

Beseler **TOPCON**

WITH
BEHIND
MIRROR
METER
SYSTEM

CB

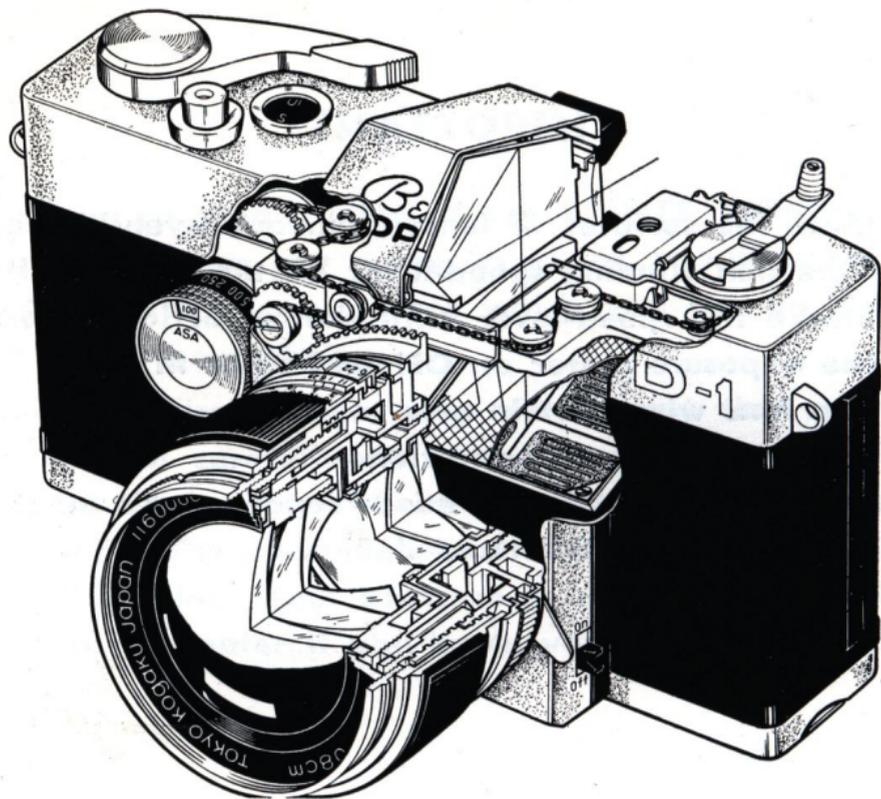
D1

Congratulations on your choice of the BESELER TOPCON D-1 which we are sure will give you many years of unfailing service. The BESELER TOPCON D-1 is a camera which you can be proud of and which will justify your choice.

Before touching your camera, may we suggest that you read this instruction manual carefully, in the order that it is written, and that you familiarize yourself with its working parts (so that your fingers will work the camera automatically) before you even load your first roll of film. Your pleasure in using the BESELER TOPCON D-1 will be even greater if you know your camera thoroughly.

IMPORTANT

- 1. Don't touch the surfaces of lenses, mirrors, eyepiece, or shutter.**
- 2. Stroke the film winding speed-lever all the way—until it stops.**
- 3. Don't stroke the speed-lever until shutter action is completed.**
- 4. Keep the exposure meter on OFF when not in use.**
- 5. Cover the lens when not in use.**
- 6. Don't use force Re-read instructions.**
- 7. If your BESELER TOPCON D-1 needs repair, don't do it yourself. Contact the nearest authorized dealer.**



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PART I

THE BESELER TOPCON D-1

In this part you are introduced to the camera, the names of its various parts, the distinctive features of the camera and the BESELER TOPCON D-1 system of photography, which is built around the fully integrated single lens reflex system.

A FULLY INTEGRATED SINGLE LENS REFLEX SYSTEM

The BESELER TOPCON D-1 is a fully integrated and completely automated single lens reflex camera. It is complete in all details and equipped with many of the latest advanced features, not generally found in a camera of this class. It is a very valuable second camera for professionals who already own a Super D. It is an excellent single lens reflex for advanced amateurs, or

even for beginners, who want to use the best there is.

The principal virtue of the camera is the system itself—with viewing-focusing through-the-camera-lens. There is absolutely no parallax—even when the standard lens is exchanged for a telephoto, or extended by bellows, or used for photomicrography—and auxiliary finders are not required or supplied. Because the reflex mirror intercepts the very image that will be focused on the film plane, the final picture is always seen even before the shutter is released.

BUT, the real value of the BESELER TOPCON single lens reflex system is in its focusing screen:—

- (1) The screen is precision centered to coincide exactly with the center of the film frame, and shows an almost life-size finder area that matches the exact film area,
- (2) The focusing screen has TRUE (not plain glass) ground glass boosted with fresnel lens for corner-to-corner brightness, and,

(3) A micro-prism focusing spot, surrounded by a fine focus ring, for speedier linear focusing and faster ground glass focusing.

For full automation of the single lens reflex system, the BESELER TOPCON D-1 has the fully automatic instant opening lens diaphragm action, —in all popular focal length lenses. This means that the lens is always wide open for maximum view-focusing ease but closes down automatically to the predetermined aperture for the picture-taking moment and re-opens once more to wide aperture, in an action that is so fast that it is hardly noticed at faster shutter speeds.

And, for added convenience, this lens action is always coupled with the instant return mirror action, which means that the reflex mirror, in coordinated action with the shutter and lens diaphragm, jumps out of the way for picture-taking but snaps back instantly to viewing position, completely eliminating mirror black-outs and permitting rapid sequence shooting. The action is fast but positive with

mirror vibration held to a minimum.

However, the most astonishing and revolutionary feature of the BESELER TOPCON D-1 is the built-in thru-the-lens Mirror-Metering system. This is a CdS exposure meter attached behind the reflex mirror and internally coupled to both lens diaphragm and shutter speed. In other words, it is only necessary to take a reading of the reflected light from the subject area (same as seen on the focusing screen) coming through the lens onto the mirror; adjust either aperture or shutter speed, or both, until the match-point indicator in the finder shows exposure is correct; and, then simply press the shutter release to get the picture.

Since the exposure reading is through the lens, it is highly accurate. Because only 7% of the Mirror-Lite is taken away from the finder, the view is neither obstructed nor darkened. And, the Mirror-Meter is mechanically coupled to all RE. Auto-Topcors. This means that full automation is not lost and view-focusing at maximum aperture is possible.

For speedy view-focusing, and to take full advantage of the single lens reflex system, the BESELER TOPCON D-1 has a fixed Pentaprism finder, unexcelled for speedy snap-shooting. It has a large rectangular-shaped eyepiece, which permits viewing into all four corners of the finder field. The eyepiece frame has vertical slots on either side to which various accessories, may be attached.

The crowning touch to the BESELER TOPCON D-1 is, of course, the range of superior TOPCOR lenses—noted for fine optical design, superior lens characteristics and general top performance under difficult shooting conditions. The seven most popular focal lengths are supplied with the fully automatic lens diaphragm—the RE. Auto-Topcor group. Telephoto lenses are also supplied with preset diaphragm—the R. Topcor group, greatly increasing the range of shooting that can be handled. And, for convenience and maximum performance in close-up shooting, there also two wonderful Macro-Topcor lenses. These have been spe-

cially designed with extreme lens extensions. To round out the BESELER TOPCON D-1 system of photography, most of the top quality accessories available for the BESELER TOPCON Super D can be used. In addition, other exclusive accessories, greatly increase the D-1's versatility in various fields of photography—macrophotography, photomicrography, reproduction work, color slide copying, etc.

Finally, please remember that the BESELER TOPCON D-1 system is a growing system and that additional valuable and practical accessories and lenses will be made available as the need arises.

MAIN FEATURES OF THE BESELER TOPCON D-1

Standard Lens:

RE. Auto-Topcor f/1.8 58mm 6 element lens. Exakta type modified bayonet mount. Fully automatic instant opening lens diaphragm internally coupled to built-in exposure meter. RE. Auto-Topcor f/1.4 58mm 7 element lens is also available.

Shutter:

COPAL Square focal plane shutter, with non-rotating single axle shutter speed dial. Eleven equal distant shutter speed settings 1, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125, 1/250, 1/500, and 1/1000 sec. plus Bulb; internally coupled to built-in exposure meter.

Finder:

Eye-level Pentaprism finder, with large-size rectangular-shaped eyepiece. Eyepiece frame has vertical slots for accepting eye-cup, accessory shoe, adapter for correction lens, magnifier, and angle viewer.

Focusing Screen:

True ground glass over full area is boosted by fresnel lens for overall brightness; has micro-prism focusing spot surrounded by fine focus ring. Center of finder is aligned exactly with center of film frame.

Mirror Action:

Positive stopping instant return mirror action, coupled with shutter and lens diaphragm actions.

Exposure Meter:

Cadmium Sulphide exposure meter is attached behind (and is an integral part of) the reflex mirror. Narrow 0.05mm (0.002") slits cut in mirror surface permit 7% light transmission to meter, without darkening or obstructing focusing screen view. Gives average reading for whole subject area seen in focusing screen. Internally coupled to both shutter speed and lens diaphragm (of all TOPCOR lenses). Match-point indicator in right lower half of focusing screen. Covers range of EV 2.7 to EV 16.7, with ASA 100 film and f/1.8 lens. Works on STANDARD miniature 1.3 volt mercury battery.

Flash Synchronization:

M-X twin flash sockets for synchronization with all flash bulbs and electronic flash units. Class M and FP bulbs synchronize at all speeds with flash cord inserted in M-socket. Using the socket marked "X", electronic flash synchronizes at all shutter speeds up to and including 1/125 sec. (Red colored settings on speed dial) system.

Speed-Lever:

180 degrees single stroke, advances films, charges shutter and mirror raising mechanism, as well as advancing exposure counter.

Exposure Counter:

Additive exposure counter automatically returns to start-mark upon opening camera back.

Film Rewinding:

Fold-down rewind crank flips open for fast rewinding action; turn-stop rewind button automatically pops up with speed-lever action.

Self-Timer:

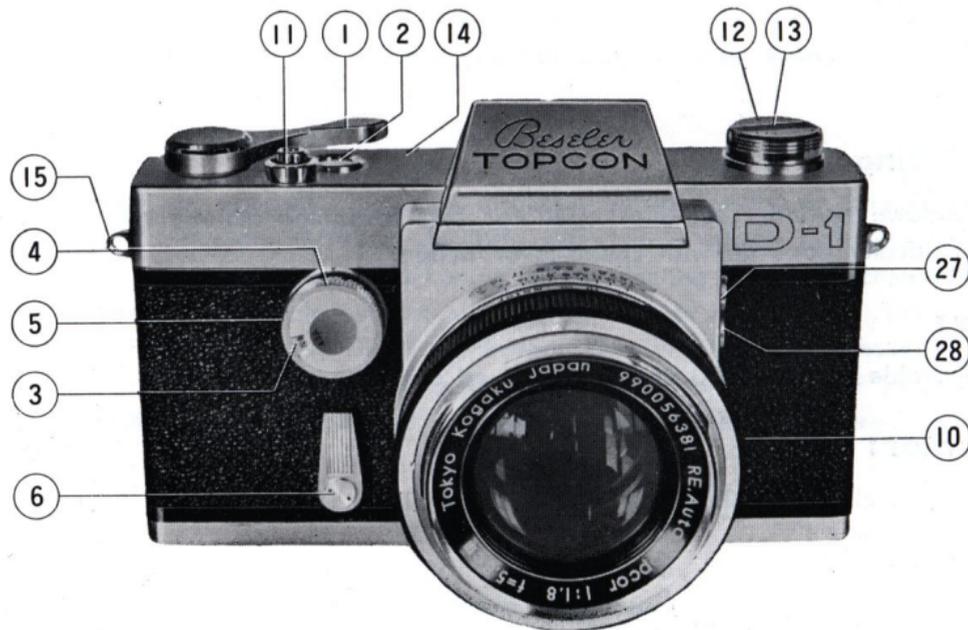
Adjustable for 5 to 10 seconds delayed action.

Film Indicator:

Nineteen click-stop film speeds ASA 25 to 1600 (or DIN 15 to 33.)

Film Loading:

Hinged camera back locks tight on safety catch when closed. Opens when lock is pulled down.

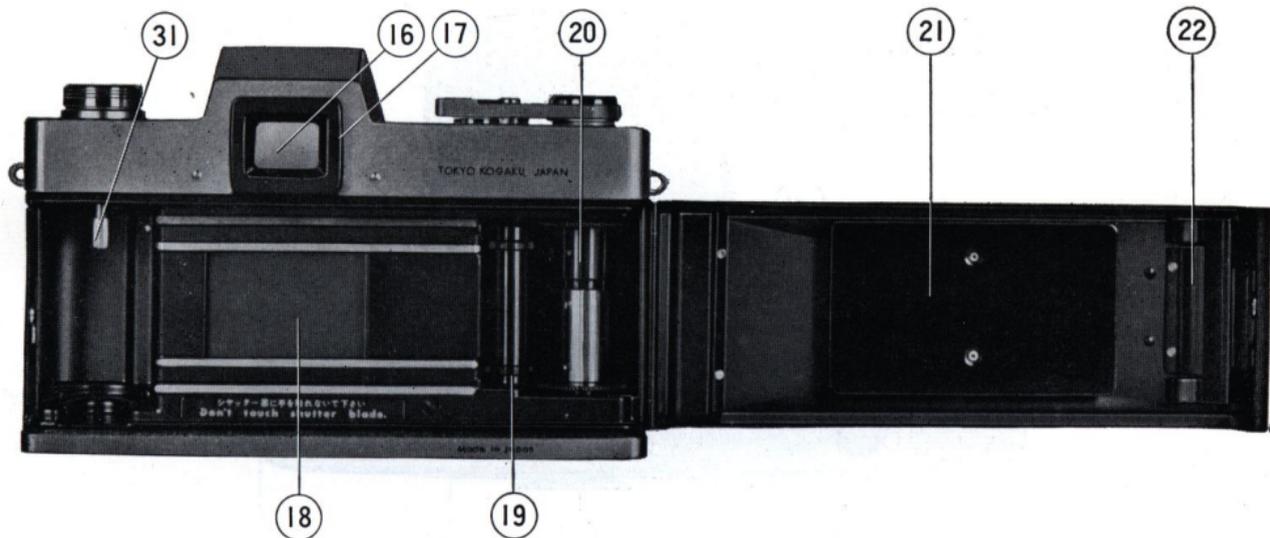


NOMENCLATURE

- ① Film winding speed-lever
- ② Exposure counter
- ③ Film speed indicator

- ④ Shutter speed scale
- ⑤ Film speed adjusting ring
- ⑥ Self-timer lever

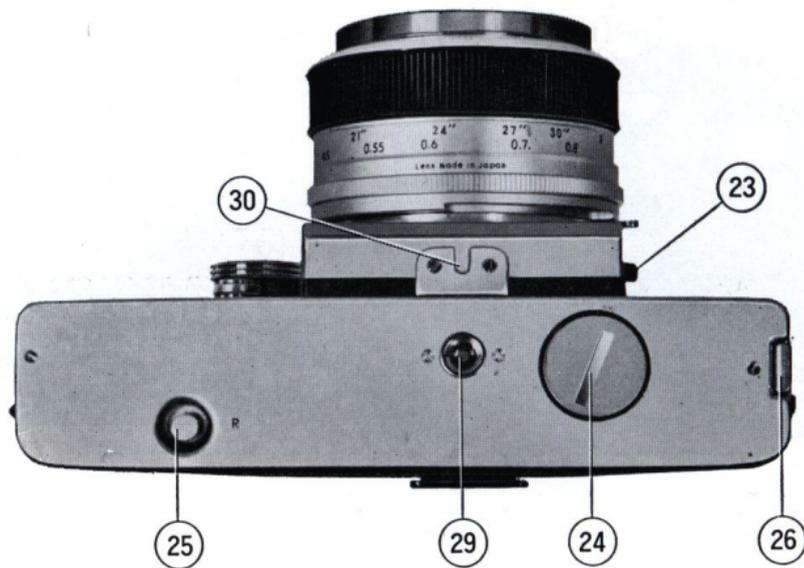
- ⑦ Aperture ring
- ⑧ Depth of field scale
- ⑨ Distance focusing ring



- ⑩ Lens locking lever
- ⑪ Shutter release button
- ⑫ Rewind knob

- ⑬ Rapid rewind crank
- ⑭ Film plane indicator
- ⑮ Shoulder strap lug

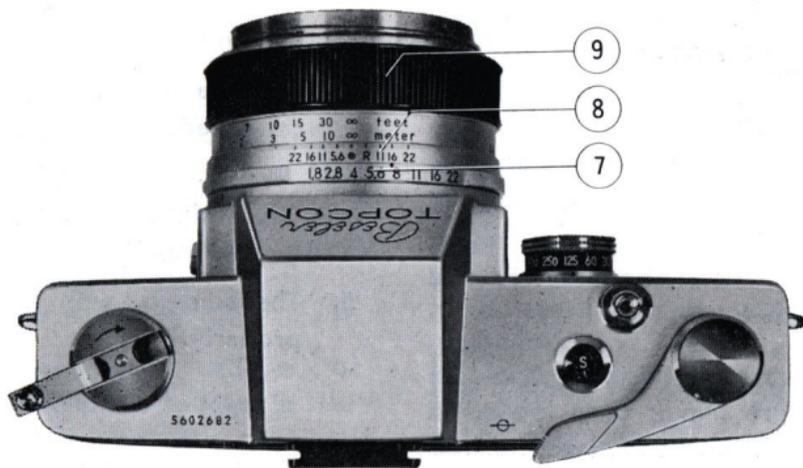
- ⑯ Finder eyepiece
- ⑰ Eyepiece frame slot
- ⑱ Focal plane shutter



- ⑱ Film transport sprocket
- ⑳ Film take-up spool
- ㉑ Film pressure plate

- ㉒ Cartridge pressure spring
- ㉓ Battery switch
- ㉔ Battery compartment cover

- ㉕ Rewind button
- ㉖ Back cover lock
- ㉗ M-setting flash socket



- ②8 X-setting flash socket
- ②9 Tripod socket
- ③0 Alignment groove

- ③1 Rewind shaft

PART II

BASIC PICTURE-TAKING PROCEDURES

Only the basic procedures for taking pictures with the BESELER TOPCON D-1 are given in this part. Additional information for taking superior pictures are covered in Part IV and film loading is discussed in Part III.

The procedures covered in this part should be practised fully, before film is even loaded in the camera. You should become so familiar with the movements that they are done automatically. Basically, picture-taking may be considered simply as—

1. Advancing the film one frame, cocking the focal plane shutter, charging the mirror mechanism, etc., and
2. Releasing the shutter.

However, since exposure conditions change, as well as the distance to the subject, it is also required that—

3. Exposure be set properly, and
4. Distance be correctly focused and subject composed.

And, finally, since sharply focused pictures can only be attained if the camera does not move while shooting, it is also necessary that—

5. The camera, with accessories, be held properly.

CORRECT EXPOSURE

One of the most important factors governing the taking of superior pictures is correct exposure, which is the correct relationship between—

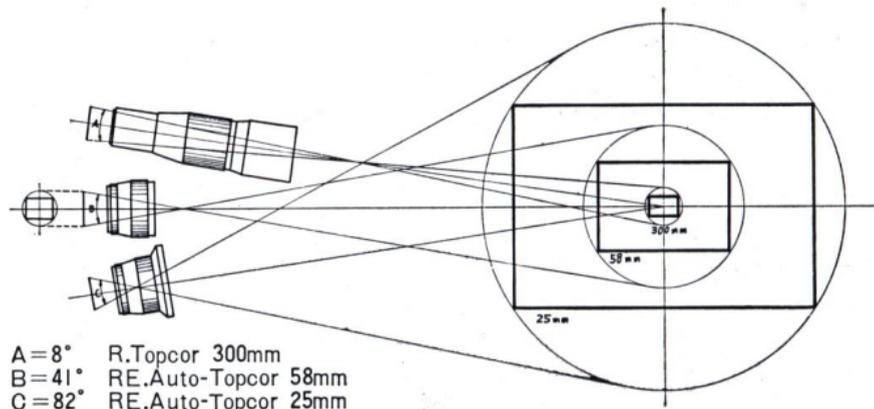
1. Shutter speed, and
2. Aperture (lens opening), as decided by—
3. The brightness of the subject, and dependent on—
4. The speed (film sensitivity — ASA or DIN index number) of the film loaded in the camera.

When either the lens opening or shutter speed, or both, are incorrect for the brightness of the subject matter, either under-exposure or over-exposure is the result. Thus, it can be seen that it is very important to be able to judge the brightness of the subject correctly in order to obtain properly exposed pictures.

TOPCON Mirror-Meter :

For obtaining far more accurate exposure adjustments than possible with other cameras, the BESELER TOPCON D-1 has an exclusive built-in CdS Mirror-Meter (an exposure meter attached behind the reflex mirror). It is internally coupled to both shutter speed and lens diaphragm. Since the Mirror-Meter is designed to give an average exposure reading for the full area covered in the focusing screen, based on the amount of light reflected from the subject through the camera lens onto the reflex mirror, it is superior to other exposure meters.

1. It gives precise accurate exposure readings no matter whether interchangeable lenses, from wide-angle to telephoto, or special lenses are attached to the camera, or even when the camera is used on the microscope or with the telescope, and, of course, it works perfectly with the standard 58mm lens.
2. The exposure factor is automatically taken



into account when the lens is racked out for ultra close-up shootings.

3. Filter factors, light transmission properties of the lenses, overall illumination of the field of view, etc., are all automatically taken into consideration and exposure calculations and worries are always eliminated.

The exposure measuring range of the Mirror-Meter is entirely dependent on the speed of the lens attached to the camera because exposure readings are always taken of the

reflected light coming through that particular lens. For example, with the fast RE. Auto-Topcor f/1.4 lens and ASA 100 film, the Mirror-Meter is capable of measuring image brightness from 0.5 cd/m² to 8000 cd/m², or giving exposure readings from EV 2 to EV 16, which is automatically changed to EV 4 to EV 18 (image brightness 2 cd/m² to 32000 cd/m²) when the f/2.8 lens is attached (and ASA 100 film used).

Setting Film Speed :

Since correct exposure is dependent on the film speed, the film speed indicator (3) should first be set to the proper ASA (DIN) speed number.

Lift up and revolve the milled ring, around the shutter speed dial, until the required number is seen in the window on top of the dial face. There are nineteen click-stop ASA (DIN) film speeds from 25 to 1600, with the stops between numerals indicating intermediate speed numbers.

In you are not sure what your film speed is, check the instruction sheet in the film package. If speeds other than ASA (DIN) are indicated, use the following table for conversion to the film speed of the camera.

ASA & BSA	DIN 4512/1	European Scheiner	TGL 16150	Weston
25	15	26	15	20
32	16	27	16	24
40	17	28	17	32
50	18	29	18	40
64	19	30	19	50
80	20	31	20	64
100	21	32	21	80
125	22	33	22	100
160	23	34	23	125
200	24	35	24	160
250	25	36	25	200
320	26	37	26	250
400	27	38	27	320
500	28	39	28	400
650	29	40	29	500
800	30	41	30	650
1000	31	42	31	800
1250	32	43	32	1000
1600	33	44	33	1250

Exposure Reading :

Switch on the exposure meter, by pushing the control switch (23) up to ON. This will place the exposure pointer index (a circle on the end of a pointer) into the lower right half field of the finder. Next, point the camera at the subject until the required area fills the focusing screen (and Mirror-Meter).

Adjust either the shutter speed dial or the aperture ring or both, until the match-point indicator, seen in the lower right half of the finder field, is aligned correctly with the index.

Normally, it is simpler to choose a suitable shutter speed first and then adjust the aperture ring until the indicator is aligned to show correct exposure. This is because the aperture ring is moved in the same direction as the movement of the indicator.

The top and bottom rims of the circular index

can be used for obtaining one stop over or under exposure adjustments where desired.

In all instances, however, once correct exposure is obtained with the finder indicator, both shutter speed and lens openings are automatically adjusted and nothing else need be done.

Recommended Shutter Speeds :

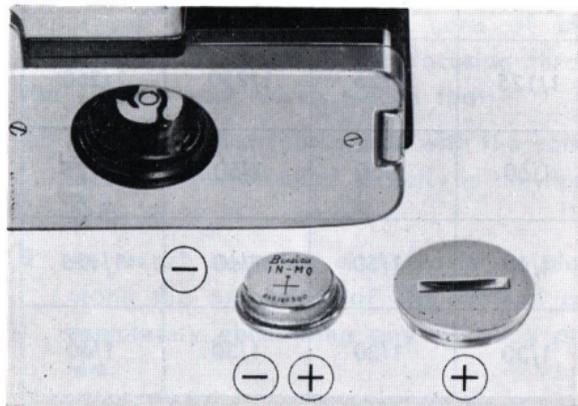
As noted previously, it is recommended that the shutter speed be set first, as it is more often dictated by the lighting condition and film speed. The table on page 17 should be used as a general guide:—

CAUTION:

For longer battery life, the exposure meter control switch should be set to OFF when not in use (the circle index mark will disappear from the finder field when set to OFF).

Changing Battery:

Use a coin, or similar object, to unscrew the battery compartment cover (24). Let the old battery drop out of the compartment. Insert the new battery, being careful that the + side is facing outwards or else you will short-circuit your meter.



NOTE:

The battery is a round mercury battery of 1.3 volt, similar to PX-13 (Mallory), E625 (Eveready), No. 625 (General) and TH-MC (Toshiba). If you cut off your meter after each reading, your battery should last almost 2 years under normal usage. However, it is recommended that you exchange it every year because the mercury battery does not slow down but suddenly drops dead.

CAUTION:

The shutter speed dial of the camera cannot be revolved completely, although it may be revolved in either direction. It will not go beyond 1000 (for 1/1000 second) or B. (for bulb exposures).

CAUTION:

Do not use B (bulb exposure) for exposure readings. It is not suitable for taking a reading.

Lighting	Film Speed (ASA) (DIN)	25	32	50	100	200	400
		15/10	16/10	18/10	21/10	24/10	27/10
Bright Sun on Sand or Snow		1/125	1/125	1/250	1/500	1/1000	1/1000
Bright Sun Strong Shadows		1/125	1/125	1/125	1/250	1/250	1/500
Hazy Sun Weak Shadows		1/125	1/125	1/125	1/125	1/250	1/250
Cloudy Bright No Shadows		1/60	1/60	1/60	1/60	1/60	1/125
Open Shade Under Clear Blue Sky		1/60	1/60	1/60	1/60	1/60	1/125
Cloudy Rain		1/60	1/30	1/30	1/30	1/30	1/60

SINGLE LENS VIEW-FOCUSING

Two other important factors for obtaining good pictures are:—

1. Accurate focusing of the image on the film plane, and
2. Correct composition of the subject matter within the limits of the negative area.

In the BESELER TOPCON D-1, both these important factors are taken care of by a single system,—viewing and focusing through the camera lens, which means that—

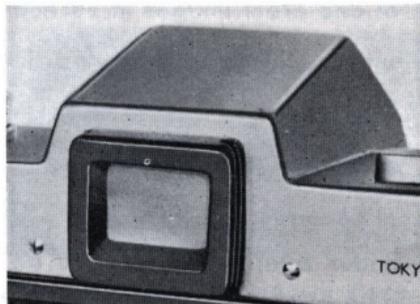
1. Focusing adjustments made with the camera lens can be checked directly in the finder, and,
2. An exact negative size frame is placed along the extension of the optical path, completely eliminating any parallax problem.

Furthermore, the system as incorporated in the BESELER TOPCON D-1 is doubly attractive because—

1. Focusing is always done at the widest aperture and the lens diaphragm closes down automatically (not manually),
2. The finder shows 93 percent of the final negative frame, with an equally spaced margin area around the full frame, and,
3. The centers of the finder and film negative frame coincide exactly.

Pentaprism Finder :

The finder system utilizes a Pentagonal prism



finder, which is precision-made of the finest optical glass.

With the Pentaprism finder—

1. A right side up laterally correct image, moving in the same direction as the actual subject, is always seen, and is especially attractive for fast, candid type snap-shooting.
2. Both eyes can be used for shooting, with one eye on the finder and the other on the general scene. This is particularly useful when following a moving object.
3. Eye-level viewing also means correctly lateral and erect images in vertical format.
4. Brilliant and life-size enlarged image are obtained.

Large-Size Finder Eyepiece :

The BESELER TOPCON D-1 has one of the largest finder eyepieces (16), and an eye-cup also may be attached to the eyepiece frame.

The large-size rectangular eyepiece is valuable for checking all four corners of the finder area, even when the user wears eyeglasses.

Correction lenses may also be used if the user's eyesight is defective.

Attachment of Correction Lens :

For diopter correction, six accessory lenses for giving -3 to $+3$ correction are available. There is also an adapter which attaches to the eyepiece frame. The adapter should be slipped into the eyepiece frame slots (17) and the correction lens should then be



screwed into the adapter. Consult your optician for the proper correction.

Focusing Adjustments :

All focusing adjustments for obtaining a sharp image on the film plane must be made directly on the camera lens itself, simply by revolving the distance focusing ring (9) in either direction until the image is properly focused. The distance may be found by reading the distance figure opposite the distance index, which also doubles as the aperture index. All focusing adjustments are checked on the focusing screen.

Focusing Screen :

The focusing screen has a full-area ground glass field plus a micro-prism focusing spot, surrounded by a fine focus ring.

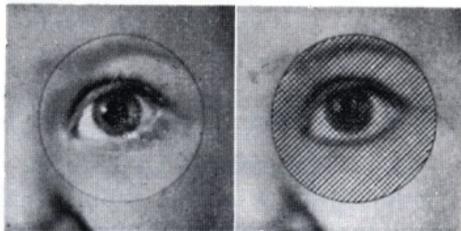
1. Full-Area Ground Glass: The ground glass extends over the full area of the finder screen, except for a central round portion, and is boosted for additional brightness and brilliance by the TOKO-

BRITE, a fresnel type plate lens.

2. Fine Focus Ring: A narrow ring surrounds the split-image rangefinder, which is not assisted by the fresnel lens but gives a finer focusing ground glass circle.

Ground glass focusing is done at wide aperture by observing the sharpness of the image as seen on the ground glass. If sharpness is in doubt, re-focus in either direction from the initial point of utmost sharpness and compare results.

3. Micro-Prism Focusing Spot : The focusing spot in the center is made up of



In Focus

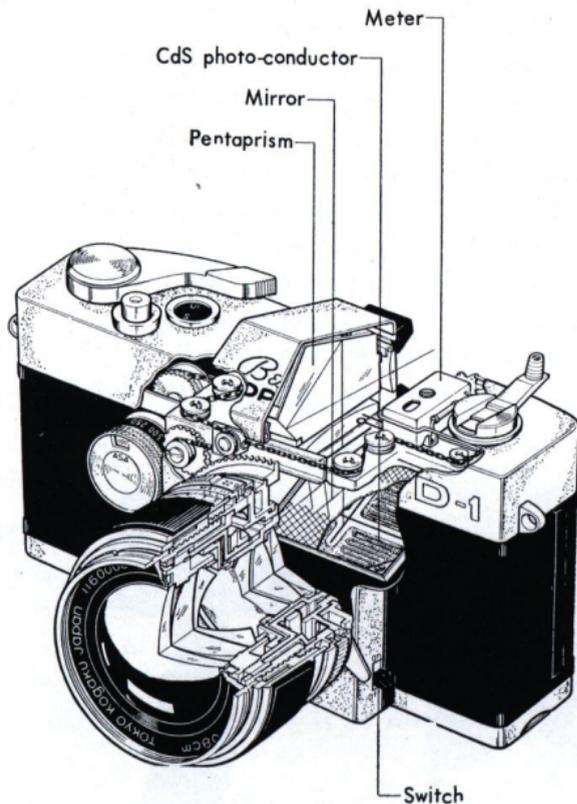
Not in Focus

numerous microscopic prisms which break up the image when it is not in focus so that the image is seen indistinct and blurred. When the distance focusing ring is revolved and the subject is accurately focused, the image in the focusing spot will be seen distinctly and sharply.

Subjects with linear features will be particularly effective for focusing because the straight lines will look ragged and broken up when out of focus but will be seen straight when in focus.

When in doubt, revolve the distance focusing ring either ways from what is considered optimum focusing and check the effect.

Combined focusing is recommended in most cases. The area covered by the micro-prism finder spot is small, and the ground glass simultaneously enables one to focus on the entire picture area.



HOLDING THE CAMERA

As important as correct exposure and accurate focusing are for getting better pictures, it is just as important to hold the camera in the most steady and comfortable working position. Practise the following methods. They are recommended for the BESELER TOPCON D-1, but may also be used with longer lenses attached, or with the angle finder in position.

Horizontal :

Most photos are taken in the horizontal format. Take a firm grip on the distance focusing ring (9), with the left thumb and left forefinger, resting the camera body on the palm of the left hand. Place your right thumb against the speed-lever (1), with either the right forefinger or middlefinger on the shutter release button (11) and the rest of the hand cradling the right side of the camera

body. Most of the holding will be done by the left hand, which will also take care of focusing. The right hand should advance the film and take the picture.

In this position, the camera should be brought up to the right eye, leaving the left eye to take in the whole field. Press both elbows tightly against the body for additional support. The camera should be pressed against the forehead to minimize camera movement.

Vertical:

Without changing the basic grip noted above, turn the camera around until the speed-lever side is topmost. Now the left side of the camera body will be supported by the left hand. The right elbow will not be pressed against the body but will jut out into space, not giving any support to the camera. This version, however, is superior to turning the camera body around the opposite way because the speed-lever can still be used for speedy



winding action.

Upside-down Horizontal :

Although not recommended for everyday shooting, it does give some additional height. The distance focusing ring should be held by the right thumb and forefinger, with the Pentaprism resting on the palm of the right hand. The left hand should be used for advancing the film and pressing the shutter release, with the left thumb on the speed-lever and the left forefinger on the shutter release.

NOTE:

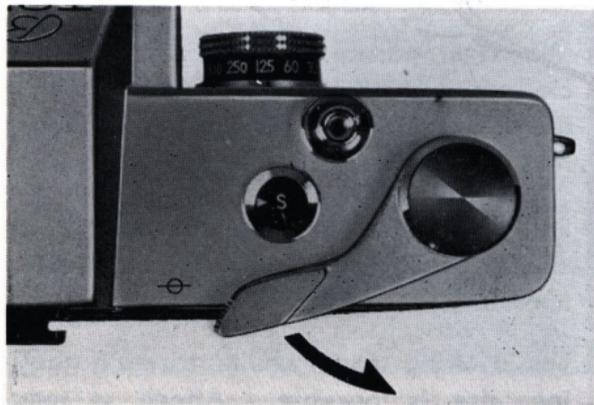
While the above methods are recommended, individual preference may take precedence if the camera can be hand-held in the most comfortable position to assure steadiness without strain, and if there is no loss of handling speed.

In any case, the following principles must be followed to keep camera shake at a mini-

mum :—

1. Spread the legs wide apart. Use the body, or as much of it as possible for supporting the camera. Dig both elbows into the body, press the camera against the forehead, nose and/or cheek, depending on your facial structure, etc.
2. Hold the camera firmly but not tensely. Leave the fingers free to work.
3. Don't jerk the shutter button. Press it smoothly and gently.
4. Whenever possible use the tripod, especially at slower speeds. If not possible, use other props, such as desk, chair, tree, ledge, or anything solid.
5. Pull the neck strap taut, whenever possible, looping it around the wrists, if necessary, for further support.
6. Use a string (rope, chain) tripod if nothing else is possible. Attach a long

string to the lugs of the camera body and pull it taut by running it around both feet.



SPEED-LEVER ACTION

In the holding positions noted, the ball of the right thumb is kept constantly pressed against the speed-lever. When an exposure has been made, the right thumb is used to push the speed-lever as far as it will go, letting it return on its own accord.

In any case, the speed-lever action will—

1. Advance the film by one frame,
2. Advance the exposure counter by one frame,
3. Cock the focal plane shutter,
4. Charge the mirror raising mechanism,
5. Release the shutter lock,
6. Set the flash circuit, and
7. Engage the speed-lever lock.

SHUTTER RELEASE

When the shutter release button (11) is gently and smoothly pressed with the right forefinger, the following actions take place as the picture is taken:—

1. The mirror swings up. (The safety flash circuit is half closed.)
2. The lens diaphragm closes down to the pre-determined aperture.
3. The focal plane shutter opens and closes, taking the picture. (The shutter flash circuit is fully closed.)
4. The mirror return mechanism is charged.
5. The mirror returns to reflex viewing position. (The safety flash circuit is broken.)
6. The lens diaphragm opens to full aperture.
7. The shutter release is locked.
8. The speed-lever lock is released.

PART III FILM LOADING PROCEDURE

Now that you have thoroughly familiarized yourself with the BESELER TOPCON D-1 and know how to view-focus, set exposure, hold the camera and take the picture, you are ready to load your first roll of film in the camera and actually take your first pictures.

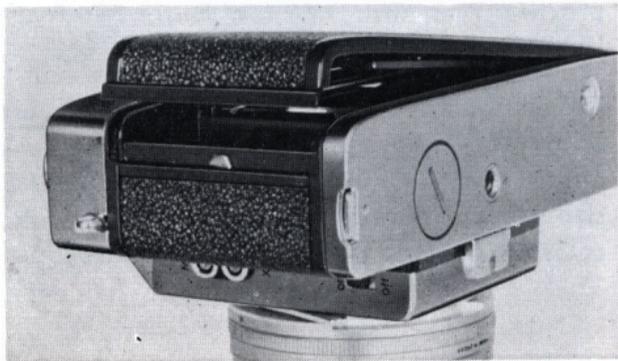
If you have an old roll of exposed 35 mm film, however, it is a good idea to try several practice runs with the film before actually loading your first roll of good film.

The BESELER TOPCON D-1 is designed to use 35 mm film in daylight cartridges and will take either 20 or 36 exposures of 24 mm × 36 mm size black-and-white pictures. There are also color films of 12, 20 or 36 exposures.

FILM LOADING

Both loading and unloading of films should never be done in direct daylight or strong artificial illumination, although it is not necessary to get into a really dark room. Outdoors, get in the shade of trees, buildings, or even your own body, where no direct light will hit the camera. The camera should be placed on a solid object or on your lap so that it will not be dropped accidentally.

Opening Camera :



1. Pull down the back cover lock (26) on the bottom of the camera and the back cover will spring up.

CAUTION :

Don't press the back cover at this time or it will not spring up.

2. Pull it open all the way.

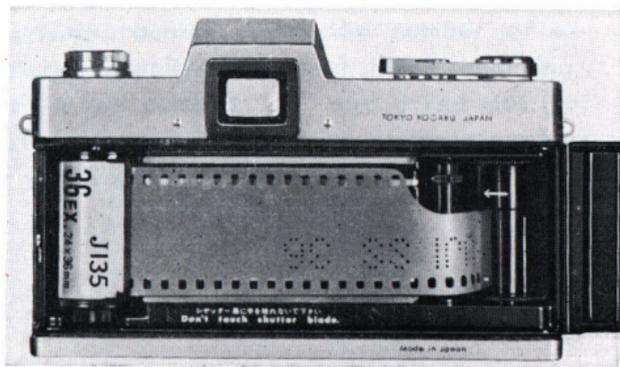
Loading Film :

3. Pull up the rewind knob (12) as far as it will go and insert the loaded film cartridge into the empty chamber, with the



leading end of the film pointed towards the take-up spool (20).

4. Push the rewind knob back down to catch hold of the film cartridge. If the slot on the rewind (film cartridge) shaft (31) does not engage the cartridge, revolve the rewind knob until it catches.
5. Pull out the film from the cartridge and insert it as deep as possible into the slit on the film take-up spool (20), checking, at the same time, that the perforation on the film engages the catch, which will



be seen protruding at the lower end of the slit on the film take-up spool.

If the slit is not visible, revolve the film take-up spool, by its serrated flange, until the slit appears.

6. Revolve the serrated flange slowly so that the film perforations at the top and bottom fully engage the film transport sprocket (19) teeth.

Closing Camera :

7. Once the perforations fully engage the sprocket teeth, carefully close the back cover by pushing it until it catches.
8. Slowly turn the rewind knob (12) clockwise which will tension the film inside the cartridge. Once this is done, each time the speed-lever is stroked the rewind knob will also turn counter-clockwise, indicating that the film is being advanced properly.

Advancing the Film:

9. Push the film winding speed-lever (1) with the thumb of the right hand until a full stop is made. As noted, this action will not only advance the film one frame but also charge the shutter action, as well as other inter-related mechanisms.

Press the shutter release button (11).

10. Repeat the above operation once more, which will mean that two frames will have been advanced and that the next

film winding action will place the third frame into position for actually taking the first shot.

The two blank exposures are required because the first two frames may have been exposed in film loading.

CAUTION:

Always stroke the film winding speed-lever until it makes a full stop.



EXPOSURE COUNTER

For keeping track of the number of exposures made, the BESELER TOPCON D-1 has an automatic exposure counter (2) which requires no adjustment at all. Whenever the back cover is opened, the exposure counter automatically returns to the starting-mark, i.e., white dot index.

Two blank exposures put the exposure counter on "zero", indicating readiness for the actual shooting.

With each following speed-lever action, the exposure counter shows the number of exposures actually taken (not those remaining), with a red colored "20" and a red dot (for 36) to show the completion of these numbers of exposures.

UNLOADING FILM

After the last exposure is made, as indicated by the exposure counter, do not advance the film winding speed-lever, anymore or you will tear the film, or pull it out of its cartridge.

In any case, if the speed-lever does not move easily, the exposure counter should be checked to see whether the last exposure has been taken or not.

If the last exposure has been taken, leave the speed-lever half-advanced, as it is, and proceed with rewinding the film.

CAUTION:

Don't open the back cover at this time or you will ruin your exposed film.

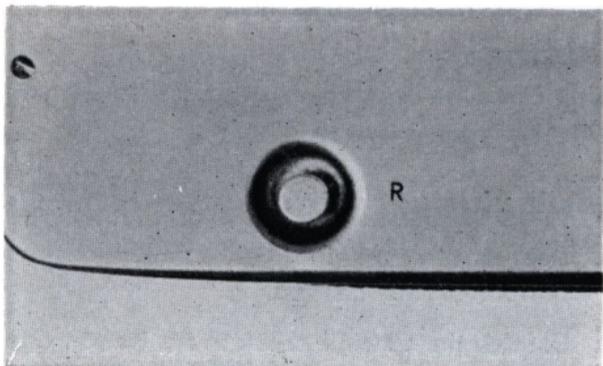
Rewinding:

1. Depress the rewind button (25) on the bottom of the camera.
2. Unfold the rewind crank from its storage position and revolve it clockwise.

Revolve the rewind crank to rewind the exposed film back into its cartridge. Rewind smoothly and at an even speed.

Erratic or too rapid rewinding, under certain atmospheric conditions, can cause static electricity marks on your film.

Rewind until you feel the tension lessen as the film end slips out of the take-up spool and then stop rewinding.



Unloading:

3. Open the back cover as noted.
4. Pull up the rewind knob and lift out the cartridge.
5. Bend the end of the film (as a sign that the film has been exposed) and place it in its original packing for full protection until the film is developed.

NOTE:

The rewind button may be left depressed because the next speed-lever action will automatically pop it up.

MAINTENANCE

1. During extremely cold weather, protect your camera by keeping it under cover (inside your coat) until about one minute before the shot (to permit condensation to clear up).
2. If the camera is intended to be used in freezing weather continuously, winterization is recommended. See your dealer.
3. In extremely hot weather, keep your camera cool by keeping it in the shade. Do not put it in the glove compartment or on the rear window deck of the car. Leave it on the floor or seat where it is the coolest.
4. Don't keep your shutter tensioned if successive shots are not intended.
5. Don't keep your distance focusing ring at the focused distance. Always return it to infinity.
6. Cover your lens(es) with their cap(s) when not in use.
7. Don't touch any of the glass surfaces, whether lens, mirror, or eyepiece with your fingers.
8. Don't touch the focal plane shutter.
9. Always keep the exposure meter on OFF, when not in use.
10. Protect your camera, lens and exposure meter against rain, dust, sand, strong sunlight and salty air outdoors by keeping the cover of the leather everready case closed until the actual shot.

PART IV

ADVANCED PHOTOGRAPHIC PROCEDURES

In the previous parts, you have been introduced to the BESELER TOPCON D-1 acquainted with rudimentary picture-taking steps, as well as shown how to load and unload film into the camera. In other words, it should now be possible for you to take quite acceptable pictures.

However, in order to get the best out of your BESELER TOPCON D-1 to take photographs of higher quality, to enjoy a wider range of photography, and to obtain satisfaction from photography, you will soon realize that the basic steps so far mastered must be augmented further. In the following sections you will find much information which should help you in improving your shots.

CORRECT EXPOSURE READING

After taking several rolls of film, you may soon realize that it is not as simple as merely pointing the Mirror-Meter at the object to obtain the desired effect or the correct exposure.

While correct exposure depends on the effect that the photographer is looking for in the final picture (such as over-exposure, under-exposure, shooting for the shadows, or just getting the high-lights, etc.), the points noted below should be followed in taking any exposure reading :—

Landscape :

Since the sky is much brighter than the general scene, the exposure reading should be taken of an area having less sky than the general scene. Otherwise the overall effect may be slightly over-exposed. It will not be necessary to shield the Mirror-Meter against the light from the sky, however, as it is deeply recess-

ed and protected against reading excess light.

Shots against the open sky:

When shooting objects, like flags, buildings, etc., standing out against the open sky, take an exposure reading of a similar object with the light striking it at the same angle as the subject matter and modify it by 1/2 stop less.

Contrasty shots:

First decide what effect is being sought and control your exposure reading accordingly. Since the Mirror-Meter gives an average reading for the full area seen in the finder area, there is no problem if an average effect is required. If, however, an entirely different effect is being sought, take an exposure reading of the portion which interests you the most, letting the contrasty portion (i.e., lighter or darker portion) get lighter or darker as the case may be.

Inaccessible objects:

For shooting objects at a far point, where exposure readings are not possible without getting an excessive reading of the background, use any nearby object with the same texture and lighting condition as the subject and take a close-up reading.

Portrait:

Move in close and take an exposure reading of the face area to be included in the shot. This will give an average reading for the face. Care must be taken, at this time to see that no shadow is cast on the subject by the camera or that the light source shines directly into the lens. If there is extreme contrast, between high-lights and shadows, and some special effect is sought for, take readings of the interesting portion at close-up distance, of approximately four inches.

Back-lighting:

If possible, move in close and take a reading of the front-lighted subject area only. Check to see that the back-light does not affect the reading. If this is not possible, take a reading from the camera position but then open the lens $1/2$ to 2 stops to take into account the excessive contrast between the front light and back-light.

Very low light:

In extreme low light situations, take a close-up reading of a white paper or other white object and multiply it $5\times$. If $f/2$ and $1/100$ second, the corrected reading will be $f/2$ and $1/20$ second. If a white subject is not available, or the location very dark, as in dimly lighted bars, stages, etc., take an exposure reading of the principal light source. Next, multiply the reading thus obtained $8\times$ to $10\times$ for the corrected exposure reading. Thus, if the reading should be $f/2$ and $1/100$ second, the corrected exposure should be $f/2$ and $1/10$ or $1/15$ second.

Snow landscapes:

In general, exposure is extremely difficult because contrast is extreme. An average reading of a scene, including a great portion of snow background, would result in under-exposure of the subject. But, if the exposure reading is made of the subject only, the snow will turn out as a blank white mass, due to over-exposure. For an average reading, it is recommended that the palm of the hand be used as a substitute. However, if the subject is the main consideration, take a close-up reading of the subject. For getting both subject and background in the picture with sufficient detail, when the subject's fairly close the use of flash fill-in may be the only logical solution. The extreme contrast in this case may not permit any compromise reading.

Gray card of 18% reflectance:

For an average reading, a gray card of 18% reflectance will serve for measuring the in-

tensity of the light being reflected from an "average" subject, much as the palm of the hand will do, but with greater accuracy. This may substitute for exposure readings from the subject in the case of extreme contrast, or subjects too far for close-up reading, for portraits, etc.

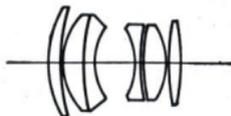
TOPCOR LENSES

The standard lens, supplied with the BESELER TOPCON D-1 is the RE. Auto-Topcor f/1.8 58 mm lens. It is a 6 element Gauss type optic covering a 41° field of view. It has apertures from f/1.8 to f/22 and focuses from infinity to 18 inches (45cm).

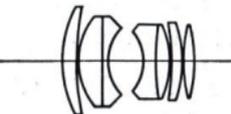
The lens is fully automatic and is interchangeable with a full range of other TOPCOR lenses.

The second "standard" lens, which is available separately, is the RE. Auto-Topcor f/1.4 58 mm lens. This is a 7 element modified

RE. Auto-Topcor f/1.8 58 mm



RE. Auto-Topcor f/1.4 58 mm



Gauss type lens, also covering a 41 degree field of view. It contains diaphragm openings from $f/1.4$ to $f/16$ and focusing down to 18 inches (45 cm).

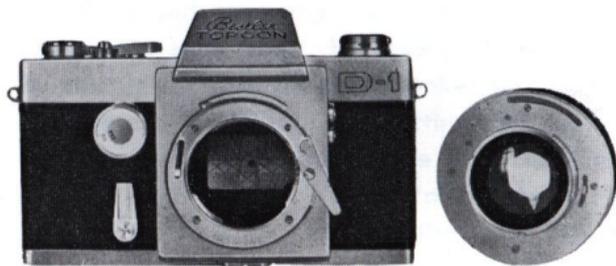
Fully Automatic Instant Opening Lens Diaphragm Action :

Both standard lenses are equipped with the fully automatic lens diaphragm action, internally coupled with the camera mechanism, and thus permit completely coordinated and synchronized action with the focal plane shutter and reflex mirror actions.

In the simplest terms, this means that the lens diaphragm is always wide open at full aperture for viewing and focusing through the lens, but closes down instantly for picture-taking and opens up instantly when everything is over—there is no chance of missing a single important action.

When the shutter release is pressed, the lens diaphragm closes down immediately to what-

ever aperture has been pre-selected—even before the shutter starts opening and stays closed for the exposure. It then snaps open immediately and automatically to maximum aperture again. In the meantime, the reflex mirror also swings up for the exposure and snaps down instantly after the shot. The only movement seen in the finder is a slight flicker which is hardly noticeable.



Lens Opening :

The automatic diaphragm, as noted above, has the all important task of stopping down to control the amount of light that enters the lens and passes through to the film plane. The

graduated series of lens opening, are called "apertures" or "stops" and are controlled on the standard RE. Auto-Topcor lens by revolving the aperture ring (7), on the lens barrel, until the required aperture number is opposite the aperture index mark.

The correct aperture, for the shutter speed of the camera, is automatically set to the aperture index whenever the exposure indicator is correctly matched to its index, while taking an exposure reading.

The standard lenses have the following apertures, with the exposure ratios noted, showing that the larger numbers are the smaller apertures :—

Aperture

1.4 1.8 2 2.8 4 5.6 8 11 16 22

Exposure Ratio

1/8 1/5 1/4 1/2 1 2 4 8 15 30

Lens openings between the above apertures are also available and are used when the required shutter speed calls for it. The above

table shows that each smaller aperture permits only one-half the amount of the next larger aperture and requires double the exposure. Stopping down will require a corresponding increase in the shutter speed if light conditions remain unchanged.

In other words, if the shutter speed is originally set at 1/60 second for f/8 aperture, it will be changed to 1/30 second if the aperture is stopped down to f/11 or to 1/125 second if the aperture is opened one stop to f/5.6.

Lens Mount:

The BESELER TOPCON D-1 has a precision fitting modified bayonet lens mount. It provides for the quickest, simplest and most troublefree attachment or removal of TOPCOR lenses from the camera.

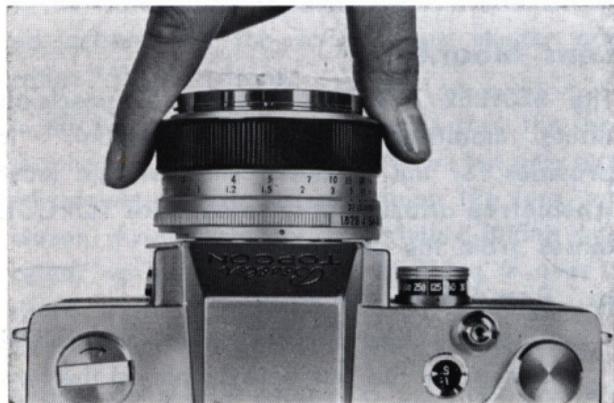
a. Removing the lens:

Press the lens locking lever, which will disengage the lens locking pin on the lens barrel. Rotate the lens a quarter turn

counter-clockwise, around its optical axis, until two red dots (one on the lens barrel and one on the camera body) are lined up. Lift the lens carefully out of the camera body.

b. Attaching the lens:

Line up the red dot on the rear end of the lens barrel with that on the body flange and insert carefully. When well-seated, turn the lens clockwise until a full stop is made and it clicks into position.



Lens Covers:

When not in use, the lens should be covered with its hard rubber or metal snap-on cover to protect the lens surface. When lenses are detached from the camera body, their rear ends should be covered and the camera body cap be used to protect the interior of the body.

TOPCOR INTERCHANGEABLE LENSES

For a fuller enjoyment of the BESELER TOPCON system of photography a wide range of Topcor interchangeable lenses, besides the wonderful standard RE. Auto-Topcor optics, are available for the user to choose from. All of them take full advantage of the single lens reflex system and do not require the purchase of an additional accessory finder.

In other words, when any of the interchangeable lenses are attached to the camera nothing else is required—simply view and focus the subject directly through the camera lens and enjoy the wonderful system which is not to be experienced with a rangefinder camera.

Interchange with the standard lens is simple and quick with the modified bayonet mount providing simple but positive locking action, as explained on pages 41 and 42.

a. Wide-Angle Lenses:

The wide-angle lens has a shorter focal length than the standard 58mm lens, and covers a much wider field of view. The image is much smaller and the depth of field of the lens is much deeper. All of these characteristics grow stronger as the focal length grows shorter. Because of these characteristics, the wide-angle is especially valuable for architectural work, interior shots of rooms, groups in small rooms, and whenever there is not much room to back up. It is also used for fast candid shooting, by utilizing its great depth of field, for zone focusing, and for slower speed possibilities because of its smaller image. At the same time, it can be used for exaggerated perspectives because of its extra wide field of view.

b. Telephoto Lenses:

As opposed to the wide-angle lenses, the telephoto lens covers a smaller field of view, shows a smaller picture area with

TABLE OF TOPCOR LENSES

	Focal Length	Angle of Field	Distance	Lens Hood Mount	Screw-in Filter Mount	Weight	Length from Flange
RE. Auto-Topcor f/3.5	25 mm	82°	6.5in ~ 10feet and ∞ 0.16 ~ 3meter and ∞	Screw Stopper	Special Bayonet	320 gr.	53mm
RE. Auto-Topcor f/2.8	35 mm	63°	9in ~ 15feet and ∞ 0.23 ~ 5meter and ∞	Bayonet	49mm P=0.75	250 gr.	56mm
RE. Auto-Topcor f/1.4	58 mm	41°	18in ~ 30feet and ∞ 0.45 ~ 10meter & ∞	Bayonet	62mm P=0.75	300 gr.	49mm
RE. Auto-Topcor f/1.8	58 mm	41°	18in ~ 30feet and ∞ 0.45 ~ 10meter & ∞	Bayonet	49mm P=0.75	220 gr.	38mm
RE. Auto-Topcor f/2.8	100 mm	24.5°	4 ~ 100 feet and ∞ 1.2 ~ 20meter and ∞	Bayonet	49mm P=0.75	280 gr.	54mm
RE. Auto-Topcor f/3.5	135 mm	18°	4 ~ 200 feet and ∞ 1.2 ~ 30meter and ∞	Snap-on 51mm	49mm P=0.75	400 gr.	87mm
RE. Auto-Topcor f/5.6	200 mm	12°	10 ~ 200 feet and ∞ 3 ~ 60meter and ∞	Snap-on 51mm	49mm P=0.75	460 gr.	128mm
R. Topcor f/3.5	90 mm	27°	3.5 ~ 100feet and ∞ 1 ~ 30meter and ∞	Screw-in 49 mm	49 mm P=0.75	190 gr.	69mm
R. Topcor f/4	200 mm	12°	7 ~ 200 feet and ∞ 2.2 ~ 60meter and ∞	Screw-in 65mm	62mm P=0.75	860 gr.	152mm
R. Topcor f/5.6	300 mm	8°	15 ~ 300 feet and ∞ 4.5 ~ 100meter & ∞	Fixed	62mm P=0.75	740 gr.	180mm

a larger image pulled in closer, and a shallower depth of field, than the standard lens. This effect grows stronger as the focal length grows longer.

For its main characteristic of pulling in distant objects, the telephoto is most commonly used for shooting distant objects which cannot be approached close enough to isolate and emphasize. At the same time, it is very often used, especially the focal lengths 100 and 135 mm, for portraiture. Its natural perspective and shallow depth of field is useful for eliminating distracting backgrounds. These effects also make the 100 mm and 135 mm useful for shooting close-ups.

The Topcor interchangeable lenses are supplied with two types of diaphragm action.

a. RE. Auto-Topcor Lenses:

This group of lenses have the same fully automatic instant-opening lens diaphragm

action, found on the two standard 58 mm lenses, and are mechanically coupled to the built-in exposure meter. They are, therefore, extremely useful for everyday photographic assignments.

Besides the two standard lenses—RE. Auto-Topcor $f/1.8$ 58 mm and RE. Auto-Topcor $f/1.4$ 58 mm—two wide-angle lenses and three telephoto lenses are available. These six focal lengths are those most in demand with professionals and advanced amateurs.

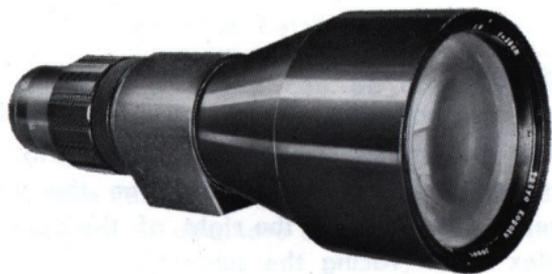
The two wide-angle lenses are $f/3.5$ 25 mm and $f/2.8$ 35 mm—the former with a 82° field of view and the latter with a 63° field. Both are of retro-focus design to accommodate the longer rear-flange-to-film-plane distance, characteristic of the single lens reflex. But the most distinctive feature of both Topcor wideangle lenses is that they can be used on the BESELER TOPCON D-1 without lock-



ing the mirror out of position and without using a special finder.

The three telephoto lenses are f/2.8 100mm, f/3.5 135mm and f/5.6 200mm. All three optics are designed for hand-held shooting. They feature greatly shortened barrel lengths, extreme lightness in overall weight and excellent shooting balance. The 100mm lens covers a 24.5° field of view and focuses

down to 4 feet (12 meters): the 135mm covers a 18 degree field of view and has a minimum focusing distance of 6 feet (1.8 meters); and the 200mm has a 12° field, and focuses down to 10 feet (3 meters). All three are used extensively for portraiture work. The first two are also used for close-ups (extended with bellows).



b. R. Topcor Lenses:

This group of lenses include only tele-photos. They are not equipped with the more complicated automatic lens diaphragm which grows too complex and costly with longer focal lengths.

The R. Topcor lenses have a simplified preset lens diaphragm action and are optically coupled to the built-in exposure meter. In other

words, the exposure meter is coupled to the lens diaphragm as it is stopped down or opened up, and shows the correct exposure reading for the actual lens opening.

Preset Diaphragm:

The preset diaphragm mechanism consists of an aperture index mark—a white diamond, an aperture scale ring and a knurled preset diaphragm ring with a white preset

index dot, in that order from the front end of the lens barrel.

The aperture scale ring and the preset diaphragm ring can be moved interlocked, or the preset ring can be moved independently, as required.

1. Since it is speedier to view-focus initially, set the maximum aperture opposite the aperture index which will give maximum focusing ease.
2. When view-focusing is completed, revolve the preset diaphragm ring and aperture scale ring interlocked until the exposure indicator shows the correct exposure.
3. If the depth of field at this time is not suitable, revolve the interlocked rings until the depth of field is suitable. Then, rotate the shutter speed dial until the exposure is corrected.
4. If the following shots are based on the same exposure, revolve the preset mark

opposite the suitable aperture. It will only be necessary to revolve the preset diaphragm ring interlocked with the aperture scale ring until it stops, automatically, at the pre-selected aperture.

NOTE:

The aperture ring cannot move to the left when the maximum aperture is set to the diamond aperture index, nor can the white preset dot move to the right of the aperture index mark (facing the subject).

Three telephoto lenses from 90 mm to 300 mm are available.

The R. Topcor f/3.5 90 mm is a lightweight lens, particularly suited for portraiture work and covers a 27° field of view. The f/4 200 mm lens, a five element optic of extreme lightness and good balance, is a favorite for hand-held telephoto shooting of sports, animals, landscapes, and is even used for portrait shots of full length.

The f/5.6 300 mm lens is an astonishingly light

and well-balanced 4 element telephoto suited for hand-held shooting.

CAUTION :

The R. Topcor lenses are extremely light for their size, but hand-held shooting is not recommended if a tripod can be used. Because these long focal lengths enlarge a small area, they also magnify the movement of the subject (and the camera) and thus make it absolutely necessary to eliminate the hazard of camera shake.

When using the camera on a tripod, with any lens, always use a cable release to minimize camera vibration. If a cable release is not available the self-timer (16) will substitute.

The longer lenses are equipped with a tripod socket (permitting either horizontal or vertical format) and, thus the lens itself is mounted on the tripod instead of the camera.

Macro-Topcor Lenses

In addition to the regular TOPCOR inter-

changeable lenses, two close focusing macro lenses are also available. Both lenses have been specially designed to give optimum performance at the close focusing distances, contrary to the normal lenses which are designed to give their best performance at infinity.

Preset diaphragm action is possible, even when used on bellows attachment by utilizing a double cable release.

a. Macro-Topcor f/3.5 58 mm standard lens:

The lens has two sections—the lens section and the focusing mount. The latter has the distance scales, depth of field scales and magnifications for both the 58mm and 135mm lens. It can be used with either lens, or may be used independently as a variable extension tube. The lens section can also be used together with the bellows for greater extension, or may be used reversed, with an accessory reverse-adapter. The focus-

ing range, with the focusing mount, is from infinity to $1/2\times$, or from $0.8\times$ to $1.31\times$ with lens reversed.

b. Macro-Topcor f/4 135 mm telephoto lens :

To be used with focusing mount of the 58 mm Macro-Topcor lens or with bellows. Focusing range with the focusing mount is infinity to $1:4.5\times$ and infinity to $1:3\times$, with the Model III TOPCON bellows, which may be further extended by reversing the lens.

DEPTH OF FIELD

In focusing on a distant object, from just inside a window, you may notice that the window frame is blurred, or out of focus. By stepping back from the window, you will notice that without re-focusing, the window frame will gradually become more distinct. On the other hand, if instead of backing away, you re-focus on the window frame, you will notice that the subject initially focused will now be blurred and out of focus.

From the above, it will be noted that when a certain subject is focused, not only that subject but certain other subjects, both in front and back of the first subject will be seen sharply. In other words, when a subject has been focused at a certain distance, the lens presents an apparently sharp image not only at the precise distance but also at somewhat farther and nearer distances. This zone of apparent sharpness is known as the depth of field.

The rules governing the depth of field are :—

1. The depth of field is greatest as the diaphragm is closed down and least as the diaphragm is opened. The wide-open aperture of the fully automatic lens always shows the minimum depth of field.
2. The depth of field becomes greater as the subject-to-camera distance increases and least at close focusing distance.
3. The depth of field is greater in the background and shallower in the foreground but grows progressively equal as the focusing distance is decreased.
4. The depth of field increases with the use of a short focal length (wide-angle) lens and decreases with the longer telephoto lenses.

Depth of Field Scale :

The depth of field scale, on the lens barrel, shows at a glance the zone of apparent

sharpness at any lens opening or distance setting and is utilized for quickly and simply ascertaining the depth of field.

The depth of field scale (8), is next to the distance scale, and is made up of identical pairs of apertures on both sides of the distance index, which also represents the widest aperture. These identical pairs of apertures indicate the distance that will be in focus at these lens openings.

1. Finding the depth of field :

For example, if you are using a f/11 lens opening and focusing on 10 feet (3 meters), read the distances opposite the figures 11 on both sides of the depth of field scale, which will be about 8 and 15, showing that the depth of field is approximately 8 ft. to 15 ft. (2.4 to 4.6 meters).

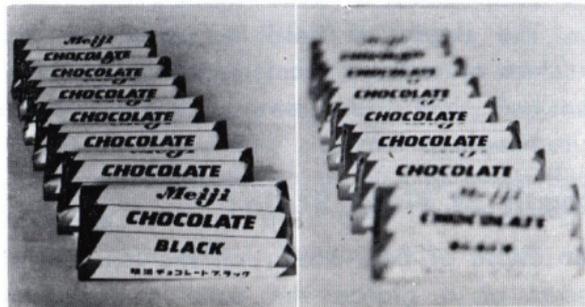
On the other hand, if f/11 does not give a sufficient zone of sharpness, check the depth of field scale to see which aper-

ture does give you a broader depth of field. If, for example, it should be $f/22$, your zone will be seen to extend from approximately 6 ft. to 30 ft. showing that stopping down the lens will drastically change your depth of field.

Of course, since it also means that the shutter speed must be decreased to compensate for the reduction in the effective amount of light reaching the film, there are limits to which the lens should be stopped down.

2. Zone focusing :

An alternative and more practical method for finding a suitable aperture, when the zone of sharpness which must be used is already known, is zone focusing. In this method, don't focus on the prime subject, but first focus on the nearest important subject and note the distance setting. Next, focus on the farthest important subject and also note the distance. Now set these distance settings opposite iden-



tical aperture numbers or as near as possible to them.

For example, let's imagine that your nearest subject is 8 ft. and the farthest 15 ft., as found on the distance scale. Turn the distance focusing ring until these figures come opposite identical numbers (f/11 in this case) and you are all set.

3. Fast zone focusing:

When there is not enough time to find the extreme limits for the above zone focusing method, a rough but faster method is also possible. Since it is known that the foreground is more shallow than the background (except in close-up shooting where a shallow depth of field prevails anyway), focus on a subject about two-fifths of the way into the required zone of sharpness and choose an aperture which will be consistent with the overall field.

Depth of Field Table:

When greater accuracy is required in ascertaining the depth of field, especially for close focusing distances, the depth of field table should be used. All figures on the depth of field scale are in round sums because it is impractical and impossible to indicate accurately on the limited space of the scale. It should be realized, however, that the depth of field does not imply that everything within this zone is of equal sharpness or that the sharpness falls off abruptly at the limits of this zone. On the contrary, critical pin-point sharpness is only found in the plane actually focused. Sharpness gradually grows less sharp as the distance goes farther from this plane of focus. However, for most practical purposes, everything within this zone is normally considered of acceptable sharpness. But the final criterion in this case should be decided by the use of the final photo, whether it must be greatly enlarged (in which case greater sharpness will be required) or whether

it will be used without much enlargement.

In the following depth of field tables, it is assumed that the circle of confusion is $1/30$ mm, or that a pin-point represented on the negative by a dot not exceeding $1/30$ mm is sufficiently sharp. This dot then is termed "circle of confusion" and is used as a standard for this table because sharpness of depth of field is a highly debatable point from each user's standpoint, and certain standards must be agreed on beforehand.

In all instances, the distances on the scale or in the table are measured from the focal or film plane (indicated by the marking \oplus (39) on top of the camera) to the subject.

ATTENTION:

The depth of field should be increased, as much as possible, by stopping down the aperture rather than by increasing the focusing distance, or by using a shorter focal length lens, if this is more practical.

Depth of Field Table (distances in feet)

RE. Auto-Topcor 1 : 1.8 f = 5.8 cm

1/30 mm

F feet	1.8	2.8	4	5.6	8	11	16	22
∞	∞ ~ 184	∞ ~ 119	∞ ~ 83	∞ ~ 60	∞ ~ 42	∞ ~ 30	∞ ~ 21	∞ ~ 15
30	35.9 ~ 25.8	40.3 ~ 23.9	47.2 ~ 22	61.3 ~ 19.9	111 ~ 17.4	∞ ~ 15	∞ ~ 12.3	∞ ~ 10.1
15	16.3 ~ 13.9	17.1 ~ 13.3	18.3 ~ 12.4	20 ~ 12	23.4 ~ 11.1	29.7 ~ 10.1	53.8 ~ 8.8	∞ ~ 7.6
10	10.6 ~ 9.5	10.9 ~ 9.2	11.3 ~ 8.9	12 ~ 8.6	13.1 ~ 8.1	14.8 ~ 7.6	19.1 ~ 6.8	29.1 ~ 6.1
7	7.26 ~ 6.76	7.42 ~ 6.62	7.69 ~ 6.48	7.9 ~ 6.29	8.36 ~ 6.03	9.02 ~ 5.74	10.4 ~ 5.31	13.3 ~ 4.88
5	5.13 ~ 4.88	5.2 ~ 4.71	5.3 ~ 4.73	5.43 ~ 4.64	5.64 ~ 4.5	5.92 ~ 4.34	6.47 ~ 4.09	7.3 ~ 3.84
4	4.08 ~ 3.92	4.13 ~ 3.88	4.18 ~ 3.83	4.26 ~ 3.76	4.39 ~ 3.68	4.55 ~ 3.57	4.86 ~ 3.41	5.3 ~ 3.23
3	3.04 ~ 2.96	3.07 ~ 2.93	3.1 ~ 2.91	3.14 ~ 2.87	3.2 ~ 2.82	3.2 ~ 2.82	3.44 ~ 2.67	3.64 ~ 2.56
2.5	2.53 ~ 2.47	2.54 ~ 2.46	2.56 ~ 2.44	2.59 ~ 2.42	2.63 ~ 2.39	2.68 ~ 2.35	2.77 ~ 2.28	2.89 ~ 2.21
2.25	2.27 ~ 2.1	2.28 ~ 2.22	2.30 ~ 2.22	2.32 ~ 2.19	2.35 ~ 2.16	2.39 ~ 2.13	2.46 ~ 2.08	2.55 ~ 2.02
2	2.0 ~ 1.98	2.03 ~ 1.98	2.04 ~ 1.97	2.05 ~ 1.95	2.07 ~ 1.93	2.10 ~ 1.91	2.16 ~ 1.87	2.22 ~ 1.83
1.75	1.75 ~ 1.73	1.77 ~ 1.73	1.78 ~ 1.72	1.79 ~ 1.71	1.80 ~ 1.70	1.82 ~ 1.68	1.86 ~ 1.65	1.91 ~ 1.62
1.5	1.50 ~ 1.48	1.51 ~ 1.49	1.52 ~ 1.48	1.52 ~ 1.48	1.54 ~ 1.47	1.55 ~ 1.45	1.57 ~ 1.43	1.60 ~ 1.41

Depth of Field Table (distances in meters)

RE. Auto-Topcor 1 : 1.8 f = 5.8 cm

1/30 mm

m \ F	1.8	2.8	4	5.6	8	11	16	22
∞	∞ ~ 56	∞ ~ 36	∞ ~ 25	∞ ~ 18	∞ ~ 12.7	∞ ~ 9.3	∞ ~ 6.4	∞ ~ 4.7
10	12.1 ~ 8.5	13.8 ~ 7.8	16.5 ~ 7.2	22.5 ~ 5.6	48.5 ~ 5.6	∞ ~ 4.8	∞ ~ 3.9	∞ ~ 3.2
5	5.48 ~ 4.6	5.79 ~ 4.4	6.49 ~ 4.18	6.89 ~ 3.93	8.24 ~ 3.7	10.9 ~ 3.3	23.8 ~ 2.8	∞ ~ 2.4
3	3.17 ~ 2.85	3.26 ~ 2.78	3.39 ~ 2.69	3.58 ~ 2.58	3.91 ~ 2.44	4.41 ~ 2.28	5.63 ~ 2.06	8.47 ~ 1.85
2	2.07 ~ 1.94	2.11 ~ 1.90	2.16 ~ 1.86	2.24 ~ 1.81	2.36 ~ 1.74	2.53 ~ 1.66	2.88 ~ 1.54	3.46 ~ 1.41
1.5	1.54 ~ 1.46	1.56 ~ 1.44	1.59 ~ 1.42	1.63 ~ 1.39	1.69 ~ 1.35	1.77 ~ 1.3	1.93 ~ 1.23	2.17 ~ 1.16
1.2	1.22 ~ 1.18	1.24 ~ 1.17	1.25 ~ 1.15	1.28 ~ 1.13	1.31 ~ 1.11	1.36 ~ 1.07	1.45 ~ 1.03	1.58 ~ 1.43
1	1.02 ~ 0.99	1.03 ~ 0.98	1.04 ~ 0.97	1.05 ~ 0.95	1.08 ~ 0.94	1.11 ~ 0.91	1.17 ~ 0.88	1.24 ~ 0.84
0.8	0.81 ~ 0.79	0.82 ~ 0.79	0.82 ~ 0.78	0.83 ~ 0.77	0.85 ~ 0.76	0.86 ~ 0.75	0.89 ~ 0.73	0.94 ~ 0.7
0.7	0.71 ~ 0.69	0.71 ~ 0.69	0.72 ~ 0.69	0.72 ~ 0.68	0.73 ~ 0.67	0.75 ~ 0.66	0.77 ~ 0.64	0.8 ~ 0.63
0.6	0.61 ~ 0.6	0.61 ~ 0.59	0.61 ~ 0.59	0.62 ~ 0.59	0.62 ~ 0.58	0.63 ~ 0.57	0.65 ~ 0.56	0.67 ~ 0.55
0.55	0.55 ~ 0.55	0.56 ~ 0.54	0.56 ~ 0.54	0.56 ~ 0.54	0.57 ~ 0.53	0.58 ~ 0.53	0.59 ~ 0.52	0.61 ~ 0.51
0.5	0.5 ~ 0.5	0.51 ~ 0.5	0.51 ~ 0.49	0.51 ~ 0.49	0.51 ~ 0.49	0.52 ~ 0.48	0.53 ~ 0.47	0.54 ~ 0.47
0.45	0.45 ~ 0.45	0.45 ~ 0.45	0.46 ~ 0.45	0.46 ~ 0.44	0.46 ~ 0.44	0.47 ~ 0.44	0.47 ~ 0.43	0.48 ~ 0.42

Depth of Field Table (distances in feet)

RE. Auto Topcor f/1.4 58 mm

1/30 mm

F feet	1.4	2	2.8	4	5.6	8	11	16	22
∞	∞ ~ 233.3	∞ ~ 163.4	∞ ~ 116.8	∞ ~ 81.9	∞ ~ 58.6	∞ ~ 41.1	∞ ~ 30.0	∞ ~ 20.7	∞ ~ 15.2
30	34.4 ~ 26.6	36.6 ~ 25.4	40.2 ~ 24.0	47.1 ~ 22.1	61.1 ~ 20.0	110.6 ~ 17.5	∞ ~ 15.1	∞ ~ 12.4	∞ ~ 10.2
15	16.0 ~ 14.1	16.5 ~ 13.8	17.1 ~ 13.3	18.3 ~ 12.7	20.0 ~ 12.0	23.4 ~ 11.1	29.6 ~ 10.1	53.9 ~ 8.83	906.8 ~ 7.35
10	10.4 ~ 9.61	10.6 ~ 9.45	10.9 ~ 9.25	11.3 ~ 8.96	12.0 ~ 8.61	13.1 ~ 8.13	14.8 ~ 7.60	18.9 ~ 6.86	28.9 ~ 6.15
7	7.20 ~ 6.81	7.29 ~ 6.73	7.41 ~ 6.63	7.61 ~ 6.49	7.88 ~ 6.30	8.33 ~ 6.05	8.98 ~ 5.76	10.3 ~ 5.33	12.6 ~ 4.91
5	5.10 ~ 4.91	5.14 ~ 4.87	5.20 ~ 4.82	5.29 ~ 4.74	5.42 ~ 4.65	5.62 ~ 4.51	5.90 ~ 4.35	6.43 ~ 4.11	7.23 ~ 3.86
4	4.06 ~ 3.94	4.09 ~ 3.92	4.12 ~ 3.88	4.18 ~ 3.84	4.25 ~ 3.78	4.37 ~ 3.69	4.54 ~ 3.59	4.84 ~ 3.43	5.26 ~ 3.26
3	3.03 ~ 2.97	3.05 ~ 2.96	3.06 ~ 2.94	3.09 ~ 2.91	3.13 ~ 2.88	3.19 ~ 2.83	3.27 ~ 2.77	3.42 ~ 2.68	3.61 ~ 2.58
2.5	2.52 ~ 2.48	2.53 ~ 2.47	2.54 ~ 2.46	2.56 ~ 2.44	2.59 ~ 2.42	2.63 ~ 2.39	2.68 ~ 2.35	2.77 ~ 2.28	2.89 ~ 2.21
2.25	2.27 ~ 2.23	2.27 ~ 2.23	2.28 ~ 2.22	2.30 ~ 2.20	2.32 ~ 2.19	2.35 ~ 2.16	2.39 ~ 2.13	2.46 ~ 2.08	2.55 ~ 2.02
2	2.01 ~ 1.99	2.02 ~ 1.98	2.03 ~ 1.98	2.04 ~ 1.97	2.05 ~ 1.95	2.07 ~ 1.93	2.10 ~ 1.91	2.16 ~ 1.87	2.22 ~ 1.83
1.75	1.76 ~ 1.74	1.76 ~ 1.74	1.77 ~ 1.73	1.78 ~ 1.72	1.79 ~ 1.71	1.80 ~ 1.70	1.82 ~ 1.68	1.86 ~ 1.65	1.91 ~ 1.62
1.5	1.51 ~ 1.49	1.51 ~ 1.49	1.51 ~ 1.49	1.52 ~ 1.48	1.52 ~ 1.48	1.54 ~ 1.47	1.55 ~ 1.45	1.57 ~ 1.43	1.60 ~ 1.41

Depth of Field Table (distances in meters)

RE. Auto Topcor f/1.4 58mm

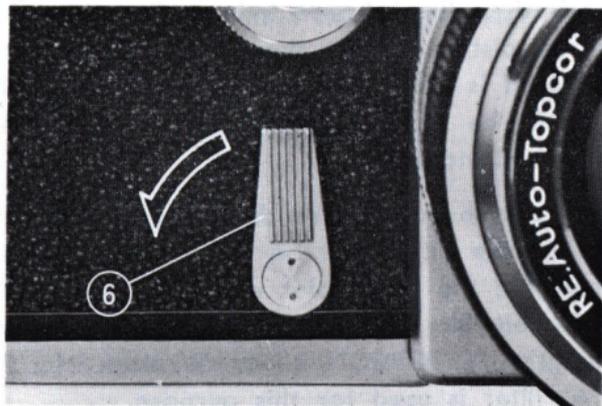
1/30 mm

F m	1.4	2	2.8	4	5.6	8	11	16	22
∞	∞~71.1	∞~49.8	∞~35.6	∞~25.0	∞~17.9	∞~12.5	∞~9.14	∞~6.31	∞~4.62
10	11.6~8.78	12.5~8.35	13.8~7.83	16.6~7.17	22.6~6.45	49.6~5.60	∞~4.82	∞~3.91	∞~3.20
5	5.37~4.68	5.54~4.56	5.79~4.38	6.22~4.19	6.89~3.93	8.23~3.61	10.9~3.27	24.0~2.83	∞~2.44
3	3.13~2.88	3.18~2.84	3.26~2.78	3.39~2.69	3.57~2.59	3.90~2.45	4.40~2.29	5.60~2.07	8.39~1.86
2	2.05~1.95	2.08~1.93	2.11~1.90	2.16~1.86	2.23~1.81	2.35~1.74	2.59~1.67	2.86~1.55	3.43~1.43
1.5	1.53~1.47	1.54~1.46	1.56~1.45	1.59~1.42	1.62~1.40	1.68~1.36	1.76~1.31	1.92~1.24	2.15~1.16
1.2	1.22~1.18	1.23~1.18	1.24~1.17	1.25~1.15	1.27~1.13	1.31~1.11	1.36~1.08	1.45~1.03	1.57~0.98
1.0	1.01~0.99	1.02~0.98	1.02~0.98	1.03~0.97	1.05~0.96	1.07~0.94	1.10~0.92	1.16~0.88	1.23~0.85
0.8	0.81~0.79	0.81~0.79	0.81~0.79	0.82~0.78	0.83~0.77	0.84~0.76	0.86~0.75	0.89~0.73	0.93~0.70
0.7	0.71~0.69	0.71~0.69	0.71~0.69	0.72~0.69	0.72~0.68	0.73~0.67	0.74~0.66	0.77~0.65	0.80~0.63
0.6	0.60~0.60	0.61~0.59	0.61~0.59	0.61~0.59	0.62~0.59	0.62~0.58	0.63~0.57	0.65~0.56	0.67~0.55
0.55	0.55~0.55	0.55~0.55	0.56~0.54	0.56~0.54	0.56~0.54	0.57~0.53	0.57~0.53	0.59~0.52	0.60~0.51
0.5	0.50~0.50	0.50~0.50	0.50~0.50	0.51~0.49	0.51~0.49	0.51~0.49	0.52~0.48	0.53~0.48	0.54~0.47
0.45	0.45~0.45	0.45~0.45	0.45~0.45	0.46~0.45	0.46~0.44	0.46~0.44	0.46~0.44	0.47~0.43	0.48~0.42

SELF-TIMER

For taking your own photograph, or for acting as your own assistant and holding lighting equipment or a reflector, or for minimizing camera vibration on the tripod, the built-in self-timer (6) is a very useful mechanism. It permits delayed shutter releases between 5 to 15 seconds.

After stroking the film winding lever in the usual manner, charge the self-timer by pushing



down the self-timer lever 70 degrees. Then depress the shutter button. The lever will return to its normal resting position and actuate the shutter release. At the 70 degree position, the delay will be a maximum 10 seconds or so, while at intermediate positions the delay will be anywhere from 5 seconds up.

The self-timer may be charged before or after the shutter speed is set and before or after film winding action.

CAUTION:

Do not stroke the film winding lever until the shutter action is completed. The return of the self-timer lever to its original position does not necessarily mean that shutter action is completed, especially with slow shutter speeds.

INFRARED PHOTOGRAPHY

For obtaining special effects and/or for specialized work, you may want to use infrared film. This is a special purpose film, used a great deal in aerial photography, documentary photography, criminology and in medical work. Due to its characteristics of cutting through haze and fog, actually seeing more than is visible to the eye, it is used extensively in aerial photography and in landscapes, where trees and foliage turn to white or light color (due to the reflection of infrared rays in the chlorophyll of the leaves) against a dark sky. It is also used to get a night or moon effect, in broad daylight. In criminology, it is used for the purpose of discovering alterations or forgeries in documents, for deciphering charred papers, for reading documents stained or aged beyond recognition. Infrared film is noted for the fact that it is sensitive only to the blue-violet infrared wave lengths, whereas ordinary panchromatic film is sensitive to all the colors

of the spectrum. When focusing, the visible point seen in white light—is used for focusing whereas the infrared rays are not visible colors but longer in wave length than the long visible red rays and, therefore, cannot be used for focusing. In other words, some adjustment must be made in focus if sharpness is to be retained on the film. In the BESELER TOPCON D-1 the "R,, mark (infrared index) (40) on the distance focusing scale is used for this purpose. After focusing in the normal manner, the distance setting obtained is shifted to the infrared index. For example, if the distance index shows that the distance focused is 10 ft., the distance focusing scale should be revolved to place 10 ft. at the infrared index.

For a true infrared rendition of the subject, a suitable filter must be used to cut out the blue (in the blue-violet wave length) as the infrared film is also sensitive to this wave length. A TOPCON R2 or Wratten No. 25 (A) filter is used for this purpose.

Infrared film is extremely slow in any case but even more so when used in combination with a red filter. Because the ratio of infrared wave length in the visible light is variable, no exposure indexes can be given for exposure reading of the visible light. But, a fairly accurate reading is possible when the lens itself is covered with the red filter and an exposure reading taken. In any case, the instructions enclosed with the film should be followed carefully, with several bracketing shots made to be on the safe side. In general, more exposure rather than less seems to be a safe guide.

FLASH PHOTOGRAPHY

When the available light is not sufficient for taking pictures at the desired aperture or speed, or if the subject is in the shadow and details are obscured, artificial illumination, such as photolamps, flash bulbs or electronic flash, should be used.

FLASH ATTACHMENT

As a portable method of artificial illumination, the flash unit using flash bulbs is one of the most economical, simple-to-use and efficient type available.

To use the flash unit on the BESELER TOPCON D-1, first slip the accessory shoe into the slots on both sides of the eyepiece frame. Then attach the unit to the shoe. Finally, insert the flash cord plug of the unit into the suitable flash socket (27 or 28).

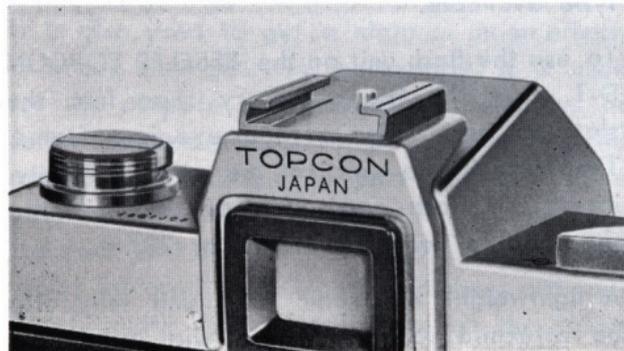
A lightweight electronic flash unit may also be attached to the camera with the shoe,

although a suitable bracket may also be used for attachment of larger units. The bracket should be fixed to the bottom of the camera with the fixing screw locking it to the tripod socket (29).

FLASH ILLUMINATION

The various types of flash bulbs found on the market are classified according to their time-to-peak (firing delay) or the time it takes from contact until peak brightness is reached.

Class FP: Class FP (flat peak) bulbs are



suitable for the focal plane camera only and are designed so that the intensity of the bulb is spread out over a period (the flat peak) for uniform illumination during the total period of exposure for all fast shutter speeds up to 1/1000 second on M-setting. Maximum intensity is reached 20 milliseconds (one millisecond being 1/1000 second) after contact. This peak brightness is then held at a level peak for 20 milliseconds (small FP bulbs) or 50 milliseconds (large FP bulbs).

Class F: The firing delay is 4~6 milliseconds. Although light output is low, the stopping action is a fast 1/200 second, with shutter speed set at 1/30 second or slower.

Class M: The firing delay is 16~18 milliseconds. Since light intensity is the greatest, it is used when fast shutter speed is not required but maximum light output is necessary. Synchs at all speeds up to 1/1000 second on M-setting.

In this class are included the small miniature

light bulbs and all glass no-base bulbs which give great light output for their very small sizes.

Electronic Flash or Strobe-Light: There is no firing delay with electronic flash units and, while they do not have great intensity of light, they may be re-used many times (although the initial outlay is comparatively expensive). Their speed is a very fast 1/500 to 1/1000 second or better, stopping most actions even though the shutter is set to 1/125 second or slower.

FLASH SYNCHRONIZATION

It will readily be realized that the camera's shutter must be synchronized to match the various time-to-peaks of the different classes of flash bulbs. This is taken care of effectively and quite simply in the BESELER TOPCON D-1 by having two flash sockets, M and X, with a suitable shutter speed is chosen to fire the bulb by closing the flash contact at

the appropriate moment for the flash bulb being used. There are no selector switches, synchroswitches, or other time-consuming operations. Simply look up the appropriate shutter speed from the table on page 62, set it to the shutter dial and press the shutter release button.

SAFETY FLASH CONTACT SYSTEM

The BESELER TOPCON D-1 has a built-in safety flash contact which works independently of the shutter flash contact. This safety flash contact is coupled with the instant return mirror action and, therefore, is closed only when the mirror is fully raised. Since the mirror only begins rising just before shutter contact and returns immediately after the shutter action, premature flash shots are not possible. The flash bulbs may be inserted either before or after the film winding lever is stroked and the shutter charged.

FLASH EXPOSURE

With flash illumination, the exposure meter can no longer be used for obtaining a correct reading and, thus, a substitute method must be used for determining the correct exposure.

In flash photography with the flash unit on the camera, the distance focused is of very great importance for calculating the correct aperture. The brightness of the flash illumination decreases with the square of the distance, or, in other words, an object six feet away will receive only one-fourth the light of an object three feet away.

To find the correct aperture, find the guide number, which is based on the shutter speed and film speed being used (and usually found in the instruction sheet furnished with the flash bulbs), and divide it by the distance from flash to subject (not from camera to subject) which will be the required aperture. For example, the guide number is 120 and the distance 15 feet from flash unit to subject.

This requires an aperture of $f/8$. This figure is normally based on the use of an efficient reflector in a room of average brightness. For a bright room use a smaller aperture and for a large room or at night outdoors use a larger aperture.

Class of Flash Bulb	Shutter Speed							
	$\frac{1}{1000}$	~	$\frac{1}{125}$	~	$\frac{1}{30}$	~	1	B
M	M-Setting							
FP	M-Setting							
F					X-Setting			
X (Electronic Flash)				X-Setting				

TIPS FOR BETTER PICTURES

FOCUSING:

1. For distant views without any foreground interest, set the focusing distance to infinity and the aperture to $f/5.6$ or $f/8$, as this will give maximum sharpness in the far distance.

Don't focus so that the farthest limit of the depth of field just reaches infinity. In this case, the lens would be focused on the near infinity point or hyperfocal distance and the acceptable range of sharpness would extend from the farthest limit to as far as possible in the foreground instead of being sharp only in the far distance.

2. For distant views (landscapes) with foreground interest, focus on the foreground subject and the far distant view. Set the distances thus obtained against the depth of field scale until they are

opposite identical aperture figures. Use the aperture and distance obtained in this way, and there will be sufficient depth of field to cover the picture required.

Don't focus on the mid-point because the foreground is shallower in depth of field than the background and you will be focusing on a farther point than sufficient for covering the foreground subject.

3. For most landscapes, try to insert some foreground interest, particularly of human subjects. This will give your picture greater impact, story-picture value and even three dimensional effect. Even dark foliage in the foreground, or deep shadows, will set off the lighter background landscape and give the picture greater strength.
4. When shooting interior or architectural pictures, focus on the near and far limits required to be covered. Set these figures against the depth of field scale

to obtain the required aperture and distance. The aperture will usually be a small lens opening.

5. For portrait or close-up shots, work with a comparatively large aperture and focus on the center of interest, such as the subject's eye. This will produce a very shallow depth of field, for placing emphasis and dramatizing the center of interest, while, at the same time, making it stand out sharply defined against a subdued and diffused background. Furthermore, use a neutral colored and uncluttered background, or move the subject away from the background, or use the sky as the background (if shooting outdoors) and take your pictures early or late in the day when the light is softer than the midday sun.
6. Use zone focusing for sports shots, actions within a limited area or sudden snap shots, when you find little time for ac-

curate focusing. Set your aperture at $f/8$ and shutter speed according to prevailing conditions. Set distance at 10 ft. which will give a depth of field of 8 ft. to 15 ft. Under most conditions shutter speed should be about $1/125$ to $1/250$ second, sufficient for most fast action.

If your particular requirement calls for a larger depth of field, set the limits of your zone against the depth of field scale and find your aperture and distance settings, but choose an aperture which will give you a sufficiently fast shutter speed.

7. If zone focusing is not possible for fast action shots because the selected shutter speed requires a large aperture and results in a shallow depth of field, use pre-focusing.
- Focus on the spot that the subject will pass and snap the shutter at the right moment.
8. Use the widest aperture for its selective

focus ability, for placing emphasis where it is required, for dramatizing the center of interest, for eliminating distracting background and for greater directional impact.

9. Use the smallest aperture for its covering power from a few feet away to the far distance and for its ability to gather all the separate elements together and organize them into a more effective picture.
10. Move in for close-ups of a part of the subject, which will cover the full negative frame, with added impact and drama, and change the commonplace subject into a more powerful picture.

SHUTTER SPEED:

1. Choice of shutter speed is entirely dependent on the requirements for stopping the action. Choose the fastest possible shutter speed to minimize camera vibration.
2. Choice of shutter speed for any moving object is dependent on—
 - a. The speed at which the subject is moving; the faster the subject the faster the shutter speed.
 - b. The distance of the subject from the camera; the greater the distance the slower the shutter speed.
 - c. The angle at which the subject is moving in relation to the camera; movement towards or away from the camera requires a slower speed than movement at right angle to the camera, while movement at intermediate diagonal angles requires speeds between these two limits.

- d. The focal length of the lens used ; the longer focal length shows an enlarged image moving at a faster speed than a shorter focal length from the same position and thus requires a faster shutter speed.
 - e. The degree of "stopping" required ; the fastest speed of 1/1000 second can "deep freeze" most fast action but sometimes a blurred movement of the arms or legs will prove more effective in conveying the feeling of motion than if the motion is stopped "dead".
3. Panning the subject movement can also stop the motion, if exposure conditions do not permit a fast shutter speed, or if the blurred background will help to convey the feeling of motion more readily.

Move the camera with the subject and release the shutter while following the movement smoothly through to the end.

4. Catch the "peak" of the action with a slow shutter speed, if a fast shutter speed is not possible.

Since most actions have a beginning, a peak and an ending, with a momentary pause between each phase, try to catch the peak of the action which should also be the most interesting.

5. Use extra slow speed, with the camera set on the tripod and no special lighting set-up, for catching the "mood" of dimly lighted subjects or interiors. While the subject will not be seen as distinctly as in a flash-lighted picture, the subject will have a "mood" resemblance which will not be captured in an artificially lighted shot.
6. Use the following Shutter Speed Table as a "guide" for choosing a suitable shutter speed.

SHUTTER SPEED TABLE

Distance from Camera	Action Direction of Movement	Person	Moderately	Car
		Walking	Running	Moving at 20~25 m.p.h.
		Briskly	Person	
15 ft.	Parallel	1/500	1/1000	Pan Camera 1/1000
	Diagonal	1/250	1/500	
	Towards or Away	1/125	1/250	1/500
30 ft.	Parallel	1/250	1/500	1/1000
	Diagonal	1/125	1/250	1/500
	Towards or Away	1/60	1/125	1/250
60 ft.	Parallel	1/125	1/250	1/500
	Diagonal	1/60	1/125	1/250
	Towards or Away	1/30	1/60	1/125

FLASH SHOTS:

1. Always use fresh batteries. Otherwise you may not get the required light output when you need it.

B-C (battery-capacitator) flash guns are recommended over straight battery types because they are more consistent.

2. Always use the proper flash bulbs for faithful color rendition. Blue coated bulbs are for use with daylight color film; clear wire filled lamps are balanced for Type F color film and gas filled bulbs for Type A film.
3. Use the correct diameter reflector for the bulb being used or your light will be wasted. Bayonet base FP and SF bulbs require a 5" reflector; M class bulbs are used with 3" reflectors while AG types can be used with the smaller 2" reflector.
4. Clean all contact points of the battery and bulb. Avoid kinking the connecting cord

to prevent possibilities of short circuit.

5. When using flash in a room with weak light, expose strictly according to the main flash without taking room light into consideration.
6. Try using your flash off the camera, at the end of its connecting cord, slightly above and to the left of the camera and pointed slightly down towards the subject. Background shadow will be eliminated and three dimensional effect will be attained with shadows under the nose, lower lip and chin.
7. Use the flash gun on a long extension cord, for side-lighting, back-lighting, or from other angles, keeping in mind that the exposure is based on the flash-to-subject distance and not camera-to-subject distance.
8. Use bounce flash for an effect closest to natural or room light. Point the flash gun at the ceiling (or wall) so that the light

will be reflected onto the subject. Point the light at an angle, so that the light will also strike the subject at an angle (for the most natural lighting effect), rather than straight upwards.

Exposure is calculated on the flash-to-ceiling-to-subject distance but the lens diaphragm is opened one extra stop to compensate for absorption of light by the ceiling and general spilling over of the flash. For a darker ceiling, or a high ceiling, open up two stops, as a general "guide".

9. For multiple flash lighting, using extension flash guns off the camera flash gun, don't take the extra light into account if it is purely background lighting but calculate exposure based on the main flash only.

If two or more bulbs are used from the same distance to the subject to illuminate the same general area, multiply the guide number by 1.40.
10. When using flash as "fill-in" outdoors

for eliminating harsh shadows or in against-the-sun shots, keep the flash fill-in at a lower intensity than the main sunlight so that some of the shadow is still retained, instead of the flash fill-in overpowering the sunlight effect.

Base exposure on sunlight and divide the aperture to be used into the guide number (for the flash bulb and film combination at the shutter speed being used) for getting the focusing distance. Since this will give you equal intensity as the sunlight, move the flash farther away or cover the flash reflector with a white handkerchief (which will cut the flash illumination intensity about half).

11. Always cover the flash reflector with a clear transparent plastic bag for protection against accidental bulb explosions.

STORAGE OF THE BESELER TOPCON D-1

1. Store your BESELER TOPCON D-1 TOPCOR lenses and TOPCON accessories away from humidity, salty air, dust, extremely high or low temperatures and corrosive fumes.
2. Store your BESELER TOPCON D-1 in a cool, dry and well ventilated place.
3. Don't store it in closed compartments, containers or in the glove compartment of your car.
4. Don't store it in a damp room, in the basement, or in any wet place.
5. When storing your camera (and other equipment) for a long period :—
 - a. Take it out of its leather case.
 - b. Remove the battery from the camera.
 - c. Check to see that the shutter is not

tensioned.

- d. Return the focusing ring to infinity.
- e. Wrap the camera completely in a dry and soft lint-free cotton cloth.
- f. Place it in a tin-lined container which will close tightly.
- g. Put in a lot of desiccant, such as silica gel.

If the BESELER TOPCON D-1 is stored for a very long time, take it out once in a while to give it an airing when the weather is cool and dry.

PART V

ACCESSORIES FOR THE BESELER TOPCON D-1

The scope and range of photography possible with the BESELER TOPCON D-1 is greatly enlarged and complemented by the availability of a full range of optically superior TOPCOR brand interchangeable lenses, and a wide variety of practical and exclusive accessories. These increase the pleasure of using the BESELER TOPCON D-1 in various fields of photography.

Refer to Part IV on the full range of TOPCOR interchangeable lenses.

1. LENS HOODS

The lens hood is one of the most important accessory for use with all the lenses provided for the BESELER TOPCON D-1 and is recommended for against-the-light shots and

artificial illumination (flash and flood lighted) shots. It helps to eliminate stray light which might effect the brilliance and clarity of the picture. At the same time, as an added bonus, it protects the lens surface from rain or snow which would cause image distortion. Since the various focal lengths have different fields of view, the use of the wrong hood will not only not serve its purpose but may even prevent part of the light image from entering the lens, causing vignetting. Thus, there are various lens hoods for the different focal lengths TOPCOR lenses. They are further differentiated by the diameter size and method of attachment.

The lens hoods available for the BESELER TOPCON D-1 are:—



a. Outside Bayonet Mount :

These lens hoods are simply inserted over the outside bayonet mounts of their respective lenses and revolved until firmly fixed. They are available for four RE. Auto-Topcor lenses— $f/1.8$ 58 mm, $f/1.4$ 58 mm, $f/2.8$ 100 mm and $f/2.8$ 35 mm. That for the $f/1.8$ 58 mm and for the $f/1.4$ 58 mm can be reversed on the lens barrel for storage in the everready case.

b. Screw-in Type :

These lens hoods are simply screwed in until firmly attached. They are available for two R. Topcor lenses— $f/3.5$ 90 mm and $f/4$ 200 mm.

c. Collapsible Built-in Type :

These lens hoods are part of the lens itself, they are pulled out for use and pushed back when not required. Three lenses—the RE. Auto-Topcor $f/3.5$ 135mm, RE. Auto-Topcor $f/5.6$ 200 mm and R. Topcor $f/5.6$ 300 mm—have this type.

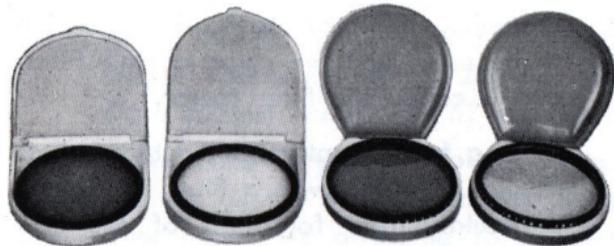
d. Push-on Type:

The RE. Auto-Topcor f/3.5 25mm wide-angle lens has a rectangular-shaped lens hood which is pushed on over the lens flange and fixed into position by tightening the screw on its side.

2. FILTERS

Filters are very important tools for getting pictures with the colors and/or effect that you want for a particular subject. They can prove to be the difference between a superior, sparkling picture and an average photo.

a. Filters for Black-and-White Films :



One of the main purposes of the filter for black-and-white photography is for separating the color tones which cannot otherwise be faithfully rendered in their shades of the gray tones. They are also used for obtaining special effects by exaggerating or suppressing some of the tones for high-lights or dramatic picture value.

Color as seen by the eye has a different brightness compared to the panchromatic film, i.e., yellow seems to be 10 times brighter than blue. Actually blue is only four the fifths the brightness of yellow. In other words, for obtaining a faithful rendition of the scene it becomes necessary to absorb some of the light (color), preventing it from reaching the film, while transmitting the other colors to the film. Filters, supplied in different colors, control the different tones by their quality of lightening objects of their own color (transmitting the light) and darkening

those of their complementary color (absorbing the light). For example, a yellow filter will darken the blue of the sky.

b. Filters for Color Films :

In color photography, filters are used for two main purposes. Light balancing filters are used when color film is exposed to light for which it is not balanced (suited). All color films are made for specific color qualities, or light sources. Daylight Type color film for example is designed for use under the average daylight conditions prevailing from 9 a.m. to 3 p.m., or when the color temperature of the light is 5500°K. On the other hand, Type F film is designed for use with clear flash bulbs and will require a filter when used with photoflood lighting.

Color compensating filters are used to correct color deficiency in the existing illumination, by raising or lowering the

color temperature to suit the film being used, or for obtaining special mood effects. For example, when using Daylight Type in the early morning (before 9 a.m.) the effect would be reddish unless the color temperature is increased with a filter and the red colors absorbed.

c. Exposure Factors :

Since filters absorb part of the light that would normally reach the film, it is necessary to increase exposure time or use a larger aperture when using filters.

The additional exposure ratio depends on the film color sensitivity, color of the prevailing light, or artificial illumination to be used, and the color of the filter, and is called the filter factor.

With a few exceptions, all outdoor shots should be taken with a filter, this being particularly true for shots of the sky, with or without clouds. Filters should be

eliminated, however, when the shot calls for a very short exposure under poor lighting conditions.

d. Filter Mounts :

Filters for the RE. Auto-Topcor and R. Topcor lenses are available in three basic types of mounts, as follows:—

- i. **Screw-in Type :** The filter is simply screwed into the filter mount on the front flange of the lens and is supplied in three different filter mount sizes. The RE. Auto-Topcor lenses f/1.8 58 mm, f/2.8 35 mm, f/2.8 100 mm. f/3.5 135 mm, f/5.6 200mm and the f/3.5 90mm R. Topcor lens use the 49mm filters. The RE. Auto-Topcor f/1.4 58mm and R. Topcor lenses f/4 200 mm and f/5.6 300mm accept the 62mm filters.
- ii. **Lens Rear Bayonet Mount Type :** For use on the f/3.5 25 mm RE. Auto-Topcor lens, by attaching to the rear lens mount instead of to the front

flange which is extremely large.

The tables on pages 83 and 84 show the color, effect (use) and exposure factor for Topcon filters supplied for both panchromatic and color films. With the BESELER TOPCON D-1 however, it is only necessary to take an exposure reading with the required filter over the lens and the reading will include the exposure factor.

The lens rear bayonet mount filters, for the 25mm wide-angle lens, are supplied in Y1, Y2, O2, YG and UV, for black-and-white films, and Daylight, Cloudy, Mor. & Eve., Flash and Flood, for color films. All other mount filters are supplied in Y1, Y2, O2, R2 and UV, for panchromatic films, and also include F Type, besides the above-noted five types, for color films.

NOTE :

The UV filter is often used to protect the valuable lens because it is colorless and does not require any increase in exposure.

FILTER FACTORS FOR BLACK-AND-WHITE FILM

Filter	Color	Use	Filter Factor			
			Pan. B		Pan. C	
			Day.	Tung.	Day.	Tung.
Y1	Light Yellow	Suitable for all outdoor work, landscapes, snow scenes and particularly effective for accentuating clouds on a blue sky.	1	1	1	1
Y2	Medium Yellow	Gives more brilliance to spring and autumn foliage. Renders yellow and green lighter and blue darker.	1.5	1	1.5	1
O2	Medium Orange	A special effect filter suitable for depicting heavy clouds against dark sky and bringing out details in distant views by reducing mist. Renders yellow and red lighter, and blue darker; subdues skin blemishes in outdoor portraits.	3	2	3.5	3
R2	Medium Red	Greater contrast than Y2 or O2 filters, for dramatic cloud effect against black sky. For dark wood furnitures by artificial light. Use with infra-red film for special effects.	6	5	6	5
UV	Colorless	Use for high altitudes above 6,000 feet, as it eliminates ultraviolet rays which reduce contrast.	1	1	1	1

Ref: Pan: B ...SUPER XX, PLUS X, PANATOMIC X, MICROFILM (KODAK), ULTRA-SPEED, SUPREME (ANSCO), NEOPAN S & SS (FUJI)

Pan: C.....TRI-X, PANCHROME, ORTHO X (KODAK)

FILTER FACTORS FOR DAYLIGHT COLOR FILM

Filter	Alteration in Color Temp.	Use	Filter Factor
SKYLIGHT	Absorbs ultra-violet rays and some blue light	Suitable for sunny weather as it absorbs ultra-violet rays and counteracts the tendency towards being excessively bluish, giving natural color balance. Especially effective for cutting bluish reflection from young foliage.	1
CLOUDY	7500°K → 6000°K	For use on cloudy days as it lowers the color temperature and absorbs the bluish colors, giving overall color balance and saving the picture from being excessively blue.	1.2
MOR. & EVE.	5000°K → 6000°K	For use in the morning and evening hours when the picture will be excessively reddish. Raises color temperature and absorbs reddish colors.	1.6
FLASH	3800°K → 6000°K	Use with clear flash bulbs not suited for daylight color film. Raises color temperature and gives correct color balance of otherwise excessively reddish picture.	2.4
FLOOD	3200°K → 6000°K	Used to raise the low color temperature of flood lamps and absorbs reddish colors.	3.2
F TYPE	6000°K → 4000°K	For use with Type F film when exposed for daylight. It lowers the daylight temperature to flash type film temperature and absorbs bluish colors.	2.9

- Ref: 1. Daylight films are Kodachrome, Daylight ; Kodacolor, Daylight ; Ektachrome, Daylight
Anso Color, Daylight ; Agfa Color, Daylight ; Gevaert Color, Daylight ; Fuji Color.
2. Type F films are Ektachrome, Type F ; Kodachrome Type F ; Ansochrome Flash Type.

3. TOPCON LENS-LITE EXPOSURE METER

This revolutionary exposure meter, covers the range ASA 6 to 1600 (DIN 9 to 33), shutter speeds 60 seconds to 1/1000 second and apertures f/1 (without lens attached) to f/22. It has been designed to take a reflected light exposure reading through the lens at the film plane. It employs a mercury-battery cadmium sulphide photocell.



a. **Macrophotography :**

The exposure meter takes the place of the camera and reads the actual amount of light that passes through the lens plus extension tubes and/or bellows and falls on the film plane. Exposure reading is obtained, promptly without further calculations.

b. **Photomicrography :**

The meter takes very accurate readings by measuring the amount of light that reaches the film plane through the microscope plus microscope attachment, up to 150 \times magnification (with suitable illumination.)

c. **Telephoto :**

Simply attaching the Lens-Lite meter to the telephoto lens eliminates the guesswork normally connected with exposure readings of subjects at extreme distance from the camera. May be used with standard or even wide-angle lenses as well.

d. Independent Use :

The exposure meter may also be used independently, without the lens, for taking readings in extremely low levels of illumination.

4. MACROPHOTOGRAPHY ACCESSORIES

The BESELER TOPCON D-1 system of photography has several valuable and exclusive accessories for use in macrophotography, or photography at extreme close-up distances. Both rigid extension tubes and bellows are available for the purpose of extending the distance between the lens and film and controlling the degree of magnification in the final picture image. Since view-focusing is through-the-lens, matter what extension is used, it is photographic work like this which makes one really appreciate the value of the BESELER TOPCON D-1 single lens system.

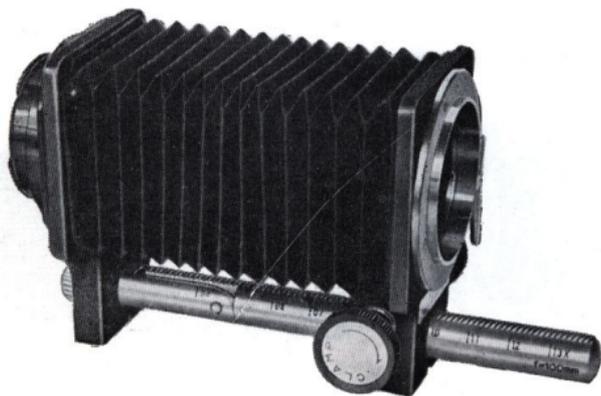
a. Extension Tube Set :

The set consists of three different length (9 mm, 15 mm and 30 mm) extension tubes which can be used singly, or in various combinations. They control the total extension of the lens from a minimum 9 mm to a maximum 54 mm (with the lens set at infinity). All tubes have bayonet mounts and, therefore, changes in combinations can be made simply and speedily.



b. Bellows Attachment, Model I:

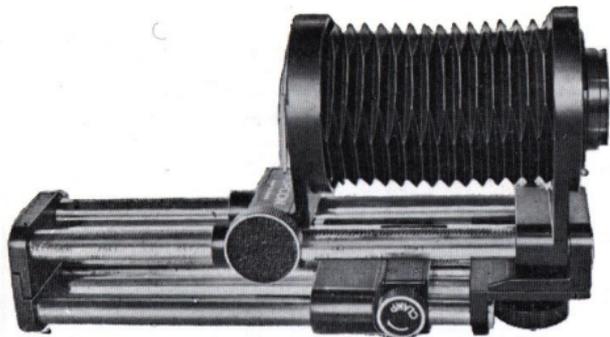
This folding bellows attachment has been designed for use on field trips, as it folds into a compact shape. The single rail bellows has a minimum extension of 40 mm which racks out to a maximum 140 mm, for a scale of reproduction ranging from 0.69 to $2.41\times$, with the 58 mm lens. The bellows may be used in combination with the extension tube set for additional extension.



c. Bellows Attachment, Model III:

This top quality bellows is a complete set in itself, accepting other accessories, such as the Macro-stand Attachment and Slide Copying Attachment. The lower rails are detachable for use separately in other photographic fields. When used as a complete bellows attachment, the pair of double rails provide one of the fastest means for focusing the lens in extreme close-up shooting. The top rails control the degree of lens extension while the lower rails position the accessory as a whole, thus speeding up composing. The magnification ranges from 0.5 x to 3 x, with the 58 mm lens, and 0.5 x to 1.5 x with the 100 mm lens. This is more than any other standard bellows.

The lower rails may be detached and used separately for positioning the camera plus lens and accessories in reproduction work, etc.



d. Macro-Stand Attachment :

The attachment is a fixed stage for placing small objects to be photographed at a pre-determined scale of reproduction without focusing problems. It is ready for use simply by inserting into the front member of the Model III bellows, and setting both bellows and macro-stand to the same magnification figures, on their respective rails. This will automatically place the object in correct focus. The attachment also minimizes vibration during shooting.

e. Automatic Extension Tube :

The accessory is a 9 mm length extension tube for providing semi-automatic diaphragm action with the RE. Auto-Topcor lenses in macrophotography. After the desired aperture is set to the lens, the diaphragm lever is cocked, setting up the semi-automatic diaphragm spring action and opening the lens to its maximum aperture for view-focusing.

By using a TOPCON double cable release,



screwed into the diaphragm release (of the accessory) and the shutter release (of the camera), the diaphragm will automatically close down to the pre-determined aperture and the shutter will be released in fully coordinated and automatic actions.

Used with the extension tube set, the accessory may replace the No. 1 (9 mm) tube or be used for additional 9 mm extension.

Scale of Reproduction using the Extension Tubes & Automatic Extension Tube

Extension Tubes Used		Focal Length of Lens			
No.	Length mm	f = 58 mm	f = 35 mm	f = 100 mm	f = 135 mm
1 or A	9	0.16~0.33	0.25~0.53	0.09~0.19	0.07~0.18
2	15	0.26~0.43	0.42~0.7	0.15~0.25	0.11~0.22
A+1	18	0.31~0.48	0.51~0.8	0.18~0.28	0.14~0.24
1+2 or A+2	24	0.41~0.59	0.67~0.95	0.24~0.34	0.18~0.29
3	30	0.51~0.70	0.84~1.12	0.3 ~0.4	0.22~0.33
A+1+2	33	0.57~0.74	0.94~1.2	0.33~0.43	0.24~0.36
1+3 or A+3	39	0.67~0.84	1.09~1.37	0.39~0.49	0.29~0.4
2+3	45	0.78~0.95	1.25~1.53	0.45~0.55	0.33~0.44
A+1+3	48	0.83~1.0	1.35~1.65	0.48~0.58	0.36~0.47
1+2+3 or A+2+3	54	0.93~1.1	1.51~1.78	0.54~0.64	0.4 ~0.5
A+1+2+3	63	1.1 ~1.25	1.8 ~2.1	0.63~0.73	0.47~0.58

A = 9 mm
 No. 1 = 9 mm
 No. 2 = 15 mm
 No. 3 = 30 mm

5. SLIDE COPYING ATTACHMENT

The TOPCON slide copying attachment must be used in combination with the bellows attachment, Model III, to which it is attached. Consisting of bellows and an adjustable spring-actuated slide holder, duplications of color transparencies as well as production of black-and-white negatives from color transparencies are possible. With suitable controls over lighting, correction filter, copying film, enlargement and cropping, improvements over the original slide are even possible.

6. PHOTOMICROGRAPHY ACCESSORIES

Two types of microscope attachments are available for use with the BESELER TOPCON D-1 and replace the lens which is not used in photomicrography. The camera body is connected to the microscope, by either of

these microscope attachments, and the final picture image is always seen directly on the focusing screen, without the use of expensive, complicated and bothersome accessories.

- a. **Microscope Attachment, Model III:**
A two-piece attachment for low magnification only, using only the objective of the microscope, with a photographic lens included in the attachment to replace the ocular of the microscope, which is not used.
- b. **Microscope Attachment, Model IV:**
A non-rigid bellows for high magnification use, with the camera body supported firmly on the copying stand and the bellows slipped over (but not fixed to) the microscope tube. The attachment does not provide any support for the camera body but is designed to eliminate all vibrations from the camera body being transmitted to the microscope. It provides a light-tight connecting sleeve. May be

used, if necessary, with extension tubes or bellows, Model III, for even greater photographic magnification.

7. COPYING STAND

This is a four-unit copying kit consisting of a three-unit stand and a wooden baseboard measuring 20.28 inches \times 20.28 inches. It is used for copying and reproduction work, as well as for supporting the camera and attachments in macrophotography, photomicrography, slide copying work and for eliminating vibration during such shooting. Without the extension column in place, the height of the column is 18.89 inches, permitting copying work of the size 11.02 inches \times 7.48 inches. The extension column gives a maximum height of 41.46 inches, sufficient for reproduction work of the size 20.47 inches \times 13.62 inches, both when using the 58mm lens.

8. ANGLE VIEWER

For viewing the finder field at right angle to the optical axis. For low-angle shots, over-the-crowd shots, etc., simply attach the angle viewer to the eyepiece frame slots and a view somewhat similar to the adapter inserted into that obtained when looking through the waist-level finder will be possible, without the disadvantage of viewing a laterally reversed image.

The angle viewer is useful for close-ups, macrophotography, reproduction work, photomicrography and for obtaining unusual angle shots.

9. MAGNIFIER

For greater magnification in critical focusing work, slip the magnifier onto the eyepiece adapter (which is attached to the eyepiece frame) and the full focusing area will be seen enlarged 4 \times . May be flipped up, out of the way, when not required.

CLEANING THE BESELER TOPCON D-1

1. The camera body should be brushed with a soft brush. Or use a rubber-ball blower to blow away the dust. Then wipe the body with a soft lint-free cloth. This should be done each time the camera is used at the seashore or on a rainy day. Salt and rainwater can be the cause of stains and rust, unless cared for as soon as possible.
2. If the camera is dropped into the ocean, wash immediately with clean water, lubricate with good quality oil and send out for repairs as quickly as possible. It will be more difficult to repair after any length of time has elapsed.
3. The lens should be touched as little as possible. First, blow off any loose matter, then dust the surface with a soft hair brush and gently wipe with lens tissue.
4. If further cleaning must be done on the lens, use a lens tissue or a clean lint-free cloth, wrapped around a piece of rod. Lightly moisten with plain water, or pure grain alcohol, or possibly a mixture of alcohol and ether (in 4:1 ratio). The tip should be moistened so lightly that it is dried almost immediately and the lens should be lightly wiped from the center outwards in ever-widening circles. Don't rub the surface under any condition.
5. Don't wipe the reflex mirror or focusing screen, unless absolutely necessary, and then only very lightly with a lens tissue. Always blow foreign matter away or dust it with a soft hair brush first.
6. Use a blower or a soft hair brush to clean the inside of the camera.
7. Keep the film pressure plate clean at all times.
8. Don't oil the camera mechanisms.

9. Don't take the lens, or other optical elements apart.

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