

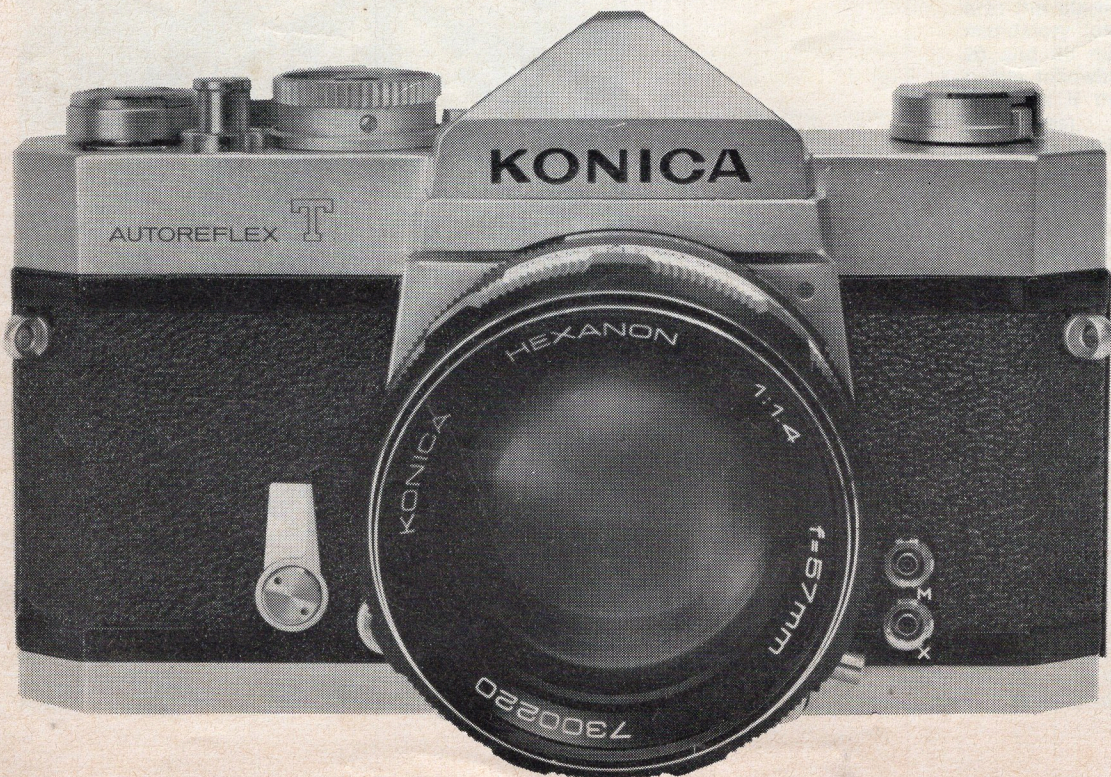
BANC D'ESSAI®

PHOT
ARGUS®

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KONICA
AUTOREFLEX

T



a full
report

by

Gérard BOUHOT

The **Konica Auto-Reflex T** is one of the few cameras that stand out as pacemakers in the photographic field.

It is an improved version of the **Konica Auto-Reflex**, which already was the only single lens automatic focal plane shutter reflex camera, and is still in production.

The **KONICA AUTO-REFLEX T** is a single lens reflex camera, with quick return mirror, interchangeable lenses, and metal focal plane shutter. It operates automatically or manually, with indication in the viewfinder of the aperture used. It is equipped with TTL cells on the pentaprism, metering by weighed integration of the viewed area, at full aperture opening or at stopped down aperture.

Two small size cells are attached to the prism output face, on each side of the eyepiece. The cells look at the lens, and are supported by a frame ensuring a given angle between them. Their respective field overlap only on the lower edge of the viewed image, and on none of the 3 other edges. If the metering of the lower edge is represented by a factor of 10, this factor drops to 3 on the lateral edges. This achieves weighed metering. The incidence is set so that the metered field represents 50% of the viewed area with a 50 mm lens, 30% with a 35 mm lens, and 80% with a 135 mm lens.

As was discussed on the article about the location of TTL cells, Phot'Argus issues n° 21 and 23, it is the weighed system which pays off best for the amateur. It can be used without necessitating any doubt thinking about the reference area to meter, and compensates for the sky influence in landscapes or silhouette

effect in backlight shots. The sensitivity of the light metering system ranges at 100 ASA from 1/4 of a second at f/1.2 (Exposure Value 2.5) to 1/1000 at f/16 (Exposure Value 18).

The power is supplied by 2 mercury type Mallory PX 675 batteries, located in a compartment on the left bottom. The lid can be unscrewed with a coin. A battery position sketch is glued in the compartment, and the + terminal of the second battery is marked on the lid. These batteries are small. Be careful: stick to the instructions, and do not mount them inverted. The use of 2 batteries of 1.3V each, a total of 2.6V, is the reason for fast and reliable reactions of the exposure meter needle.

This camera is very thoughtfully designed and therefore it is something of a paradox that the battery test is the most delicate operation. Irrespective of the cell switch ON or OFF position, remove the lens, set the sensitivity at 100 ASA, set the shutter at 1/125, and press the "check" red button located on the bottom plate. The exposure meter needle, visible on the right side of the viewed image, must reach the red mark or beyond. The settings: 100, 1/125 and the check button are all in red for the sake of convenience, and a self sticking label that one can glue under the film advance lever, serves as a reminder of the check sequence and of the mounting sense of the batteries.

The meter switch is located on the top left of the back. Its rotating control knob is actuated by thumb or forefinger pressure to the OFF = exposure meter off, black marking, or to the ON = operating exposure meter, red marking. This knob, diffi-

cult to reach at first sight, is in fact practical to use, protruding by no more than 2 mm from the back and not touching the nose while viewing, but readily visible and well located.

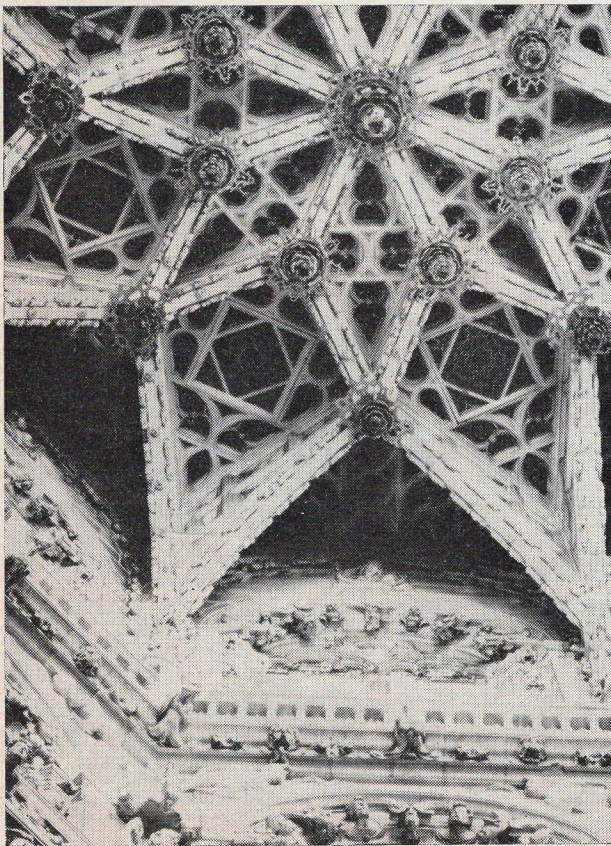
The battery lifetime is 1 to 2 years if the camera is systematically switched off. If prolonged storage is foreseen, remove the batteries.

The back cover can be opened by pulling on a deeply recessed lever at the bottom of the left side; this lever is powerfully springloaded. The back cover opens 175 degrees to the right and carries a very wide pressure plate. Do not handle the cartridge in full sunlight if possible. The cartridge installation is made very easy by a cutout in the bottom: you only need to present the cartridge tilted forward (without lifting the rewind button) and drop it, it sits in place by itself, but one should sometimes turn the rewind knob to let the film spindle find its proper place. Take the film tip and insert 1 or 2 perforations into the multislotting quick loading take up spool. Do not engage more than 2 perforations (if the film come out on the other side, it would create thickness bumps). Wind the film advance lever to stretch the film, and check that the sprocket teeth are engaged into the film perforations. The film winds under the take up spool. Close the back cover by simple pressure.

Complete the first cocking. The counter moves from S to a red point. Release. Unfold the rewind crank and rewind gently in the indicated arrow sense to stretch the film, then fold it back. Cock. The rotation of the rewind knob indicates the film transport. Release. The counter goes to a second red point just before 1. Cock the first frame to shoot. The number of exposed frames is indicated in white figures (even values) and white dots (odd values). It is very easy to read and steps forward when cocking. The red marks are: the starting S, the two points of the mandatory lost frames when loading, the 20 and 36 numbers, as well as the two points following 36 (after which the counter slips if the cartridge has more than 36 frames). The counter resets to zero when the back is opened.

The film advance lever, with friction drive, has an initial 20 degrees dead sector away from the case, to permit a good grasp. A small teflon piece, recessed into its base, avoids any damage to the case when one pushes it back home. The stroke is short, 150 degrees, enabling the cocking to be performed with limited hand displacement on the case. This movement is smooth and quiet, but must be done in one single stroke. There is no cocking signal, and only the blocked film advance lever tells that the camera is cocked.

The release button, with a concave top, is easy to reach. It is threaded for fitting a cable release (the bottom of the case has a Kodak pitch threaded socket located close to the center of gravity). Its stroke is long, 6 mm, as on all automatic cameras (first engagement of exposure values, then release) but its operation is smooth and it offers an even resistance. The release is relatively noisy.



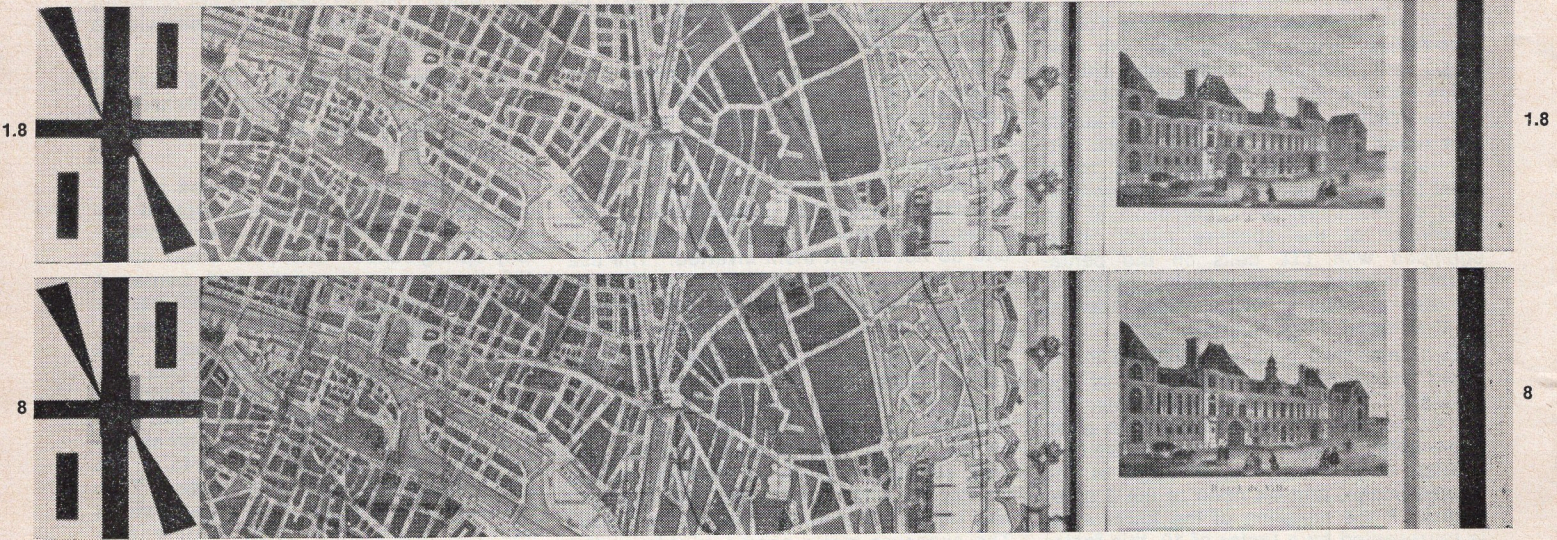
135 mm Telephoto lens, automatic exposure 1 second at f/3.7. Burgos Cathedral gothic dome, Spain. Original Kodachrome II. High lighting contrast subject.

Linear enlargements $\times 10$ approximately

Hexanon 52 mm f/1.8 - No. 7403538

Center

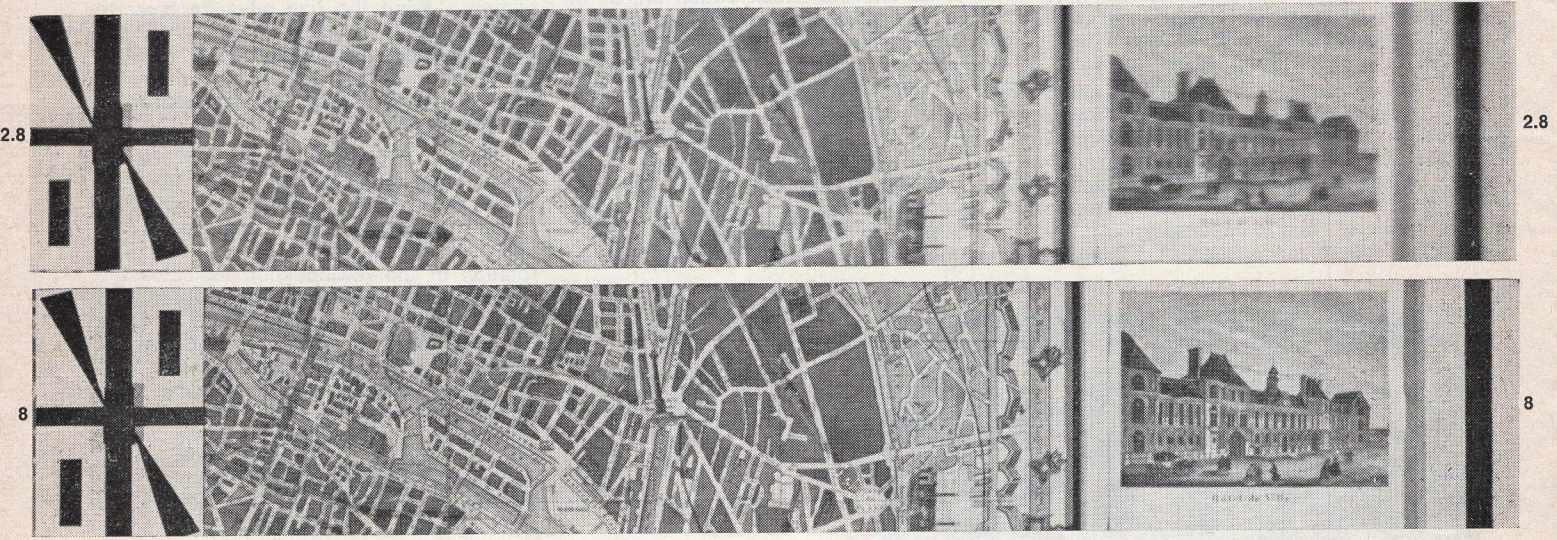
Edge



Center

Hexanon 35 mm f/2.8 - No 8 314 857

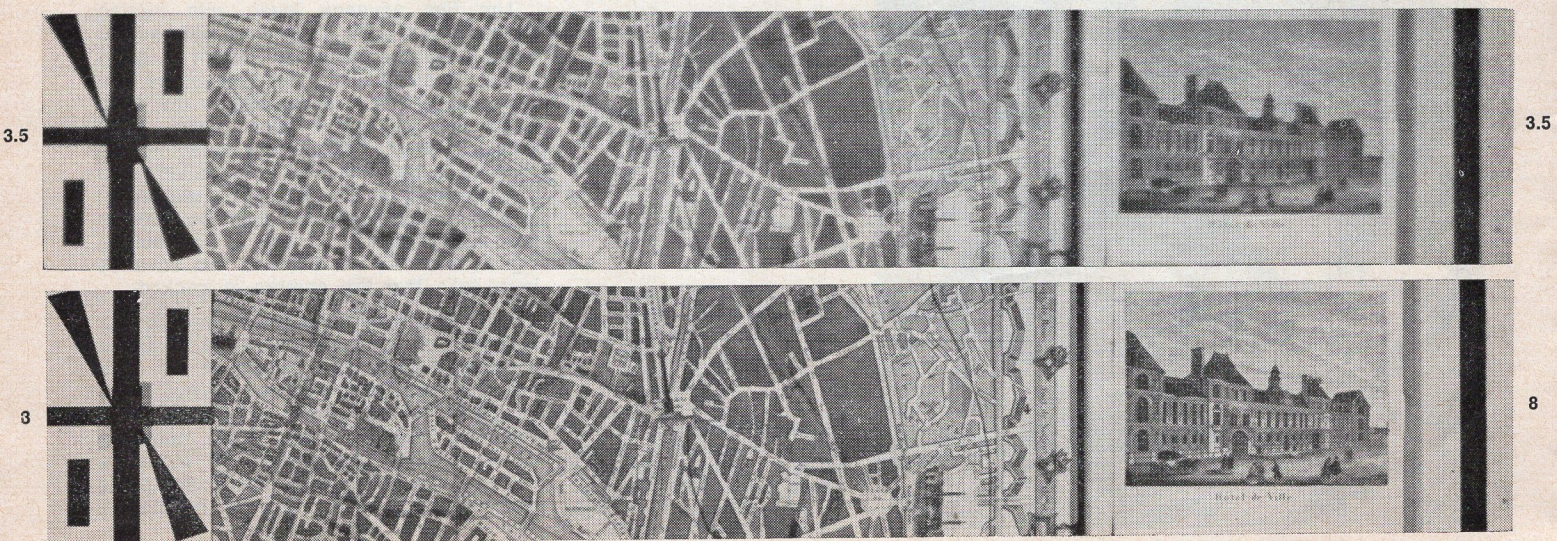
Edge

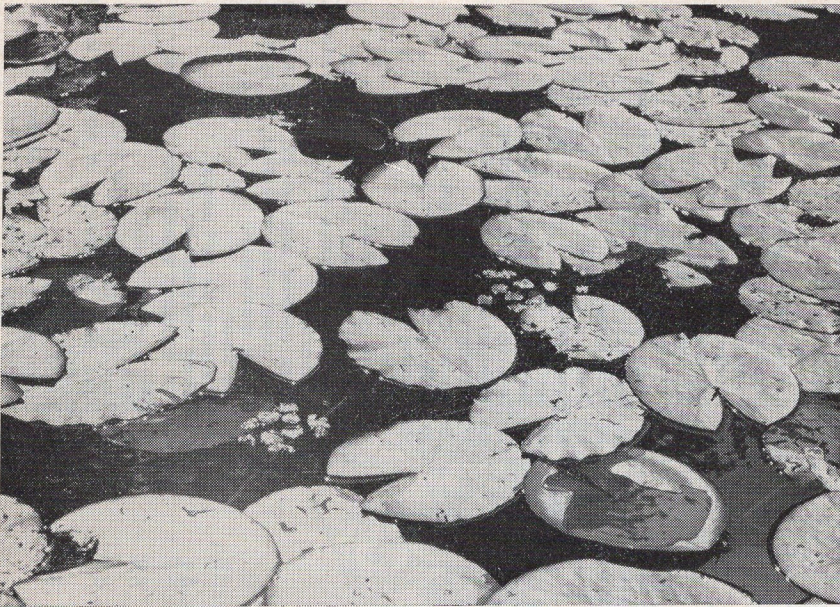


Center

Hexanon 135 mm f/3.5 - No. 7320431

Edge





52 mm Standard lens, automatic exposure 1/125 at f/9. Water-lily leaves, Yrieux Lake, Landes, France. Original Kodachrome II. Subject with very high reflections.

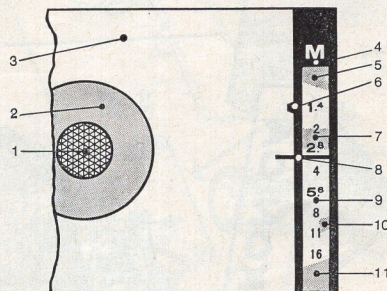
When one first opens the back cover, one can see that the machined film runners are wide, that the exposure window has a notch at the bottom right for identification of films taken with a **Konica Auto-Reflex T** (a useful refinement), and that the shutter has metal blades. This is a Copal S with vertical translation in 7.5 milliseconds. A protecting lip protects the blinds, at the time of delivery, from accidental finger contact, which can be very detrimental to this type of shutter. It still operates satisfactorily below minus 40 degrees C.

Although this is a Copal S, its shutter speed dial is on the right top of the case. This has been achieved by the Konishi-roku engineers through a level gear, and it is therefore moved from the front to the top side. It gives 11 calibrated speeds, according to the standard progression from 1/1000 to 1 second and B exposure. The figures are very readable, the setting mark being a black dot located on the left of the dial. This dial does not move during release, but does not have a continuous rotation between settings, as there is a stop between the 1/1000 and B positions or even before B, depending on the sensitivity of the film used. The speeds are not repeated in the viewfinder.

The film sensitivity is set on the ring of the speed drum. The range goes from 25 ASA or 15 DIN to 1600 ASA or 33 DIN. Intermediate values are indicated by graduations and explained in the instructions book. If it happens that one cannot achieve the sensitivity setting, change the indicated speed and the sensitivity setting will then become possible.

For normal operation, the aperture ring is set at position EE (Electric Eye) and the exposure meter switch at ON. The **Konica Auto-Reflex T** operates then automatically. If the exposure meter is OFF, the meter needle stays in the underexposure zone. When in automatic operation,

the diaphragm opening selected, between f/1.2 and f/16, is visible under the meter needle on the right side of the viewed image. Beyond f/16 the pointer gets to a



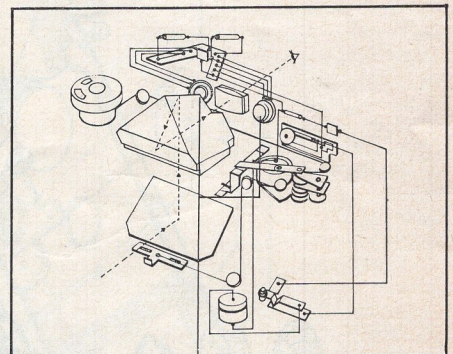
1. Spot of micropisms (3 mm diameter).
2. Frosted very fine grain collar (5 mm diameter).
3. Mat seen with Eresnel lens backing.
4. M = sign showing that the camera is used manually.
5. Underexposure zone.
6. Stop down indicator.
7. Maximum aperture of the lens in use.
8. Meter needle.
9. Aperture scale.
10. Battery vest indicator.
11. Overexposure zone.

red zone indicating that the picture would be overexposed if shot, and that one should modify the speed. With the diaphragm set at f/1.2, the same thing happens for underexposure below f/1.2. For lens with less aperture (up to f/4 for the 21 mm), the KONICA AUTO-REFLEX T system is very elaborate and highly practical. When one mounts the lens, the underexposure zone moves to the maximum aperture of the corresponding lens, covering the rest of the scale, for instance for the 21 mm, from f/1.2 to f/4. This system, so far exclusive to this camera, avoids any risk of wrong exposure, and enables a beginner to use a wide range of lenses

in automatic mode, without any further worry.

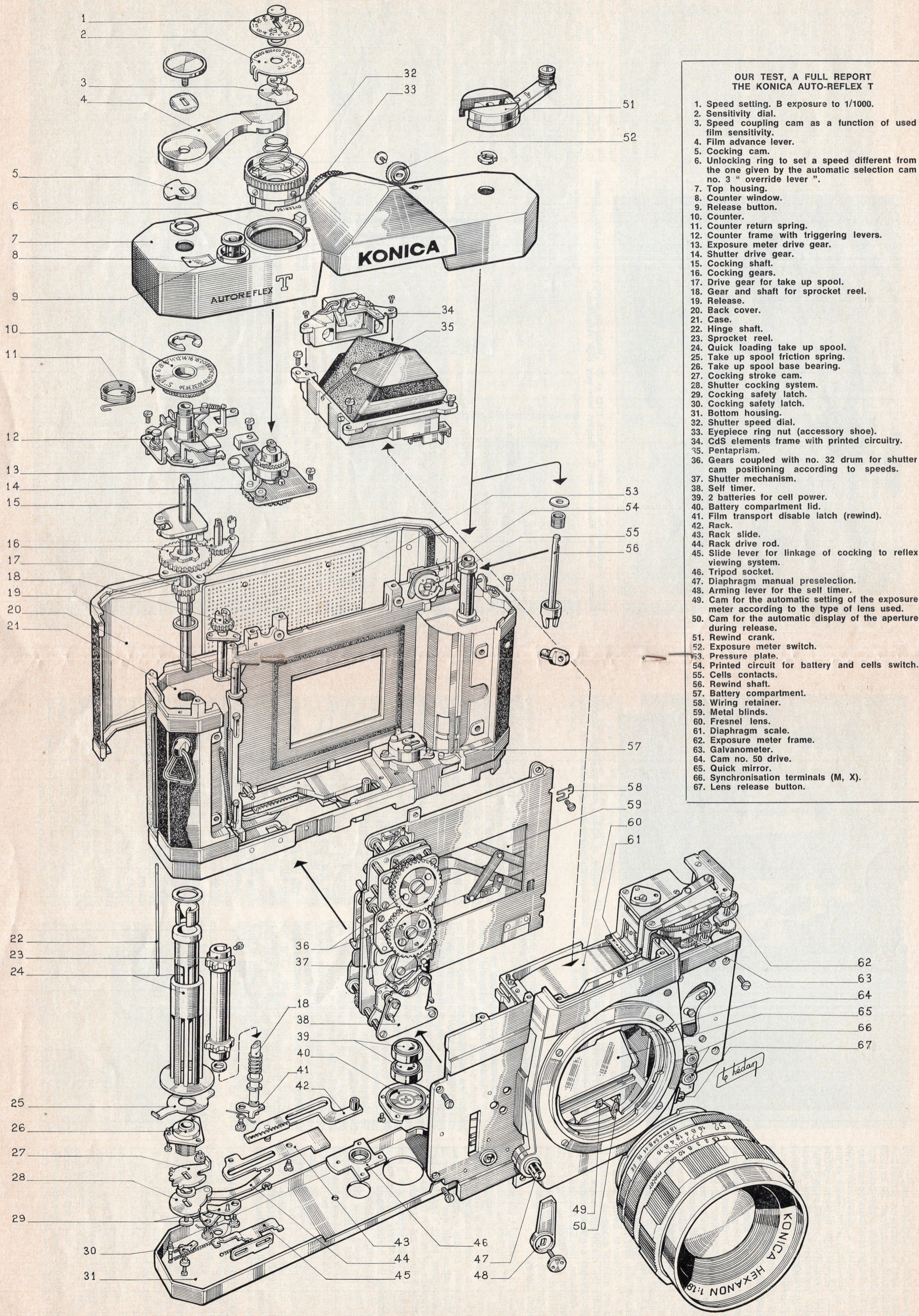
In fact, to get down into details, one should note that for an f/4 aperture lens, the underexposure zone begins at f/3.5; when the meter needle is beyond the red zone, into the usable automatic zone, it is between f/3.5 and f/4, therefore only 1/4 of an f step from the maximum aperture. The exposure latitude of the film used is accounted for, and the automatism operates with the maximum capability of the lens. When in the EE automatic mode, the meter needle always shows the opening in use. When actuating the shutter speed dial one can use the desired exposure combination, without risk of over or underexpose. The settings are cross coupled. This automatic system enables to select a speed or a diaphragm opening.

During the exposure metering in the automatic mode, one can very simply perform corrections, for instance at certain backlight conditions by doing a closer metering... because pressing the release button halfway will block the setting on the present opening value... one only has to subsequently view and then release. One can also meter with a particular camera orientation as desired, read the metered opening value, abandon the EE automatic mode, and set the diaphragm which one wants to use. One avoids in this way to keep the release button halfway in. The manual setting permits under all circumstances to read the opening metered by the exposure meter and to use the desired one.



Inside view of the exposure meter and of the reflex viewing.

The crosslinkage of the exposure meter is maximum from 25 ASA (1 second to 1/500) to 50 ASA (1/2 to 1/1000) and decreases regularly until 1600 ASA (1/60 to 1/1000) as indicated in the instruction book table. But a very important feature is that you do not need to look it up in the book. The shutter speed dial is automatically stopped at the limit values compatible with the sensitivity of the film in use thanks to special cams. Nevertheless, the other values can still be used: rotate the arrow sens the "override" lever until its stops, and dial the desired speed. The camera then operates in manual without any indication of it in the viewfinder; do not forget to set the diaphragm (if by chance you forget it, and remain on the EE automatic position, it does not seem



OUR TEST, A FULL REPORT
THE KONICA AUTO-REFLEX T

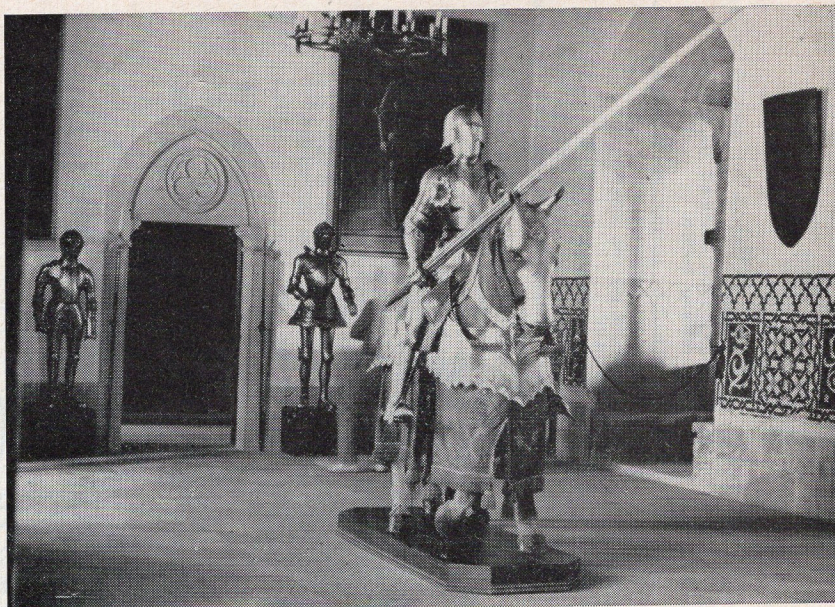
1. Speed setting. B exposure to 1/1000.
2. Sensitivity dial.
3. Speed coupling cam as a function of used film sensitivity.
4. Film advance lever.
5. Cocking cam.
6. Unlocking ring to set a speed different from the one given by the automatic selection cam no. 3 "override lever".
7. Top housing.
8. Counter window.
9. Release button.
10. Counter.
11. Counter return spring.
12. Counter frame with triggering levers.
13. Exposure meter drive gear.
14. Shutter drive gear.
15. Cocking shaft.
16. Cocking gears.
17. Drive gear for take up spool.
18. Gear and shaft for sprocket reel.
19. Release.
20. Back cover.
21. Case.
22. Hinge shaft.
23. Sprocket reel.
24. Quick loading take up spool.
25. Take up spool friction spring.
26. Take up spool base bearing.
27. Cocking stroke cam.
28. Shutter cocking system.
29. Cocking safety latch.
30. Cocking safety latch.
31. Bottom housing.
32. Shutter speed dial.
33. Eyepiece ring nut (accessory shoe).
34. CdS elements frame with printed circuitry.
35. Pentaprism.
36. Gears coupled with no. 32 drum for shutter cam positioning according to speeds.
37. Shutter mechanism.
38. Self timer.
39. 2 batteries for cell power.
40. Battery compartment lid.
41. Film transport disable latch (rewind).
42. Rack.
43. Rack slide.
44. Rack drive rod.
45. Slide lever for linkage of cocking to reflex viewing system.
46. Tripod socket.
47. Diaphragm manual preselection.
48. Arming lever for the self timer.
49. Cam for the automatic setting of the exposure meter according to the type of lens used.
50. Cam for the automatic display of the aperture during release.
51. Rewind crank.
52. Exposure meter switch.
53. Pressure plate.
54. Printed circuit for battery and cells switch.
55. Cells contacts.
56. Rewind shaft.
57. Battery compartment.
58. Wiring retainer.
59. Metal blinds.
60. Fresnel lens.
61. Diaphragm scale.
62. Exposure meter frame.
63. Galvanometer.
64. Cam no. 50 drive.
65. Quick mirror.
66. Synchronisation terminals (M, X).
67. Lens release button.

to be too important, because the exposure meter looks like it reacts correctly between 1/1000 and 1 sec, from 25 to 1600 ASA). The crosslinkage limits only correspond to the design engineers consciousness. When dialing a speed, don't go wrong: it is the black point which is the mark, and not the top of the override lever. After using the camera in the override mode, remember to turn the shutter speed dial backwards to come back within the crosslinkage limits.

Besides this automatic EE mode, the **Konica Auto-Reflex T** may be used in manual. You only dial a speed and set a diaphragm on the lens ring. A remarkable feature is that the mere fact of turning this ring from EE to any other value brings an M letter within the viewfinder above the diaphragm scale, as a sign of the camera being used manually. The exposure meter can be switched off, or left on to determine the diaphragm. In fact, it remains linked to the film sensitivity, to the speeds, and to the maximum opening of the lens in use, and its indications are still valid. In order to better show the switch to the manual mode, in addition to the M letter, the diaphragm scale could advantageously get a green colour as an example, because the EE position is so convenient that one tends to forget looking at the meter needle, and the M mark could go unnoticed; an abnormal colour would catch the eye.

The viewing is very bright, distortion and aberration-free; it only shows some reflections when the eye is not well centered. The picture is viewed nearly life size with the 52 mm lens. The focusing screen is entirely visible for people wearing glasses, but they must move their eye in order to read the diaphragm scale. They had better use eyepiece correction lenses, available from +3 to -2.5 diopters. The center of the focusing screen is a 3 mm diameter spot, made of very efficient microprisms breaking the horizontal and vertical elements of the image (usable with the standard lens up to 5.6 if one closes the diaphragm by the test button). This spot is surrounded by a frosted very fine grain collar 5 mm in diameter, to be used for focusing with the long telephoto lenses which are incompatible with the microprisms beyond 400 mm. The rest of the screen is mat with an invisible Fresnel lens backing (one can just see it when closing down to f/16). The pentaprism cannot be dismantled.

The basic lens is the **Konica Hexanon f/1.8 of 52 mm** with 6 elements in 5 groups. The focusing ring, very smooth, is located at the front of the lens and is engraved white on black from infinity to 0.45 m over 225 degrees. The aperture ring is indexed, and engraved white on black from f/1.8 to f/16 (large figures for integer values, small figures for intermediate values) over about 30 degrees, and has a yellow EE mark which could have a stronger indexing. In between a depth of field scale, engraved black over mat chrome, carries a mark for infrared shooting (do not then use the camera in EE) and one finds a large 52 mark telling the lens focal length. All indications are therefore readable from the top. The front of the lens



35 mm Wide angle lens, automatic exposure 1/2 second at f/3.5. Armour Room, Segovia Alcazar, Spain. Original Kodachrome II. Soft diffused lighting through veils.

is 55 mm in diameter and carries a thread to receive filters or a lens hood with an inner black velvet coating.

The automatic diaphragm can be closed down voluntarily before release to check the depth of field. Read the value off the pointer on the viewfinder scale, dial it by rotating the aperture ring, and push the button located at the bottom right of the lens. One then checks the depth of field. This operation uncouples the automatism, and is only practical when the camera is being used in the manual mode. In fact, in the EE position, a push on the preview button closes the diaphragm down to f/16. To check the depth of field in automatic, the following less precise but good enough operation can be performed, although not indicated in the instruction book. Simply push on the preview button until the meter needle gets within 1/2 a division of the underexposure zone, i.e. the nominal opening value of the lens in use. The diaphragm is then opened to the value measured by the exposure meter, and one can still judge the corresponding depth of field. Let the test button free again, and release if you so wish.

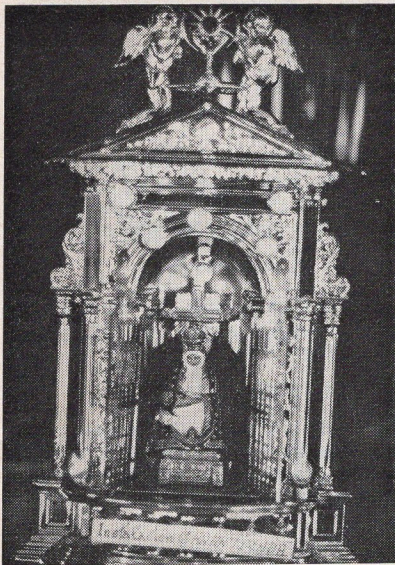
To change lenses, press the button located tangentially at the bottom of the camera front and rotate the lens 45 degrees to the left. This can be done easily with one hand and is therefore very practical. To mount a lens, align the red marks, and turn the lens to the right until it catches. When carrying lenses, use their back caps, because the two plungers, although mutually protecting each other, remain vulnerable.

The special Konica bayonet is very large and of excellent craftsmanship, the lens has no play whatsoever. It is very large in diameter: 47 mm (avoiding angle vignetting in photomacrography) and the flange

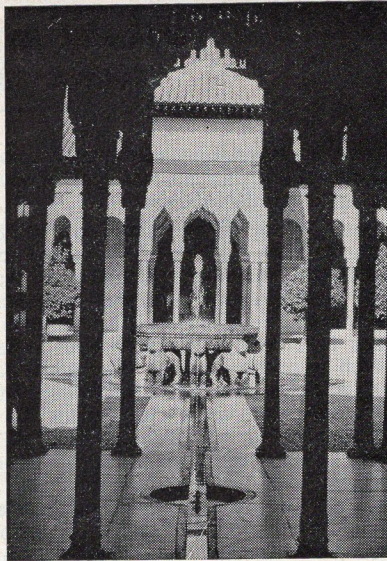
back is very short: 40.5 mm. This enables the use, through adaptation rings, of the KONICA FM, FP, FS AUTO-REFLEX, EXAKTA, PRAKTIKA and NIKON lenses. These lenses are used at stopped down aperture metering. It is also the metering mode, when using extension tubes or bellows. Set the ASA sensitivity, select a speed, put the exposure meter switch ON, and turn the aperture ring until the cell pointer reaches the triangular black mark located on the edge of the diaphragm scale near the f/1.4 position. When tracking is achieved, the exposure is set. Double checks have proved excellent agreement between the stopped down aperture metering of any ordinary lens with the full aperture metering of the automatic lenses (which should not be used stopped down). During this type of metering the M mark is visible in the viewfinder.

The owners of a KONICA AUTO-REFLEX may have their lenses modified for the T case, at nominal cost. The maximum opening is then linked to the exposure meter and they can then be used as those originally foreseen for the T case, as the bayonet mount is identical on both cameras.

Available automatic lenses are the Hexanon AR: f/4 21 mm, f/3.5 28 mm, f/2.8 35 mm, f/1.8 52 mm, f/1.4 57 mm, f/1.2 58 mm, f/1.8 85 mm, f/2.8 100 mm, f/3.5 135 mm and 200 mm, the Hexanon Zoom AR f/3.5 from 80 to 200 mm. The range of lenses with preset and manual diaphragms goes from 28 to 2 000 mm. A total of 23 different lenses including 3 Zooms. Some of these lenses carry sliding lens hoods. All carry an anti-dazzle dichroic coating insuring an obvious colour balance and they are delivered in black leather carrying case. All have the control rings located in the same positions.



52 mm lens, focusing to 45 cm, full opening. Granada Virgin, Spain (reproduction about 20 cm actual height). The light sources (only the eight small lit up lamps) have not fooled the automatic metering.



52 mm lens, automatic exposure at 1/125. Lions yard, Granada Alhambra, Spain. Original Kodachrome II. Subject presenting a wide variety of elements from pure white to black silhouette.

Although the flange back of these lenses is very short, an articulated rod system enables an instant return mirror of very large size to be used. Longside vignetting on the focusing screen does not occur, in photomacro or micrographie, as well as during the use of very long telephoto lenses. Antireflection baffles at the base of the lens recess minimise the stray reflections. The mirror rod linkage system also decreases vibrations during release.

A self timer device, adjustable from 1 to 10 seconds according to its arming angle from 5 to 35 degrees, can be armed before or after the shutter is cocked. When it has been armed, one must use it. Retarded release is through the normal release button. To avoid a wrong cell metering, release while the eye is still in front of the eyepiece, thus avoiding a possible unwanted input of light that could give a false reading, because, once the release is started, the system cannot change the selected combination. One should say that the cells look well protected from these parasitic light inputs.

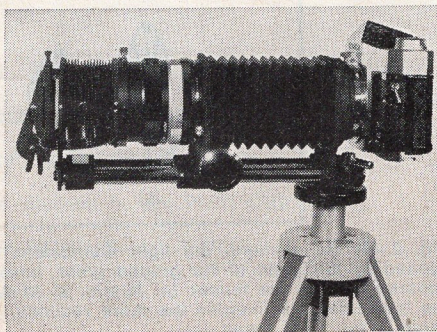
At the end of the film, the film advance lever may stop partway in its stroke. Push in the film rewind button, located on the right bottom side. It will latch and spring back at the first next cocking. Unfold the rewind crank which is very well designed, with a turning knob, and rewind. The frame counter resets to zero whenever the back is opened.

The shutter has provision for B exposure. The diaphragm must then be used in manual. The shutter is synchronised at the X terminal for electronic flash from 1 second to 1/125 (red engraving) and for the F class flash bulbs from 1 second to 1/60. At the M terminal, it is synchronised for M, FP and MF (AG. 1) class flash bulbs,

from 1 second to 1/1000. The synchronisation terminals have a standard 3 mm diameter and are located at the bottom left of the front plate. An accessory shoe may be attached to the eyepiece.

The body, a very handsome and handy design, measures 149 mm in length, 94 mm in height, 89 mm in depth, and weighs 970 grams when fitted with the 52 mm f/1.8 lens. The serial number is engraved on the top right of the back, two eyelets on the front of the camera enable the fitting of the carrying strap which comes with the camera, as the everready black semi-soft carrying bag. This bag permits to leave the lens food permanently fitted to the standard lens. The packaging, in metallic grey and black with white and orange lettering, is pleasant. The instructions book and the booklet on interchangeable lenses are luxuriously appointed.

A great many accessories are available: lens hoods, filters and screw-in close-up lenses; lens mount adaptees; eyepiece correction lenses; extension tubes set; extension bellows; professional type bellows



with slide copying adapter (possible enlargement); extension ring and double release for the diaphragm control in photomacrography; angle viewfinder; microscope adapter; accessory shoe; copy stand; cable release...

You should not be afraid of the complexity of this description of **KONICA AUTO-REFLEX T**. Remember that in the normal automatic mode, you only need: to set the film sensitivity, to select a speed, to turn the exposure meter ON, to check that the meter needle is between the red marks... and to release.

This system is very practical and efficient, as can be witnessed by the hundreds of Kodachrome II transparencies that we shot during the 3 months we used this camera and it proved to us its efficiency and sturdiness. The camera is good looking, easy to use, far superior to many others for its practicality.

Its automatic exposure system can be used, without any special care, in most cases by the beginner as well as by the professional.

indicated speeds	Actual speeds
1	1
1/2	1/2
1/4	1/4
1/8	1/7.5
1/15	1/15
1/30	1/28
1/60	1/60
1/125	1/100
1/250	1/250
1/500	1/500
1/1 000	1/990

Camera tested n° 693 909 camera used n° 690 609.

Main differences between the KONICA AUTO-REFLEX and the KONICA AUTO-REFLEX T:

- The TTL system of light metering.
- The lens mount system.
- The quick loading.
- The absence of format change (18 × 24 and 24 × 36 mm), therefore the absence of the 18 × 24 marks on the focusing screen.
- The micropism spot 30% less in area.
- The film advance lever less thin and less sharp.
- The shutter speed dial located on top of the case.
- The more accessible rewind crank.
- The more readable counter.
- The self timer and case better designed and more practical.
- The longer mirror.
- The battery check button independent from exposure meter switch.

BAD FEATURES:

- No cocking signal.
- Cocking in one single stroke.
- Exposure meter switch a little difficult to operate.
- No tell-tale for film transport.
- No tell-tale disc for the type of film in use.
- Compulsory retarded release after self-timer is armed.
- Cocking stroke imposing a slight movement of the hand on the case.
- Shutter speed dial with no continuous setting.
- Loud release noise and long release button stroke.
- Cell crosslinkage limited for very high speed films.
- Focusing screen and scale not entirely visible for people wearing glasses. But eyepiece correcting lenses available.
- Complicated battery test.
- Preselection plungers vulnerable when no back cap cover is used.
- Depth of field complicated to test in automatic mode.

GOOD FEATURES:

- Crosslinkage depending on the maximum opening of the used lens visible in the viewing field.
- Indication in the viewfinder of the manual mode.
- Weighed metering. Fast and accurate movements of the meter needle.
- TTL exposure meter with reading of the diaphragm in the viewfinder and metering at full aperture opening or at stopped down aperture.
- Exposure meter use in controlled automatic or in manual modes.
- Possibility to correct the exposure meter reading by fixing the meter needle (see text).
- Easy focusing.
- Modern metal shutter. Smooth release. Coupling for electronic flash up to 1/125.
- Easy and quick loading. Notch mark in the picture window.
- Crosslinkage limits and override practical.
- Well protected back cover opening lever.
- Wide choice of lenses with efficient single hand operation mount. Focal length indication on the mount.
- Clear, aberration free, almost lifesize viewed image with 52 mm lens.
- Handsome look. Serial number on the case.
- Wide exposure meter range from 25 to 1600 ASA = 15 to 33 DIN.
- Shutter speed dial non rotating during release.
- Counter reset and film rewind button springback automatic. Back cover opening 175 degrees.
- Large size quick return mirror.
- Exposure meter switch and battery check.
- Depth of field check.
- Possibly to use manual preselection lenses.
- Lens mount adapter for several makes of lenses. Synchronisation terminals of standard diameter.
- Rewind crank.
- Many accessories.

EXPOSURE METERING SYSTEM OF THE KONICA AUTOREFLEX T CAMERA

The **Konica Autoreflex T** camera is for the time being the most automated camera available on the market.

Besides its highly advanced features: metering with fully open or stopped down diaphragm, automatic diaphragm, indication in the viewer whether operation is automatic or manual—it is its Through The Lens Electric Eye Weighed Spot metering which is so remarkable. The abbreviation for this system TTL-EE-IDP/weighed is nowadays well known, except for the IDP, especially the IDP/Weighed. It is this latter which will command our special interest. IDP means Integrated Data Processing. It not only means that the automatic information of the correct exposure by the data for the opening and the shutter time is given, but that these variable data are correctly applied at the very moment of releasing the shutter. And in addition, the metering is not done as all over integration, but exhibits features to evaluate only the essential portions of the image, it is Weighed.

This is truly a variable TTL adapted to try to attempt the best results. The Konishiroku designers conceal under the seal of the IDP/Weighed a refined application of optical principles which are inherent in single lens reflex camera.

a) Let us first consider a wide angle

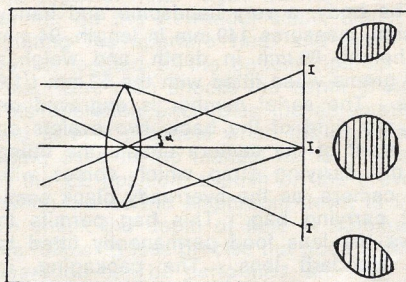


Fig. 1. The light intensity in the corners of the image is a function of the field angle α . If the intensity at the center I_0 is taken as 100% as reference, the intensity I in the corners is only 54% for a wide angle lens (75% for a standard lens and, 95% for a telephoto lens).

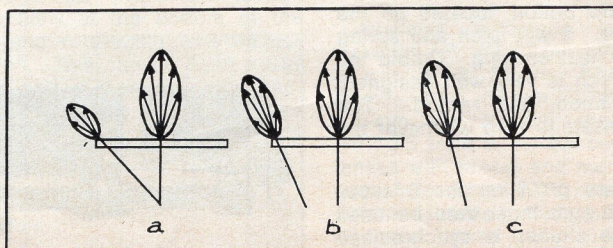


Fig. 2.—In the corners, the light distribution curves ("eggs"), created by the light diffusion caused by the grain of the ground glass, have oblique axes, the more oblique the wider the covered field of the lenses (a. 35 mm, b. 52 mm, c. 135 mm). Also their lengths representing the intensities are likewise the more reduced, the wider the field. The central intensity is the same in the three cases.

lens. The light rays emanating from the center of the lens subtend an angle 2α . If we assign to the center a light intensity I_0 of 100%, the yield in the corners (fig. 1)

$$I = I_0 \cdot \cos^4 \alpha$$

For a 35 mm focal length the field covers $2\alpha = 63^\circ$. Using above equation and rounding off α to 30° :

$$I = I_0 (0.86)^4 \quad I = 0.54 I_0$$

That is, only 54% of the center light intensity prevails in the corners, a shading of one diaphragm value (for an inverted telephoto formules wide-angle the shading is less).

For a 52 mm lens (half field over the diagonal $\alpha = 22^\circ$): $I = 0.75 I_0$ and for a telephoto lens of 135 mm ($\alpha = 9^\circ$): $I = 0.95 I_0$. Thus according to the lens is use the light distribution varies from the center toward the corners and diminishes the more the focal length becomes shorter.

b) What happens at the plane of the ground glass?

Suppose the ground glass is uniformly ground and let us follow a central light ray and one farthest away (figure 2). The light transmitted is diffused by the texture of the ground glass. The envelop of all diffused light rays has the shape of an egg. These envelopes in the corners, resembling symbolic eggs, are the more inclined with respect to those in the center the more the lens is a wide angle; and their lengths, which in the center equal to I_0 , are proportionally reduced to I (figures 2 and 3). In the case of a camera the ground glass is aided by a Fresnel lens which, as field lens, partly straightens the envelopes, see figures 3 a to 3 c.

c) Let us now consider a system of light integration from the ground glass of the viewer by two light sensors whose field of view is restricted by a kind of cylindrical baffles (see upper part of figure 3 a). If we incline the axis of the light cells with respect to the ground glass we can diminish the influence, for instance, of the sky in the image. The light cells, therefore see only a part of the light rays diffused by the ground glass as outlined for various focal lengths of taking lenses in dense black lines in the figures 3 a

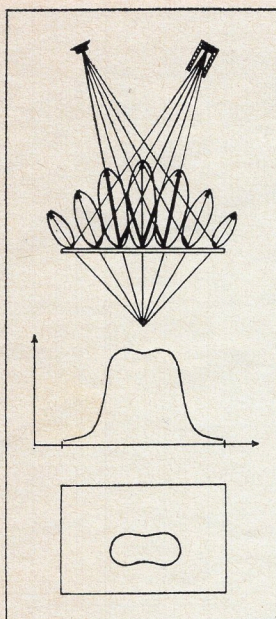


Fig. 3 a.

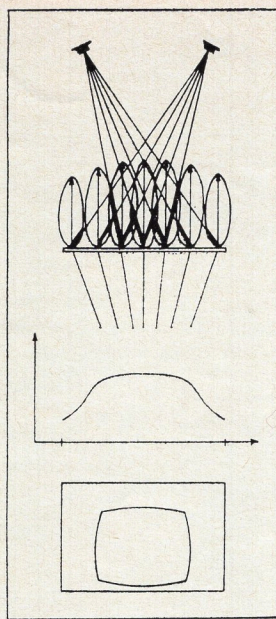


Fig. 3 b.

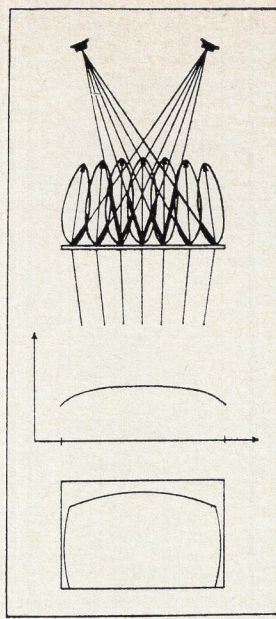


Fig. 3 c.

Figure 3 a - Wide angles : Diffusions in the plane of the ground glass are shown and the portions of those light rays that are seen by the light sensors are in dark black. The acceptance angle of the sensors is limited by baffles which are a kind of bushing for the cells. One is shown only at the right hand side, but this design feature and also the inclination applies to the other cells in the figures as well.

The response of the inclined light sensors, overlapping in the center on the major axis of the "eight", is shown in the diagrams in the middle of the figure. The vertical represent the intensities, the horizontal the length of the ground glass.

In the lower part of the figure the pattern of an oval spot (slightly resembling an "eight") is shown, which is the spot of which most of the metering is taken.

Figures 3 b and 3 c are for standard and long focal lenses: The diagrams in the middle of the figures again show light intensities versus length as metered by the two cells. The lower part of the figures indicate the areas or zones and their size, where most of the metering takes place. The patterns are more or less rectangles with bowed sides.

through c (upper part), where the lower delineations outline the field favored by the light cells, and the central part of the

figures indicate the diagram of light intensities viewed by the cells for the purpose of exposure metering.

The result of this is:

For a 35 mm lens the weighed spot is a narrow central zone with rapid attenuation at the margin of the image. On the ground glass a spot faintly resembling the figure eight represents the area of measurement covering about 30 % of the whole surface. For a 50 mm lens the zone of measurements is wider and flatter, somewhat a larger rectangle with rounded sides, covering about 50 % of the ground glass. And finally for a 135 mm lens the spot is large and flat, it fills almost 80 % of the surface of the image in the viewer.

The design allows about equal integrated light for all three spots impinging on the cells thus assuring the same metering for a standard subject whatever the focal length of the used lenses may be.

d) Concluding: This system realizes the requirements of advanced photographers as the designers of the Konica camera have proposed themselves, to wit:

- The metering is said to be "spot" in the case of wideangle lenses. The influence of great contrast is thus largely diminished. Most of the metering results from the spot whereas the surroundings contribute, but a small part.

- The metering is said to be "weighed" in the case of normal lenses where the area of measurement covers an appropriate portion of the majority of subjects for determining correct exposure. This area represents the lower central part of the ground glass, and the rest, the three marginal areas, that are the two lateral sides and above, contribute to the measurement by the rate of 3 to 10.

- The metering, furthermore is said to be almost all over "integration" in the case of telephoto lenses where the portion of the subject is limited by reason of the telephoto effect and therefore is not subject to strong light contrasts. If any such exist, these contrasts are attenuated by the atmospheric diffusion and therefore the integration method is scarcely weighed.

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