

The Leicaflex SL is a single lens reflex camera, with instant return mirror, indication of the speed in the viewfinder and selective, semi-automatic exposure metering by tracking pointer, when the lens is fully open.

It differs essentially from the LEICAFLEX by its TTL exposure meter and the focusing which occurs over the whole of the viewing glass.

In the Leicaflex SL, the light sensitive element is installed in a very peculiar way. The main instant return mirror is halfaluminized. It reflects $80^{\circ}/_{\circ}$ of the light towards the viewing glass and lets $20^{\circ}/_{\circ}$ through. It is backed, except at its center, by a metal mask. The lateral part of the lightbeam is absorbed by the black coating of the mask. The central part is reflected by a cylindrical mirror horizontally oriented, towards the light sensitive element located in the bottom of the mirror compartment, close to the blinds under the main mirror.



This sensitive element is very particular, and consists of two coils deposited on the same support and in series (1 coil is used at low light and the 2 coils are used in high light). This setup permits a deviation of the galvanometer larger at both ends of the range than in the middle. This sensitive element is deeply recessed in the casing, which is itself divided by a partition. It is therefore well protected against any possible stray light.

In this fashion, light coming in through the eyepiece is harmless. To reach the sensitive element, it must go through the mirror, when it is reduced to $20 \, {}^{0}$. The sensitive element not being located under the aperture, it is protected: the small amount of stray light that came through is absorbed by the black coating of the walls. The same applies to the weak part of the central beam that could reach the edges of the cylindrical mirror. Stray light is completely eliminated.

The opening in the mirror corresponds to 1/6 of the field angle (that is 1/6 of the viewing glass diagonal, or roughly 7 mm in diameter). The outcoming beam is integrated by reflection on the cylindrical mirror. This beam represents 1/20 of the image area, or 5%. This is, therefore, with a 50 mm lens, a selective metering and not a "spot" must be applied only to metering over 1 to 3 degrees). This metering area covers 1/20 of the viewing glass area and correspond to a field of 8 degrees with the 50 mm, 12 degrees with the 35 mm, 1 degree with the 400 mm ... its edges are very sharp. The metering with a telelens (one meters with the tele and one comes back to the normal lens afterwards), or by getting closer to the subject, becomes, if one so wishes, "spot" metering.

The metered surface is constant relatively to the picture area, even when switching from a very wide angle to a telelens. Therefore, the system has been named Equifocus (egality, irrespective of the focal lens used).

The selective system is the most efficient one when one knows how to master it. Whatever the situation: snow subject, water, backlight, landscape with predominant sky, contrasted lighting as encountered indoors, subject on a light or a dark background, macrophotography with contrasted lighting, ... it will give the ideal reading... if one knows how to select the light element to meter irrespective of its colour. For reversal-type film, one should rather meter the clearest area in which one wishes to obtain details. For the ordinary negative films, one should preferably meter the darkest area in which one wishes to obtain details. For the two types of films, one can get used to meter over an average area. On snow, it is recommended to meter a shadow area of average clearness.

One can say that this type of metering is equivalent to a metering at close distance, but done from the location where one intends to shoot... a measuring of the subject within the subject. The very clear parts (light sources, reflections) or very dark ones (dense shadows) can be eliminated. When using the camera in special optical mounting installations, vignetting of the angles or of the top part of the image on the focusing screen has no effect on the measurement.

When the main mirror swings out, the secondary mirror, hinged independently, folds to the back of the main mirror. The mask becomes full, and the light that could come in through the eyepiece is stopped, the film is protected.

The mechanical linkage of the mirror has no rod to draw it back during swinging, but gives it a maximum velocity at the middle of the movement, and lower at both ends. When swinging out, the shock is partially damped by a damping lever which actuates the shutter. When returning, the mirror stops on an adjustable screw; if its head were teflon-coated, the noise would be considerably reduced.

The CdS cell is powered by a mercury oxide type battery Mallory PX 625 (one may also use a PX 13 battery), the lifetime of which extends to 1 or 2 years. With a coin, unscrew the lid of the compartment. Introduce the battery, + terminal up. The polarity is not indicated, but the compartment shape prevents any inversion. Screw the lid back, and check the voltage delivered by the battery. Push the small black button located on the left side of the prism housing. The lightmeter pointer must reach or overshoot the black circle at the bottom of the viewing glass.

To load the camera, open the back by nail pushing on the safety button on the left side, and by pushing the locking bar in the arrow sense, upwards. The back cover cannot be opened inadvertently. Fold it open to the right. It opens 180 degrees, resetting to zero the frame counter at the same time. Cock and release to let the film rewind button spring back.

One can remove the back completely. Push up, with a sharp edge, the head of the screw located in the hinge. Free the bottom of the hinge, pivot the back upwards, and free the top of the hinge. Remounting is the inverse procedure.

Unfold the crank and lift the rewind knob.

The take up spool is of the easy load type. It consists of a central black element and a grey base ring. With the right hand, introduce the lead-in tongue (2 perforations) under one of the five arms of the ring, until it hits a stop. The film winds under, make use of one of the left arms of the ring, while presenting the film back to the shaft, its forward end to the camera. Even if you engage 3 or 4 perforations, the catch will be good, because the leadin tongue is then engaged under two arms of the ring. This operation is very easy and quick.

Bring the cartridge to its recess on the left while engaging the perforations in the take up spool (one has sometimes to rotate slightly the ring with a finger, it turns only from right to left). Push the rewing knob back home (one may have to turn is slightly to let the drive spindle mesh with the cartridge shaft). If necessary, stretch the film a bit by winding up the crank. Make sure the film is properly located between the two guides of the roller close to the cartridge.

Close the back by simple pressure until it snaps. The wide modern pressure plate rests on 4 stops and leaves to the film a gap of a few hundredths of a millimeter between its surface and the runners. The film is therefore located very exactly without risk of corrugation.

Cock and release. Stretch the film by gentle winding of the rewind crak. Cock and release to go beyond the second lost frame. Cock for the first good frame, the counter gets to mark 1. All numbers are indicated in black. The counter steps during cocking. Beyond 36, it goes to 40 and slips further on this mark.

Only the reverse rotation of the rewind knob tells that the film is being transported. Since the mirror is of the instant return type, only the blocking of the film advance lever tells that the camera is cocked.

At rest, the cocking lever is sprung back to the camera case. One moves it with the soft part of the thumb, and it catches when moved 60 degrees away and perpendicular to the camera case (this operation also switches the exposure meter ON). In its open position, the cocking lever is particularly easy to actuate thanks to its plastic coating. Its cocking stroke of 120 degrees must be completed in one single movement (if one stops halfway, it springs back to zero and will catch again only when one moves beyond the position previously reached), this forces the hand to move slightly on the case. This operation is silent.

The release button is on the film ad-

DISTORTION









forefinger on the release), and the prism housing bearing on the eyebrow.

The viewfinder is the "control centre". The speed in use is displayed by a pointer moving along a scale at the bottom of the viewed image. The latter is corresponding to the area limited by the opening of a standard slide mount 22.5×34.5 mm (the film window measures 23.8×35.6 mm).

Viewing is done over the entire screen,

which is made of a special structure close to microprisms (60 degrees tilted lines on both sides of vertical lines creating hexagons crossed by 3 diagonals). This structure insures an exceptionnally bright viewing (in spite of the absence of a Fresnel lens, which is compensated for by the curved bottom prism face).

Viewing presents only a slight drumshaped distortion and is virtually free from colour aberration or reflection. No Fresnel lens is a pleasant feature, as the image is not disturbed by concentric circles. This is probably the brightest viewfinder of all 35 mm reflex cameras. The image exhibits a slight bue-green cast due to the use of a semi-transparent mirror. As it swings out during exposure, this has no effect on the actual pictures. The image is viewed life-size with the 50 mm lens. The focusing screen is almost entirely visible for people wearing glasses, but they may also slip correcting lenses on the eyepiece. The basic setting of the eyepiece is -0.5 diopter, which fits the largest sample of users of optical instruments.

A central patch of pyramid shaped microprisms, with 4 sides, breaking horizontal and vertical lines, aids the accuracy of the focusing. Its area corresponds to the exposure meter field. If these microprisms are used for focusing a subject with parallel dense lines (like a TV picture with its raster) they produce a moiré-effect on each side of the ideal focusing, with extreme accuracy. They can be used down to f/5.6 with the 50 mm lens, and are still efficient with the 560 mm lens.

The left hand operates the lens. The focusing rings are located at the front of all lens mounts, and rotate over 280 degrees. They are actuated between thumb and forefinger, and their operation is very smooth. With the tip of the middlefinger, one can push on the depth-of-field test button located on the right side of the lens. When it is pushed, the diaphragm closes to the preselected value.

The left hand also operates the aperture ring. It is located at the back of all lenses, rotates over 45 degrees in the same sense, and is ratched at each stop and half-stop.

Open the film advance lever in order to put the exposure meter in operation. After having selected the reference area of the subject, which is not necessarily the center of the picture (ones views again after the metering is done), one brings by rotation of the aperture ring or of the speed drum (their position is displayed in the viewfinder) the tracking pointer on the meter needle. If the meter needle pointer just touches the edge of the ring constituting the tracking pointer, one has a $\pm 1/2$ stop correction available. The + sense, or more generally the diaphragm "open" sense, is indicated on the top of the focusing screen by a large black dot (which also corresponds to the lower limit of the linkage); the "close" sense is indicated at the bottom of the focusing screen by a small black dot (upper limit of the linkage).

The exposure setting can be achieved by cross-coupled control of the speeds and of the apertures, but one may also select a speed (for moving suject) or an aperture (depth of field concern), provided one remains within the limits of the exposure meter coupling.

The tracking pointer is coupled to the sensitivities, the apertures and the speeds. It is recommended to read the exposure when viewing horizontally, in order not to upset the balance of the mobile parts of the galvanometer (this indication is somewhat superfluous, for we did not notice any difference in readings). One should not push on the depth of field tester during the meter-reading, because this should take place at full aperture.

At 100 ASA, the range of the exposure meter coupling extends from 1/4 second at f/2 to 1/500 at f/16, and, at 25 ASA, from 1 second at f/2 to 1/125 at f/16. At 8 ASA, the range is from 1 second at f/2 to 1/30 at f/16 and at 6400 ASA from 1/250 at f/2 to 1/2000 at f/16. Beyond this intervals, the tracking pointer is no longer visible.

The Company LEITZ being known for its efficient and honest service to its customers, a table gives the corrections to apply when using filters. With a TTL camera, the exposure meter accounts for the filter absorption, but the manufacturers never mention that the sensitivity of the CdS element is maximum in the greenyellow colours and minimum in the blue and red. The corrections to apply are, with a yellow filter 1/2 f/stop, with a yellowgreen or polaroïd filter 1 f/stop (these are the only filters supplied; red filters are not available and corrections for their use are not indicated).

The Leicaflex SL lenses have 2 coupling cams, and can be used on the LEICA-FLEX. The LEICAFLEX lenses have only 1 cam, and can only be used with closed diaphragm metering on the Leicaflex SL (mount the lens, push on the depth of field tester to close the diaphragm, then rotate the aperture ring or the speed drum to make both pointers track, and open 1 f/stop or double the exposure time to allow for the correction inherent to this metering method). To use the LEICAFLEX lenses on the Leicaflex SL at full aperture metering, have them modified by an authorized LEITZ workshop which will add the second cam at a nominal cost (only the Super Angulon f/3.4 of 21 mm of the LEICAFLEX cannot be modified : it was to be used with mirror up, and this mode is suppressed on the new camera).

In addition to the cocking and release, the right hand controls the shutter speed dial. It is very readable, with white marks on a black background. Its motion is not continuous due to the presence of a stop between B and 1/2000, but it does not turn during release. The textile focal plane shutter (translation in 9 milliseconds) provides the speeds in the standard progression (half or double) from 1/2000 to 1 second, plus B exposure. One may use all intermediate values except between 1/8 and 1/4, and 1/30 and 1/60 second (this should be reminded visually in the viewfinder). For time exposure, the release button is threaded to receive a cable release, and the bottom has a threaded small tripod socket, near the center of gravity.



Linear enlargements \times 10 approximately





Cell metering from cupboard door.

A self timer device is built-in, on the right side of the lens. The 10 seconds delay is obtained after arming over 180 degrees. Once armed it must be used, the release being through the regular release button. If one does not arm fully, the release button may be blocked, so complete the arming and everything is back in order again.

The synchronization terminals are 3 mm standard, located on the left of the lens, but equipped with locking and protected by small black caps which are rather difficult to extract without loosing them. The upper socket, marked by a lightning sign, is intended for electronic flash (synchronization from B to 1/100; the 1/100 position being marked by a lightning on the shutter speed dial and by a point in the viewfinder between 1/60 and 1/125). The same terminal works for magnesium M 2 flash bulbs from 1 second to 1/30. On the terminal marked by the symbol "flash bulb", the AG1B, AG3B and flashcubes, are synchronized from 1 second to 1/60; the XM1B, PF1B, XM5B and PF5B from 1 second to 1/125, and the GE 5, 25, M 3 and PF 60 B from 1 second to 1/250. The two types of flashes may used simultaneously.

A pressure on the handsome red key on the right side of the front face enables the dismounting of the lens after a 60 degrees rotation to the left. This can be done single handed, by holding the lens, while pushing the key with the tip of the thumb. For mounting, align the red dot of the lens base, repeated on the mount by a red half ball, with the red key, and turn it to the right until it catches. This mount has a very positive catch, without any play. Interchange of lens is recommended in the shadow when possible, in order not to "dazzle" the sensitive element.

The interchangeable lenses, all with

automatic diaphragm, have linear translation mounts of exceptional craftmanship. Up to the 50 mm a built-in baffle at the back of the lenses avoids a possible direct illumination of the sensitive element. The diaphragm preselection finger is protected by the mount, and is ball-bearing mounted, which ought to ensure an excellent system reliability.

Let us notice here two exceptional features: the diaphragm leaves are not made of the usual bluished steel the reflecting surface of which may introduce parasitic light, but of a black semi-mat grained material! Close to the "meter" mark on the distance scale, two small figures give the decimal part of the lens focal length, for example, 19 stands for 50.19 mm, this indication can be useful in photomacrography and on the occasion of some special repairs. Quite an astonishing detail luxury!



Cell metering from TV screen.

The LEITZ lenses, optically very elaborate, have been specially designed to ensure the highest possible contrast to the pictures.

Between the focusing ring, graduated white in meters and yellow in feet, and the aperture ring, one finds a depth of field scale without infrared mark. The standard lens is the Summicron R f/2 to 16 of 50 mm with focusing down to 50 cm, 6 elements, field angle 45 degrees. As wide angles, one can use the Super-Angulon R f/4 to 22 of 21 mm, focusing down to 20 cm, 10 elements, field 93 degrees (it is designed to be used in reflex viewing, its layout as inverted telephoto lens decreases optical vignetting of the corners), and the Elmarit-R f/2.8 to 22 of 35 mm, focusing down to 30 cm, 7 elements, field 64 degrees. As telephoto lenses are available the Elmarit-R f/2.8 to

22 of 90 mm, focusing down to 70 cm, 5 elements, field 27 degrees, the Elmarit-R f/2.8 to 22 of 135 mm, focusing down to 1.5 m, 5 elements, field 18 degrees, and the Elmarit-R f/2.8 to 16 of 180 mm, focusing down to 2 m, 5 elements, field 14 degrees.

A zoom lens is manufactured jointly by LEITZ and ANGENIEUX: focal length 45 mm to 90 mm (rotation 100 degrees, central ring), focusing from infinity to 1 m (rotation 100 degrees, forward ring), opening f/2.8 to 22 (rotation 45 degrees, back ring), 16 elements, field 51 to 27 degrees, transmission 70 %, very smooth operation, 69 mm diameter, 107 mm length, weight 780 grams.

Filters are normalized and are to be installed behind the front threaded ring. delivered with the lenses (serial VIII 1/2 -21 mm, serial VI-35 mm and 50 mm, serial VII-90 and 135 mm, serial VIII-180 mm and zoom). One may have the UV filter on the lens all the time to protect the front component. In order not to bend the ring, handle it with a single point clamp, between thumb and foreringer. The 180, 135 and 90 all have a built-in sliding lens hood, that can be protected by a cap. The 50 and 35 have press-in lens hoods (operated by pressure on two opposite lugs) which, when fitted inverted and capped, serve as a lens protector. The 21 mm has a special bayonet lens hood, and the zoom a screw-in type. A back cover is supplied with each lens.

To unload the camera, push on the film rewind button located on the right of the bottom, unfold the crank, wind the film by rotating in the arrow sense. The counters steps back during this operation, witnessing film transport (the reading of the counter and the locking, before the take up spool frees the film, enable to rewind the film without getting the lead-in tongue



Cell metering from lamp.

into the cartridge, in case one wishes to unload before reaching the end of the film).

The case is pleasantly shaped. The sides have eyelets for a carrying strap, the serial number is engraved under the bottom to the right; in the prism housing, one finds an accessory shoe, and the base has two centering holes. When the Summicron-R 50 mm is fitted, the dimensions are: 150 mm in length, 97 mm in height and 100 mm in thickness; the weight is 1090 grams, only 100 grams more than the average camera, in spite of the wide use of expensive metals. If the black grain template carrying the SL mark looks intriguing, you should know that it covers 3 adjusting screws permetting the exposure meter calibration without dismounting the camera.

What else may one wish for future developments? May be for a few scientists, an interchangeable viewfinder; and for the not so knowledgeable amateur, the choice of the Leicaflex SL and ordinary LEICA-FLEX (integration by external exposure meter) metering system at the flip of a switch?... Perhaps?

Many accessories are available on top of those already described during the test:

- eveready case, with removable front;
- suitcases for varied equipment;
- set of 3 extension tubes, with central screw element, enabling to reach a ratio of 1 with the 50 mm Summicron (it is not advisable to use them with the 35 mm);
- the close-up lenses ELPRO VI a and b for the 50 mm and VII a and b for the 90 and 135 mm, which are supplements consisting of achromatic doublets specially designed for photomacrography, they may be used in conjunction with the extension tubes, which then introduces an exposure factor (an auxiliary lens alone does not necessitate an increase of exposure time). The closeup lens/tacking lens set represents a true optical combination;
- the bellows focusing system permits, with the Macro-Elmar f/4 to 22 of 100 mm (series VII filters, telescopic lens hood), the focusing between infinity and a ratio of 1 (maximum correction for a ratio of 0.1); a wide lateral knob permits the fast change of diaphragm from open to the preselected value. The rack has two movements: variation of the extension, and movement of the whole camera/bellows/lens. Scales are marked on the crank for 90, 100 and 135 mm lenses. The exposure factors, for the 90 and 135 lenses, are smaller than those given in the

usual tables, for one has to account for the magnifying effect of their telephoto design. The back rotating ring permits to set the camera horizontally or vertically. The extension bellows can be used with any other lenses. With the 50 mm, on can reach a ratio of 3; an adaptor permits to use in photomacrography the LEICA lenses of the VISOFLEX II and III above a focal length of 65 mm (the viewfinder vignetting does not appear on the picture);

- a reproduction stand is foreseen;
- a fast focusing TELEVIT-R system can be adapted to the TELYT f/4.8 280 mm and f/5.6 400 and 560 mm lenses.

The Leicaflex SL is available in chrome and black grained standard finish and in black finish.

Let us remind that a black, power version of this camera, exists, the **Leicaflex SL Mot** which we describe in Chapter III on the Photokina news report, Phot'Argus n° 22, november 1968, p. 10.

The Leicaflex SL stands out even among more than 40 different TTL cameras. Its finish explains the 2 years guarantee given on it. This is a camera "physically" pleasant to use, and having a professional metering system!

The SL symbol comes from Selektive Lichtmessung (selective metering) but is also used in LEITZ notices as the abbreviation of "Summa cum Laude" = with the maximum glory.

Camera tested serial number 1200890.

Indicated speeds	Actual speeds
1	1
1/2	1/1.66
1/4	1/3.8
1/8	1/7.6
1/15	1/16
1/30	1/30
1/60	1/66
1/100	1/80
1/125	1/135
1/250	1/277
1/500	1/500
1/1000	1/909
1/2000	1/1550

BAD FEATURES:

- No cocking signal.
- No zeroing of the exposure meter.
- No tell-tale for film transport.
- Cocking stroke requiring a slight move of the hand on the camera.
- Cocking in a single stroke.
- Shutter speed dial with stopped rotation.
- Cell linkage limited for extreme film sensitivities.
- Focusing screen not entirely visible for people wearing glasses.
- Self timer with fixed delay, not disarmable.
- Battery polarity not repeated on the case.
- Necessity to learn how to use selective metering.
- No IR mark on the lenses; no film plane reference.
- Necessity to have the LEICAFLEX lenses modified to use them on the SL.

GOOD FEATURES:

- Equifocus selective metering (see text) at full aperture: very elaborate system.
- Very smooth release button.
 Instant return mirror. Deep note and
- faint release noise. — Practical cell switch and battery test.
- Batteries PX 625 or PX 13. Cross coupled metering (speeds or apertures). — Depth of field tester.
- Possibility to use various types of len-
- ses with stopped down aperture method.
 Speeds readable under the focusing screen.
- X synchronization at 1/100. Speed range extended to 1/2000. Intermediate speeds usable (except 1/8 to 1/4 and 1/30 to 1/60).
- Under and over-exposure indication visible in the viewfinder. Corrections for filters given.
- Take-up spool with quick loading system.
- 180 degrees opening back. Unwanted opening impossible. Automatic resetting counter. Film rewind button springing back automatically. Removable back.
- Easy to grasp film advance lever.
- Very high standard mount lens, removable with single hand. Protected plunger. Uniform location of various control rings on all lenses. Normalised filters.
- Rewind crank. Synchronization terminals of standard diameter. Serial number on the bottom face of the camera. Self timer device. Tripod threaded socket. Memory disc for type of film in use. Strap eyelets.
- Many accessories. Very high standard of finish. 2 years guarantee.

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