

YASHICA ELECTRO 35



Evolution of Electro 35 Gold Mecanica...

> a full report

by Gérard BOUHOT The **Yashica Electro 35** is an automatic 35 mm camera with aperture preselection, coupled rangefinder and electronic shutter.

The original feature of this camera is its shutter. In a conventional automatic camera, the coupled mechanical shutter is made of some 300 mobile pieces to cover a speed range from 1/500 to 1 second. The special Copal Elec shutter, designed for the **Yashica Electro 35** by the tearn Yashica/Copal (shutter specialists) requires only 35 moving pieces for a speed range from 1/500 to 120 seconds! 2 minutes!

One could often read, in Phot'Argus, about the so called electronic shutters. As in most cases, springs are actuating the 5 blades of the central shutter. Only their closing control is done by a solenoid between 1/500 and 120 seconds. Furthermore, without battery, the shutter operates mechanically and gives 1/500 of a second

But here, the shutter is, in addition, slaved to a CdS cell which controls the automatism through 5 transistors and 4 diodes. When the release button is pressed, the shutter blades open fully and the battery is connected. The light, coming into the cadmium sulphide photoresisting cell (CdS), enables a current to flow through an electronic circuit to a capacitor. When the capacitor reaches a prescribed charge level, the transistorized circuit triggers the solenoïd which lets the shutter blades close. There are no galvanometer, no meter needle, no tracking device: the regulation is entirely electronic.

This solution is particularly interesting because a very wide coupling range, associated with an f/1.7 opening, permits automatic colour shooting even in very dark environments, like the first lights of dawn or night street lights. A flash is only necessary for moving subjects. If one uses an Honeywell Auto-Strobonar unit, one has a fully automatic set up under all conditions.

Unscrew with a coin the lid of the battery recess situated on the left side of the bottom. Drop in a Mallory type TR 164 battery. This battery has still relatively little use in photography. Its voltage is 5,6 volts; it measures 44.3 mm in length and 16.6 mm in diameter. Each camera is supplied with one battery. The polarity is indicated on it. The lid carries a + red mark, and a battery installation sketch is glued in the battery recess (the Yashica people went to this luxury of care because the small electrode of this cylindrical battery is not the positive terminal, but the negative one, unlike its more usual carbonzinc or alcaline counterparts). Screw the lid with a battery in place. To check it, give a short push, with a nail, on the small red button "Bat. Check", flush with the back of the camera (at the center of the upper part) to avoid accidental pressures and unnecessary battery drain. A bulb, located under a window on the right of the button, glows brightly in green when the voltage is normal and the battery correctly positioned. If the bulb does not glow, check the sense of the battery (inverting it is harmless to the electronic circuitry), or even change it. If the camera is to be stored for a long time, remove the battery and store it in a cool dry place.

Paris street at night. Focusing at 6 m. TRI X, MICRO-DOL X, automatic exposure approximately 1 second at f(17

Children writing, indoors, scene lit up by veil curtains (they have been kept closed in order to retain the very soft diffuse lighting). TRI X, MICRODOL X, automatic exposure about 1/50 second at t/1.7.





Linear enlargements ×10 approximately.



Set the sensitivity, ASA (from 10 to 400) or DIN (from 12 to 27) by rotating the dial located on the right top of the case. This dial will move by applying pressure with two fingers on the grooved parts of its edge. The values in DIN have individual steps. The dial is secured against unwanted rotation through these two safety features. The red setting mark is engraved on its periphery.

Place the AUTO (Automatic) mark engraved on the front ring of the lens in front of the triangular red mark. Rotate the aperture ring-which is the center ring on the lens, to any value from 1.7

to 16 in front of the mark (because this camera is automatic with preselection of the aperture). If one does not know the meaning of these figures, simply align the "window" symbol (located between f/1.7 and f/2), or the "cloud" symbol (located in front of f/4), or the "sun" symbol (located in front of f/11), with the mark.

Cock the camera and this turns the electronic circuit on. View the subject, set the distance, and push gently on the release button (stroke about 4 mm) while looking through the viewfinder.

If no lamp comes on, the diaphragm setting was judicious. Keep pushing on

Transparency taken off a projection screen at f/4, about 1/30 of a second. Test picture (one can see a TV screen on the right side). Copper sulphide, photomicrography in polarized light.



the release button (total stroke about 8 mm) to shoot.

Center

If a red lamp glows very brightly above the viewed image, the system tells you that, if you release, the picture would be over-exposed because 1/500, the fastest shutter speed would still be too long for the selected opening. Close the diaphragm, check the exposure: if the lamp no longer glows, release. If the lamp still glows, close the diaphragm still a little more. For beginners, they do not need to know about openings: red lamp glowing, turn the symbol ring in the red arrow sense. View, check, and release. .

When the smallest opening is still not small enough, use a grey neutral $\times\,4$ filter, and set an ASA sensitivity figure divided by 4 on the sensitivity dial (for instance 100/4 = 25 ASA).

- If an orange very bright lamp glows above the right edge of the image, the camera is telling you that it will expose longer than 1/30 and you should then:
- either open the diaphragm (if you so wish and if it is possible) to get a faster speed. Beginners will then turn the symbol ring in the orange arrow sense, possibly until it hits a stop.
- or get the camera on tripod for time exposure. The release button located on the top right may be fitted with a cable release. The tripod socket, with Kodak pitch, is located in the middle of the bottom, close to the center of gravity.
- or use a flash if you do not want time exposure.

The control lamps, visible in the viewfinder, can also be seen with their colour on the top of the body through two square windows, and the turning arrows, orange, to the left, and red, to the right, go with them together with the word "Turn", as a DISTORTION



reminder of turning the symbol ring when they are illuminated.

These lights enable the knowledgeable photographer to select, when he wishes to do so, the shutter speed instead of the opening. By rotation of the aperture ring and check, he can determine: either the aperture for which the system will select 1/500, or the one for which 1/30 is selected, or both if he so desires. By a simple interpolation reasoning, based on 1 or 2 references, he will then be able to select very precisely the speed he wants to use: for instance, almost 1/500 to immobilise seagulls in flight, or about 1/150 to shoot underwater.

One should take note that if the orange lamp indicates that the exposure will last longer as 1/30, it does not tell, in the possible case of insufficient light, that if the shutter is released, the picture will be under-exposed. In practice the automatism reaches for all sensitivities 6 seconds at f/1.7, 8 seconds at f/2 (the coupling is not linear for the first two openings), then regularly increases up to 120 seconds from f/8 to f/16, and therefore the subjects calling for a longer exposure, with an under-exposure risk, are rare. For instance, this is largely sufficient when using Kodachrome II to shoot at small streets with little lighting at night.

A great many night pictures have shown that, as in the case of the Kodachrome II shot of the La Rochelle France harbour, lit by street lights at the very beginning of dawn, the limit of the automatism permits, even then, to make very good pictures (possibly an even longer exposure would have been preferable, who knows?).

The couplings indicated above are the actual limits of the automatism. If one releases in a very dark environment (or if one voluntarily covers the window of the cell) the shutter would stay open for ever. To avoid this, a leakage current is desi-

gned into the circuit, and this sets the limits of the system.

If one wants longer exposure times, operate manually. Set the front ring of the lens from AUTO to B exposure.

By turning the same ring in the other direction, from AUTO to the "Lightning" symbol, one can work with a flash. The synchronisation terminal, 3 mm standard diameter, is located on the left top side. The shutter speed is then 1/30 of a second, and synchronisation is good for all flash types. Use normally the guide number.

Let us now come back to a few features, since the automatic operation has been described.

The cell is located on the top right of

the front face. One should avoid to place any finger in front of it when holding the camera. The sensitivity setting is done by uncovering more or less the sensitive CdS element. In fact the rotation of the dial sets the more or less complete overlap of two V shaped blades acting as a diaphragm (at 400 ASA, the 5 mm diameter sensitive surface is fully uncovered; at 10 ASA, the opening is only about 1 mm²). This setting is thus mechanical and is limited to 400 ASA, a rather low value when one considers the sensitivity of presently available films.

The duration of exposure is only determined before release, it is not preselected. It adjusts itself during the shooting if light conditions vary. Therefore, one cannot set a particular speed/opening combination (to decrease the sky influence, to correct for a backlight, ...) by partially depressing the release button.

The viewfinder located on the top left covers more field than the lens itself. The observed image is roughly 2/3 of lifesize, is entirely visible for people wearing glasses, and exhibits very few side reflections. The actual picture size frame is indicated by 4 bright yellow corners. The center of the frame is occupied by the losange shaped window of the rangefinder. This rangefinder operates in complementary colours: the whole of the picture is dyed in light purple, which goes unnoticed, and the rangefinder window is dyed in the same bright yellow as the frame corners. The focusing is achieved when the split elements of the image in the wanted focusing plane superimpose.

The focusing is done by rotating the back ring of the lens mount (range from infinity to 0.7 m or 2.5 feet, black marks, over 120 degrees, smooth). The lens ring has a depth of field scale, complemented by a table in the instructions book. An infrared mark is missing, since the camera cannot operate automatically in IR.

Parallax is automatically corrected by the displacement of the viewer frame



TV screen picture shot at 1/30 to avoid strobing (1/30 reached through orange light, see text). Test picture.



Contrasted lighting, with light source within the field. Paris show window. Shooting distance 0.7 m at f/1.7. Automatic exposure, hand held camera with elbows braced to the waist and stiff legs to avoid blurred picture.

during focusing. The size of the image is not compensated for, since the lens can only be focused down to 0.7 m.

On the left of the lens mount, a self timer can be armed before or after cocking, and gives a variable delay between 4 and 10 seconds according to the arming angle. Once it is armed, one has no choice but use it.

The YASHINON DX 45 mm lens has a maximum f/1.7 aperture. In spite of this extreme aperture, the pictures only exhibit diaphragm reflections or caustics—of very good aesthetics—when the sun or a very bright light source are present in the field. Unfortunately, it is not dismountable. Auxiliary lenses are now available. Please note that the test pictures have been taken by focusing through the rangefinder, as we explained it in "a few hints on the test bench, issue n° 14". The aperture ring is only indexed at nominal steps between f/1.7 and f/16, the shutter realising an infinite variety of speeds between 1/500 and 120 seconds.

To open the cover back, pull the lever imbedded at the bottom of the left side. Its recessed position and a powerful spring prevent accidental opening. Drop the cartridge on the left, tilt towards the front, and set it in place: a special cut in the bottom avoids the lifting or pushing of the rewind knob. Thread the film leader on the runners to the take up spool, and wedge a few millimeters (about two perforations, it wont't take any more) into one of the 6 slots of the take up spool.

Begin to cock, the film winds under the take up spool, and check that the sprocket teeth are engaged in the perforations. Close the back cover by pressure. Cock and release to move past S (Start, marked in red) and the 2 marks, and bring picture 1 in ready position. The counter will step during cocking, 20 is marked red, the other marks are white and the counter stays slipping on 37 beyond 36 pictures.

This type of loading is very easy to perform.

The cocking is smooth and rather quiet, except 1/3 of its way when it claps loudly. It stroke is 200 degrees from the first 15 degrees dead sector, which forces the hand to move while cocking. It gets back simply to the case by pressure. It must be actuated in one single stroke and only comes back to rest after cocking is fully completed. Only its blocking indicates that the camera is cocked, as only the counter-rotation of the rewind knob during cocking indicates the proper film transport action. When releasing this camera is quiet, although it produces a faint whistle at the end of long exposures.

Two remarks are worth being made: when one does multiple cocking during loading, if the camera is set so as to expose for a long duration, and one cocks again after release before the shutter has closed, a safety device closes it at the beginning of cocking, avoiding any damage. The electronic circuit is switched-on by cocking, one must then cock at the time of taking a picture. A long habit with my EXAKTA II-A without instant return mirror tells me to cock immediately after having shot; even under these conditions, the battery lasted 8 months. A rotary safety, concentric to the release button (turn it 90 degrees to L = Lock), blocks it when the camera is cocked, but does not switch the circuit off as the manual says.

To unload the camera, push the film rewind button located at the right of the bottom (it will spring back automatically at the next first cocking) unfold the crank and wind if (the correct sense is indicated by arrows on the crank and on the knob), open the cover back (the frame counter automatically resets to S) and pull the cartridge out.

The Yashica Electro 35 is 152 mm long, 90 mm high, 87 mm thick and weighs 770 grams, its case is metallic. It comes with a lens cap, a black leather rigid bag with foldaway detachable front, in a handsome cardboard packaging. The carrying strap attaches to the bag. The serial number is engraved on the top of the back. Two side eyelets can receive a strap. The accessory shoe without synchronisation is located on the left part of the top. There is neither a tell tale disc for the type of film in use, nor a film plane mark.

Some accessories are foreseen:

- Screw-in filters of various type (they may be used in automatic mode by setting on the sensitivity dial the sensitivity in ASA divided by the filter factor).
- Screw-in lens hood, 55 mm in diameter, not fitting in the bag.
- Cylindrical slip-on lens hood, 57 mm in diameter, not fitting in the bag, but delivered in a case attachable to the strap.
- Tripod ST 7, maximum diameter 40 mm, 170 mm long, weight 180 grams. When closed, it can be used as a handle with a wrist strap. Unscrew the base knurled knob, unfold the 3 legs and screw again the knurled knob which keeps them apart. Screw the camera to the ball head. Loosen it by a screw and set the camera in height (through 190 degrees by using the ball slot one can bring it to horizontal one way or the other) and in direction (through 360 degrees). A little knurled knob on the base permits to turn the camera through 360° without touching the ball. By turning the plate on top the ball upside down, one gets a witworth screw. This tripod may be used as a table tripod, or as a chest stand ...

This camera, whose looks are slightly less modern than its electronics, proposes through its lamps an intelligent automatism which we could almost never fault through several months of varied use, at sea, on snow, under-water, and primarily for the execution of many night shots, of course feasible by other means, but that only the automatism led us to try without cable release, without tripod, by leaning against a tree, a street pole, or a wall...

Tested Camera: nº 7, 127, 166. Camera Used: nº 7, 042, 045.

Measurement of speeds impossible: the camera is automatic by continuous variation of exposure time between 1/500 and 120 seconds.

Bad features:

- Cell on the case, not TTL (there is still on the market no TTL camera with a rangefinder).
- Mercury type Mallory TR 164 battery still rare.
- Exposure metering limited to 400 ASA sensitivity.
- No under-exposure indicator.

- Self timer that cannot be disarmed.
- Impossible to fix a speed/opening combination.
- Focusing down to 0.7 m only, and fixed lens.
- No cocking signal, no film transport tell-tale.
- Cocking in a single stroke, forcing the hand to move.
- Impossible to switch-off the circuit after cocking, even though the release button has a safety lock.
- No tell-tale disc for the type of film in use.
- Accessory shoe without synchronisation.

Good features:

- Automatic camera with aperture preselection. Very wide coupling: 6 seconds at f/1.7, 8 seconds at f/2 until 120 seconds at f/8 to f/16 for all sensitivities.
- Electronic shutter automatically coupled from 1/500 to 120 seconds, few moving parts.
- Coupled viewfinder with complementary colours. Bright frame viewfinder with parallax correction.
- Orange (1/30) and red (1/500) pilot lamps in the viewfinder and on the top of the case making the automatism "clever" (see text).
- Battery check. Sensitivity setting with individual DIN stops.

- Simple settings for beginners by symbols and arrows (see text).
- B exposure; 1/30 synchronisation for all flash units; self timer with 4 to 10 seconds variable delay.
- Back cover opening with safety lock. Quick loading.
- Cocking and release smooth and rather quiet.
- Film rewind button springing back automatically, and resetting counter when opening the back cover.
- Reliable operation of the automatism under varied environments; good sturdiness (after 8 months of extensive use).
- Personalized appearance, bulk kept within limits.

EVOLUTION OF ELECTRO 35

Since the 1968 Photokina, several versions of the Electro 35 have been marketed. It exists now in black, very professional finish: the Electro 35 Professional has gold plated electronic circuitry in order to do away with the corrosion risks and to improve electrical conductivity (the rest of the electronics and the camera itself remaining unchanged). The Electro 35 Gold Mecanica (in France sold under the name of Electro 35 Mecanicor), in matt chrome, also has a gold plated circuitry identical with the black Professional and its film advance lever is plastic coated with an initial 20 degrees dead sector away from the body. On the Electro 35 Gold Mecanica body the atom symbol on the top right of the from face is gold plated and a G precedes the trade mark Yashica.

These cameras may also be puchassed: either as "Professional set" consisting of a camera, an ST7 tripod, and a carrying case, or as a "kit" consisting of a camera, an ST7 tripod, a carrying case, a shoulder strap, a cable release, a lens hood, a UV filter, a yellow filter and the auxiliary wide-angle and telephoto lenses with auxiliary viewfinder, the whole lot being carried in a stiff leather suitcase.

The "lens conversion set" consisting of the auxiliary wide-angle and telephoto lens with viewfinder, can be purchased independently from the kit. The viewfinder fits on the camera accessory shoe, and has separate trimming frames for "vide" and "tele". The wideframe corresponds to the maximum field of the viewfinder. These frames indicate approximatively the fields covered by the auxiliary lenses $58.4 \text{ mm} (\times 1.3; 3 \text{ components in } 3 \text{ groups}; field 40 \text{ degrees}) and 37.7 \text{ mm} (\times 0.8; 2 \text{ components in } 2 \text{ groups}; field$

60 degrees). These auxiliary lenses screw on the standard lens (if a filter was used before, do not forget to renove it as its mount would cause vignetting). They can receive slip on lens hoods of 74 mm

Linear enlargements \times 10 approximately

YASHINON-DX : f = 45 mm, f/1.7 - No 80 609 606

YASHINON-DX : f = 45 mm, f/1.7 with auxiliary wide-angle lens : f = 37.7 mm, f/4.

Edge

Edge

YASHINON-DX : f = 45 mm, f/1.7 with auxiliary telephoto lens : f = 58.4 mm, f/4.

Edge

8

.

Center

diameter, and screw-in type filters of 72 mm diameter (the use which is not recommended as they wild disturb the picture in the corners).

When using the auxiliary lenses, a correction of the distance setting is necessary. Measure the distance as usual with the camera range-finder, read the subject range on the focusing scale of the lens, in meters or in feet; read on the conversion ring of the auxiliary lens in use the range setting required (engraved red) as a function of the range measured (engraved black and white); dial this new range setting on the lens focusing scale instead of the measured distance; then shoot. If the measured range falls between the scale figures, one shall select the nearest figure to it. In the instructions manual, one can find intermediate value settings if one wants to be so accurate. The conversion ring of the wide-angle is engraved on white, on black for the telephoto, for easy handling. For the older Electro 35 cameras, new distance scales are supplied with the auxiliary lenses, their graduations are finer than those already existing on the camera, so that they correspond to the conversion tables (set the camera on infinity, tear off the protection backing of the scale, set its infinity sign in front of the red mark on the lens barrel, and paste it while avoiding bubbles; several scales an supplied with each set, enabling the customer to finally do a first class job). The range

conversion operation, relatively long to perform, makes the use of these auxiliary lenses more complicated, and restricts them to still subject photography. The auxiliary lenses having an aperture of f/4, do not set the normal lens diaphragm ring on 1.7-2-2.8 or 4, only use 5.6-8 or 11 (avoid to use 16).

These accessories extend the use of the Electro 35, and the diversified types will certainly enlarge the field of potential customers.

VM Éditions, 3, place Malesherbes, 75 - PARIS (17°). Phone : 227-25-44.
US Edition published in France by VM Éditions. Abstract from « PHOT'ARGUS ».
Copyright © 1969 by VM Éditions (PARIS). Chief Editor : Robert MONNIER.

All rights reserved

including the right of reproduction in whole or in part in any form (with the exception of the right to use short quotations for review of book).

Made and Printed in France by : Busson Ltd., PARIS.

Subscription « Phot'Argus test, a full report (R) » in English, 6 issues per year, air mail delivery : 13.75 \$.

Regular Phot'Argus (R) Magazine suscription, 6 issues per year, air mail delivery : 3.95 \$.

Dépôt légal 1969/2°; nº 297 P