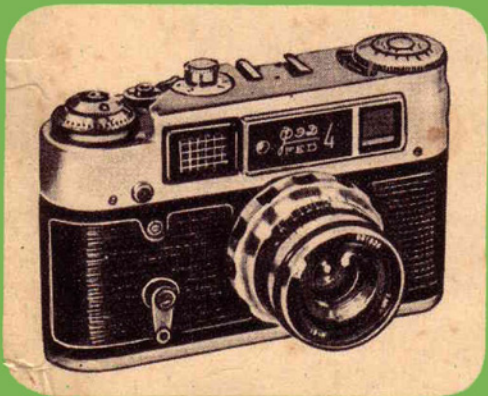




v/o mashpriborintorg



CAMERA

ФЭД

FED

4

This manual contains a brief description of ФЭД-4 (FED-4) camera and the basic rules for using the camera. It cannot serve as a photography manual.

Slight differences between the description and the camera may occur as a result of technical modifications being introduced in the design of the camera.

ФЭД-4 camera operates on standard 35-mm film with a picture size of 24×36 mm. The wide range of shutter speeds, the trigger winder, synchronizer, automatic releaser, dioptric view-finder setting, the light weight and compactness of the camera will satisfy the requirements of either amateur or professional photographer.

ФЭД-4 camera is fitted with "Industar-61" lens with lanthanum optics which makes it possible to obtain perfect large-size pictures. The camera is so designed that it is also possible to use interchangeable lenses "Jupiter-8", "Jupiter-9", "Jupiter-11", "Jupiter-12" and others.

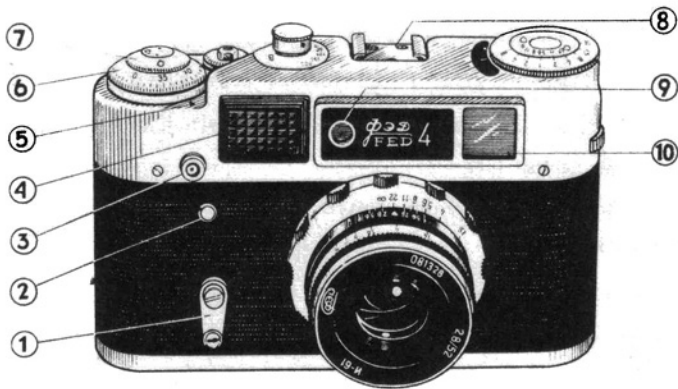
In taking a picture the camera is focused with the help of the range-finder.

The photoelectric exposure meter incorporated in the camera makes it always possible to choose the proper exposure and ensures obtaining good negatives under various lighting conditions.

The automatic releaser allows the photographer to take pictures of himself.

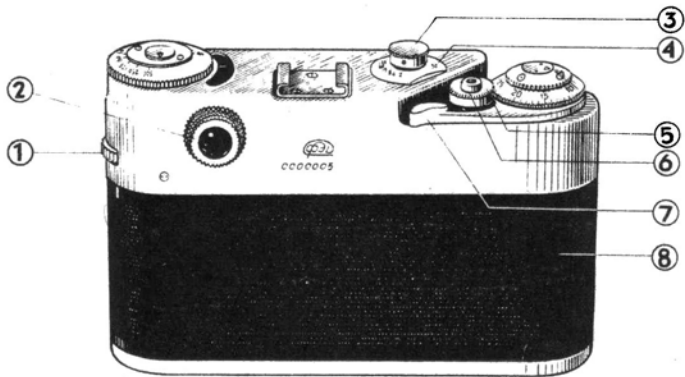
At the bottom of the camera there is a socket for a tripod.

It is possible to photograph with a tripod without taking the camera out of its case.



Front view:

1 — automatic releaser lever; 2 — automatic releaser button; 3 — synchronizer socket; 4 — exposure meter aperture; 5 — frame indicator; 6 — picture counter dial; 7 — film indicator; 8 — accessory shoe; 9 — range-finder aperture; 10 — view finder aperture



Rear view:

1 — rewinding disk; 2 — dioptic view finder ring; 3 — exposure head; 4 — shutter speed dial; 5 — disconnecter clutch; 6 — release button; 7 — winding lever; 8 — rear hood

TECHNICAL DATA

Size of negative, mm	24×36
Negative material	standard 35-mm film
Magazine charging capacity	1.6 m for 36 pictures
Lens	anastigmat "Industar-61", relative opening 1:2.8 with focal length $F=52.4$ mm
Connecting dimensions for attachments	plane — $d=42$ mm; threaded — 40.5×0.5
Focusing limits	from 1 m to ∞ (infinity)
Range-finder	optical, aligned with view finder
Shutter	curtain with speeds: 1, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{15}$, $\frac{1}{30}$, $\frac{1}{60}$, $\frac{1}{125}$, $\frac{1}{250}$, $\frac{1}{500}$ sec and "B" (by hand)
Exposure meter	photoelectric, single-range
Automatic releaser	mechanical
Synchronizer	X-contact
Weight of camera in case, g	1000

The camera can be loaded under ordinary soft lighting conditions in the following way:

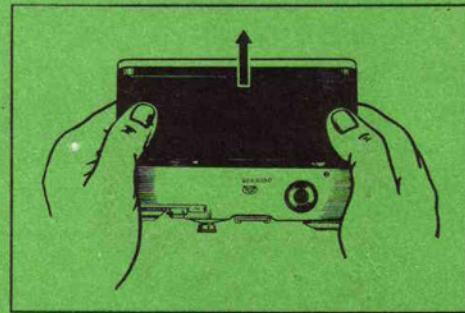
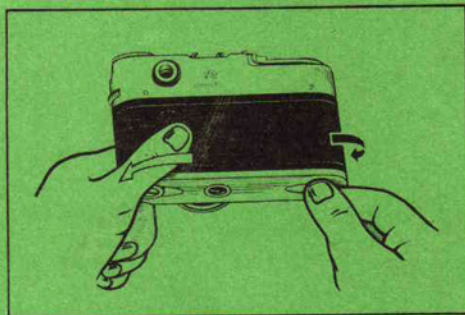
by turning the nut on the case bottom unscrew the tripod screw retaining the camera; remove the camera from the case. Raise the lock shackles with the nail and turn them half-way round as far as they go.

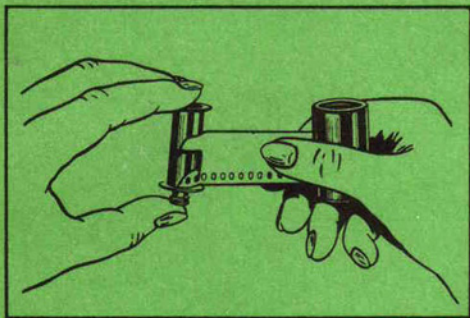
Then, pressing with the thumbs, shift the camera back in such a way that its edge comes out of the camera slot and remove it.

Take the take-up reel and the magazine out of the camera. The reel is removed with a certain amount of effort.

Load the magazine with a film (the magazine is loaded in the darkness).

Having pulled out the free end of the film about 10 cm long from the magazine, fasten it on the reel in such a way that the spring tooth enters one of the film perforations.





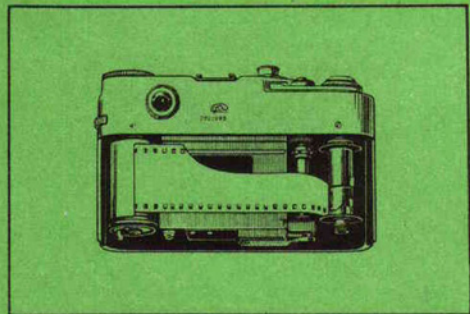
Fit the take-up reel on the bush and then place the magazine to the camera. At this point the film should be slightly stretched and the teeth of the sprocket should enter the perforations of the film.

Close the camera.

The unexposed film is fed to the picture aperture by winding the shutter twice pressing the release button after each winding.

The winding lever should be turned as far as it goes.


When properly loaded the camera is wound easily without jerky motions and noticeable efforts.





Then, by turning the dial scale set the "0" point of the picture counter opposite to the indicator.

Align the sensitivity scale dial with the film-type indicator index in accordance with the data of the film loaded in the camera.

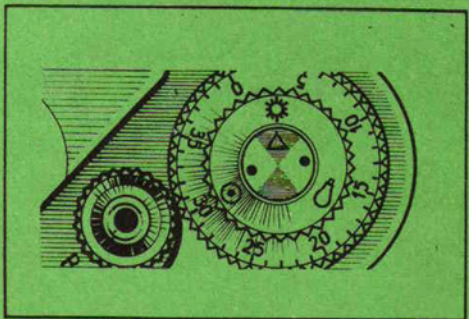
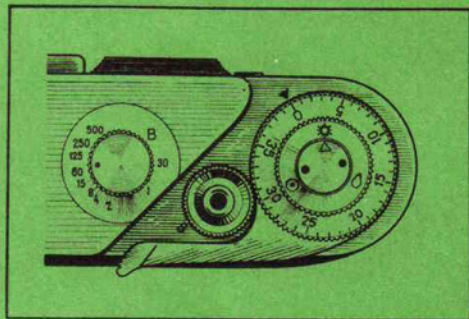
The film indicator is a memory device consisting of a movable sensitivity scale with conventional designations of film types figured on it.

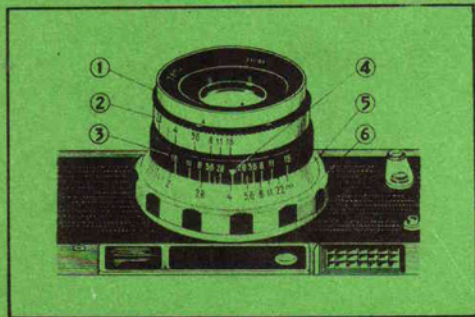
 — colour film for day light

 — colour film for artificial light

 — black-and-white film

and a stationary disk with an index.





1 — front ring; 2 — diaphragm scale;
3 — depth-of-field scale; 4 — index;
5 — distance scale; 6 — driving ring

The camera is equipped with "Industar-61" lens with lanthanum optics.

The lens mount is fitted with the following scales:

the **diaphragm scale** indicates changes of the lens light diameter — rapidity of lens;

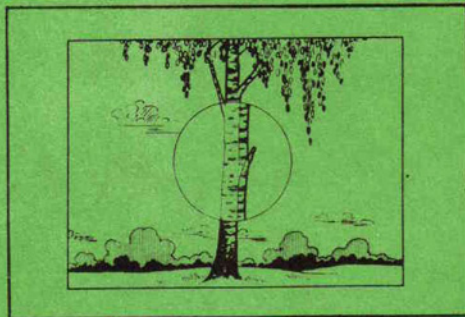
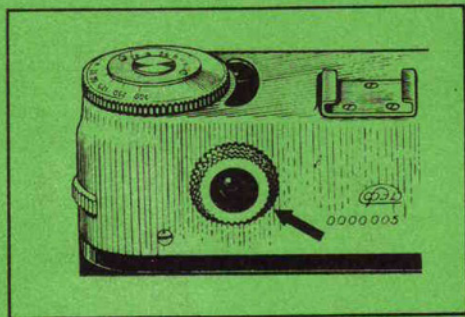
the **depth-of-field scale** which, when focusing, indicates of the distance scale the limits within which the range sharpness will be satisfactory for each selected diaphragm value;

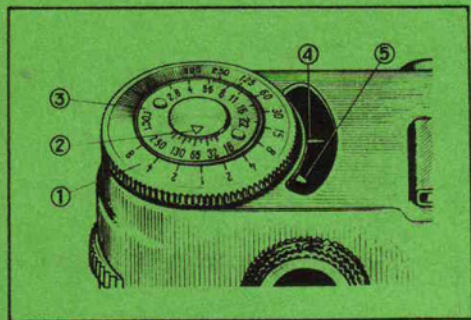
the **distance scale** serves for focusing the lens. The scale designations correspond to the distance from the object photographed to the surface of the film in metres.

The camera is focused with the help of the optical range-finder. In order to set the camera at an accurate and proper focus first turn the ring of the dioptic focusing, focus the view-finder by your own sight (the dioptic focusing mechanism provides a correction of ± 2 diopters).

Then aim the camera at the object to be photographed. In the center of the field of view of the view-and-range-finder a disc differing in colour is seen, in which the image will be double.

By turning the distance ring of the lens align the image into one. It is recommended to set the camera approximately in the middle third of the light field.





1 — exposure scale dial; 2 — indicator dial; 3 — diaphragm and sensitivity dial; 4 — galvanometer pointer; 5 — fixing pointer

The camera exposure meter allows to quickly and faultlessly find the exposure and diaphragm values which are most favourable for taking pictures under the given conditions.

The basic components of the exposure meter are: a photocell, the galvanometer and a calculator.

The necessary exposure is found with the help of the calculator.

The calculator consists of three disks the first of which represents a drive of fixing pointer and has a shutter speed scale from $\frac{1}{500}$ to 8 sec. Black figures stand for parts of the second, red ones — for whole seconds.

Dial 3 is fitted with a diaphragm scale and a scale of film sensitivity represented in GOST units. The central stationary disk is equipped with an indicator.

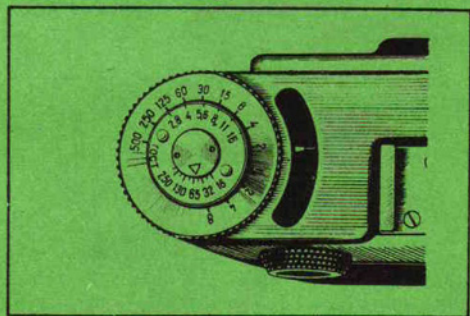
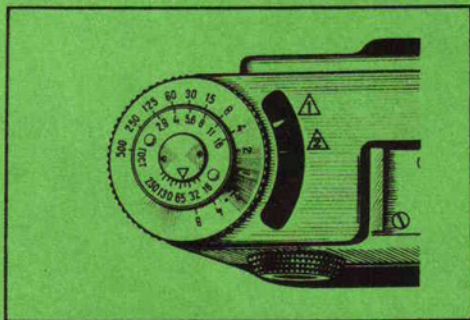
Nearby in the aperture the fixing pointer and the galvanometer pointer are seen.

Prior to setting the necessary shutter speed place the sensitivity value of the film loaded in the camera on the scale opposite to the index.

Then aim the camera at the object to be photographed and by turning the shutter speed dial clockwise or counterclockwise make fixing pointer 5 coincide with galvanometer pointer 4 as it is shown in the Fig. Then find the reading of the calculator which is at the point of intersection of the strokes of the shutter speed scale and that of the diaphragm scale within the interval from 2.8 to 16.

It should be noticed that any of these combinations gives the same exposure and is used according to concrete photography conditions. In the adjacent picture such combinations are:

shutter speed $\frac{1}{125}$ sec — diaphragm 2.8
correspondingly $\frac{1}{60}$ — 4; $\frac{1}{30}$ — 5.6;
 $\frac{1}{15}$ — 8; $\frac{1}{8}$ — 11; $\frac{1}{4}$ — 16.





It should be kept in mind that the exposure meter is affected by the mean brightness of the objects to be photographed. In case the area of the object which is important from the point of view of the plot occupies a small part of the frame and its brightness considerably differs, you should better find the exposure value standing in the immediate vicinity of the object to be photographed, i. e. at a distance of 30—40 cm.

Protect the aperture of the photoelectric exposure meter from immediate rays of powerful light sources, otherwise it may result in an error in the process of determining the exposure value.

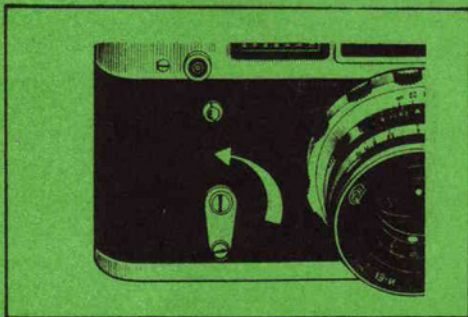
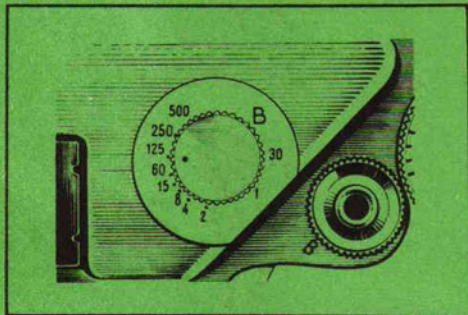
In case the light source is in front of the camera always use a sunshade!

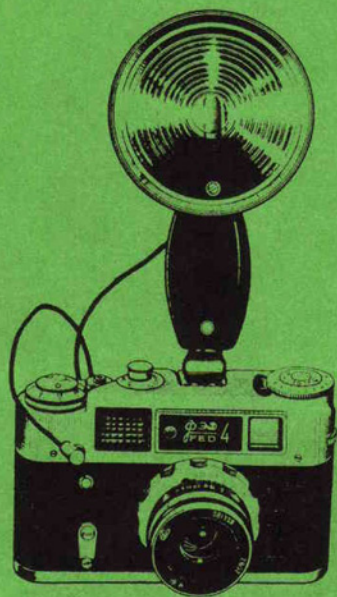
In order to set the necessary exposure slightly raise the head, turn it till the index coincides with the division of the exposure scale and lower the head back in place.

The exposure can be set only with the shutter wound up. Do not turn the head in the interval between 30 and 1.

The numbers on the scale show the exposure values provided automatically by the shutter (1, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{15}$, $\frac{1}{30}$, $\frac{1}{60}$, $\frac{1}{125}$, $\frac{1}{250}$, $\frac{1}{500}$ sec). "B" serves for obtaining prolonged exposures "by hand".

In order to wind the automatic releaser the lever is turned counterclockwise from the bottom position and into the top position. Then press the release button of the automatic releaser and stand in the spot selected beforehand. The shutter will go off from 9 to 15 sec after the automatic releaser is switched on.





It is possible to wind the shutter with the automatic releaser either released or wound up.

A flashlamp can be used only at a $\frac{1}{30}$ -sec exposure.

When photographing with a lamp, place the lamp reflector in the camera shoe and insert the lamp plug pin wire in the synchronizer socket.

Irrespective of the set shutter speed the diaphragm should be selected in accordance with the sensitivity of the film, the distance to the object photographed and the lamp power.

More detailed information on photographing with flashlamps can be obtained by referring to a manual on lamps and photography.

The following order of working with the camera is recommended.

Open the case, remove the protective cover from the lens. Looking into eyepiece of the view-and range-finder, select the spot to be photographed and the desired arrangement of image in the picture.

Focus the lens.

Set the diaphragm in accordance with the required field depth.

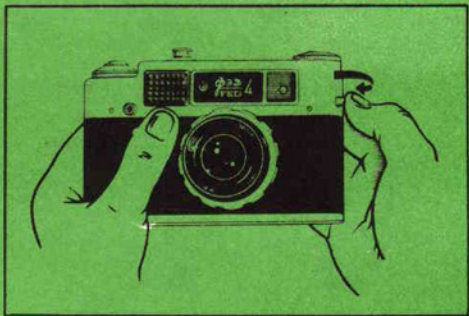
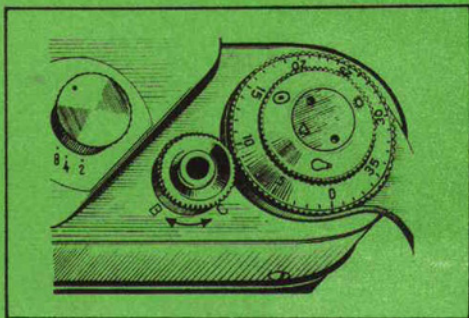
Turning the lever, wind up the camera shutter.

Using the calculator find the necessary exposure value and set the shutter exposure head opposite to the corresponding division value of the scale.

Aim the camera at the object to be photographed and smoothly and evenly press the release button.

So you have exposed the whole film. Before opening the camera the exposed film should be rewound into the magazine.





For rewinding the film disengage the shutter mechanism by pressing the fluted edge of the disengaging bush downwards and turning the bush towards letter "B" (return), whereupon the disengaging bush should sink.

In the process of rewinding the film the lens should be covered.

The rewinding head is turned in the direction indicated by the arrow.

Complete rewind of the film is defined by the effort needed for pulling out the film from the take-up reel.

Open the camera and take out the magazine.