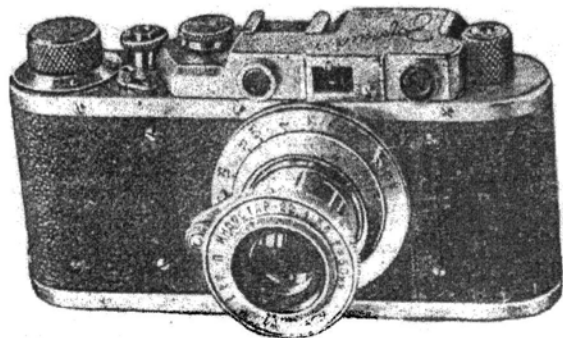


The camera  
**ZORKI**



***INSTRUCTION MANUAL***

## INTRODUCTION

The Russian word "Zorki" means "Sharp-sighted".

The "Zorki" camera was an exact copy of the "FED" whose production started before WW II. The FED camera in turn, was a copy of the famous Leica II camera.

The first batches of the Zorki were engraved "*FED 1948 Zorki*". The earliest ones were marked "FED" only, with the famous KMZ (Krasnogorsk Optical and Mechanical Factory) logo without an arrow.

These were supplied with "Industar 22" 3.5/50 or "Industar 50" 3.5/50 lenses. However, some of the cameras were fitted with other lenses.

The Zorki camera has a shutter speed range of 1/20, 1/30, 1/40, 1/60, 1/100, 1/200, and 1/500, as well as B (or Z). Some cameras made in 1948 had an additional 1/1000 top speed.

The shutter release was modernized in 1950 to accommodate a threaded cable release. After 1952, camera body shells were made by die casting.

In the early 50s, a small number of Zorki cameras were fitted with additional slow shutter speeds.

In 1955, a new shutter step progression was introduced — 1/25 to 1/500 sec.

Unlike the FED, Zorki cameras had always been manufactured with the true 28.8 lens register.

A total of **835502** Zorki cameras were produced.

## 1. PURPOSE

The camera is made for amateurs and photojournalists.

The Zorki is a modern and perfect camera using normal 35mm film.

The camera can be used for landscape, portrait, group snapshots, sports, and other types of photography.

## 2. BASIC FEATURES OF THE CAMERA

1. Picture format is 24 x 36 *mm*.
2. A 1.6 metre film length will yield 36 exposures.
3. Focal Plane shutter.

Shutter speeds: 1/20, 1/30, 1/40, 1/60, 1/100, 1/200, 1/500 sec., and Z (manual long exposures).

4. "Industar-22" lens («Индустар-22» in Russian) with coated optics.

a. Focal length = 50 *mm*.

b. Relative aperture of lens is 1:3.5.

c. Aperture scale: 3.5; 4; 5.6; 8; 11; and 16.

d. Distance scale in metres: 1; 1.25; 1.5; 1.75; 2; 2.5; 3; 4; 5; 10; 20; and  $\infty$  (infinity).

5. Lens mount M39x1 *mm*, similar to Leica Thread Mount (LTM)

6. Optical viewfinder for 50 *mm* lenses.

7. Optical rangefinder with baselength of 38 *mm*, coupled to the focusing mechanism of the lens.

8. Film winding is coupled to shutter cocking and frame counter.

9. The camera is equipped for film rewinding which enables film loading under normal, but not too bright lighting conditions.

10. Tripod socket:  $\frac{3}{4}$ " pitch.

Camera dimensions: width, 135 *mm*, height 70 *mm*, and length at working position, 70 *mm*.

11. Weight, 580 *grammes*.

### 3. COMPLETE CAMERA SET

1. Camera with "Industar-22" lens.
2. Take-up spool.
3. Cable release.
4. Front lens cap.
5. Film cassette type 135.
6. Leather case with strap
7. Description for "Zorki" camera
8. Passport.

**Note:** the Zorki camera without the "Industar-22" lens can be supplied with large aperture lenses like the "Jupiter-3" or "Jupiter-8".

It is not recommended to unscrew the lens from the camera.

If the lens needs to be replaced with another (for example, a telephoto or wide-angle objective), it is necessary to **set the lens first to minimum focus, eg. 1 metre**, before removing and mounting the lens.

The camera's passport indicates the actual optical register (working length) of the lens supplied with the camera.

Select only interchangeable lenses whose optical registers (working distances) match the values given in the passport.

A small off-white plate is enclosed in the pocket of the camera case, and can be used for notations marked with a soft (H or HB) pencil.

Notations can be easily erased.

#### **4. NOMENCLATURE AND RULES OF MANIPULATION WITH THE CAMERA**

(fig. 1).

**1. Shutter and Film Winding Knob.** Turn the knob only to the direction of the arrow until it stops. With a single action, the film moves on by to the next frame, the shutter curtains are cocked, and the frame counter moves by one notch.

**2. Frame Counter Ring.**

**3. Nipples for setting the Frame Counter Ring.** Set the the frame counter to 0 after loading the camera. The

ring is held by friction. Turn it to the direction indicated by the arrow engraved on the winding knob.

**4. Index Arrow for the Frame Counter.**

**5. Shutter Release Button** with threaded cable release attachment.

**6. Mechanism Switch.** To rewind film back into its cassette, shift the switch to "B".

**7. Shutter Speed Dial.** Set and change shutter speeds only with the shutter cocked. The dial should be lifted slightly and then turned to set the desired speed. The dial can be turned only from 20, 30, 40, 60, 100, 200, 500 and back.

The dial cannot be shifted between Z and 500.

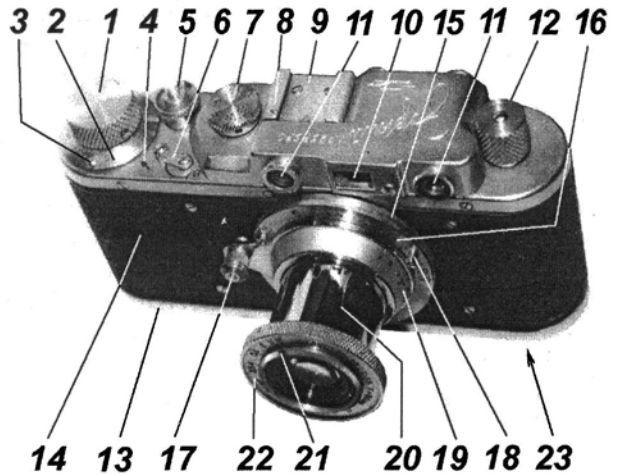


Fig. 1

**8. Arrow Index for Shutter Speed.**

**9. Accessory Shoe** for mounting special devices like supplementary optical viewfinders for other focal lengths, frame view finders, auto release self-timers, flash units, etc)

**10. Optical Viewfinder Window.**

**11. Optical Rangefinder Window.**

**12. Film Rewind Knob.** Turn knob towards the direction of engraved arrow to rewind film.

**13. Removable Baseplate Cover** has a locking key and a nut for mounting the camera on a tripod.

**14. Baseplate Fixing Pin.**

**15. Lens Mount Flange.**

**16. Lens Distance Scale.**

**17. Focussing Knob.** Lens locks at infinity. To focus, release the lock by pushing the knob button lightly.

**18. Restrictive Pin.**

**19. Depth of Field Scale.**

**20. Lens Barrel.** Set the lens to shooting position by pulling out the front ring 22 until it stops and turn it clockwise until it locks into position. To retract the lens, do the procedure in reverse.

**21. Aperture Setting Ring with Index.**

**22. Lens Front Ring with Aperture Scale.** The scale is engraved with the relative apertures.

**23. Baseplate Locking Key** (see fig 2)).

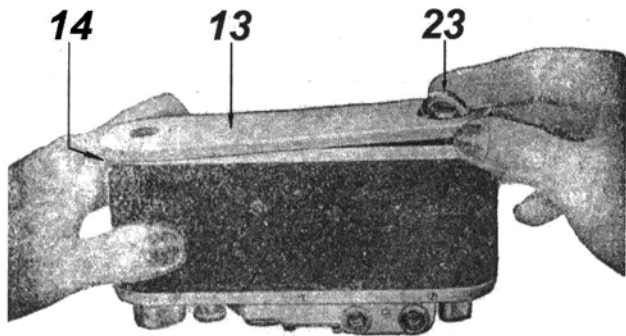


Fig. 2

## 5. OPENING THE CAMERA

Take the camera as shown in fig. 2. Lift the key of the lock 23 and twist it counter-clockwise by half a turn. The arrow on the key will then point to «ОТКРЫТО» = "opened"

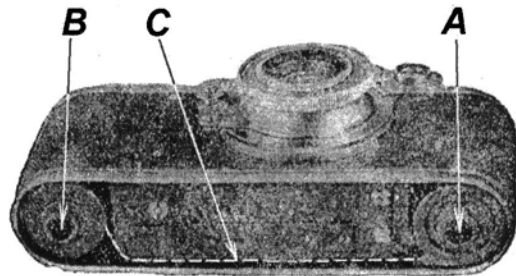


Fig. 3



The position of the film cassette and takeup spool inside the camera is shown in fig. 3.

The film cassette fits into the film chamber freely and easily pulled out by grabbing the knob "A".

The takeup spool for exposed film should fit into the spring spool drum and can be pulled out by grabbing knob "B".

## 6. THE FILM CASSETTE AND LOADING IT WITH FILM

**Note:** Modern 135 film cassettes can be used without any restrictions.

The film cassette (fig. 4) consists of three parts (fig. 5): the shell, spool, and caps. The cassette has to be disassembled for film loading. Hold it as

shown in fig. 6 and lightly tap the spool knob on a rigid surface.

The following steps should be done under a red safelight, or total darkness, depending on the film's spectral sensitization.

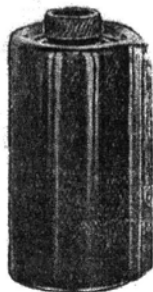


Fig. 4

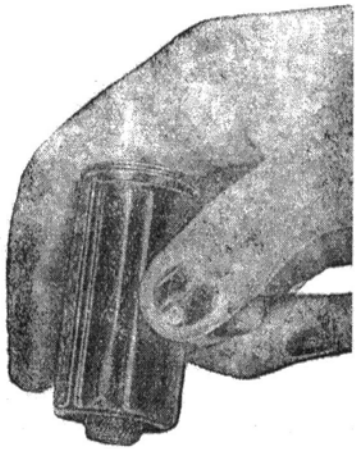


Fig. 5

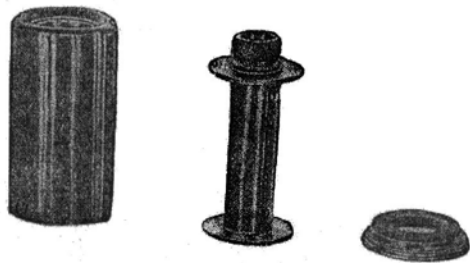


Fig. 6

Cut off the film end and insert it into the spool, fitting it under the spring, as shown in fig. 7. Pay attention to the bend of the film and press down the film end with a finger nail. The coated side should face the spool shaft. Reel in the film taut around the

spool. Do not make the roll taut by winding heavily from the spool end to pull in the film. This will result in scratches on the emulsion surface. Don't touch the emulsion surface. Hold film only by the edges.

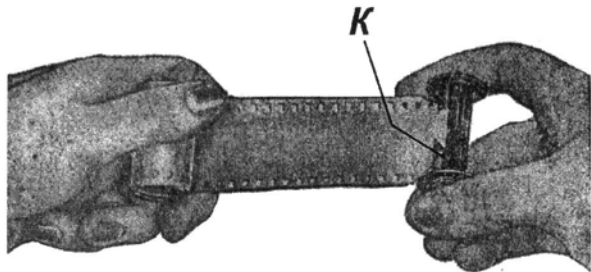


Fig. 7

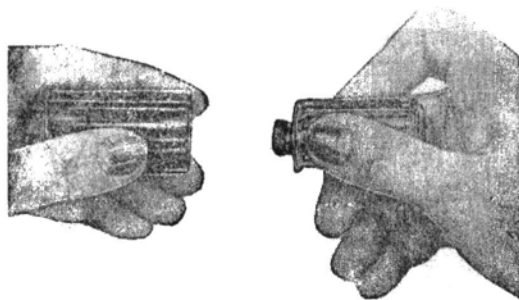


Fig. 8

Insert the rolled film with the spool into the cassette (fig. 8) and replace cover. Subsequent steps can now be done outside the darkroom.

## 7. CAMERA LOADING

1. Extract the take up spool "B" (fig. 3) from the camera.



Fig. 9

13

2. Pull out the film leader from the cassette. This should not be longer than 10 cm. Shape it exactly as shown in fig. 9, or with the use of trimming template.

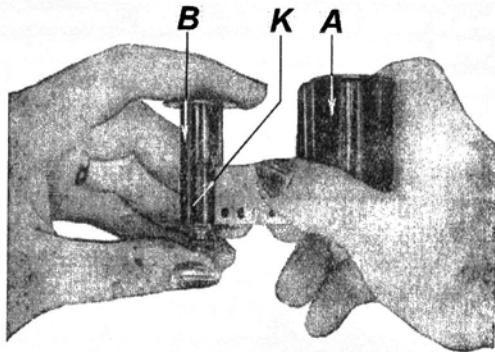


Fig. 10

3. Hold the takeup spool "B" with the left hand and the film cassette with the right. Insert the film end under the spring "K" of the takeup spool (fig. 10). The perforated edge of the film should be right next to the spool flange.

4. With the camera lying on its top (fig. 11), hold cassette "A" with the right hand and takeup spool "B" with the left. insert both simultaneously into the camera. Slide the film into the channel "C". If the film cassette does not sit properly, turn the rewind knob a bit until the cassette fits properly.

5. Replace the baseplate 13 (fig 1), press it and twist the lock key 23 clockwise by half a turn. The arrow on the key will now point to «ЗАКРЫТО» = "closed". Check that the baseplate is properly closed.

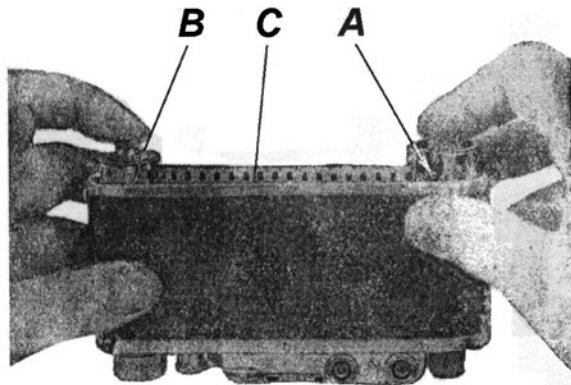


Fig. 11

6. Wind the advance knob 1 and press the shutter button 5 twice to make two blank

exposures. Check if film has been properly loaded-when correct, the rewind knob 12 (fig 1) should turn.

If it doesn't turn, loading is likely incorrect and the process has to be repeated.

7. Set the frame counter ring 2 to "0" on the index mark 4.

8. The following are common loading mistakes which result in film jamming or damage to the camera mechanism:

**a) The cassette is loaded too tightly. (Film length is more than 1.6 m)**

**Note:** This is vitually unheard of with modern or factory packed film cassettes.

The film will be hard to pull out. The film appears to tear easily and it will be shredded by the

transport sprocket where it is in contact with it. Film movement will be stopped as the sprocket teeth will just rotate where the film perforations are torn. This error is easy to detect by the absence of any movement in the film rewind knob 12 (fig 1) and by the rustle associated with moving film.

**b) The film leader is improperly cut.**

**Note:** Modern film leaders are too short for proper loading in the Zorki. Read the following carefully.

The cut part of the film leader (see fig. 9) should be 10 cm in length. About two mm of uncut film should protrude from the cassette's lips. The cut should be without sharp edges and should slope gently. No cut should be made between perforations.

If the cut is less than *10 cm* long, more than *2mm* of uncut film will extend out of the cassette. This extra length will catch on the shutter crate and can result in broken film perforations or prevent film from being properly inserted into the film channel. Broken perforations will stop film movement.

When the cut is more than *10 cm* long, wind the surplus around the takeup spool instead of pulling film back into the cassette to achieve the necessary length. Winding the extra length into the cassette may cause the cut slope to catch on the velvet traps of the film cassette and prevent proper loading or film movement altogether.

**c) The film leader is improperly inserted into the take-up spool.**

The tip of the film leader is improperly inserted under the spring of takeup spool "K". The film fits

loosely and the film isn't inserted straight into the film channel. The film won't be pulled out of the cassette properly and cause it to break its perforations and stop moving.

**d) The mechanism switch was left at "B" ("rewind mode") before loading.** The transport mechanism will not work properly, but may pull the film through. Resistance from the film cassette and the film itself can pull the leader off the take up spool.

Shifting the switch to "advance mode" will get the mechanism running correctly but may not engage the sprocket teeth with the film properly. In this case, the film will just be pressed against the camera's back wall and won't advance.

Repeat the loading sequence.

In case the film leader tip is pulled out of the take up spool but remains engaged with the sprocket teeth, the film will continue to be advanced for a few frames until the mechanism stops. Film by this time would be loosely looped around the spool and the accumulated mass will jam the advance mechanism altogether. If this happens, do not pull out the film — as this would cause damage to the camera mechanism. The jammed film can only be removed by disassembling the camera. Professional repair should be sought.

**e) The winding knob 1 is not properly engaged.** This will result in film being pulled through without engagement with the rest of the camera's mechanisms. Film will be pulled through but can get loose and result in a similar situation described in d).

## 8. BASIC SHOOTING

The camera is used in this sequence:

1. Set the lens into its working position.
2. Set the necessary aperture.
3. Cock the mechanism.
4. Set the necessary shutter speed.
5. Focus the lens, using the rangefinder by sighting through its eyepiece "R" (fig. 12)
6. Compose the shot by looking through the viewfinder eyepiece "V" (fig 12).
7. Take the picture by pressing the release button gently and smoothly.

When shooting, do not forget the main rules which are the keys to successful pictures:

**a) Hold the camera steadily for sharper pictures.**



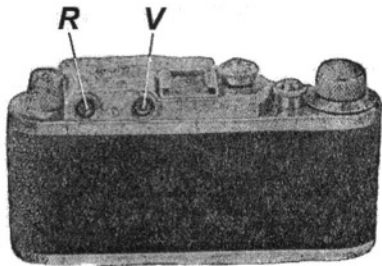


Fig. 12

When shooting with a hand-held camera, select the fastest speeds allowed by subject and lighting situations. Smaller apertures demand the use of slower speeds.

Look at figures 13-16 which illustrate the **proper** and **improper ways of holding the camera.**



Fig. 13. Correct way of handling the camera horizontally.



Fig. 14. Incorrect way of handling the camera horizontally.



Fig. 15. Correct way of handling the camera vertically.



Fig. 16. Incorrect way of handling the camera vertically.

**b) Choose the shutter speed/aperture combination for correct exposures.**

Exposure tables and calculators can be used to determine these, but an exposure meter gives the most accurate values.

## **9. UNLOADING THE CAMERA**

1. Press the shutter release button 5 (fig 1). Cap the lens.
2. Shift the mechanism switch 6 to "B" ("rewind mode") position.
3. Pull out the rewind knob 12 (fig 1) and turn it to the direction of the engraved arrow. Rewinding is at its end when a slight resistance (from film being yanked out of the takeup spool) is felt and when the shutter release button 5 stops rotating.
4. Open the baseplate, as discussed earlier.

5. Pull out the film cassette and keep it properly until it is developed.

6. Return the mechanism switch 6 back to its "advance mode", as indicated by the arrow, and turn winding knob 1 to engage the mechanism. The camera is again ready to be loaded anew.

## **10. USING THE RANGEFINDER, DISTANCE AND DEPTH-OF-FIELD SCALES**

1. Hold the camera as shown in figs. 13 and 14. Point the camera towards the subject and sight it through the left eyepiece "R" (fig. 12).

On the central part of the field, the rangefinder is seen as a yellowish transparent patch superimposed on a blue-tinged background.

2. With a lens focused at infinity, objects located at closer distances will appear as double images.

Press the button of the lens tab 17 (fig. 1) to release lens and focus by turning it. Observe the rangefinder image and turn the lens until the images coincide (fig. 17).

When the images coincide, the lens will be in focus relative to the chosen object. The distance scale 16 will indicate the subject to film distance on the scale index 19.

3. When exact distance is known, focusing is possible without using the rangefinder. Focus can be set by lining up the measured distance value on the distance scale 16 against the scale index 19.

4. Depth of field for a given focus/aperture combination can be determined from the depth of field scale 19.

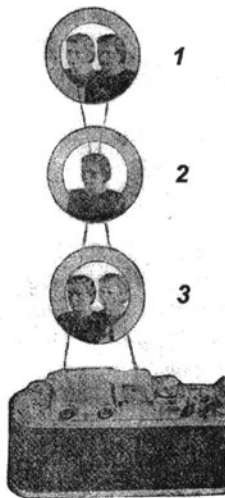


Fig. 17

- 1 - Double images = not sharp
- 2 - Images coincide = sharp
- 3 - Double images = not sharp

Depth of field is the range between the nearest and farthest point where objects would be rendered sharp in the photograph.

The Depth of Field Scale is adjacent to the distance scale located on ring 16, and has aperture numbers engraved on both sides of the index 19. After focusing, this scale shows the extent of depth of field for the chosen aperture. The range of sharpness limits will be where the aperture number lines up with on either side of the scale.

For example, a lens is focused at 4 metres and set at  $f/16$ . The range of sharpness will extend from 2 metres to infinity, when read off the depth of field

scale. At the same focus setting but with an aperture of  $f/5.6$ , the range will be from 3 to 7 metres.

As evident from the given examples, depth of field is considerably reduced with and increase in aperture size.

The depth of field scale does not indicate absolute values and may differ from actual results. The range of sharpness is just a guide for determining what would be acceptably sharp.

Acceptable sharpness defined by the depth of field scale of this camera is determined by circles of confusion with a diameter of  $0.05 \text{ mm}$ .

## 11. CARE OF THE COATED LENS

1. The optical surfaces of the lens have a very thin layer (about  $0.1\mu\text{m}$ ) of anti-reflection coating. This coating gives the lenses a lilac or pale-blue tinge in reflected light.

2. The extremely thin coating can be easily scratched with improper cleaning methods. To preserve the coating, protect the lens from dirt, dust, and oil, to reduce the necessity of cleaning or wiping.

3. The following cleaning method is recommended:

a) Remove dust with a soft, clean brush, or wipe **very lightly** with a clean flannel napkin or cotton wool.

b) Oily smudges, finger prints, perspiration marks can be removed **lightly** wiping the contaminated surfaces with clean flannel napkin or cotton wool slightly moistened with pure spirit alcohol or ether (petroleum or sulfuric).

Any residue left by the cleaning solvent can be removed with a dry napkin.

**Note:** Modern cleaning kits using better materials and cleaning solvents are better to use.

c) Moisture on the coated surfaces can leave stains and when left for long periods (i.e, during storage), can completely destroy the coating.

If the camera is brought in from a colder environment, do not open the case and lens caps immediately to prevent condensation on its

surfaces. Let it stabilize first with the ambient temperature.

4. If, through careless handling or any other reason, the coating does deteriorate, the lens will still perform better than an uncoated lens.

## **12. COMMENT ABOUT BUBBLES IN OPTICAL GLASS**

The components of modern high quality lenses are produced from special grades of glass. The smelting process involved causes inevitable formation of gasses which get trapped in the glass to form bubbles. They are always noticed with complex photographich lenses, be they Soviet or foreign made.

The bubbles do not affect the lens performance or the quality of the image. Therefore, the factory

does not accept claims about bubbles found in lenses or exchange such lenses.

### 13. WARRANTY

**Note:** This chapter is included as an example of old Soviet warranty forms. Such warranties will not be honoured by KMZ anymore.

1. In order to prevent upsetting the camera adjustments, independent disassembly of its mechanism is **forbidden**. The factory will repair the camera if hidden defects should be discovered

during the 6-month warranty period from its date of purchase, provided that the camera has not been subjected to disassembly.

2. When sending a camera to the factory for repair, it should be sent with its passport, duly stamped with the date of its purchase. The factory will not accept for repairs incomplete cameras (see completeness).

3. Address of the factory: **USSR, Krasnogorsk, Moscow area, Krasnogorsk mechanical factory. To checking department.**