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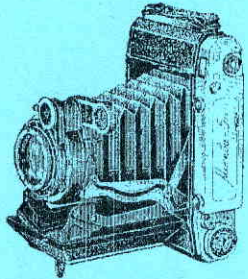
MOSKVA 2, 4 and 5

ROLLFILM RANGEFINDER CAMERAS



INSTRUCTION MANUAL

The Moskva-5 camera has the diploma of V International fairs at Damascus 1958.

ATTENTION

The following information contains a brief description and basic rules for using the cameras. It is not a manual of general photography. Before using the camera, carefully study the manipulation and operating procedures of the camera under the given description.

Small divergences between the description below and your camera are possible, due to technical developments in the design of the camera.

REMEMBER:

1. The front cover can be closed only after removing all filters and with the lens adjusted to infinity (symbol ∞).

2. It is possible to rotate ring *7* only before cocking the shutter. By attempting to turn ring *7* when the shutter is cocked, there can be breakage of internal details of the shutter.

INTRODUCTION

After the 2nd World War the USSR, as a winner-state, took a lot of German plant equipment as reparation for Soviet plants destroyed by Hitler's army. Leica and Zeiss Icon equipment was also imported for manufacturing cameras and optics, which was the main base of "Krasnogorsky Mekanichesky Zavod" (Krasnogorsk Mechanical Factory), known as KMZ. The town of Krasnogorsk is situated near the city of Moscow, the capital of the ex-USSR, thus the new camera was named Moskva (Russian wording of Moscow).

The first Moskva camera was created in 1946 on the basis of the camera Zeiss Iconta 6x9 cm. It has a metal body with folding front and back covers and, unlike other rollfilm Moskva cameras, it has focusing only with a scale of distances. The main features of the Moskva-1 camera can be found on the latest Moskva cameras: "Industar-23" and similar "Industar-24" lenses and "Moment" shutters. The next step of the camera's development was the introduction of a coupled rangefinder, which occurred on the Moskva-2 camera. On the Moskva-4 camera you can see a second format, 6x6 cm, which provided film economy and was better for portrait shootings. The Moskva-5 had fewer improvements in comparison with previous cameras. For example a self-timer and built-in non-folding viewfinder. The main features of RF Moskva cameras can be seen at *Table #1.*

Most of the information presented in the instruction manual is true for all Moskva RF cameras. In other cases, you will see notes

regarding the exact model of Moskva camera (referred to here as M-2, M-4 and M-5).

1. GENERAL DESCRIPTION

The Moskva is a hand-operated collapsible rollfilm (type 120) camera with a built-in lens.

The optical viewfinder and rangefinder with a base of 65 *mm* are conveniently located in the metal body of the camera. The advantages of the Moskva cameras include: exact focusing, a central shutter with eight automatic shutter speeds, a manually operated long shutter speed "B", a mechanism for shutter release by self-timer (M-5), and a synchronization socket for flash units (M-4 & M-5).

All parts of the camera are conveniently arranged to manage the camera whether shooting from the hands or from a support tripod. With one film loading, the camera can accept eight snapshots in a 6x9 *cm.* format, or twelve snapshots in 6x6 *cm.* format (M-4 & M-5).

By turning the barrel of the rangefinder wedges that connect to the lens, you can overlap two images seen in the view window into one to bring the chosen subject into focus.

The scale of distances, apertures, and shutter speeds, and all parts of operation are located so that work with the camera proceeds quickly and confidently.

The readout of the frame count is conducted by digits on the paper backing of the rollfilm through the windows for 6x6 (M-4 & M-5) or 6x9 *cm.* format. The covers of these windows are blocked by the appropriate frame format, and are open only in

correspondence to the selected size of the snapshot (only on M-5).

To prevent shooting two snapshots on the same frame, the film winding knob and shutter release button are connected by a blocking mechanism. The shutter release button can be pressed and the shutter will work only if the film has been wound to an unexposed frame.

2. NOMENCLATURE

The body of the camera is made of pressed metal (M-2 & M-4) or by molding under pressure (M-5), which makes the device more rigid and steady. To open the camera and to operate, it is necessary to press the button *1*. It is recommended to hold the forward cover *2* when opening. Opening the forward cover will open the folding Newton finder (M-2 & M-4).

On the forward cover there is a support *3*, which can be used for positioning of the camera on a plane, such as a table.

To close the camera it is necessary to press both right and left levers simultaneously and, overcoming the resistance of the springs *4*, fold the cover with a smooth movement of the fingers until the closing of its lock. For closing the view-finder, first close it's forward frame, and then, holding it in a closed position, close the back frame finder (M-2 & M-4).

The optical view-finder *5* represents the Newton finder system, mounted into two frames on the top of the camera (M-2 & M-4), or a telescopic system with an increase of 0.6^{x}, mounted in a metal case (M-5).

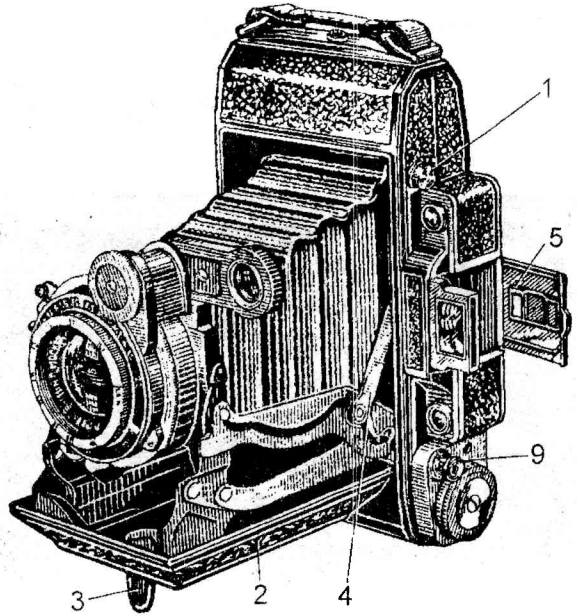


Fig. 1. Moskva-2 & 4 camera

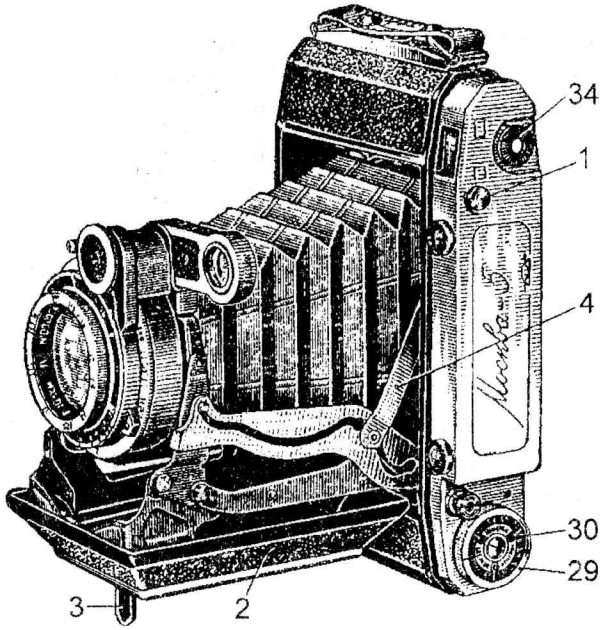


Fig. 2. Moskva-5 camera

On the M-4 camera it has an additional frame *35* for format 6x6 *cm.*, situated under the main frames and locked by a special lever *34* (see fig. 3). For translating the view-finder from frame size 6x9 to 6x6 *cm.* just turn the lever clock-wise and the additional frame will occur. For translating the view-finder from frame size 6x6 to 6x9 *cm.* press the frame *35* down and lock it by the lever.

For M-5: Translating of frame size provided by knob *34* with index, near the knob are placed 2 rectangles referring to the frame sizes of 6x6 and 6x9 *cm.* (see fig. 2). For changing the viewfinder from one frame size to the other, it is necessary to press on the head 34 and to turn it against the stop to the other frame size.

The lens "Industar" (see fig. 4) is a copy of famous Zeiss Tessar lens, it is a four element anastigmatic with a relative aperture of 1:4.5 (M-2 & M-4) or 1:3.5 (M-5). It gives a sharp image and provides high quality snapshots with black & white and color film.

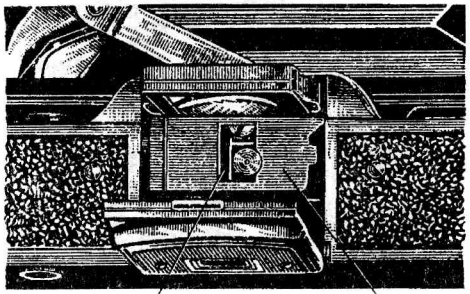


Fig. 3. Viewfinder at Moskva-4 camera.

The shutter "Moment" is an exact and complex mechanism that requires careful and attentive operation.

Adjustments of shutter speeds use the ring *7*, on which are engraved denominators of fractions designating shutter speeds in seconds, for example: 2, 5, 10, etc., instead of 1/2, 1/5, 1/10 etc.

To adjust the shutter speed it is necessary to turn ring *7* so that the number appropriate to the chosen shutter speed has stopped against the red index mark on the shutter casing.

To take pictures, it is necessary to first cock the shutter by smooth clockwise rotation of the lever *8* against the stop. After that, the shutter can be released by pressing the button *9*. The button has a hole with a conical groove for connecting the shutter release cable when photographing from a support.

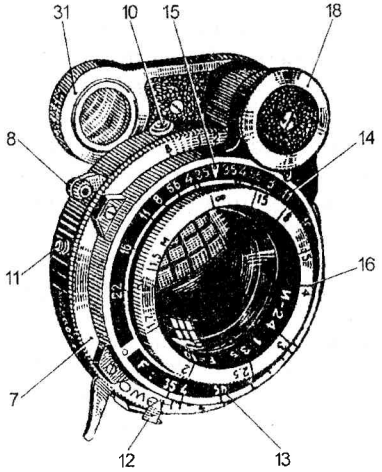


Fig. 4. "Industar" lens with shutter "Moment"

For M-5: The presence of a self-release timer allows you to take photographs away from the camera, and also in a group or other such compositions. To operate the self-timer, it is necessary to cock the shutter by turning lever *8* as described above, then to operate the button *10* and to turn the lever *8* further away, against the stop. After pressing the shutter release button, the mechanism of the self-timer will work after 9-15 seconds, and only after that will the shutter release.

NOTE: The auto release timer only works at shutter speeds from 1 to about 1/100 seconds. On the shutter speed of 1/250 seconds or beyond, it is not recommended to cock the self-timer, as this can cause breakage of various details of the shutter.

For M-4 & M-5: The contact *11* for connection of flash units is functional for both single (lamp flash) and pulse (electronic flash) type units. The contacts of the synchronization socket turn on the flash at the moment of complete opening of the shutter. The length of time from the moment of activating the lamp up to its completed flash varies. For example, an electronic flash, as a rule, will flash faster than a single lamp flash. Therefore, electronic flash units can be applied with any shutter speed, while the application of lamps is limited to longer shutter speeds of more than 1/25 seconds.

The aperture is located in the shutter between optical elements of the lens. The change of the diameter of the aperture of the lens is carried out by movement of the lever *12* on the scale of apertures *13*.

It is necessary to use small apertures when it is

desirable to increase depth of sharpness or when the light exposure of the chosen shutter speed is too great. The steps of the aperture scale are designed in such a manner that each step of the aperture changes by a factor of two (doubles or reduces by one-half) the amount of light flow getting to the film.

With changes of the aperture of the lens, depth of sharpness changes accordingly. The depth of sharpness is increased with reduction of the diameter of the aperture and with an increase of distance from the shooting subject.

For definition of the depth of sharpness, there is a scale *14*. When using the scale, it is necessary to understand that depth of sharpness is not absolute and identical sharpness of the image in the specified borders, and the field of depth are just a guide for which any object will seem rather sharp. The depth of sharpness for "Industar-23" lens can be determined also with Table #2, as usual all distances are measured from the film plane.

The rangefinder allows you to define the distance between the camera and the subject of the picture. The principle of distance measurement by the rangefinder is based on overlapping the two images of the subject seen in the window of rangefinder *17*. One of the reflecting sides of the rangefinder's prism has a special covering which cause the images of the subject to appear multicolored. This facilitates their overlapping. By rotation of the handle of the rangefinder wedges connected with the lens, you can achieve overlapping of the two images of the subject into one, thus focusing the lens on the shooting subject. On the ring *16* of the lens is engraved the scale of distances from the shooting

subject.

The back cover of the camera *19* is folding (M-2 & M-4) or removable (M-5), with two windows *20* for viewing during advancing the film and determining the current frame number (at M-2 only one window). The windows are closed by metal covers which protect the film from direct light. The cover off for the button *22*.

For M-5: For opening the window of the chosen film size, it is necessary to shift a small lever *21* on the internal part of the removable cover according to the frame size chosen during the film loading.

The second cover will be blocked and only the window of the frame size designated during film loading can be opened. For opening the second cover, it is necessary to shift the lever *21* to its other position.

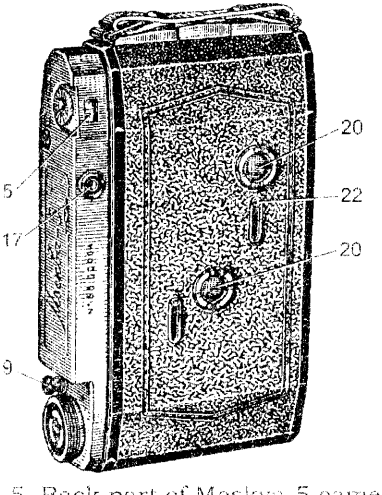


Fig. 5. Back part of Moskva-5 camera

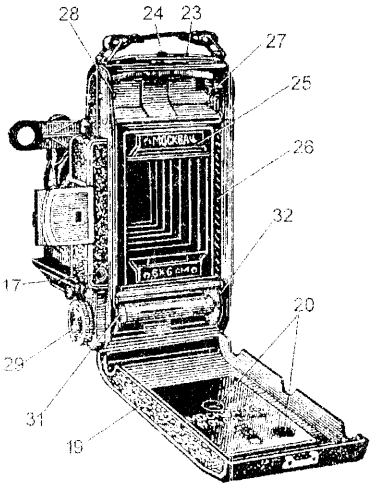


Fig. 6. Moskva-2 & 4 cameras in opened position

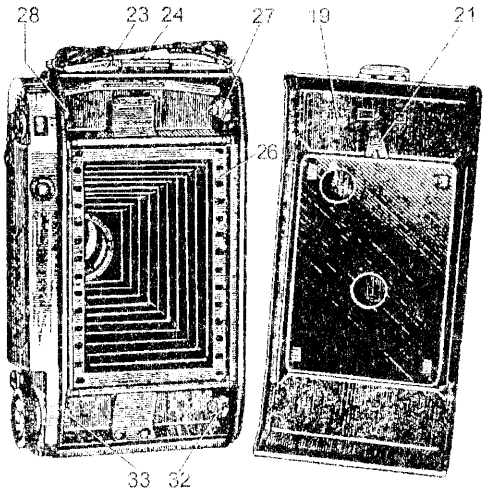


Fig. 6. Moskva-5 camera in opened position

The lock of the back cover *23* uses the button *24*. By moving this button in the direction specified by the arrow located on the lock body near the button, the lock on the back opens the cover.

For M-5: The back cover should be held by hand during opening to prevent it from dropping to the floor. For closing the back cover, it is necessary to hook its bottom part to the edge of the case and to press to the case until the lock closes.

For M-2 & M-4: For closing the back cover just shut it and press until the lock closes.

For M-4 & M-5: The framework mask *25* completes the camera set and is used for snapshots in the 6x6 *cm.* format.

For M-4: For installation a framework-mask into the camera, slightly bend it springs and put it under the ledges of framework 26 (see at fig. 6).

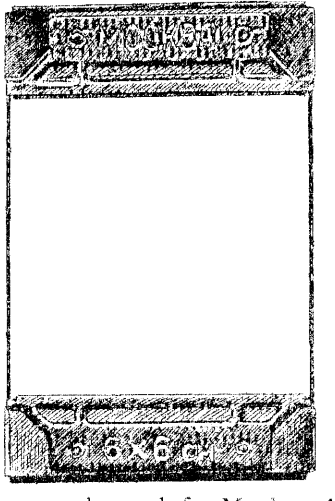


Fig. 7. Framework mask for Moskva-4 camera

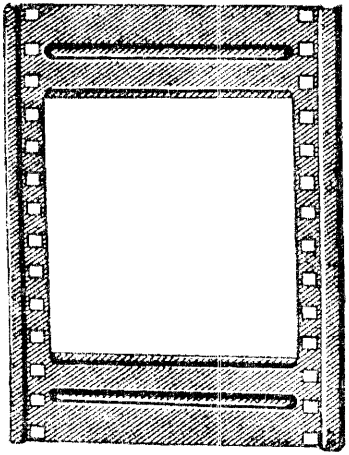


Fig. 8. Framework mask for Moskva-5 camera

For M-5: For installation of the framework mask into the camera, put it in the edges of the framework *26*. It is necessary to make certain that the holes in the framework mask are not raised above the edges of the framework *26*, as this can cause the film to be scratched and break the focusing plane.

3. BASIC OPERATIONS

3.1. Loading the film

It is necessary to protect the spool with film from strong direct light during loading and unloading of the film. The sequence of loading the film is as follows:

1. Open or remove (M-5) the back cover *19*.

For M-4 & M-5: If you want to receive 6x6 *cm*.

format insert the framework mask as described above. Do not forget to shift the head of the viewfinder to the position appropriate to the chosen frame size. ***Remember that if you wish to take pictures in the 6x6 cm. format and have not inserted the framework mask into the camera, and the viewfinder is designated for 6x6, rewinding the film past the window can cause it to be spoiled.***

2. Pull out the head of center *27* against the stop and turn it clockwise (M-5) or just pull it out (M-2 & M-4). Then insert the central hole of the spool on center *28*. Combine the other end of the spool with center *27* and turn back head of center (M-5) or just release the center *27* (M-2 & M-4) to the original position. Have the spool with the film so that the end of the backing paper is directed to the empty take-up spool.

3. Open and cautiously remove the label, extend the backing paper and insert its end into the lengthened slot of the take-up spool.

4. Pull the backing paper by the knob *29* to wind the film by making 1-1.5 revolutions, and while slightly holding the spool with the film, level the film between the spools so that it moves without skewing.

5. Return the back cover and close it as described above.

6. Open the cover of the window *20* by button *22*. Holding it by hand, rotate the knob *29* and wind the film until the occurrence of warning marks (points, hands, or arrows) on the film backing no longer appear in the window and figure "1" appears. Then stop winding, as the film is ready for the first snapshot.

7. Close the cover *22*. Open the cover only to rewind the film, and protect the window *20* from strong direct light.

NOTE: Some M-5 cameras have special springs which close the cover 22 automatically.

8. **For M-5:** On the scale of the film winding knob *29* put the type of the film and sensitivity against the index by rotating the disk *30*. It will help You to remember film speed and type.

3.2. Photographing

To take pictures, it is necessary to take the following steps:

1. Open the cover of the case (for M-4 & M-5).

2. Press the button *1* to open the front cover of the camera.

3. Establish the aperture by moving the lever *12* on the scale *13*.

4. Establish the shutter speed by turning the regulating ring *7*.

5. Cock the shutter by a smooth clockwise turn of the lever *8* against the stop. With M-5, if it is necessary, cock the self-timer.

ATTENTION! It is possible to change the setting of ring *7* only before cocking the shutter. Any attempt to turn ring *7* when the shutter is cocked, can cause breakage of internal details of the shutter mechanism.

6. Establish in a working situation the equalization of the rangefinder *21* and while looking in the window *17*, focus the lens on the subject by

rotating the handle of the rangefinder *18* to combine the two multicolored images into one.

7. Compose the picture observed in the viewfinder window *5*.

8. Release the shutter by smoothly pressing the button *9* against the stop.

9. Open the cover *22* of the window *20* and rotate the film winding knob *29* until the number of the next unexposed frame appears in the window.

The handle *29* and the button *9* are connected with a blocking mechanism, which protects against the possibility of making two exposures on the same frame. However, the presence of this mechanism does not make it unnecessary to confirm each following frame through the red-filtered window.

It is possible to use a simplified method of focusing. On the scale of distances *16*, the ten meter distance is marked by a red point. On the scale of apertures, there is a marked allocated aperture of approximately 1:11. Setting the lens on ten meters and with the aperture at approximately 1:11 will give sufficient sharpness for all distances from 4.5 *m* up to "infinity". Such adjusting is very convenient for quick photography. It is enough to open the camera, cock the shutter, choose your subject, and release the shutter.

When photographing from a supporting tripod, it is recommended to remove the camera from the case and to use the shutter release cable.

3.3. Unloading of the camera

After using all frames of the film, rotate the film winding knob until the end of the paper substrate

can no longer be seen in the window.

Make some more revolutions of the handle until the whole substrate is on the pickup spool. Now it is possible to open the back cover of the camera. By turning the head of center *32* to the right until overlapping the locking pin with the groove, extract the center against the stop (M-5) or just bend out the center *32* (M-2 & M-4). Remove the film spool and attach the end of the paper substrate to the roll using the provided tape, or by other means, to prevent unrolling of the film.

The film can be stored in such a way for some time before developing. It is recommended to remove the empty spool from centers *27* and *28*, and to rearrange it in the place of the pickup spool.

4. CAMERA & LENS CARE TIPS

Store the camera in the case intended for it, in a dry room.

Don't apply excessive efforts with the manipulation of it. Avoid strong shocks to the camera.

Protect the camera from dirt, moisture and dust.

The optical surfaces of the lens have a very thin layer (about 0.1mm) of anti-reflective coating. This coating gives the lenses a lilac or pale-blue tinge in reflected light.

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.

The following cleaning method is recommended:

Remove dust with a soft, clean brush, or wipe **very lightly** with a clean flannel napkin or cotton wool without pressing the surface.

Oily smudges, finger prints, and perspiration marks can be removed by **lightly** wiping the contaminated surfaces with a 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.

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.

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

If the camera malfunctions, take it for qualified service. Do not try to repair this camera at home!

5. 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 photographic 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.

6. COMPLETENESS

The complete set of the camera consists of:

1. Camera with shutter and lens.
2. Case for the camera (M-4 & M-5).
3. Take-up spool.
4. Shutter release cable.
5. Framework-mask (M-4 & M-5).
6. Box.
7. Description of the camera Moskva with the passport.

7. WARRANTY

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

The factory makes repair to the camera free of charge, if the latent malfunction is found out within one year from the date of its purchase, provided that the device was not damaged outside of the factory.

The faulty camera is directed to one of the guaranteed photoworkshops of the factory or is sent by ensured parcel in the complete set with passport (on which is written shop and date of sale) with a list of the noticed malfunctions to the address as marked. **Krasnogorsk, Moscow area, Krasnogorsk Mechanical Factory attn: Checking Department.**

Table # 1 (part # 1)

Specifications*

Feature	**Moskva-2**	**Moskva-4**	**Moskva-5**
Based on ideas of	Super Ikonta	Super Ikonta	Bessa II
Frame size, *cm*	6x9	6x9 & 6x6	6x9 & 6x6
Quantity of snapshots	8	8 & 12	8 & 12
Shutter	Moment-1**	Moment-23S**	Moment-24
Shutter speeds	1-1/250sec & B	1-1/250sec & B	1-1/250sec & B
Self-timer	**	**	Yes
Synchronization with flash	No	At any speed	At any speed
Lens	Industar-23***	Industar-23	Industar-24
Focal length, *mm*	110	110	105
Angle of view for diagonal of frame size 6x9 *cm*	52	52	52
Aperture	1:4.5-1:32	1:4.5-1:32	1:3.5-1:32
Filter mount, mm	33X0.5	33X0,5	External

Table #1 (part #2)

Feature	**Moskva-2**	**Moskva-4**	**Moskva-5**
Tripod mount, *inch*	3/8	3/8	3/8
Dimensions, *mm* collapsed/opened	165x95x48/ /165x125x130	165x95x48/ /165x125x130	165x95x48/ /165x125x130
Weight, *gr*	890	890	1180 w. case
Years of issue	1947-1956	1955-1958	1956-1960
Issued cameras	197,640	62,632	216,457

NOTES:

* Within each model of camera there were some differences or modifications. On the camera described here you can see only the main features. For example there exist M-4 cameras which looks like M-5 and have removable back covers.

** In 1946-1947 Moskva-2 & -4 cameras were made with German shutters "Compur" and "Compur-rapid" with self-timer. In the latest issues you can find "noname" shutters, also the copies of "Compur".

*** First "Industar-23" lenses were without coating, but were made of German optical elements. Latest lenses has red letter "П" which means coating.

Table #2 (part #1)

Depth of sharpness for the lens "Industar-23"

Distance / Aperture	**1.5 m**	**1.7 m**	**2.0 m**	**2.5 m**	**3.0 m**
4.5	1.43-1.58	1.61-1.81	1.87-2.15	2.30-2.74	2.71-3.35
5.6	1.41-1.60	1.59-1.84	1.84-2.19	2.26-2.81	2.65-3.46
8.0	1.38-1.65	1.54-1.90	1.78-2.28	2.16-2.97	2.52-3.70
11	1.33-1.72	1.49-1.99	1.71-2.41	2.06-3.19	2.38-4.06
16	1.27-1.84	1.41-2.15	1.61-2.67	1.91-3.66	2.18-4.85
22	1.20-2.01	1.33-2.40	1.50-3.06	1.76-4.44	1.99-6.35
32	1.11-2.39	1.21-2.97	1.35-4.06	1.55-6.97	1.73-13.30

Table #2 (part #2)

Distance / Aperture	**4.0 m**	**5.0 m**	**8.0 m**	**15 m**	∞
4.5	3.50-4.67	4.24-6.09	6.22-11.32	9.71-33.04	27.33-∞
5.6	3.40-4.87	4.09-6.44	5.90-12.59	8.93-46.97	21.98-∞
8.0	3.19-5.38	3.79-7.35	5.30-16.69	7.62-∞	15.42- ∞
11	2.97-6.18	3.48-8.96	4.71-28.27	6.45-∞	11.24-∞
16	2.66-8.25	3.07-14.10	3.97-∞	5.14-∞	7.76-∞
22	2.37-13.86	2.68-46.42	3.35-∞	4.14-∞	5.67-∞
32	2.01-∞	2.23-∞	2.66-∞	3.13-∞	3.93-∞