-shaped cam follower which emerges from the inside of the lens' focusing ring. It's certainly a smooth and decisive focusing system which, no doubt, accounts for this system's widespread acceptance among the zoom rings of zoom lenses and the focusing rings of the latest crop of macro zooms.



Rewind button is tucked under battery pack for easy access.

Optically, the largish 134-in.deep, 2%-in.-diameter lens performed very well under a wide variety of lab and field conditions. As you can see from the charts, lines-per-mm resolution was above average for an f/1.4 lens.

On the optical bench, our observations also indicated the f/1.4 Topcor's better-than-average design and good overall construction. On-axis color was visible wide open as a low-energy magenta fringe, while lateral color, also well-controlled, was barely observable as a slight violet fringe. The former was eliminated by stopping down to f/4. A normal amount of spherical-aberrationinduced flare of fairly high intensity was also observable at f/1.4 but was virtually eliminated from f/4 on down. Off-axis skewray flare, strong at maximum If you've gotten the impression aperture, was almost completely

Astigmatism and coma were both visible wide open, but were present in normal amounts and largely absent by f/4. Decentering was also observable wide open, but was much improved by f/4, and a focus shift of 0.06mm occurred on stopping down, a slightly better-than-average performance for a lens of this type.

Examining our test transparencies with our 50X Omag microscope corroborated our findings on the optical bench. Flare due to spherical aberration was fairly large at f/1.4, low at f/2.8 and virtually absent from f/4 on down. Color correction in the center of the field was very good, while off-axis color (purplish) was barely visible. No trace of decentering was observable in the picture and astigmatism was not observable even wide open. The well-baffled Topcon body was also free of ghost images. Coma flare, however, was rather prevalent wide open, mostly gone by f/4 and completely absent by f/5.6. From f/5.6 on down, the Topcon's imaging was particularly crisp and sharp.

Ultimately, we've got to get back to handling, for this in our opinion is the DM's reason for being. If a precision full-aperture, match-needle, behind-lens metering SLR-even one with a removable prism, sound engineering and construction, and an electric film wind-doesn't sound too exciting by today's standards, we can only say that using the Topcon Super DM proved to be infinitely more informative than reading the spec sheet. A motor drive-even a one-at-a-time motor drive-must be experienced to be appreciated. Of course, camera snobs will appreciate the gasps of the knowledgeable as they whir and click along like professionals, consuming great gobs of film. But anyone serious about taking lots of pictures in a hurry will appreciate less camera movement during rapid sequences, not to mention the saving in wear and tear on the film-advance thumb. The fact that this diabolically straightforward device happens to attach to one of the better 35mm SLR's in production doesn't hurt either.