

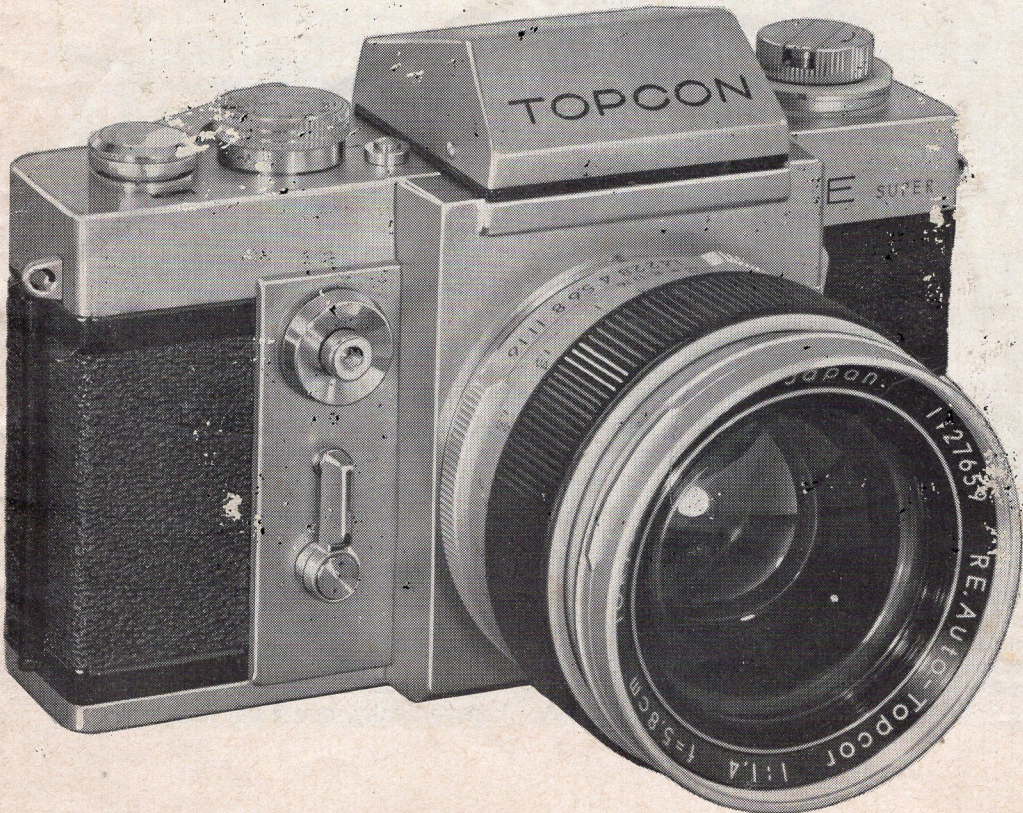
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TOPCON SUPER D



or
**TOPCON
RE SUPER
D 1 or RE 2**

a full
report

by

Gérard BOUHOT

The TOPCON RE SUPER, sold in the U.S.A. under the name BESELER TOPCON SUPER-D, was the first reflex camera on the market to provide exposure metering through the lens. It has not been modified since it was introduced in 1962.

It is a 35 mm reflex camera, with instant return mirror, featuring interchangeability of lenses, of viewing systems and of focusing screens, and semi-automatic exposure metering by integration at full aperture.

The TOPCON system is still one of the most comprehensive systems, with some very clever special accessories.

Metering method :

It was the first system of this type to be put on the market, and it is still the only one in its category... probably because of some patents!

It is the only method using the principle of the mirror/cell. The instant return mirror presents a series of non reflecting stripes, 0.05 mm in width, which let 7% of the incoming light through. The 93% remaining are reflected normally and allow viewing and focu-

sing in the same manner as in all reflex cameras (the loss of light is therefore insignificant, corresponding to about 1/8 of an f/stop).

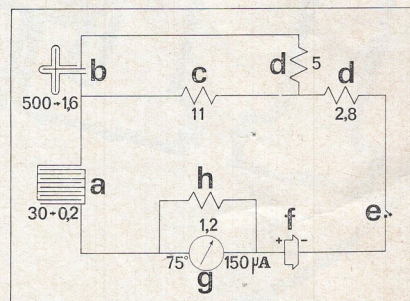
The distribution of stripes over the mirror is not homogeneous. A central cross, following the medians, features a wide pitch grid, leaving an unstriped area at the centre of the cross. As in all SLR's, the mirror is truncated in order to allow its swing behind the lens. The cross therefore determines two wide rectangles on the hinge side of the mirror and two narrower rectangles at the bottom edge. These four rectangles are covered by fine-pitch stripe grids.

The photo-sensitive cadmium sulphide (CdS) cell has quite unusual dimensions. With 34x26 mm, it reaches the size of a normal picture. It is fitted to the back of the mirror over its whole area. It is held in place as in a sandwich between the mirror proper and the metal plate covering the whole assembly. This cell, deposited on a 0.5 mm thick substrate, is protected from oxidization by a plastic coating. As with all CdS cells, it is the decrease of its resistance with increasing light which is used for exposure metering.

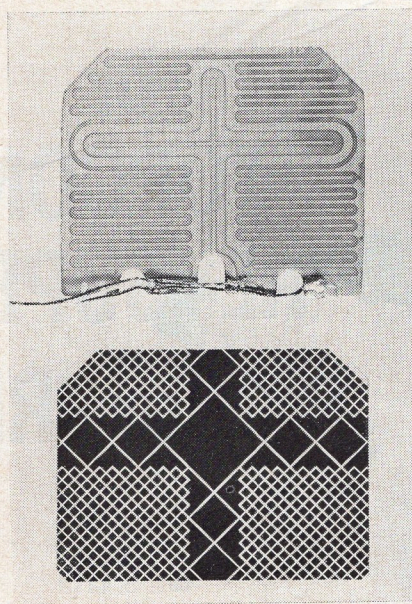
But the structure of this cell is not homogeneous, which is still another original feature of the TOPCON system. Under all four rectangles are located cell elements in fine comb configuration, providing the measurement at low light levels. Under the medians is located a wide cross shaped cell, the action of which adds to the one of the four above-mentioned combs for high light levels. The addition is performed automatically by the electrical circuit, but only when necessary. It is one of the major "tricks" of the system, and there are no mechanical contacts.

At low light levels, the resistance of the fine combs allows only a small current flow. The high resistance of the cross prevents current flow through it. At medium light levels, the fine comb resistance decreases and the current increases. As the cross resistance also decreases (it gets nearer to the "bleeder" resistance provided in the circuit), it also begins to carry

part of the current. At high light levels, the cross resistance decreases still further and current increases as it flows preferentially through the cross which is the lowest resistance path. For extremely high light level, it is the composite circuit resistance which determines current flow. The switch from low to high light level is therefore progressive and automatic. This system has been developed by TOPCON in cooperation with the TO-SHIBA electronic Company.



Electrical circuit diagram of the TOPCON RE SUPER/SUPER-D (resistor values are given in K. Ohms): a) "Combs" for low light levels (when illuminated, their resistance goes from 30 to 0.2 K. Ohms); b) "Cross" for high light levels (variation 500 to 1.6 K. Ohms); c) bleeder resistor, providing automatic switching of the circuit; d) circuit compensation resistors; e) battery switch; f) Mercury PX 13 type battery; g) galvanometer, 75 degrees deviation for 150 microamperes; h) galvanometer shunt. (Left) Exposure meter window on top of the body, with indication of 1 exposure step (1 EV) on the overexposure side, and edge of the black mark appearing on the right, indicating that the meter range limit is approaching.



Detail of the mirror/cell system: 1. Mirror covered with 0.05 mm wide stripes letting 7% of the light through to the sensitive element. - 2. CdS cell with its connecting wire: notice the distinct elements: "combs" and "cross".

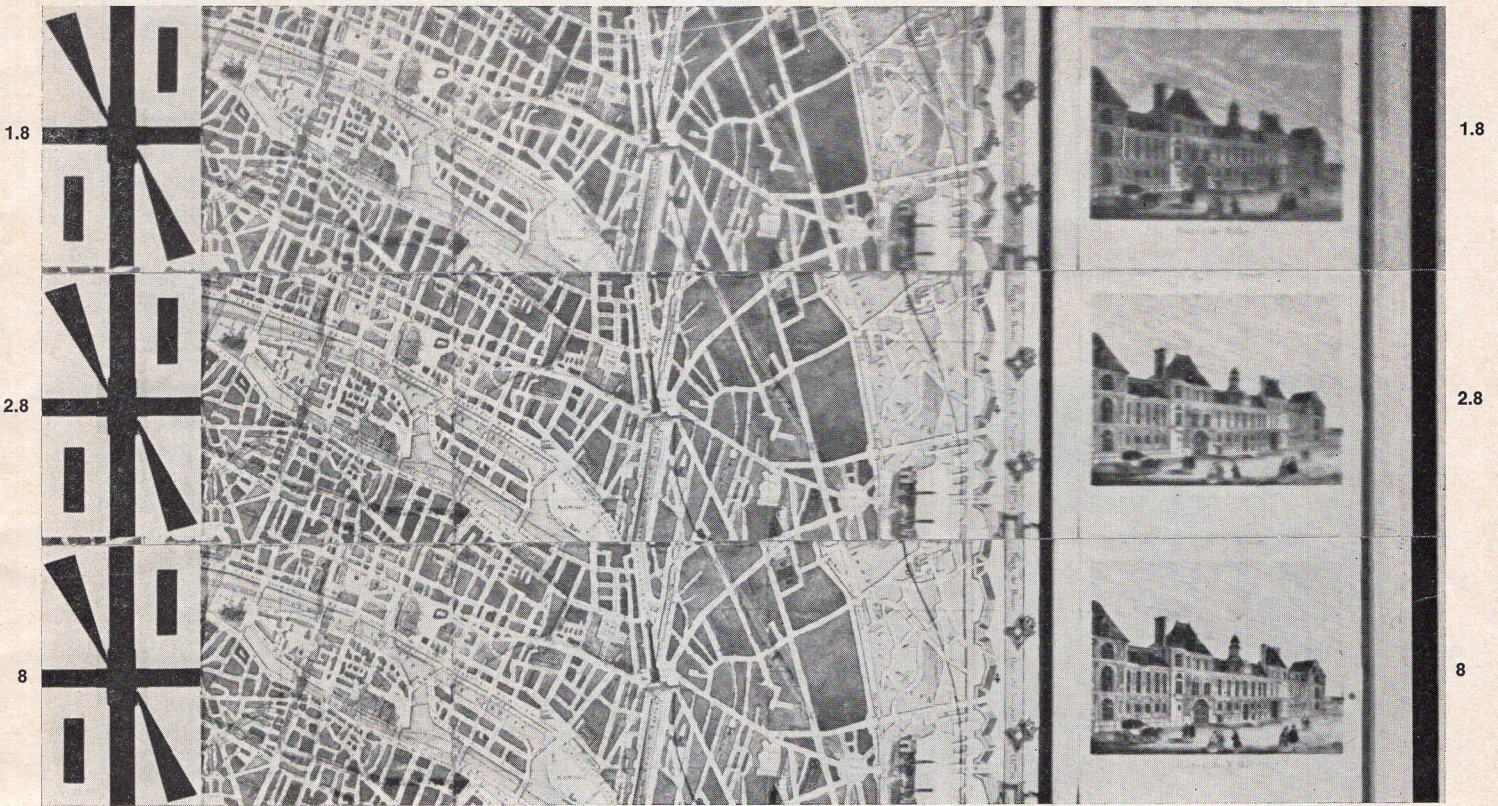
The cell/mirror is located in the light beam coming out of the lens, but at this location the subject image is not sharp. Integration is therefore a smooth one, and it becomes more and more homogeneous as the two parts of the cell become excited simultaneously. The reduction of metering area at the bottom of the mirror provides an automatic compensation for landscape pictures shot horizontally. In fact since the sky projects itself partly outside the mirror, it has comparatively less influence on the meter reading than the ground, the projection of which reaches the area near the mirror hinge. For landscape pictures taken vertically, one must first meter

Linear enlargements approximately 10x

Center

RE AUTO TOPCOR, 58 mm, f/1.8 - No. 11664094

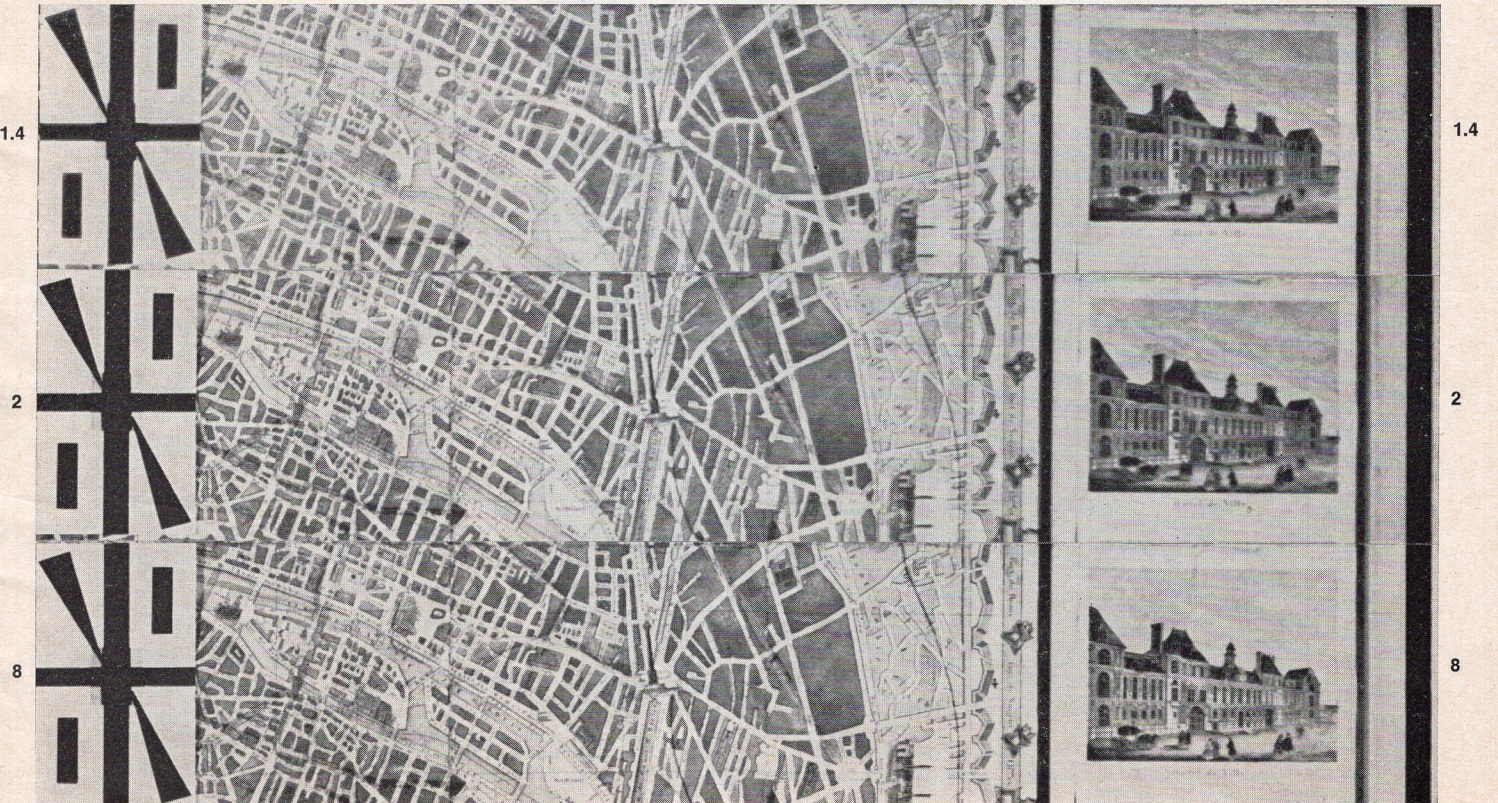
Edge



Center

RE AUTO TOPCOR, 58 mm, f/1.4 - No. 11214541

Edge



the exposure in the horizontal position.

This cell/mirror system, which intercepts the beam out of the lens, is rather insensitive to the incidence angle of the light. Whatever the focal length of the lens in use, and therefore for a wide range of beam apertures, the readings obtained are very homogeneous. Nevertheless, with long telelenses at small apertures, in photomacrography and photomicrography when the light beam becomes sub-

parallel, the mirror grid appears in black on the focusing screen (due to lack of reflected light). The grid is then all the more visible when the light rays are parallel, the area located in the vicinity of the hinge being the sharpest because it is closer to the focusing screen. The viewfinder image and the grid image become superimposed, which has led the TOPCON engineers to leave the mirror center free from stripes, thus allowing, in all cases, a perfectly efficient focu-

ing on the microprisms or the Dodin rangefinder and over a part of the frosted ring. Obviously, for normal cases, when metering is performed at full aperture, this phenomenon is not noticeable.

Due to its location, the sensitive element of that cell/mirror system is well protected against stray light that could enter through the eyepiece when one meters at fully open aperture.

The integrating systems are the easiest ones to use by the amateur photographer. In special cases, one can influence the system on purpose. To perform a "spot" type metering, one takes a reading with a longer focal length lens than the lens in use for the actual shot. According to the desired backlight effects, the operator can modify the readings at will, and he can also take either a reading at close distance or a "spot" reading. One should avoid including light sources in the metered field: sun, street-lights, highly reflective surfaces,... which could invalidate the results.

A very noteworthy advantage of the cell/mirror system comes from the fact that the focusing screen is located behind the sensitive element of the exposure meter. The focusing screen therefore plays no part in the measurement. All the available focusing screens can be used without having to introduce a correction coefficient on the exposure meter. Thus the TOPCON is:

- a TTL camera with interchangeable focusing screens (this is a rare feature because this brings quite a few complications in the design of the body);
- without correction factor as a function of the focusing screen or of the focal length of the lens in use;
- and the only one which permits TTL exposure metering with a clear focusing screen under any circumstance!

Meter readings are taken with the TOPCON at fully open aperture. This setup decreases the influence of stray light, provides bright viewing, but entails testing the depth of field (at the preselected aperture) through a separate knob, and using



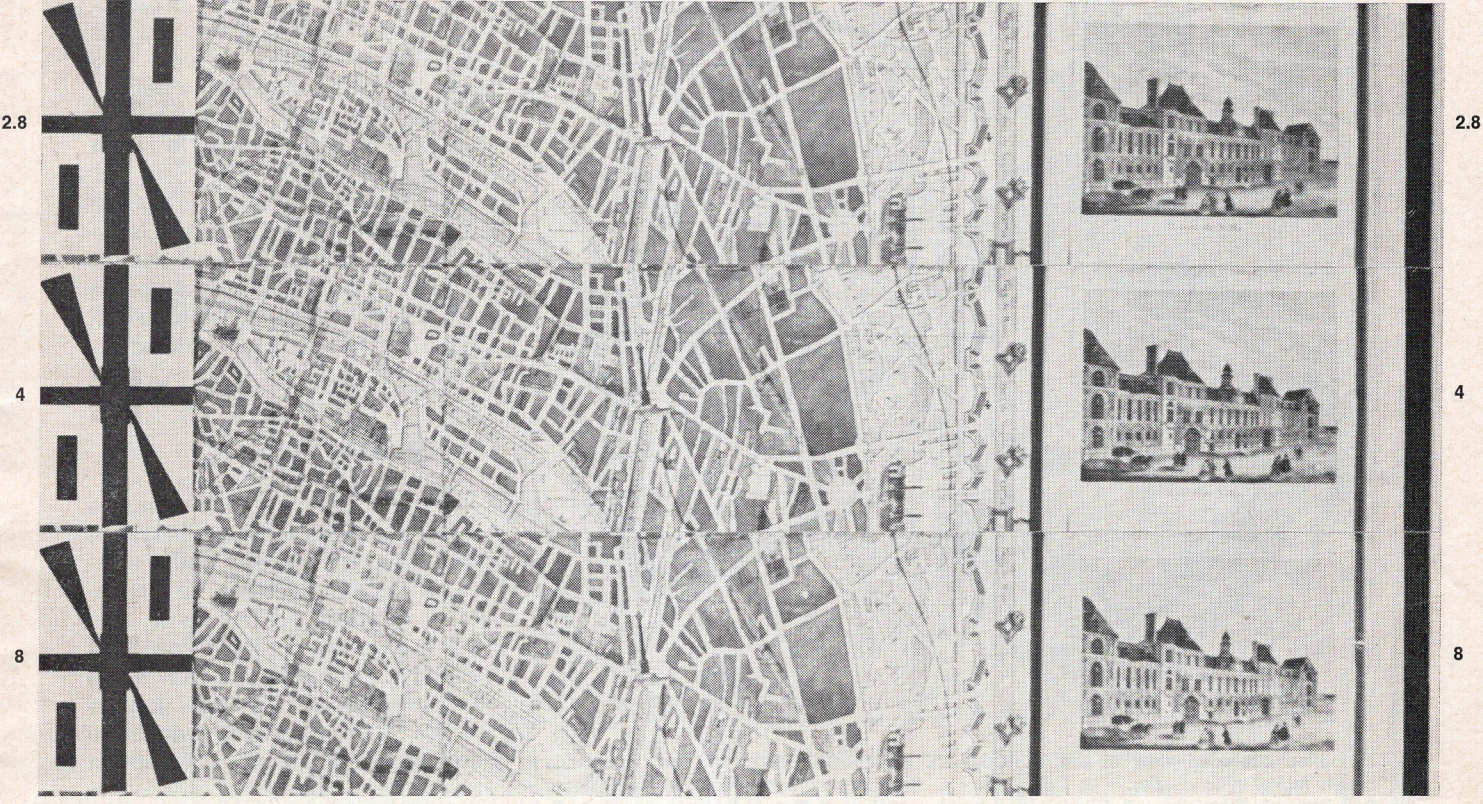
Consistency of measurements. Landscape: measurement at stopped down aperture with an Exakta lens. Close-up: ratio $0.3\times$ measurement at maximum aperture with the Macro Auto Topcor 58 mm f/3.5.

Linear enlargements approximately 10×

Center

RE AUTO TOPCOR, 100 mm, f/2.8 — No. 7505131

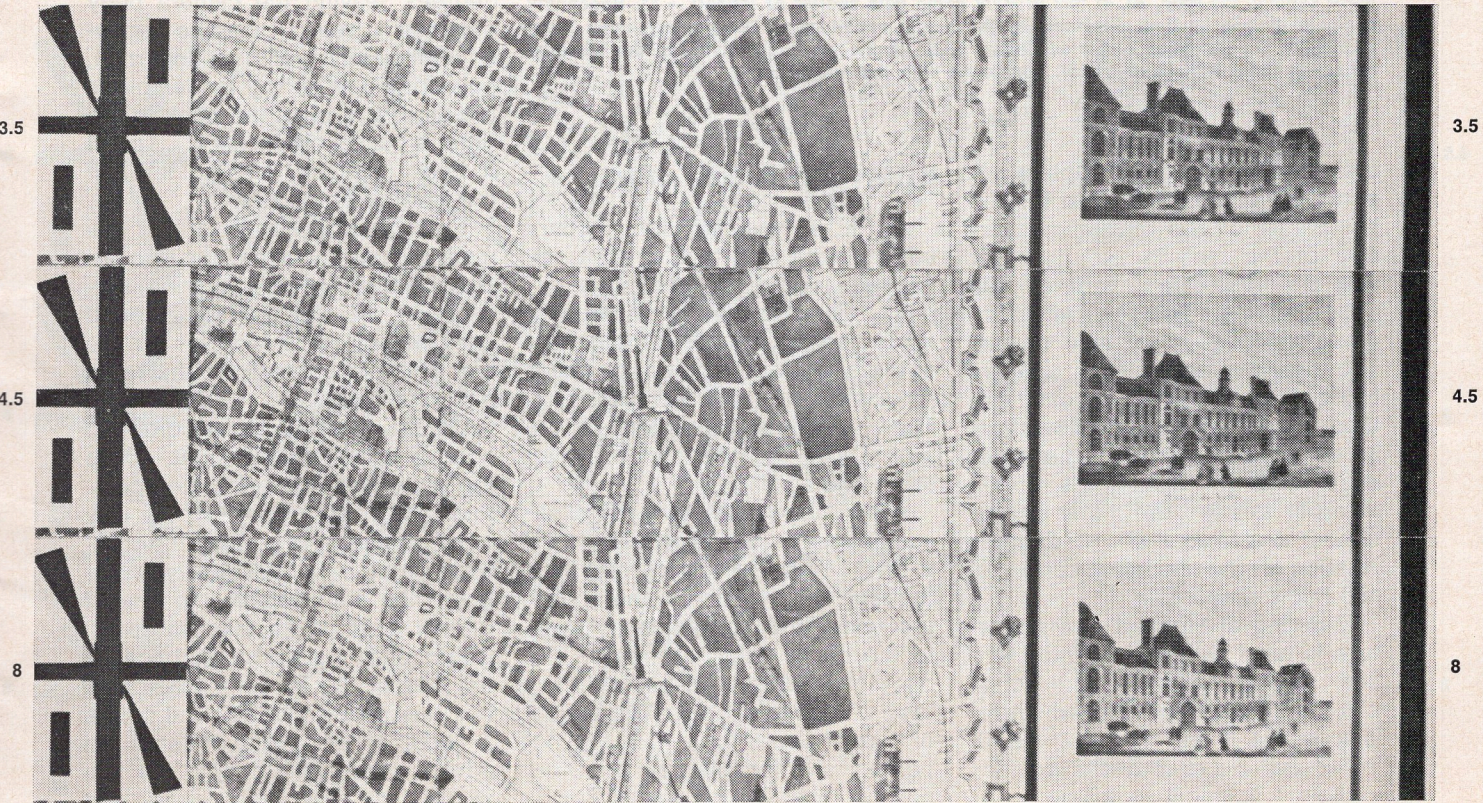
Edge

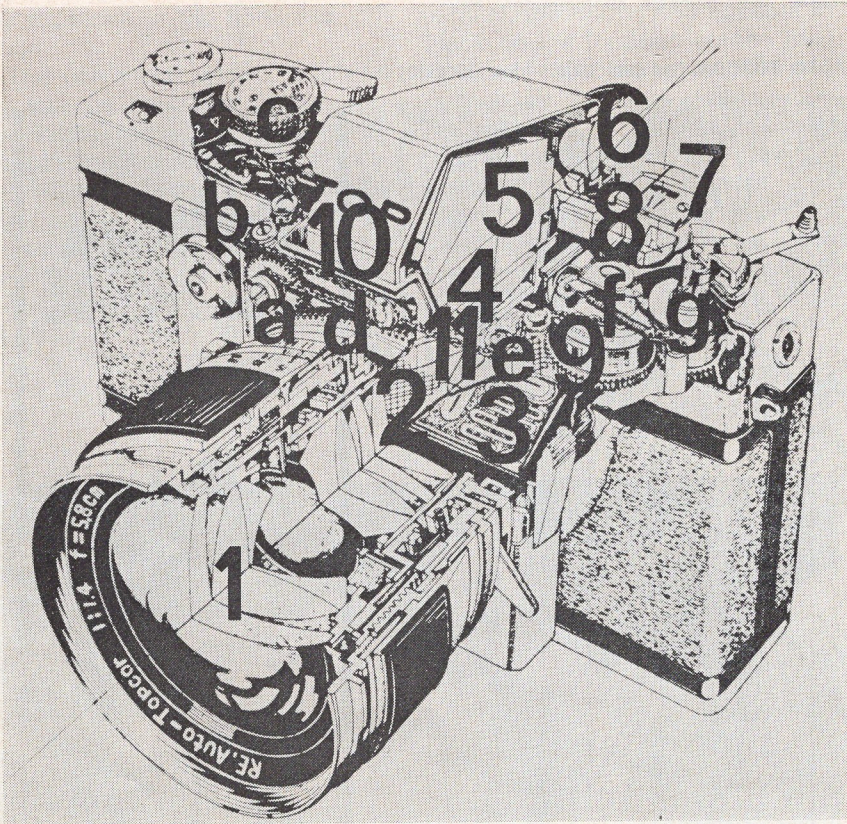


Center

RE AUTO TOPCOR, 135 mm, f/3.5 — No. 7619104

Edge





Simplified exploded view of the TOPCON RE SUPER/SUPER-D: 1. Lens. - 2. Instant return mirror with stripes. - 3. CdS cell. - 4. Focusing screen and condensing lens. - 5. Prism. - 6. Eyepiece. - 7. Window and meter needle. - 8. Transmission prism. - 9. Galvanometer. - 10. Primary coupling chain: a) connecting gears to the lens diaphragm ring; b) pulleys; c) connection to the shutter speed and film speed selector (according to these settings the loop, 10, of this primary chain gets shorter or longer). - 11. Secondary chain: d) floating pulley, displaced by the length variations of the primary chain loop; e) pulleys; f) connection of the secondary chain to the rotating housing of the galvanometer; g) chain tension regulator, concentric with the rewind knob.

lenses with special coupling. A particular cam transmits to the exposure meter the maximum aperture of the lens in use, together with the preselected aperture value after metering. This relatively complex coupling uses two chains. The metering itself, which appears to be done through a zeroing method, is in fact a current flow measurement during which the outer case of the galvanometer is rotated in order to keep the meter needle aimed at a fixed mark (75 degrees rotation for the maximum current of 150 micro-amperes).

Metering at stopped down aperture is used with non coupled lenses. In this case, it is the actual closing of the diaphragm which replaces the chain linkage. Both types of measurement provides perfectly homogeneous results.

Battery installation, switch :

A PX.13 type Mallory mercury battery, with a voltage of 1.3 volts, is used in the exposure meter circuit. Unscrew the compartment lid, located on the left of the bottom of the case, with a coin or by finger pressure on its knurled outer ring. The + terminal is marked on the lid. Drop the battery in, then screw the lid back.

With a fingernail, swing the exposure meter switch lever from OFF to ON. This lever is not very easy to reach, and it is furthermore located under the camera body (next to the battery compartment). The body must be turned upside down to read the indication. The bottom of the eveready case has the necessary slot for this operation, but not the fold-over front cover. One

must therefore open this cover to check the position of that lever.

When the camera is not in use, leave the switch OFF. Between consecutive shots, one may leave it ON. Battery life may reach two years, but since there is no battery test—a regrettable oversight—one must change it every year to be on the safe side.

After battery installation, switch ON and aim at a subject with adequate light. If the meter pointer does not move, the battery is upside down. Turn it around. Wrong installation is harmless to the electronics.

Loading, frame counter :

The TOPCON takes standard 35 mm cartridges, which must be loaded into the camera under attenuated light conditions—a worthwhile reminder. Push and turn (in the direction of the arrow), the knurled knob located close to the exposure meter switch, toward OPEN. A strong spring swings the back open. The double movement prevents any accidental opening of the camera body.

The back swings to the right 180 degrees, leaving the camera body completely free. It may be removed completely. With a fingernail, pull down the spring loader hinge pin stud, and pivot the back to the right: it comes out by itself. To put it back in place, just go through the reverse procedure.

The film plane ways are of the modern four rail type: the two internal ways are the bearing surfaces for the film, the two external ones provide side location for the film and the contact for the large pressure plate.

Lift the rewind knob in order to remove its protruding shaft. Drop the cartridge in the left recess. Push the rewind knob all the way back in, turning it slightly if necessary. Introduce horizontally two or three film perforations into one of the six slots of the take up spool. Do not push more through, because the end of the leader could come out through another slot and create a double thickness. Begin to advance the film slowly. The film winds under the spool, check that

Linear enlargements approximately 10×

Center

RE MACRO AUTO TOPCOR, 58 mm, f/3.5 — No. 13700249

Edge



Center

RE AUTO TOPCOR, 35 mm, f/2.8 — No. 7414217

Edge



it does not come off because the engagement is rather loose. The flange of the take up spool is not knurled as the instruction manual says, and therefore cannot be used to manually drive the film: one must use the film advance lever. Check that the teeth of the sprocket mesh into the film perforations.

Close the back with a strong pressure in order to lock the closing system. A small pressure only provides temporary closure, and the back may then spring open on its own at any time. Complete the film advance movement. The counter remains on the first white dot. Release the shutter. In order to take up the slack, unfold the rewind crank, turn it in the direction of the arrow. At the beginning of its rotation, this crank rises automatically by 8 mm, thereby freeing the operator's fingers from the prism hood. It also features a rotating metal handle. This gadget is a practical one. Fold the crank back, push on the rewind knob, it sinks into the body with 1/3 of a turn. Cock. The counter moves to the second dot. Release the shutter. Cock again. The counter advances to zero (this frame, which is the third one, can generally be used since it is not fogged). The first frame is marked with a red dot. Only the rewind knob rotation, during film advance, shows proper transport of the film.

If, during film loading, one turns the take up spool flange and not the film advance lever in order to check the proper film catch, at the first film advance the counter moves to the second dot. It then reaches the red dot after two frames only, but as was mentioned before this practice is not a very easy one because the spool has a slippery flange.

The counter moves during film advance. It is located on top of the body, on the right in front of the film advance lever. It indicates the number of frames already shot. The even figures are engraved white, except 20 and 36 which are red. Odd values are represented by white dots. Beyond 36, the counter slips on its black zone.

There is no film reminder disc for the type of film in use. One may

only verify that the camera is loaded by turning the rewind crank. If it turns freely, the camera is empty.

Film advance, release :

The tip of the film advance lever protrudes 5 mm off the camera body and is very easy to grasp, even when this lever is flush with the camera body. It has a 15 degree dead initial sector, after which the active stroke covers 190 degrees which forces the hand to move in the course of the stroke. But this operation may be performed by successive short strokes, which is very practical. The lever friction brake only works if the lever is returned gently. If one lets it go suddenly, the lever springs back flush with the body.

This film advance is remarkably smooth and quiet. This is a pleasant feature. One must make sure that the stroke was completed to its last millimeter beyond the "click," otherwise the interlock is not released. There is no cocking signal.

The shutter release button is located on the front side of the camera, above and right of the lens mount. Its stroke is short, 3 mm, particularly smooth and without hard point. At the time of release, the meter needle moves rapidly to the left as the sensitive element is deprived of its light. This characteristic is therefore quite normal.

Setting Film Speed :

Do not forget to set this information because it is an essential parameter of the exposure meter operation. Lift the speed selector ring, turn it to show the desired value in the window located between B and 1/1000, and let it down.

For the European TOPCON RE SUPER, the film speed range covers 15 to 33 DIN. The values are indexed every DIN degree. Figures are marked every third DIN value. Only the DIN scale is available. One must look in the instruction manual for ASA, SCHNEIDER, WESTON, GOST... conversions.

The SUPER D BESELER TOPCON has an ASA scale from 25 to 1600, indexed three times between values. It would be more normal to supply this scale even on European-sold cameras, since the ASA scale is the most frequently used now.

At the end of the film, if one exceeds 20 or 36, the film advance lever will be blocked in the course of its stroke. Do not force it in order not to tear the film perforations. Push in the disengaging button located on the right side of the bottom. It locks in. Unfold the crank and turn it. It is only its resistance which tells that the film is winding in. The noise at the end of the rewind indicates that the leader leaves the take up spool and gets back into the cartridge.

When the back is opened, the counter resets automatically to its starting point. The disengaging button will spring back up as the shutter is cocked.

Holding the camera :

The left hand holds the camera from underneath and operates the focusing ring, the diaphragm ring, and the depth of field tester. The right hand holds the camera from its side, the thumb operates the film advance and the middle finger the release.

In vertical shooting, the film advance lever is best located on top for easier operation. The instruction manual reminds us that the camera must be held firmly. An insufficient hold on the body produces vibrations upon release, which are detrimental to picture sharpness even if they do not look obviously blurred.

For time exposure, the bottom features a small pitch tripod socket, very close to the center of gravity. The release knob is threaded to accept a cable release.

Viewing, focusing :

Before measuring the exposure, one must view and focus. These two operations are done at full

aperture. The viewing is bright and the depth of field reduced (which speeds up focusing). The image is completely re-erected by the roof prism.

The image is seen in life size with the standard 58 mm lens. The center of the standard focusing screen (type 1) is occupied by a Dodin range finder with horizontal axis 3 mm in diameter, usable down to f/11 with the standard lens. A 12 mm diameter very finely ground ring, not backed by a Fresnel lens, surrounds the range finder. The remainder of the screen is finely ground and backed by a Fresnel lens. This very well made screen remains usable down to f/22. Only the grain of the ground surface shows up then, the pitch of the lens being hardly visible.

This bright viewfinder only shows slight chromatic aberrations on its edges and in the corners. A few reflections are visible at the bottom of the picture when the eye is not well centered.

The whole of the field and the exposure meter mark located at the bottom of the frame are just visible by people wearing glasses. A rubber eyecup protects the eyepiece, which is set at -1 diopter, a setting that fits most operators. The eyepiece barrel can be unscrewed and replaced by a correcting lens, which then takes the rubber cup.

Depth of field test :

Lower the lever located on the left side of the lens mount to close the diaphragm to the preselected value. When the eveready case is used, this lever becomes difficult to reach. TOPCON was the first company to provide this depth of field testing possibility on its model R.

Viewfinder system and focusing-screen interchanges :

To remove the prism, press the button located close to the speed selector with the right forefinger and push it backwards. Let this button go after a few millimeters of movement in order to catch the

prism and prevent it from falling out.

To remove the focusing screen, introduce the thumb nail under the tongue protruding at the rear of the screen frame. This tongue has two small shining slides. Lift it up. Work slowly in order not to let the screen jump out. Pull it back at a 45 degree angle to remove it.

To put a screen in, present it, inclined at 45 degrees with its front down while holding it with its tongue. Engage the front pin into the corresponding body recess and push the tongue firmly down. It cannot be mounted in any other position. On the bottom of the screen frames, the four machine bearing points are clearly visible.

To install a viewing system, insert it from the back, flat on its slides, and push it forward until it locks. The system must be held flat and pushed down, in order to engage both slides simultaneously. If one proceeds carelessly, and only one slide catches, the prism will lock, but ajar. This is not of paramount importance, since the focusing and the aiming are done on the focusing screen which is always well in place. In the case of a wrong viewing system installation, remove it and replace it correctly.

To view from above the body, without a viewing hood, simply remove the prism. Since the focusing screen is mounted on the subject and focus without any problem. One only has to make a hood with one hand in order to protect the screen from background light. This is a very interesting feature of the TOPCON RE SUPER/SUPER-D.

The focusing screen frame covers 97% of the area corresponding to the picture window. Leave a small excess when shooting slides because the slide mount reduces this area to about 90%.

Mirror, baffle :

The instant-return mirror is relatively long. Its mechanics are con-

ventional. When using long telephoto lenses in photomacrography and photomicrography, the amount of vignetting is small, about 1/8 of the picture height. In these cases, the mirror strips project themselves to a certain extent on the focusing screen. The mirror is only damped at the end of its up-swing by a thick polyfoam band located under the front of the focusing screen. At the back of the mirror on the hinge, a cloth tape protects the cell wires and prevents stray light coming through the viewing system to the film during the exposure. This mirror cannot be raised manually.

Only the back of the mirror, and the bottom of the mirror compartment feature small light baffles.

Shutter :

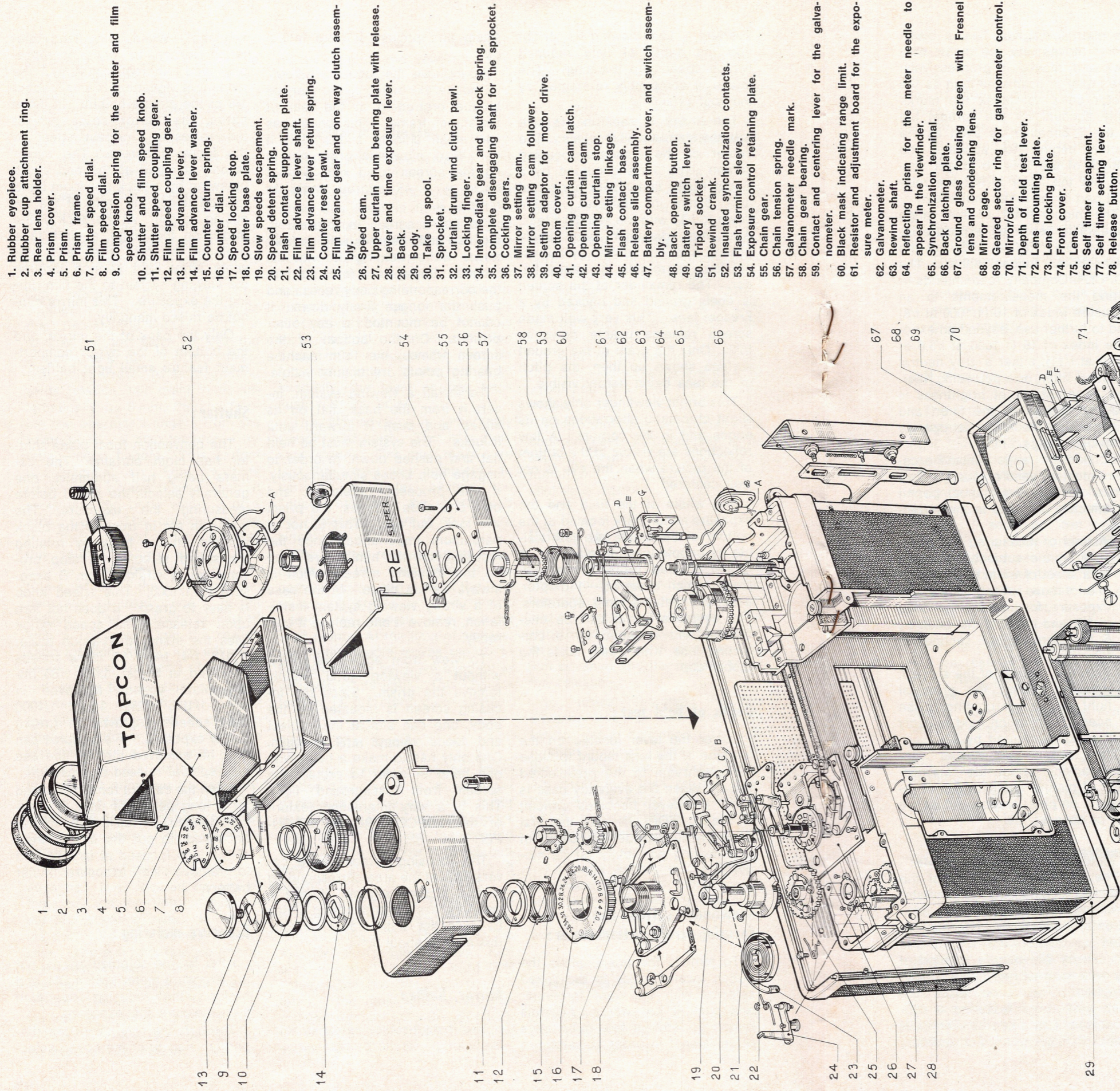
The convention focal plane shutter has cloth curtains. The camera being half automatic, one generally selects the speed before measuring the exposure. The speed is set in front of the black triangle on the body by rotating the speed selector. A stop prevents going straight from B exposure to 1/1000. This speed knob is easy to grasp. It does not turn upon release. The speed range uses the standard 11-value scale: 1, 1/2, 1/4, 1/8, 1/15, (slow speeds engraved in black), 1/30, 1/60 (intermediate speeds engraved in red), 1/125, 1/250, 1/500, 1/1000 (fast speeds engraved in green) and B exposure. T exposures can only be achieved through the use of a special release accessory.

When the camera remains unused for a long period of time, it is recommended to leave the shutter uncocked, to put the cap in front of the lens focused at infinity, and to remove the exposure meter battery.

Exposure metering :

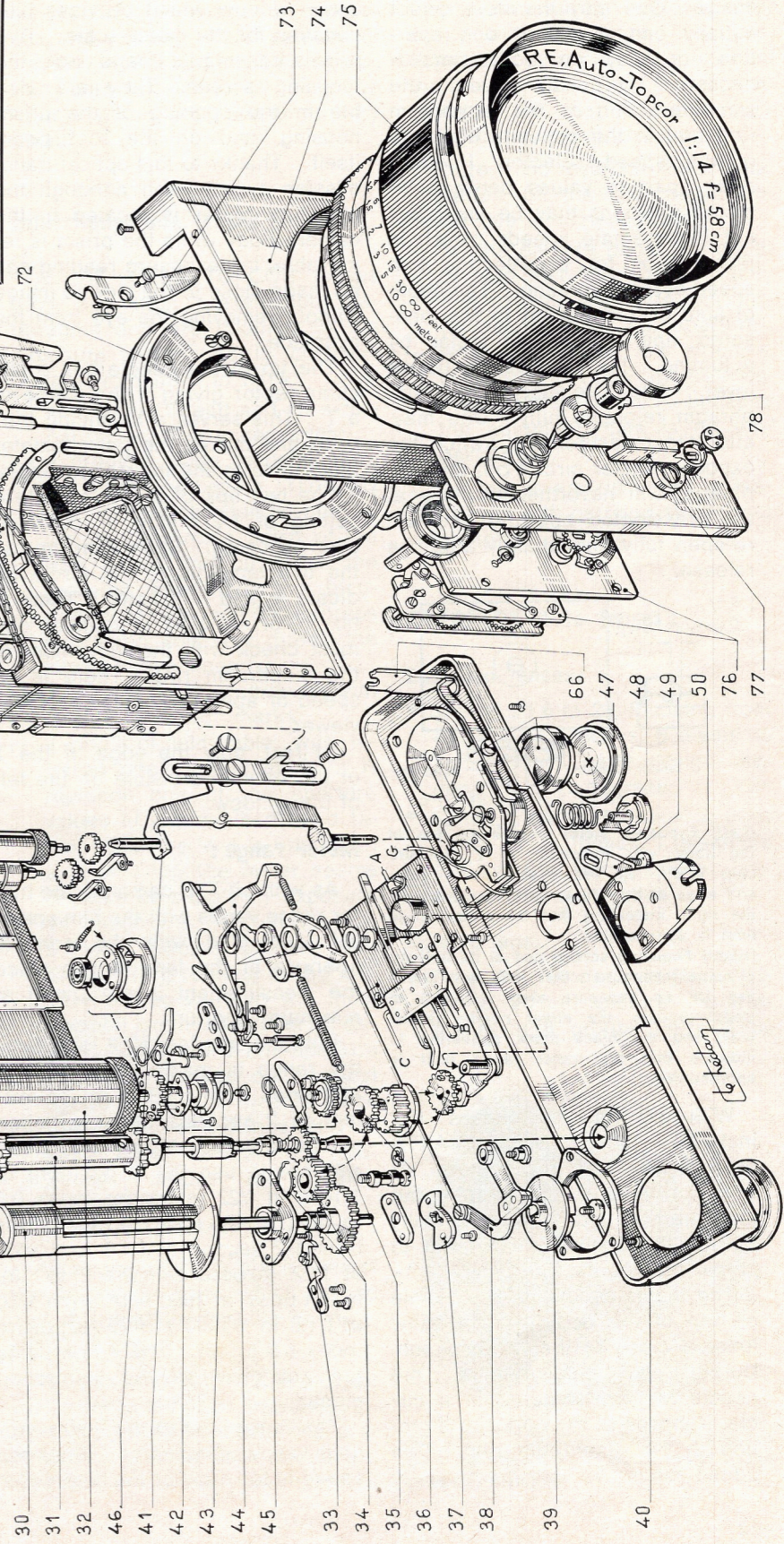
After having selected speed, put the exposure meter switch ON, and perform the focusing operation then measure the exposure.

Through the rotation of the diaphragm ring or of the speed selec-

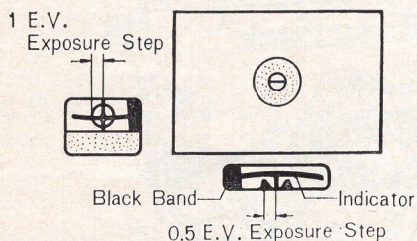


1. Rubber eyepiece.
2. Rubber cup attachment ring.
3. Rear lens holder.
4. Prism cover.
5. Prism.
6. Prism frame.
7. Shutter speed dial.
8. Film speed dial.
9. Compression spring for the shutter and film speed knob.
10. Shutter and film speed knob.
11. Shutter speed coupling gear.
12. Film speed coupling gear.
13. Film advance lever.
14. Film advance lever washer.
15. Counter return spring.
16. Counter dial.
17. Speed locking stop.
18. Counter base plate.
19. Slow speeds escapement.
20. Speed detent spring.
21. Flash contact supporting plate.
22. Film advance lever shaft.
23. Film advance lever return spring.
24. Counter reset pawl.
25. Film advance gear and one way clutch assembly.
26. Speed cam.
27. Upper curtain drum bearing plate with release.
28. Lever and time exposure lever.
29. Back.
30. Body.
31. Take up spool.
32. Sprocket.
33. Curtain drum wind clutch pawl.
34. Locking finger.
35. Intermediate gear and autolock spring.
36. Complete disengaging shaft for the sprocket.
37. Cocking gears.
38. Mirror setting cam.
39. Mirror setting cam follower.
40. Setting adaptor for motor drive.
41. Bottom cover.
42. Opening curtain cam latch.
43. Opening curtain cam.
44. Opening curtain stop.
45. Mirror setting linkage.
46. Flash contact base.
47. Release slide assembly.
48. Battery compartment cover, and switch assembly.
49. Back opening button.
50. Battery switch lever.
51. Tripod socket.
52. Rewind crank.
53. Insulated synchronization contacts.
54. Flash terminal sleeve.
55. Chain gear.
56. Chain tension spring.
57. Galvanometer needle mark.
58. Chain gear bearing.
59. Contact and centering lever for the galvanometer.
60. Black mask indicating range limit.
61. Resistor and adjustment board for the exposure meter.
62. Galvanometer.
63. Rewind shaft.
64. Reflecting prism for the meter needle to appear in the viewfinder.
65. Synchronization terminal.
66. Back latching plate.
67. Ground glass focusing screen with Fresnel lens and condensing lens.
68. Mirror cage.
69. Gearing sector ring for galvanometer control.
70. Mirror/cell.
71. Depth of field test lever.
72. Lens mounting plate.
73. Lens locking plate.
74. Front cover.
75. Lens.
76. Self timer escapement.
77. Self timer setting lever.
78. Release button.

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tor knob, the meter needle must be brought in the center of the V formed by the two marks, to be found in a window under the viewed image. One may therefore select initially one speed or one aperture, or play on both simultaneously. The needle moves in the same direction as the diaphragm ring and in the opposite direction of the speed selector. Intermediate aperture values between indexed positions may be used, but not intermediate speeds, which is one reason for preselecting one speed at the beginning. The depth of field corresponding to the measured aperture can be tested by actuating the above-mentioned lever. After release, the diaphragm re-opens fully. One may, after the measurement, switch the exposure meter circuit off, the diaphragm will nevertheless close at the preselected aperture and will re-open fully immediately after the release.



(Left) Exposure meter window on top of the body, with indication of 1 exposure step (1 EV) on the overexposure side, and edge of the black mark appearing on the right, indicating that the meter range limit is approaching.

(Right) Focusing screen and at its bottom, principal exposure meter indicator, showing 1/2 an exposure step (1/2 EV) of underexposure, the meter needle (indicator) and the black mask appearing to indicate that the meter range limit is approaching.

With non-coupled lenses (for instance those with EXAKTA mounts which fit this camera), or in photomacro or micrography, the measurement is done while actually closing the diaphragm in order to center the needle.

The meter needle is also visible on top of the body, in a window located close to the rewind knob. During the measurement, the needle is then centered in a circle: it moves in the opposite direction to the diaphragm ring. This added feature is very practical for

candid shots, at 90 degrees angle, when the body is held vertically... and is a necessary one when changing the viewing system. It is this same window which provides illumination for the meter scale. Two prisms transmit its image under the focusing screen. They are visible in the opening of the prism housing, and on the roof prism itself. Thanks to this optical transmission system, and although the exposure meter is located in the camera body while the prism is removable, the exposure reading can be made close to the viewed image without removing the eye from the eyepiece.

The tip of the needle has a circular sector giving it the shape of a T. This serves a balancing purpose and makes the galvanometer insensitive to the inclination angle.

The two tips of the V indicate a setting of 1/2 f stop in under or over exposure. Seen from the top the two tangents to the circle indicate + and - 1 f/stop. There is no + or - sign indication, one must check with the movement of the diaphragm ring. There is no speed or aperture indication in the viewer.

At rest, only the edge of the T of the needle is visible on the left of the window.

Meter range :

As with all TTL cameras, the meter range varies with the film speed set, and also with the nominal aperture of the lens in use since the measurement is performed at maximum aperture.

With the standard f/1.8 to 22 lens, the range is maximum at 25 ASA and goes from f/1.8 at B (equivalent to 2 seconds, the instruction manual advises staying with 1 sec and not to use the B position) to 1/1000 at f/22 (exposure index 0.5 to 19). At 100 ASA the range goes from 1/2 second at f/1.8 to 1/1000 at f/22 (exposure index 2 to 19). It still goes, at 1600 ASA, from 1/30 at f/1.8 to 1/1000 at f/22 (exposure index 6.5 to 19). The range limits are not given in the instruction manual.

The lower limit of the meter range is very well indicated. When the speed is too slow or the diaphragm

too open for a given film, a black sector moves into the meter window and masks it progressively. The meter is usable as long as the sector does not mask the marks (only account for the vertical leg of the T because, as soon as the sector begins to appear, one branch of the T is no longer visible, but the latter is not the relevant part of the meter indication)

The higher limit of the range appears to reach an exposure index of 19 (1/1000 at f/22) but the meter is no longer faithful. The TOPCON Company recommends limiting the measurements to an exposure index of 16 (1/1000 at f/8) and to further use, beyond an exposure index of 15 (1/1000 at f/5.6 or 1/250 at f/11), either a grey neutral 4x or 8x filter, or a polarizing filter. The apparent subject brightness is reduced thanks to the filter, and this enables the meter to operate within its range limit.

Outside the range limits, the camera must be used manually. Two tricks given in the manual permit an effective increase in meter ranges:

- instead of measuring the exposure on the subject, replace it by a sheet of white paper which is a lot more reflective: read the exposure, for instance 1 second at f/2, and multiply the value by 5; therefore shoot 5 seconds at f/2.
- from the location of the subject, measure toward the principal light source contributing to the scene illumination, and multiply the exposure read by 8.

The manual also gives very good advice about the improvement of picture quality, general reflexions on photography and on the use of accessories.

Synchronization :

The top of the left side of the body has a standard 3 mm diameter synchronization terminal. A synchronized accessory shoe may be fitted on the rewind knob. One locks it by 90-degree rotation of the grey external ring in the "Lock" direction. This shoe takes the flash assemblies featuring a synchronized foot like the TOPCON model 1 Flash gun. For ordinary

flash guns, use a sync cord connected to the terminal.

The single flash contact (terminal or shoe) provides the following types of synchronization as shown in the instruction manual:

- Electronic flash: B to 1/60.
- Magnesium M-type bulb: B to 1/15 and to 1/125 for some types.
- F-type: B to 1/30.
- FP-type: B to 1/15 and 1/125 to 1/1000.
- The colors on the speed selector knob provide simplified indications: all bulbs, black speeds; electronic, red speeds; FP, green speeds.

Self timer :

The setting lever of the self timer is located on the front face, on the right side of the lens mount. It can be set before or after the camera itself. When it is set, a small secondary release button is uncovered. Set over 180 degrees, the delay is 9 seconds. Set over 90 degrees, it is 3 seconds. All intermediate values may be used. Although the lever takes hold after 45 degrees the release can only be performed after a minimum setting of 85 degrees.

This self timer is relatively noisy and represents an elaborate design. After setting, it can be used by pushing the secondary release button. One may decide not to use it by releasing normally through the main release. In this case, it can be released after the shot by pushing on the secondary button, or leave it set if it is to be used in the near future.

Intentional double exposure :

Perform the first exposure. Turn the rewind knob in order to remove all slack from the film and hold it steady. Push the disengaging button and keep it pushed in. Cock. Expose the frame in double exposure. Then cock normally for the next picture. This operation, which is not recommended by TOPCON, permits the execution of

intentional double exposures, sometimes at the cost of a slight offset between the two exposures. One must remember that the counter records the number of exposures and not the actual number of frames in this case. This operation permits artistic or scientific effects which are sometimes very useful.

Interchangeable lenses :

All RE AUTO TOPCOR lenses have automatic preselection diaphragms and are coupled to the exposure meter. All in common feature from front to back:

- an internal thread and an external bayonet for accessories;
- a grooved, wide focusing ring, in black rubber—a TOPCON special, which stands out on the matte chrome finish of the lens barrel and facilitates the focusing operation; the focusing movement over 280 degrees is smooth and very direct; the lenses move linearly;
- a range scale engraved with meters and foot marks;
- a depth-of-field table, with infrared photography mark (a R replaces one of the aperture values of the depth of field table; when the lens is fitted with a 25 A filter, the meter seems capable of supplying exposure indications);
- a matte chrome, grooved diaphragm ring rotating to the left; from full aperture to the most stepped down value over 45 degrees; integer and half-aperture values are indexed; on the latest lenses made, this ring is black with white engravings and is even more visible; the diaphragm blades are treated matte black;
- a mounting reference point.

All engravings are black, except the reference point which is red and the reading mark of all rings which is green.

The mount is of the EXAKTA type (diameter and flange back are identical) but is modified: the preselection is internal. The mating ring surfaces are very well made in

steel. Depress the lever at the bottom left of the front side, and turn the lens over 60 degrees counter clockwise to remove it. These operations can be achieved very easily with one hand. The preselection plunger is well protected by the mount. This mount also protects the rear elements very well from possible scratches.

There is no lever for the manual operation of the diaphragm because this is unnecessary:

- on the camera body, the depth of field test lever does exactly that (but the exposure can only be measured at full aperture);
- when the lenses are mounted on adaptor rings or bellows, they become manual, because the automatic cam is no longer driven.

The lenses are delivered in leather cases with carrying straps and end caps.

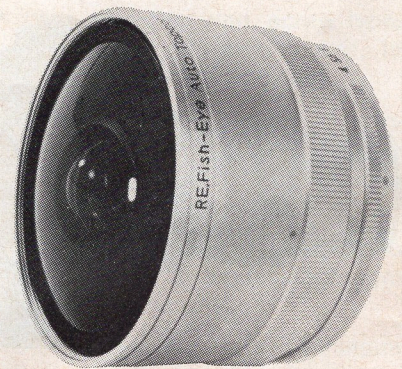
RE-TOPCOR Auto lenses :

Standard lenses:

- 58 mm, f/1.8 to 22, focusing from 45 cm or 18 inches, 6 elements in 5 groups, Gauss design, diagonal field 41 degrees;
- 58 mm, f/1.4 to 16, focusing from 45 cm or 18 inches, 7 elements in 5 groups, Gauss design, diagonal field 41 degrees.

Fisheye lens:

- 7 mm f/4, 180 degrees field on a round 20 mm picture, 12 elements in 8 groups (very good



RE AUTO TOPCOR FISHEYE 7 mm f/4 lens, 180 degree field with a round image 20 mm in diameter.

corrections), fixed focusing, aperture f/4 to 16, exposure metering in TTL, reflex viewing.

Wide angle lenses:

- 20 mm f/4 (usable in reflex viewing), 25 mm f/3.5, 28 mm f/2.8 and 35 mm f/2.8 in retrofocus design.

Telephotos:

- 100 mm f/2.8 and 135 mm f/3.5 (with built-in sliding sunshades); also worth mentioning, 90 mm f/3.5 and 135 mm f/2 with manual preselection diaphragm.

Very long telephotos:

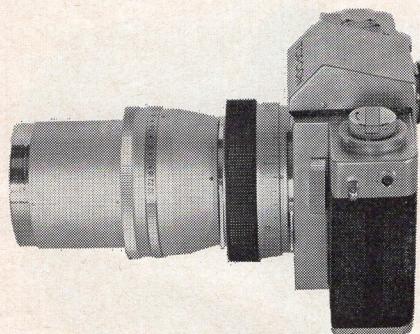
- 200 mm f/5.6, 500 mm f/5.6 (with 5 separate elements, a deluxe solution) and 1000 mm f/11 (also with 5 separate elements, and a built-in filter), all 3 featuring a built-in sunshade, also worth mentioning, a 200 mm f/4 (discontinued), a 300 mm f/5.6 and a 300 mm f/2.8 (an astonishing aperture value!), all three with manual diaphragm preselection, exposure metering at stopped down aperture (both 300 mm have a built-in sunshade).

Zoom:

- 87 to 205 mm f/4.7, 13 elements in 8 groups, with built-in sliding sunshade, focusing down to 2.5 m (1.4 m with auxiliary lens).

Photomacrography lenses:

- RE Macro Auto Topcor 58 mm f/3.5 to 22, automatic diaphragm,



MACRO TOPCOR 135 mm f/4 lens used with the HELIX FOCUSING RING (ratio infinity to 0.2X), fitted to the TOPCON RE SUPER/SUPER-D body.

5 elements, focusing from infinity to 0.5 X ratio, best performance at 0.1 X; highly recommended for normal photography (the former 58 mm with an identical design without focusing is discontinued).

- This lens can be fitted with a Macro Auto Ring, which preserves the automatism between 0.5 X and 1 X.
- Macro Topcor 135 mm f/4 to 32, automatic diaphragm after cocking, metering at stopped down aperture, 3 elements, no focusing setting, infinity to 0.2 X with the helix tube supplied and infinity to 1.1 X with the IV bellows, best performance at 0.12 X, the corners being slightly vignetted by the mount from 0.7 X, recommended for normal photography.
- Macro Topcor 30 mm f/3.5 to 16, manual diaphragm, 6 elements, without focusing, screw mount with microscope thread, bayonet interface rings, type MT. 1 flat 5.8 mm thick and type MT. 2 conical 65 mm long; this lens is



MACRO TOPCOR 30 mm f/3.5 lens with bayonet attachment MT. 1 (flat) and MT. 2 (conical).

used with the helix tube for ratios 2 X to 5 X, and with the bellows type IV for ratio 4 X to 9 X, giving best results between 3 X and 5 X, usable from 2 X to 10 X (the corners of the picture are slightly vignetted by the lens mount beyond 5 X). This lens should never be used in retro mode, and cannot be used in general photography (one can use it only above 2 X).

Accessories :

Viewfinders:

- *Standard waist-level Finder:* it flips down by simple pressure, the rear part of the hood is not closed, built-in fold away 4.5 X magnifier, manually foldable, life-size image with a 58 mm lens.
- *High magnification waist level Finder:* delivered in its case, non-foldable, eyepiece/magnifier with 6.5 X magnification with 4

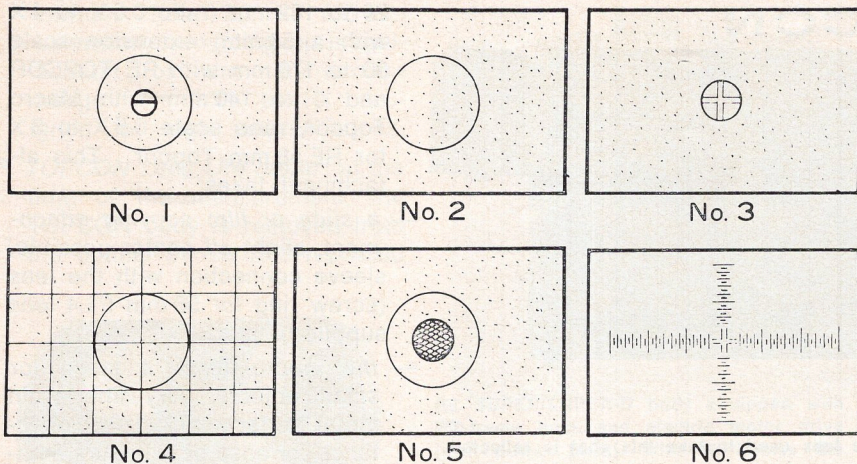


HIGH MAGNIFICATION WAIST-LEVEL FINDER 6.5X, adjustable eyepiece and rubber cup.

elements in 3 groups, adjustable from -3 to +2 diopters, image magnified 1.5 X with a 58 mm but reversed laterally, built-in rubber eyecup that can be replaced by the auxiliary magnifier (magnification 16 X of a zone 5 mm in diameter at the center of the field) or by a wrap-around eyecup.

Finder accessories:

- *Eyepiece correcting lenses:* -3, -2, 0, +1, +2, +3 diopters (see viewing) which can be fitted to the eyepieces of the prism, of the high magnification finder, and of the angle viewfinder.
- *Angle lens:* 2.5 X magnification of a 12 mm area at the center of the field, adjustable eyepiece ± 5 diopters, delivered in its case.
- *Angle viewfinder:* screws on the eyepiece of the standard prism, all orientations possible without



TOPCON interchangeable FOCUSING SCREENS (see text).

indexed positions, laterally reversed image, eyepiece adjustable over ± 3 diopters, delivered in its case (if used with the high magnification finder, it cuts the image corners slightly). It can take the auxiliary magnifier for 5 mm zone magnification at the center of the field, or eyepiece correcting lenses, or the rubber eyecup.

- *Wrap-around eyecup*: it crews in lieu of standard eyecups, it can turn in all directions, and takes correcting lenses in its inner thread.
- *Eyepiece adapter hinge*: it fits on the prism or the high magnification finder by screwing of the standard eyepiece ring without its rubber surroundings, and permits the use of the magnifier or of the angle viewfinder (they can be flipped out of the way at any time).

With all these systems, the exposure must be read from the top of the body, except for the auxiliaries fitted on the hinge adapter which only has to be flipped out. One should also pay attention to possible stray light coming in through the focusing screen.

Focusing screens:

- *Type 1*, see text.
- *Type 5*, identical to 1 but with a microprism area 5 mm in diameter (usable up to $f/5.6$) instead of the Dodin prisms.

- *Type 5 A*, identical to 5, special for telephoto lenses.
- *Type 2*, identical to 1 without central element, the 12 mm diameter disc being evenly ground.
- *Type 4*, identical to 2, but with a square grid every 6 mm.
- *Type 3*, ground, without Fresnel lens, clear center 5 mm in diameter with double cross-hairs (0.01 mm lines separated by 0.025 mm) for focusing by parallax elimination between the cross and the image.
- *Type 6*, entirely clear with central double cross-hair and bisecting scales of 1/2 mm pitch.
- *Type 7*, identical to 5, but not ground.
- *Type 7 A*, identical to 5 A, but not ground.

Very precise operating instructions concerning these screens are given in the instruction manual.

- *Accessory shoe* (see synchronization).
- *Topcon Model 1 magnesium flash gun*, synchronized no-cord foot, 22.5 Volt battery, bulb test, takes all types of bulbs, folding reflector, two illumination fields, tiltable for bounce-flash position.
- *Meter lite*, a Topcon exclusive feature, delivered in leather case: inserted into the shoe, and powered by one PX.13 battery, ON-OFF switch; this system per-

mits seeing the meter needle even in a dark environment (when one shoots a theater scene for instance, the needle is not illuminated enough by the ambient light).

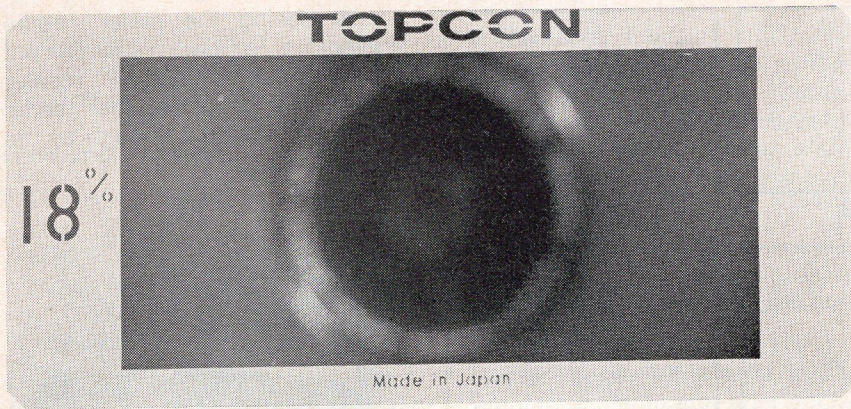


TOPCON METER LITE accessory.

- *Sunshades*, slip on type (25 mm lens), screw type (200 mm) and bayonet type (35, 58 and 100 mm) at rest they fit in reverse on the lens).
- *Screw-on filters* (from 35 to 200 mm, most lenses will take 49 mm filters) front mounted (for the 300 and 500 mm) and rear mounted (for the 25 mm); 12 grades and polarizing filters.
- *Front slip-on caps* and rear bayonet caps; eyepiece cap completely preventing any stray light input).

Photomacrography accessories :

- *Auxiliary lenses* 0, 1, and 2, screw type, 49 mm diameter, ratio infinity to 0.3 X (0.4 X with lenses 1 and 2 superimposed) with the 58 mm lens.
- *Lens reversing ring*, screw type, for 49 and 62 mm diameter, to be used beyond 1 X ratio.
- *9 mm ring with setting*, allows the use of all lenses in automatic mode (after setting) with the double cable release.
- *Set of 3 extension tubes*, 9, 15 and 30 mm without diaphragm control transmission.
- *Helix focusing ring*: minimum extension 29 mm; maximum stroke 30 mm (displacement scale in millimeters) without au-



TOPCON GRAY SPIDE reference subject (the lens used to take this shot is reflected on the semi-aluminized surface).



TOPCON incident light receptor.

29 to 182 mm (ratio 0.5 X to 4 X with a 58 mm) extension scale 30 to 170 mm with RE TOPCOR and 0 to 140 mm with Macro Topcor, ratio scale 0.5 X to 3 X for RE 58 mm Topcor. This attachment takes:

- a slide or film copying attachment, slight off-center possible, sleeve connection with the lens (screw ring for 58 mm f/1.4 lens supplied), and;
- the macro-stand, a stage for small objects, very fine grain metal surface with 18% reflectance for ease of exposure measurement, stem graduated for ratios from 1 X to 3 X.

- *Reproduction stand:* 52×52 cm base, 1053 mm column, maximum field 520×346 mm with a 58 mm lens, set dismantable.

- *Receptors for incident light exposure measurement:* delivered in their cases, 51 and 65 mm diameter, fit over the front of the lenses and are made as a hemisphere transmitting 50% of the light, but associated with a built-in correction filter yielding an overall transmission of 18%; the exposure is metered from the subject, orienting the camera towards the light source; this type of measurement provides a correction for the influence of the color (remember that the color sensitivity of a CdS cell is maximum in the green, high in the red and low in the blue), of the contrast, and of the black/white distribution, this is a TOPCON exclusive.

- *Gray slide:* this 34.5×75×1 mm glass plate has a wide semi-transparent neutral gray area transmitting 18% of the incident light, and serves as a reference surface for microscope or slide copying work (the plate takes the place of the subject when measuring the exposure) another TOPCON exclusive.

- *Microscope attachment;*

- n° III rigid, fixed extension, inherent ratio 0.5 X, dismantable for microscope eyepiece interchange, designed for low magnifications.

- Bellows attachment, non rigid,

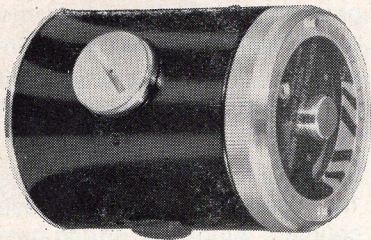
tomatic transmission, ratio infinity to 0.5 X for a 58 mm lens.

- *Portable Model 1 bellows attachment:* extension 40 to 140 mm, single folding rail, ratio 0.7 X to 2.4 X with a 58 mm.

- *Model 4 bellows attachment,* double rail, dismantable, stroke 122 mm, displacement of the front or rear part of the bellows at will, all camera orientations possible between horizontal and vertical with lock, extension from

variable from 80 to 250 mm extension, providing a magnification of the microscope image from 0.3X to 1X, designed for high magnifications.

- *TOPCON Lens Lite meter*: at the time of the measurement, the TOPCON body is removed from the optical bench and replaced

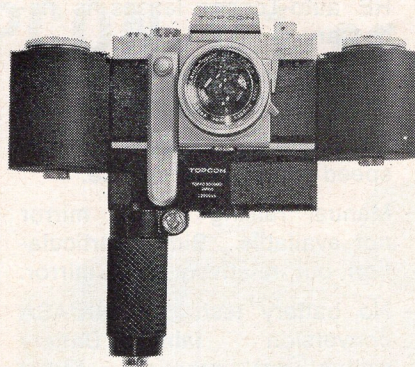


TOPCON LENS-LITE exposure meter.

by this meter: scales from 1/1000 to 60 seconds, f/1 to f/22, 6 to 1600 ASA or 9 to 33 DIN, spot measurement at the center of the field over a 12 mm diameter circle, CdS cell, one PX.13 battery, zero adjustment, ON-OFF switch, maximum sensitivity 2 seconds at f/1.8 at 100 ASA, a TOPCON specialty (discontinued).

Motor drive :

The RE SUPER/SUPER D body can be directly fitted with a motor drive. Simply unscrew the drive protection cap located on the right side under the bottom (this cap is symmetrical and identical with the battery cap), take the motor drive, unfold the release linkage, and put the interface plate on top of the motor drive. Then introduce the tip of the release linkage under the collar of the release button on the body, and tighten the connecting screw (one has to retighten this screw from time to time). The compact Nicad battery pack slips on and locks on the side of the release linkage. The release button of the motor handle may be put on L (lock) or on U (use). Before releasing the shutter, dial at the back of the motor drive a figure between 36 and 2 or 3, on the counter providing an automatic stop at the end of the film (an accurate setting is awkward be-



RE SUPER/SUPER-D body equipped with 250-frame back and electric motor drive (with power pack). With 36 frames the motor is identical (it is not longer than the body).

cause the interval between graduations corresponds to 10 frames). Select S (= single) or C (= continuous) operation with the push button at the back of the motor. With the rotating knob also at the back of the motor, select the rate for continuous operation. This is a function of the shutter speed (3 positions of the rotating knob):

- 1/4 to 1/1000 1 frame per second;
- 1/15 to 1/1000 2 frames per second;
- 1/60 to 1/1000 3 frames per second (always in reflex viewing).

At the end of the film, operate the coupling lever located on the right side of the motor (a spring returns it immediately in its neutral position). Rewind normally. Push and turn the back-opening button located under the motor drive (this button is identical to the one on the camera body).

Many accessories are available:

- *Remote hand controller* (single/continuous selection, release button with a lock position) connecting to the handle socket when using the compact battery pack; extension cords (several lengths, up to 200 meters).
- *Pocket Nicad battery pack* (built-in test voltmeter, belt clip, single/continuous selector, remote control button with lock position, drive capability of 750 frames before recharge); it connects to the bottom of the

handle through a 4 wire cable (several lengths up to 10 meters).

- *Nicad battery chargers*, 110/115 Volts or 200/240 Volts for AC power.
- *Alkaline battery power pack* (BESELER).
- *Test voltmeter* (0 to 20 Volts) usable with all 3 types of power packs.
- *AC 110/115 Volts or 220/240 Volts power pack*, with connecting cord, remote release control on its case and single/continuous selector.
- *250 frame back*: it must be used without the interface plate; dial a figure between 250 and 2 or 3 frames on the motor drive counter (this back may be used without motor).
- *250 frames special cartridges* for the 250 frames back, with their cases.
- *Bulk film loader*, with automatic stop at 50, 100, 150, 185, 200 or 250 frames, taking 15 and 30 meters film rolls.
- *Wireless remote control*, on 27.145 MHz, range 1500 meters over flat country; transmitter powered by 8 AA 1.5 Volts batteries, built-in battery test, single/continuous selector, release button, ON-OFF switch, telescopic aerial;

receiver: powered by 4 AA 1.5 Volts batteries, built in battery test, 4 sockets for connection of 4 Topcon/Motor Drive, external powering possible, on-off switch, telescopic aerial.

The TOPCON RE SUPER/SUPER D has been selected as photographic material in the USA by a certain part of the US Armed Forces and by several other Government Agencies. It has also been adopted by the Questar Company which uses it with its famous telescopes (a special control linkage added to the body permits raising of the mirror independently from the shutter operation, thereby separating the two vibration sources). Exposure measurement is done in TTL with the clear n° 6 focusing screen as when the camera is connected to a periscope or to an artillery rangefinder.

The body has eyelets for a carrying strap, but the attach rings scratch the chrome finish. The serial number is engraved on top of the body, as is the film reference plane. A notch in the bottom insures the automatic centering of accessories equipped with a centering pin. The housing design is very modern, and the finish is available in matte chrome and black, or all black. This camera, fitted with the 58 mm f/1.8 lens, measures 99 mm in height, 157 mm in length, and 95 mm in thickness, it weighs 1035 grams.

The TOPCON RE SUPER/SUPER D, which takes a motor drive without an adaptor, has a very large number of accessories and is one of the leaders in the TTL reflex category with fully open aperture metering and interchangeable viewing systems.

INDICATED SPEEDS	MEASURED SPEEDS
1	1/1.2
1/2	1/2
1/4	1/3.4
1/8	1/6.4
1/15	1/15
1/30	1/30
1/60	1/55
1/125	1/125
1/250	1/250
1/500	1/625
1/1000	1/1370

Serial number
of the camera tested: 4660349

Disadvantages :

- Exposure meter range limited for high film speeds.
- Focusing screen and meter dial not fully visible for people wearing glasses, unless use is made of correcting lenses.
- When the light beam behind the lens becomes sub-parallel, the mirror stripes become visible on the focusing screen.
- TTL metering by total integration of the viewed field requires interpretation for backlighted situations.
- When metering at maximum aperture, use of the automatic

RE auto-Topcor lenses is necessary.

- X synchronization limited to 1/60. No T (time) exposure.
- Intermediate positions of the speed selector not usable.
- Manual raising of the mirror not available. Simple articulation but relatively long mirror.
- No battery test. No DIN/ASA conversion table. Battery switch not practical. Meter battery can be mounted in reverse polarity.
- No film transport signal during advance or rewind. No cocking signal.
- Film advance stroke entailing a displacement of the hand on the body.
- Depth-of-field test hindered by the eveready case.
- Inaccurate upper range limit of the exposure meter.
- Loading and back closure needs to be watched carefully.
- Very well made bayonet, but a little small in diameter for special photography (vignetting).
- No film reminder disc of the type of film in use.
- Marks for the values, but not for the direction, of over and underexposure in the meter windows.

Advantages :

- Modular system easily adaptable to the evolution of photographic technology. One of the most developed systems.
- TTL metering at maximum aperture. Bright viewed image. Few reflections. Very small chromatic aberrations.
- Very good focusing screen, with Fresnel lens invisible even at f/22. Focusing screen mounted on the camera body.
- 9 focusing screens and 3 viewing systems interchangeable (together with many accessories). Wrong mounting of focusing screens impossible.
- Incident light receptor and

gray-slide are very clever ideas.

- Exposure meter illumination.
- Measurement by cross-selection of speeds and apertures. Semi-automatic with preselection of speed or aperture. TTL metering possible with a clear focusing screen without setting modification.
- Diaphragm preselection plungers and rear lens optical elements well protected.
- Clear indication of the lower range limit of the exposure meter.
- Detachable back, opening over 180 degrees. Automatic reset counter. Automatic spring back of the disengaging button.
- Very well designed rewind crank.
- Lens interchange possible with one hand.
- Standardization of lens configuration (focusing ring-rubber coated, IR mark, filters partly standardized, diaphragm blades treated matte).
- Very smooth release button. Instant return mirror. Normal noise. Intentional double exposures possible.
- Very smooth cocking, possible by short strokes. Easy to grasp film advance lever.
- Variable setting self timer, rather noisy.
- Speed selector knob easy to grasp, non rotating, but stop between 1 second and 1/1000.
- Standard diameter synchronization terminal. Strap eyelets. Serial number on the body. Tripod socket. Film plane reference. PX.13 battery. Centering notch under the bottom. Synchronized accessory shoe.
- Many accessories. Good appearance. Simplified RE2/D1 available.
- Motor drive of the standard body possible without modification. Compact power pack. Very high rate, 3 frames per second.
- Possible to use any lens and all optical set-ups at stopped down aperture measurement.

BESLER TOPCON D1 or TOPCON RE2

This is a 35 mm, instant-return mirror reflex camera, with interchangeable lenses, and semi-automatic exposure metering by integration at full aperture.

It is the camera body for those who do not need any motor drive, any interchangeable viewing system or focusing screen, or the second camera body for somebody who already owns an RE SUPER/SUPER-D.

The meter system is identical to the one of the RE SUPER/SUPER-D. The film speed scale goes from 25 to 1600 ASA or from exposure index 2.7 to 16.7 (1/2 second at f/1.8 to 1/1000 at f/9) according to the TOPCON data sheet. Under test, the range seems to extend over the whole setting limits, but with a loss of accuracy at the limits.

The shutter is a very modern Copal Square with 6 metal blades moving vertically. M Synchronization up to 1/1000 and X synchronization up to 1/125.

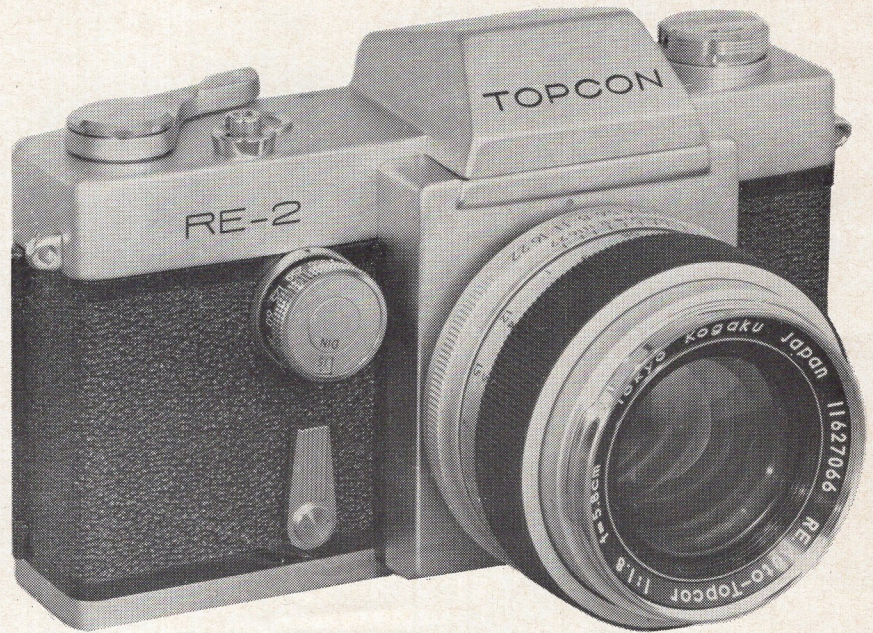
The focusing screen is of the type 1 with Dodin rangefinder in the U.S. version (microprism under special order) and of the type 5 with microprisms for the French Market.

All RE SUPER/SUPER-D lenses are usable with this body, as are the accessories (except for the viewing systems, the interchangeable focusing screens, the motor drive and its accessories, the 250-frame back, and the Meter Lite)

The special, non-synchronized accessory shoe slips on the rectangular eyepiece mount, like the eyepiece hinge adapter.

This adapter can take, either the viewing magnifier, or the angle viewer, or the rubber eyecup, or the correcting lenses.

The 22.3 x 33.5 mm viewed image corresponds to the opening of a standard slide mount. The speed



selector is on the front side, but is readable from the top. The variable self-timer, 2 to 10 seconds, cannot be unset. The rewind crank does not have the up-movement for finger clearing: it is a standard crank. The opening of the back is performed by a typical lever too, recessed in the left side. The take up spool has a spring film catch and a grooved flange. There is unfortunately no depth-of-field test lever.

The film advance is very smooth at the beginning, a little harder thereafter. Dead sector 20 degrees, setting stroke 180 degrees. The very smooth release is on top of the body. The white engraved counter starts from S (= Start), and 20 and a dot for 36 are engraved in red. The external bearing flange of the lenses has a smaller diameter than the one of the RE SUPER/SUPER-D. The diaphragm linkage is visible between lens and camera body.

The sliding meter switch on the left of the lens mount is very practical. OFF and ON positions (the latter one being repeated by a red

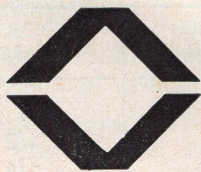
dot). The exposure meter galvanometer index only appears on the right of the viewed image in the ON position (a worthwhile safety feature).

Fitted with the RE AUTO TOPCOR 58 mm f/1.8 lens, this body is 154 mm long, 93 mm high, 91 mm thick and weighs 970 grams.

A modern complete camera or a second body of very good quality.

MEASURED SPEEDS	INDICATED SPEEDS
1	1
1/2	1/2
1/3.6	1/4
1/7.6	1/8
1/17	1/15
1/30	1/30
1/60	1/60
1/100	1/125
1/240	1/250
1/500	1/500
1/833	1/1000

Serial number
of the camera tested: 5645156



National Camera, Inc.
Englewood, Colorado, 80110

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