TABLE OF CONTENT

1. INTRODUCTION

This description manual and operating instruction (TO) is intended for studying the movie camera 1KSR-8M, and contains all information necessary for maintenance of full use of technical capabilities of the device and for its correct operation.

1.1. The list of documents you should use when studying the camera

The list of documents is shown in table 1.

Table 1

The name of the document	Designation
1. Corbel 2KU. Passport	2KU.000 TO
2. Corbel 2KU. Description manual and operating instruction	2KU.000 TO
3. Anamorphic block. Passport	35BAS-10-2-01 PS
4. Anamorphic block. Description manual and operating instruction	35BAS-10-2-01 TO
5. Anamorphic block. Passport	35BAS22-2 PS
6. Anamorphic block. Description manual and operating instruction	35BAS22-2 TO
7. Anamorphic block. Passport	35BAS23-2 PS
8. Anamorphic block. Description manual and operating instruction	35BAS23-2 TO
9. Electric drive 19EP-16APK. Passport	19EP-16APK.00.000 PS
10. Storage batteries BA. Passport	MKBI.5635.001 PS
11. Charger UZ. Passport	UZ-M.00.000 PS
12. Disconnector. Passport	2UO-12.00.000 PS

1.2. Warning

Camera design and electric circuit may be little different from stated in the description due to constant improvements of the device.

2. PURPOSE

The camera 1KSR-8M is intended for shootings of usual and wide-screen movies on black-and-white or color 35mm film from hand or from a support.

The camera works in forward direction only.

The camera has arrangement U, accommodation category 1.1 in accordance with GOST 15150-69, but for work at temperatures from minus 30 up to plus 40 centigrade.

When temperature is higher than 30°C, relative humidity should not be above 70%.

3. SPECIFICATIONS

Applicable film	35mm, GOST 4896-80
Image size on the film	in accordance with GOST 24229-80
Instability of the image, mm, no more	0,02
Overall dimensions of the camera, mm, no more: - For usual movies (with an usual focusing magnifier, lens F=50mm, 60m mag, and electric drive):	
Length	270
Width	280
Height	220
- For wide-screen movies (with a deanamorphic focusing magnifier, anamorphic block F=50mm 35BAS22-2, 60m mag, and electric drive):	
Length	490
Width	280
Height	255
Weight of the camera with usual focusing magnifier, lens F=50mm, 60m mag (without film), electric drive and shoulder belt, kg, no more	6,0
Weight of the camera with deanamorphic focusing magnifier, the anamorphic block F=50mm 35BAS22-2, 60m mag (without film), electric drive and shoulder belt, kg, no more	7,1
The base size of the camera, mm	61
Camera sound level with 60m mag loaded with film, at the steady state on 24 fps, with electric drive 19EP-16APK, dBA	50^{+2}
Shutter of the device	single-blade mirror in the bottom position with 45 degrees incline, with a constant corner of opening of 150°
Focusing magnifiers of the camera:	
- Usual	magnification is 5x, dioptric adjustment ±5 dioptres

- Deanamorphic	horizontal magnification is 6,13x; vertical magnification is 3,12x; Dioptric amendment ±5dioptres
Electric drive	19EP-16APK
Power supply of the electric drive	source of direct current (12+4.8-1.2V)
Maximum allowable current consumed by the camera at 24 fps with the 60m mag, in normal climatic conditions, A	2,4
Maximum allowable current consumed by the camera at 24 fps with the 60m mag, at temperature lower than minus 5°C, A	4,5
Capacity of mags	60m and 120m (200ft and 400ft)
Frequency of shooting, fps:	
- Fixed (crystal sync)	8, 12, 16, 24, 25, 32 with the electric drive 19EP-16APK
Start time of the camera mechanism, sec, no more	0,5

4. STRUCTURE OF THE CAMERA

The camera consists of the following main parts: the mechanism of the camera, the mag, the electric drive, the matte box, and the set of lenses. The structure of the device is specified completely in 1KSR-7M.00.000 FO.

5. CONSTRUCTION AND PRINCIPLES OF WORK OF THE CAMERA

5.1. Principle of action:

The principle of action of the camera is based on transmitting the image of an object or phases of its movement by a photographic way onto a film during its step-by-step motion.

Feeding sprocket roller transports the film from the core of feeding friction clutch. Claw mechanism feeds a film to the film channel where, after being exposed, the film is pulled further by the claw to be transported to the take-up friction clutch core by the take-up sprocket roller.

5.2. Design of the camera

General view of the device is presented on figures 1 and 2. The camera consists of the camera itself and replaceable components.

The camera itself contains a case in which the following parts are mounted:

camera gear,

head with lens mounting,

indicator of shooting frequency.

General view of the camera in its usual configuration

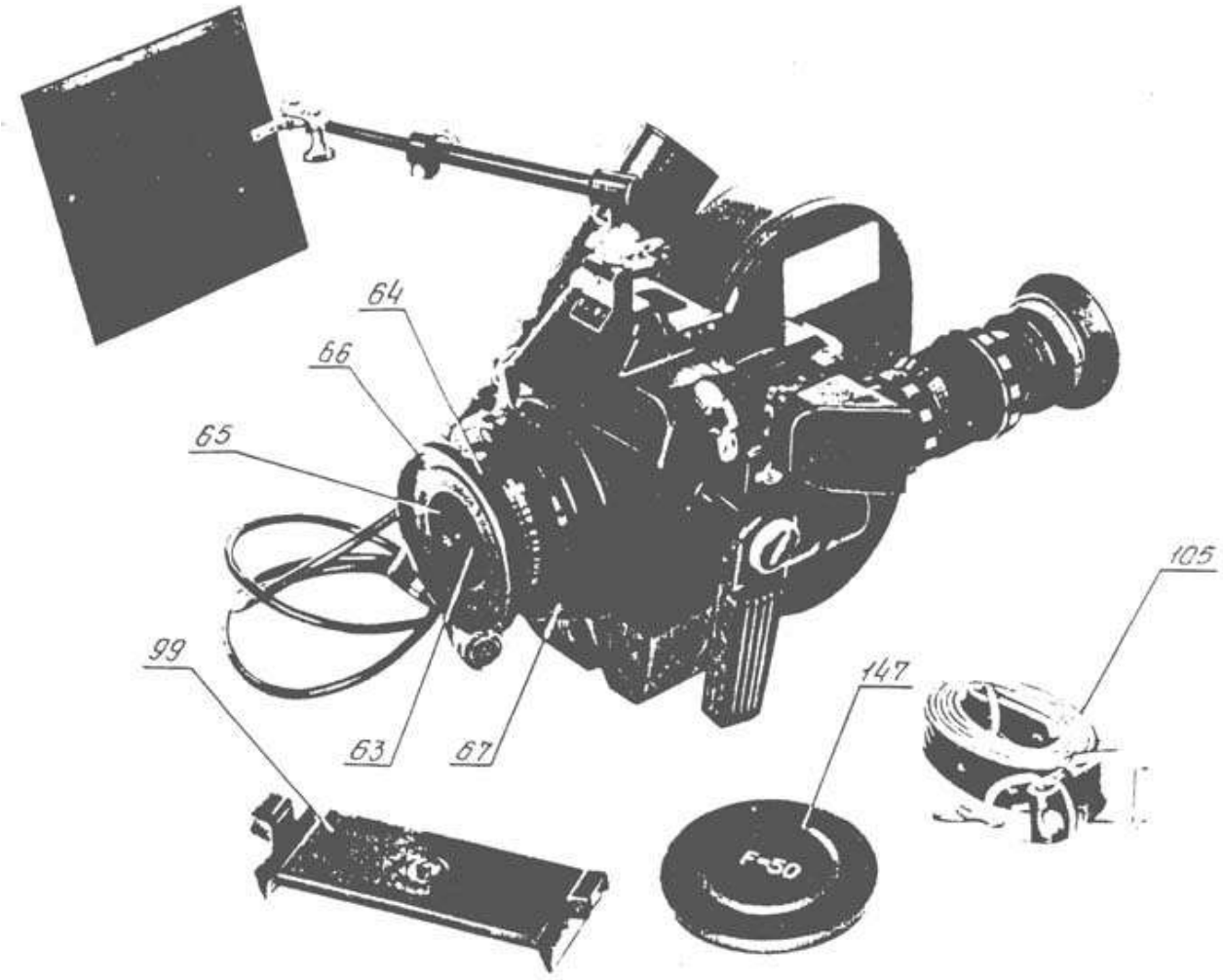

Fig. 1

63 - lens
64 - focusing mount
65 - lens hood
66 - thread
67 - ring of the lens mount
99 - body cork
105 - shoulder belt
147 - lens cap

General view of the camera in its wide-screen variant

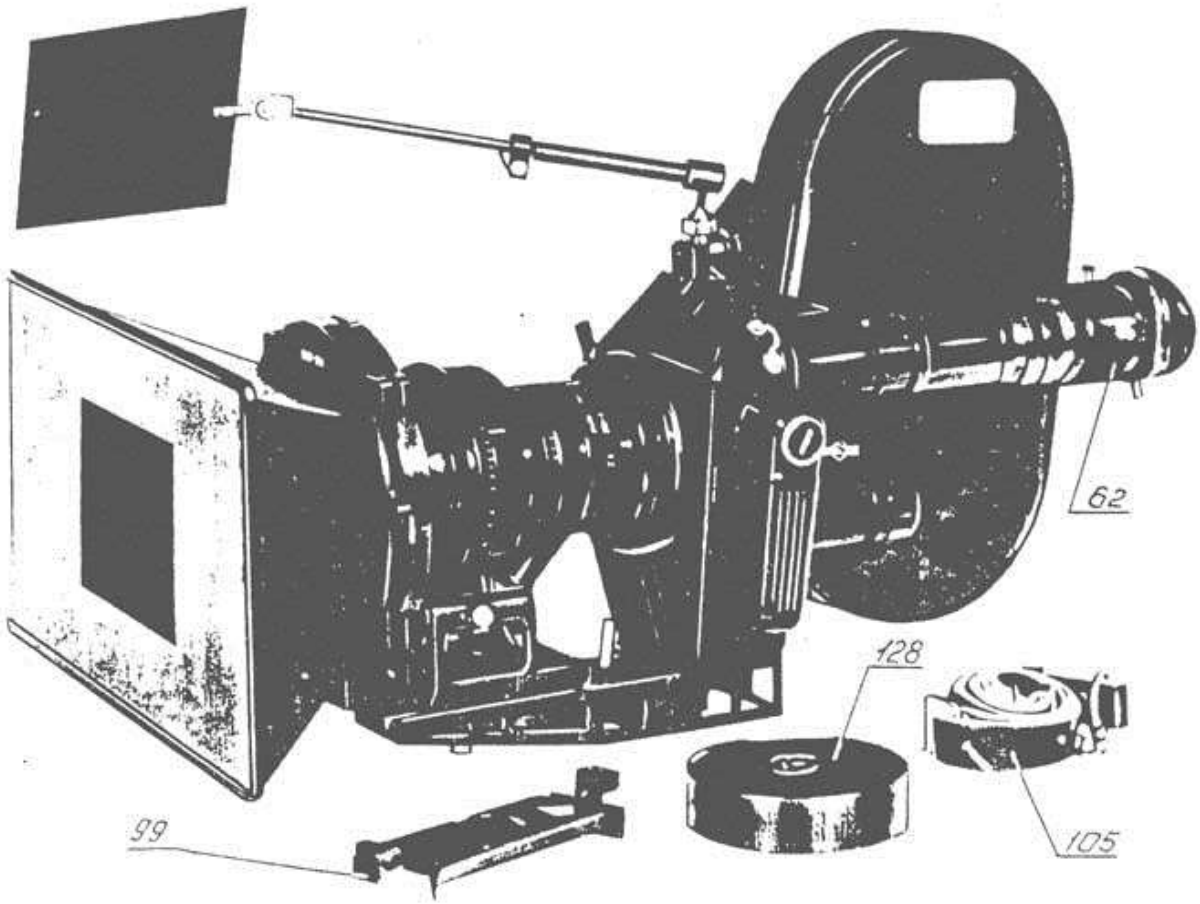

Fig. 2

62 - deanamorphic focusing magnifier
99 - body cork
105 - shoulder belt
128 - front cap of the anamorphic block

5.3. Kinematic circuit

The kinematic circuit of the camera is shown on figure 3.

Rotation from the electric drive (1) is transmitted to the claw mechanism shaft (I) which is linked kinematicaly with forked claw teeth by the coupler (2).

This pair forms a claw mechanism. There is eccentric shaft journal (4) on the claw mechanism shaft, providing the tooth input of the forked claw teeth into and out of the film perforation, and an eccentric cam (5) providing linear movement of the forked claw teeth in vertical plane. The forked claw teeth goes along guide element (6) which axis is rigidly fixed to the claw mechanism plate.

Through the pair of cylindrical cogwheels (7, 8), movement is transmitted to the single-blade mirror shutter (9) that is placed in bottom position with 45° incline to an optical axis.

Through cylindrical cogwheels (10) and (11), and a countershaft (II) on which the cylindrical spur (12) is rigidly fixed, movement is transmitted to the mechanism of the mag. Upon linking mag gear to the camera gear, the spur (12) enters into gearing with the cylindrical spur (13) located in the mag. Take-up sprocket roller (14) is fixed on the shaft (III).

Through the idle gear (15) and spur gear (16) movement is transmitted to the shaft (IV) of feeding sprocket (17), and through the spur gear (16) movement is transmitted to shaft (V) of take-up friction clutch 19.

Feeding friction clutch (20) rotates by film during taking-up.

Kinematic circuit

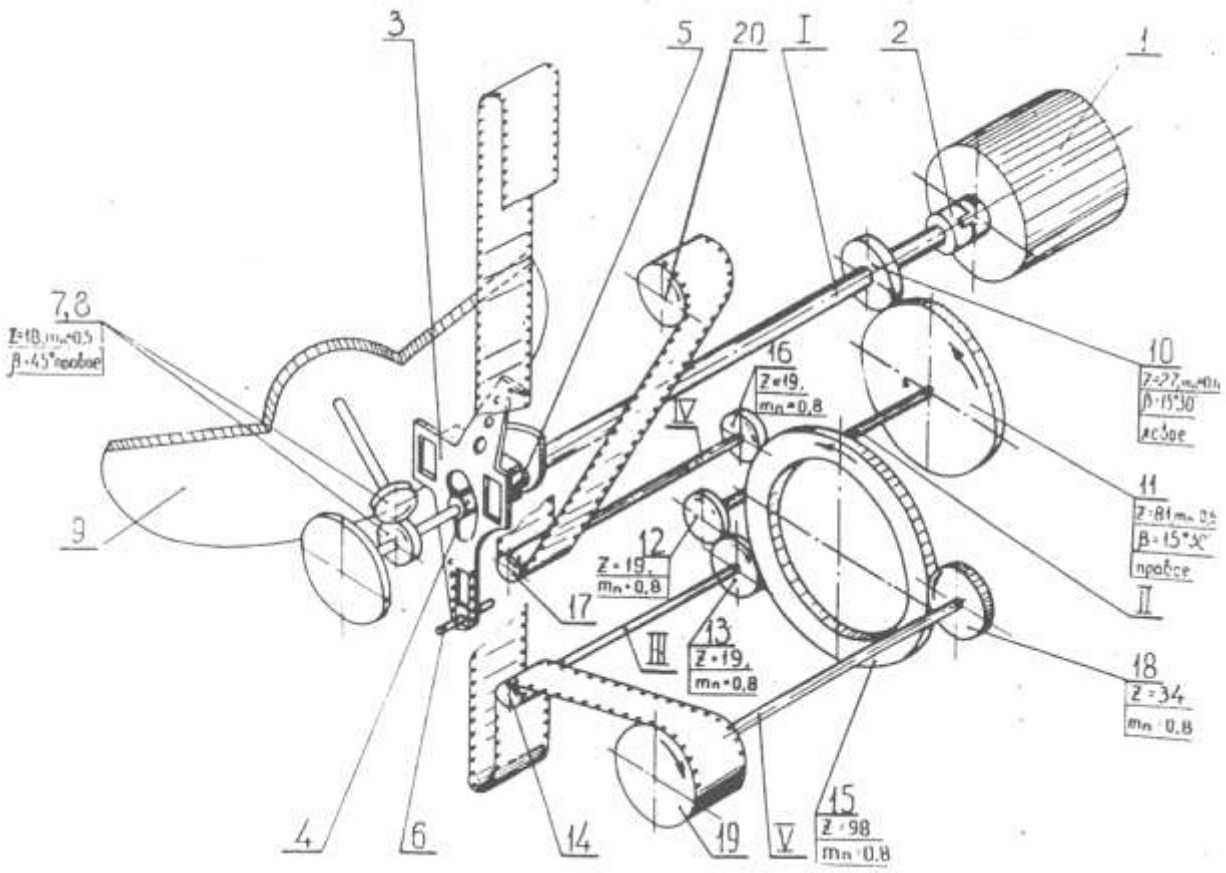

Fig. 3

I - shaft of the claw mechanism
II - countershaft
III - shaft of the take-up sprocket roller
IV - shaft of the feeding sprocket roller
V - shaft of the take-up friction clutch
1 - electric drive
2 - coupler
3 - forked claw teeth
4 - eccentric shaft journal
5 - cam
6 - guide element
7,8,10,11,12,13,15,16 - cog-wheels
9 - shutter
14 - take-up sprocket roller
17 - feeding sprocket roller
19 - take-up friction clutch
20 - feeding friction clutch

5.4. Optical circuits

5.4.1. Optical circuit (with usual focusing magnifier)

The optical circuit with usual focusing magnifier is shown on figure 4.

The lens (21) makes a subject image in the frame window of the film channel. When the frame window is closed by the shutter (9), the image is transferred by its mirror surface to the dim surface of the prism (22). By means of mirrors (23) and (24), image goes to the focusing magnifier.

The lens (25) of the focusing magnifiers makes image passed by the mirrors (26) and (27) on the back surface of the collecting lens (28), where the image is cut by the aperture (29).

The image on the surface of the collecting lens is viewed through the eyepiece (30).

5.4.2. Optical circuit (with deanamorphic focusing magnifier)

The optical circuit with deanamorphic focusing magnifier is shown on figure 5.

The anamorphic block (31) makes subject image in the frame window of the film channel. When the frame window is closed by the shutter (9), the image is transferred to the dim surface of the prism (22) by its mirror surface. By means of mirrors (23) and (24), systems of lenses (32), and an additional lens (33), an image appears in aperture (29) plane in the eyepiece (30) field of view.

Cylindrical lenses (32) deanamorph the image.

Given deanamorphed image is viewed through the eyepiece (30).

Optical circuit (with usual focusing magnifier)

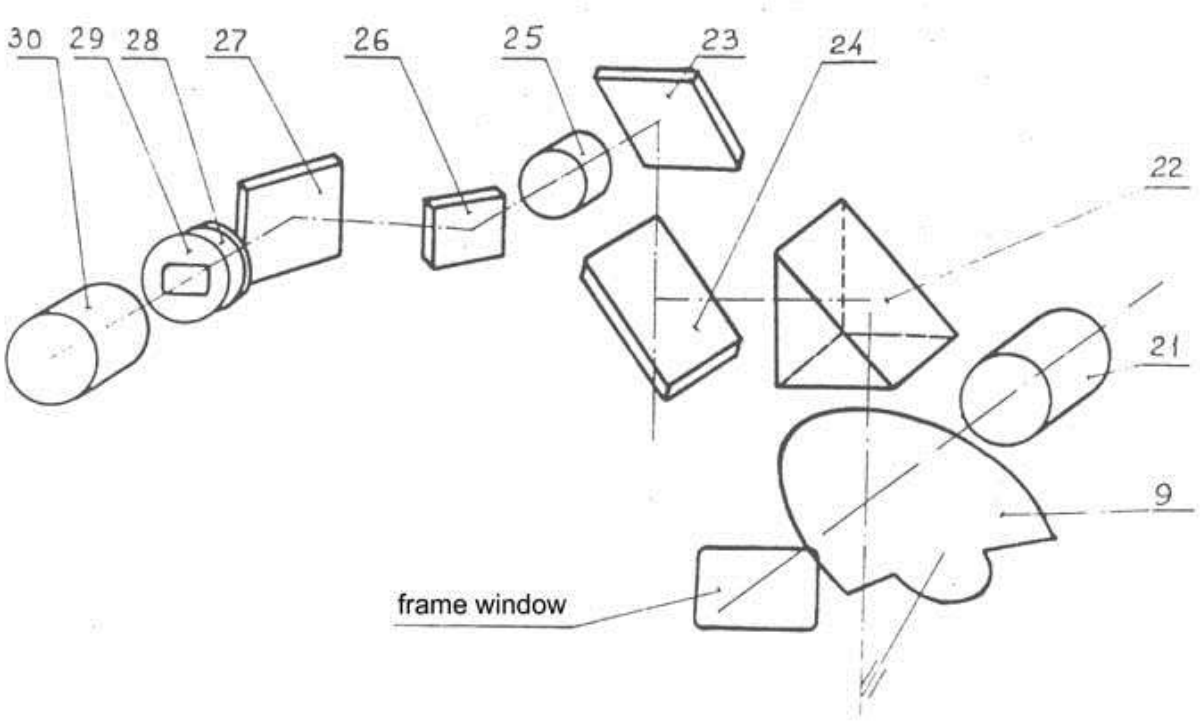

Fig. 4

9 - shutter
21 - lens
22 - prism
23,24,26,27 - mirrors
25 - lens of the focusing magnifier
28 - collecting lens
29 - aperture
30 - eyepiece

Optical circuit (with deanamorphic focusing magnifier)

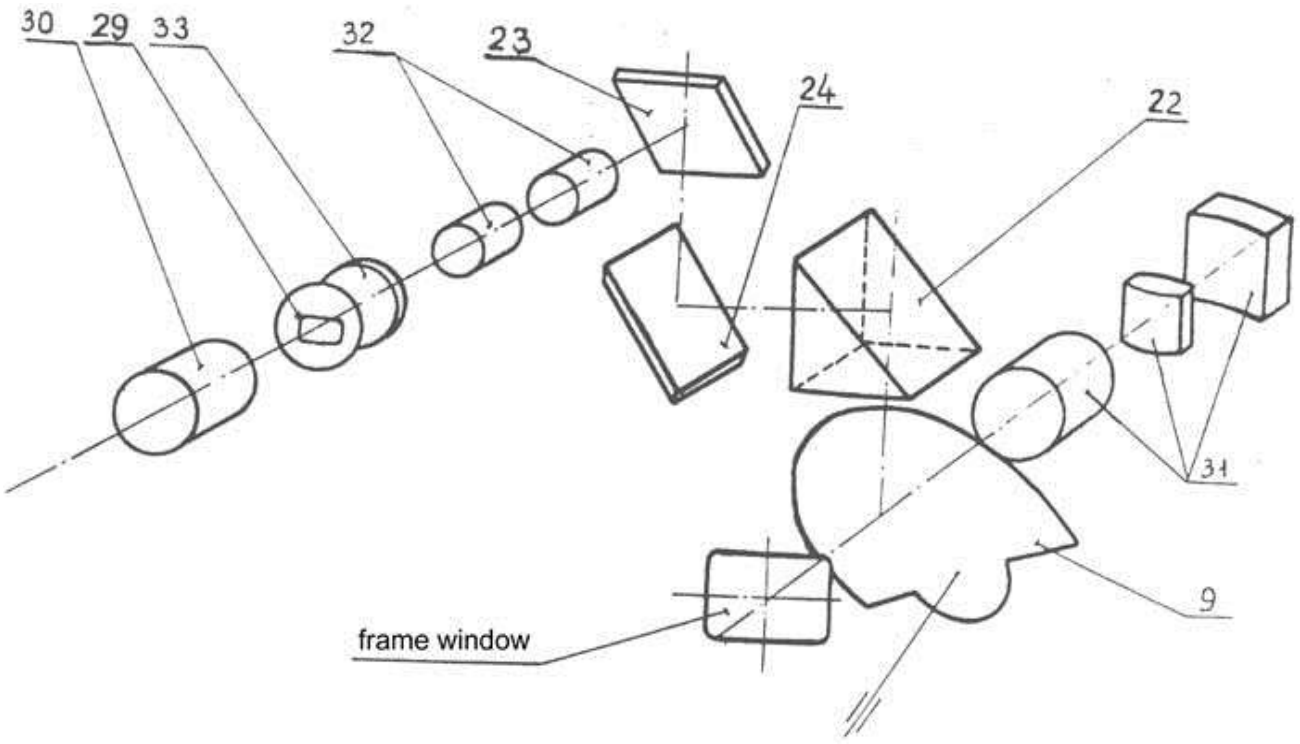

Fig. 5

9 - shutter
22 - prism
23,24 - mirrors
29 - aperture
30 - eyepiece
31 - anamorphic block
32 - system of deanamorphic lenses
33 - additional lens

5.5. Electric circuit

The electric circuit is shown on figure 6.
The camera works with the electric drive 19EP-16APK.
The camera features indicator of film speed (tachometer).
The tachometer is of inductor-type. It is based on the rotating permanent magnet and the coil, which are generating variable voltage during shooting. Voltage amplitude is in direct proportion to the shooting frequency.
Voltage of the power supply of the electric drive 19EP-16APK - ($12^{+40\%-10\%}$)V, with pulsation no more than 0,2V at current of 5A.

Electric circuit

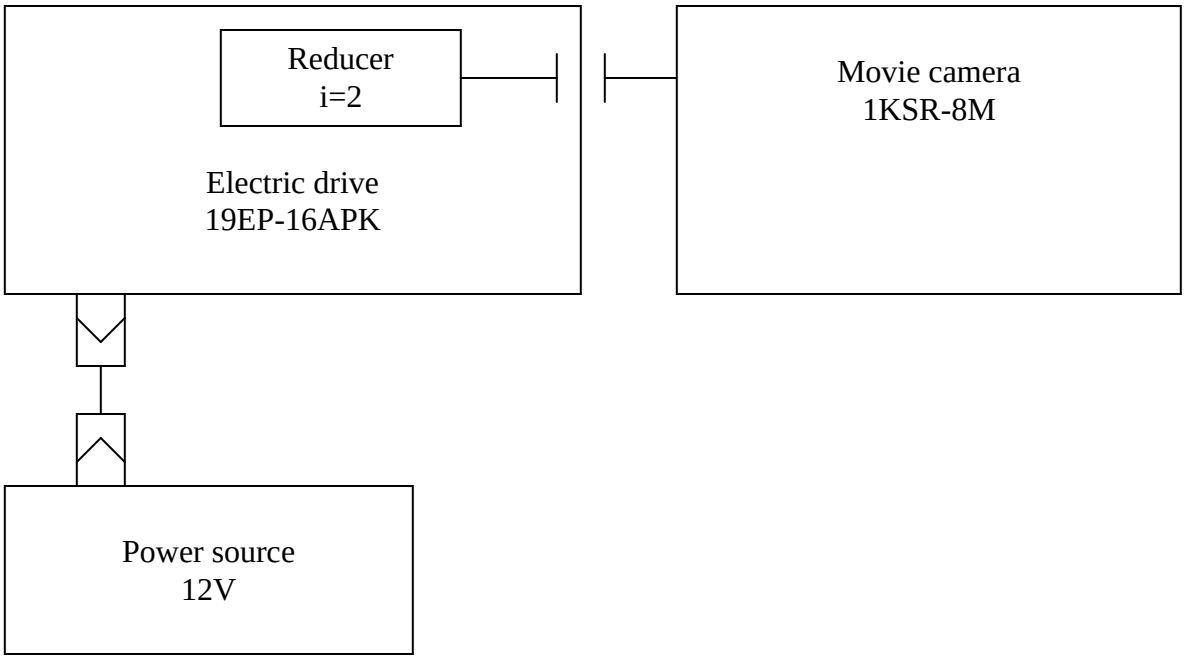

Fig. 6

6. CONSTRUCTION AND PRINCIPLE OF WORK OF THE CAMERA COMPONENTS

6.1. Camera mechanism

The mechanism of the camera includes the following basic parts: the body of the mechanism and claw-shutter mechanism.

6.1.1. Body of the mechanism

The body of the mechanism (figure 7) consists of two basic parts: the left wall (35) in which the lock of the mag (36) is built-in, and the body (37) with transmissions in which are mounted: a countershaft (II) (figure 8), parts (38) (see fig. 7) of the electric drive mounting, and bracket (39) for a carrying belt.

In the bottom part of the case there is a nut with a 3/8" thread. The body and the left wall form the rectangular channel that serves as a guide for the mag during installing it into the camera.

The body of the mechanism

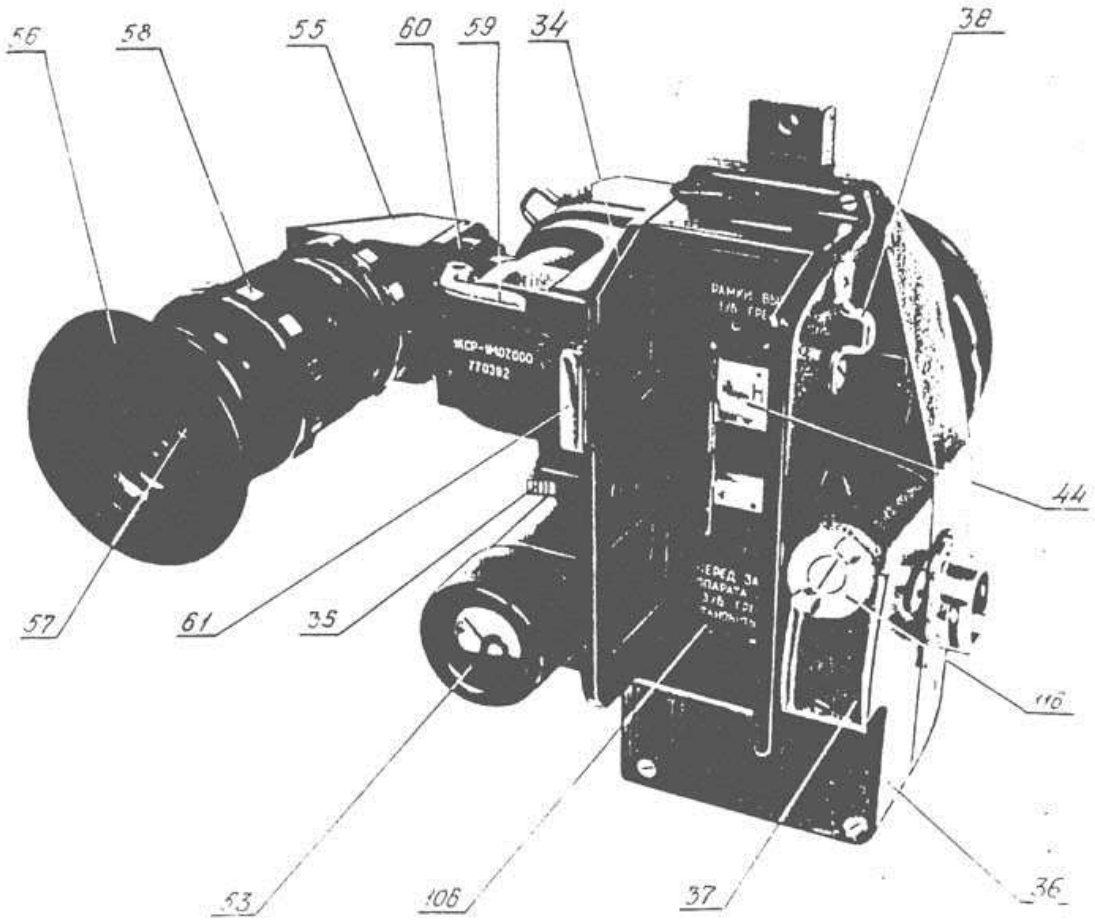

Figure 7

34 - tachometer
35 - left wall
36 - lock of the mag
37 - camera body with transmissions
38 - electric drive fastening parts
39 - bracket for the carrying belt 45 - film gate
55 - usual focusing magnifier
56 - eyepiece head with an eye shade
57 - sunshield lock
58 - ring of dioptric adjustment
59 - lock
60 - ring
61 - lock
106 - panel
116 - eccentric lock

6.1.2. Claw-shutter mechanism

Claw-shutter the mechanism (figures 7,8) is single-tooth, single-side, of the right arrangement.

Trajectory of movement of the tooth is D-shaped.

Claw-shutter mechanism is assembled into single unit consisting of the plate (40) (figure 8), carrying all construction of the claw-shutter mechanism; the shaft (I) of the claw mechanism rotating in the slide bearings (41) and (42); the forked claw teeths, the shutter, the prism with prism holder (43), mirrors with mirror holder (44), film gate (45) (figure 7).

In order to maintain smoothness of claw-shutter movement, there are flywheels (46) and (47) (figure 8) on the both ends of the claw mechanism shaft.

There is a fourpolar permanent magnet (48) on the end of the claw mechanism shaft, necessary to work of the tachometer.

Camera mechanism (without a head)

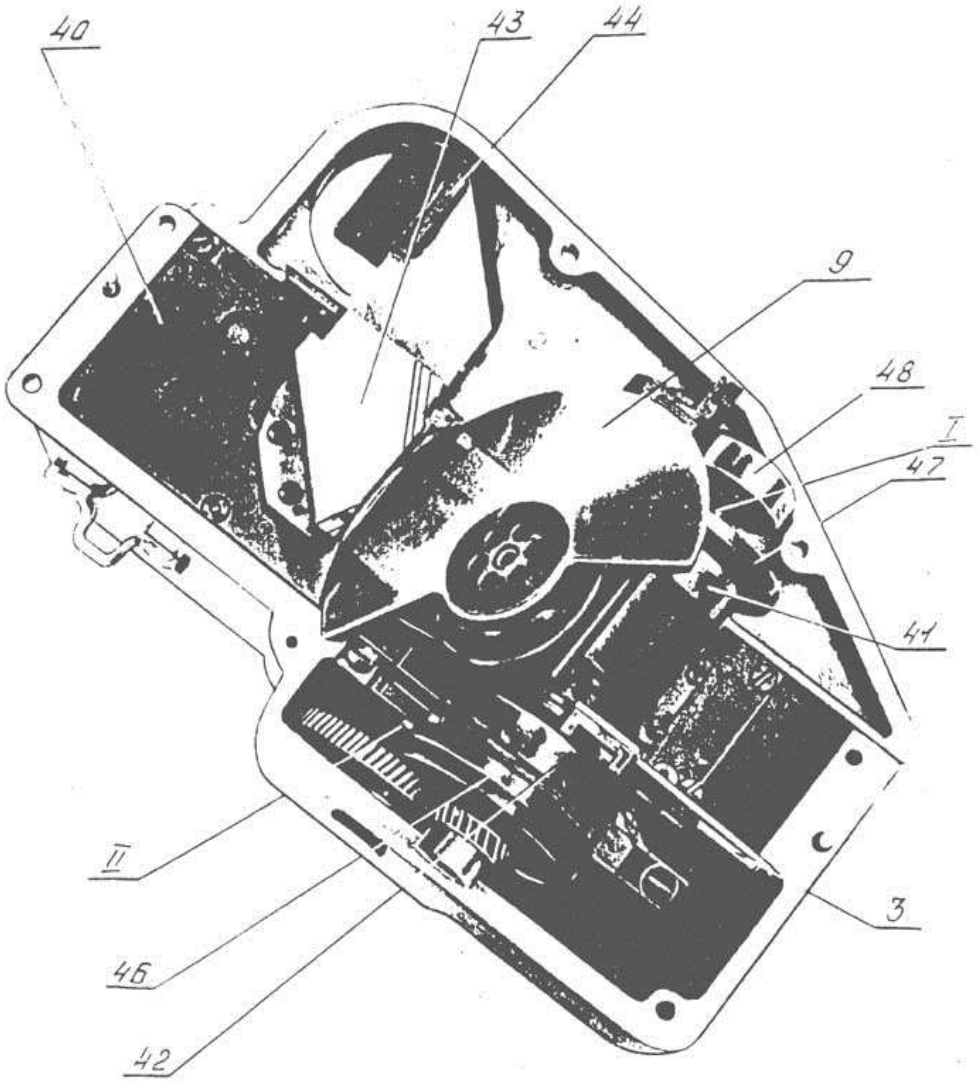

Figure 8

I - shaft of the claw mechanism
II - countershaft
3 - forked claw teeth
40 - plate
41,42 - bearings
43 - prism holder
44 - mirror holder
46,47 - flywheels
48 - permanant magnet

6.2. Head with lens mounting

There is head (49) with lens mount (50) in front of the camera (figure 9). It has fast fixing bayonet lock ring (51). The head fastens to the body by means of a screws.
The lens mount of he camera allows using of any lens with standard focusing mount (OCT-19).

Front view of the camera

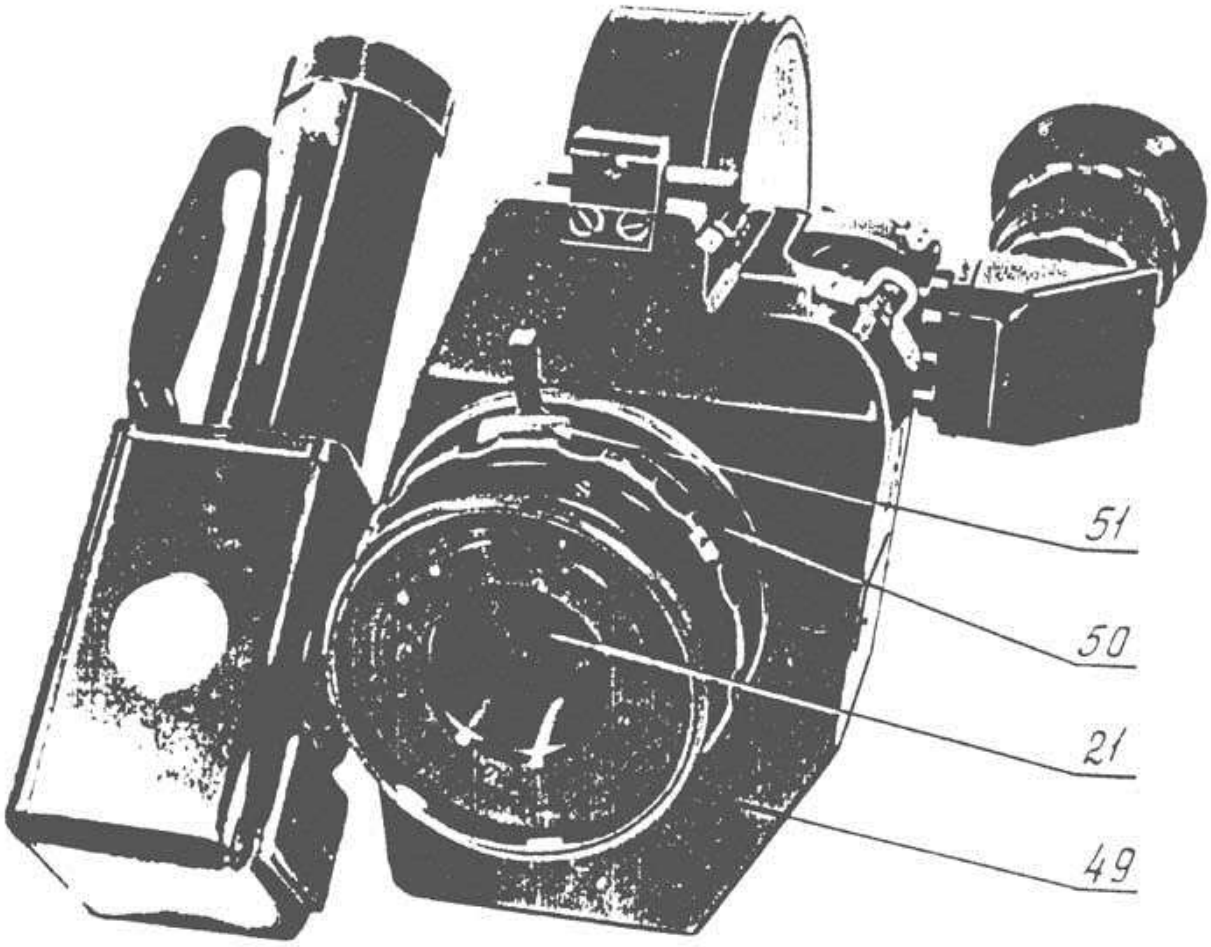

Figure 9

21 - lens
49 - head
50 - lens mounting
51 - bayonet lock ring

6.3. Tachometer

The tachometer (34) is installed into hole in the left part of the camera (figure 7). It is used to visual inspection of shooting frequency.
The principle of operation of the tachometer is based on use of the effect of electromagnetic induction.
The magnet fixed on rotating shaft of the claw mechanism induces in the coil variable EMF which size is proportional to the speed of shaft rotation (frequency of shooting).

The measuring device, the direct-current microammeter is included into the circuit of the coil; its scale is marked in values of shooting frequency.
When shooting frequency being increased, coil EMF is increased too, and, hence, increaases value of current through the microammeter.

6.4. Focusing magnifiers

Usual focusing magnifier (figure 7) gives the erect image of subject without parallactical mistakes. It has eye-piece head with an eye shade (56), sunshield lock (57) and dioptric adjustment ring (58).
The focusing magnifier may be established for right or left eye, and fixed by the lock (59). It also has opportunity to turn upwards, downwards, forward, to the left, and to be fixed by the ring (60).
The focusing magnifier is mounted into hole on the left wall of the camera body, and fixed by the lock (61).
When shooting wide-screen movies, you should mount deanamorphic focusing magnifier (62) (figure 2).

6.5. Lenses in focusing mounts

The lens (63) (figure 1) is mounted into lens mounting (50) (figure 9).
Each lens is placed into focusing mount (64) (figure 1), ending by a fixed lens hood (65) in which there is thread BB for an optical filter.
Focussing of the lenses is carried out by turn of the ring (67) of the lens mount. Thus inner part of lens is moved along an optical axis without rotating the lens.
Stopping it is made by rotation of the lens hood (65).
There are distance scales on of lens mounts. Distance scales marked in white. Aperture scales marked in red, corresponding to effective relative apertures (T-stops).

6.6. Mags

Mags (figures 10,11) have capacity of 60m and 120m (200ft and 400ft).
The mag has film channel (66) (figure 10), a mechanism and a cover (69).
Film channel has guide rails, lateral spring-loaded clips and spring-loaded frame (70).
For preventing of acidental film unwinding, the mag mechanism is automatically blocked by a latch (71) (figure 11). When a mag is installed into the camera, the latch is shifted, and mechanism being released.

The mechanism of the mag is actuated from the camera spur which being geared with mag spur (72) upon installing the mag into the camera.
There is the footage counter (73) on the back wall of the mag body. It shows amount of unexposed film in the mag.
The counter works from the lever (74) (figure 10).
Mag cores (75) are connected to theit shafts through a friction clutch of dry friction.
The effort to friction clutches is adjusted by pulling up of springs by means of the nut (76).
There are lugs (77) put onto cores. The lugs have cut-outs for fixing the end of the film.
Mag cover is demountable. It has a groove into which the ledge of the body enters, providing opacity of the mag.
The cover fastens to the mag body by the lock (78). There is the rod (79) with rectangular cut-out placed on lateral side of the cover. It used to fix the mag in the camera.
There is a plate (80) on the front part of the mag. It is necessary to put a special shield (109) onto front part of the mag to protect its film channel from pollution.

60m mag (the cover is taken off)

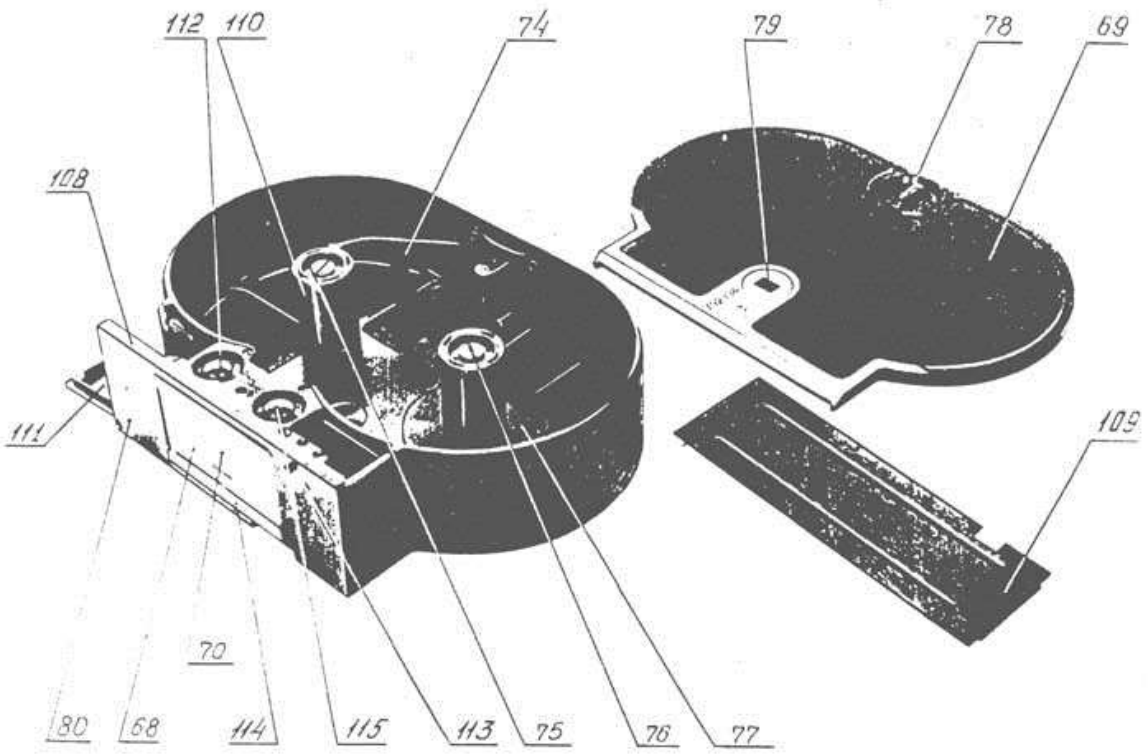

Figure 10

68 - film channel
69 - mag cover
70 - frame
74 - lever of the film counter
75 - feeding core
76 - nut
77 - lug of accepting friction clutch
78 - mag cover lock
79 - rod
80 - plate
109 - shield
110 - standard lug
111 - door
112 - button of feeding sprocker roller
113 - clamp
114 - guide rail
115 - button of take-up sprocket roller

120m mag (view on the mag mechanism)

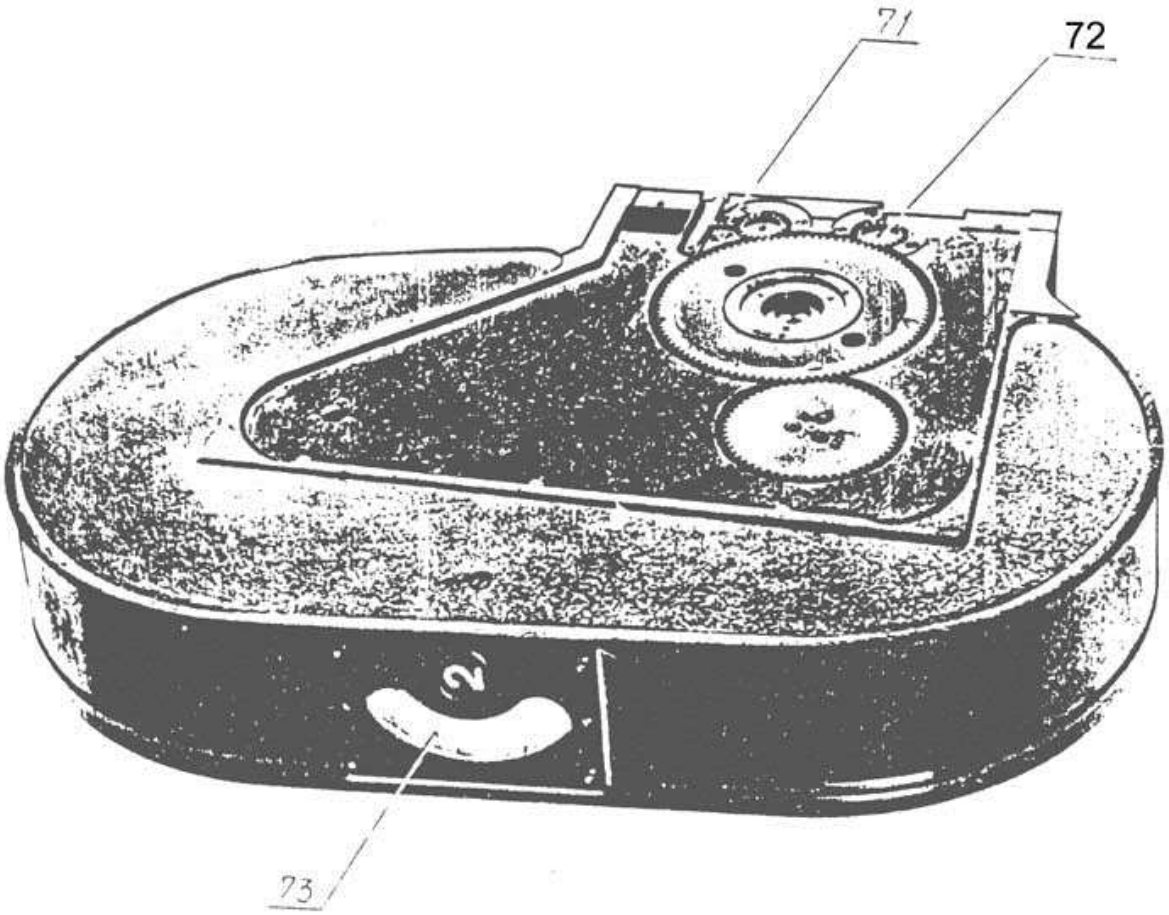

Figure 11

71 - latch
72 - spur
73 - index of unexposed film amount

6.7. Matte box 1KSR-2M

The matte box (figure 12) is used with all lenses and anamorphic blocks F = 35, 50, 75 mm.

The matte box consists of the lens hood (86), filter holder (87), and corbel (88).

At the end face of the lens hood there is a groove for matte installation. Each matte is marked accordingly to focal length of corresponding lens. The basis of the lens hood is fixed on the filter holder.

The filter holder has two slots for a framework (89), one of which is motionless, and another, with a framework, may rotates. There is tube (90) mounted on filter holder. These tubes serve as lens hoods. There are focal lengths of corresponding lenses marked on the tubes. The filter holder is attached to the corbel (86) by means of two captive screws (91).

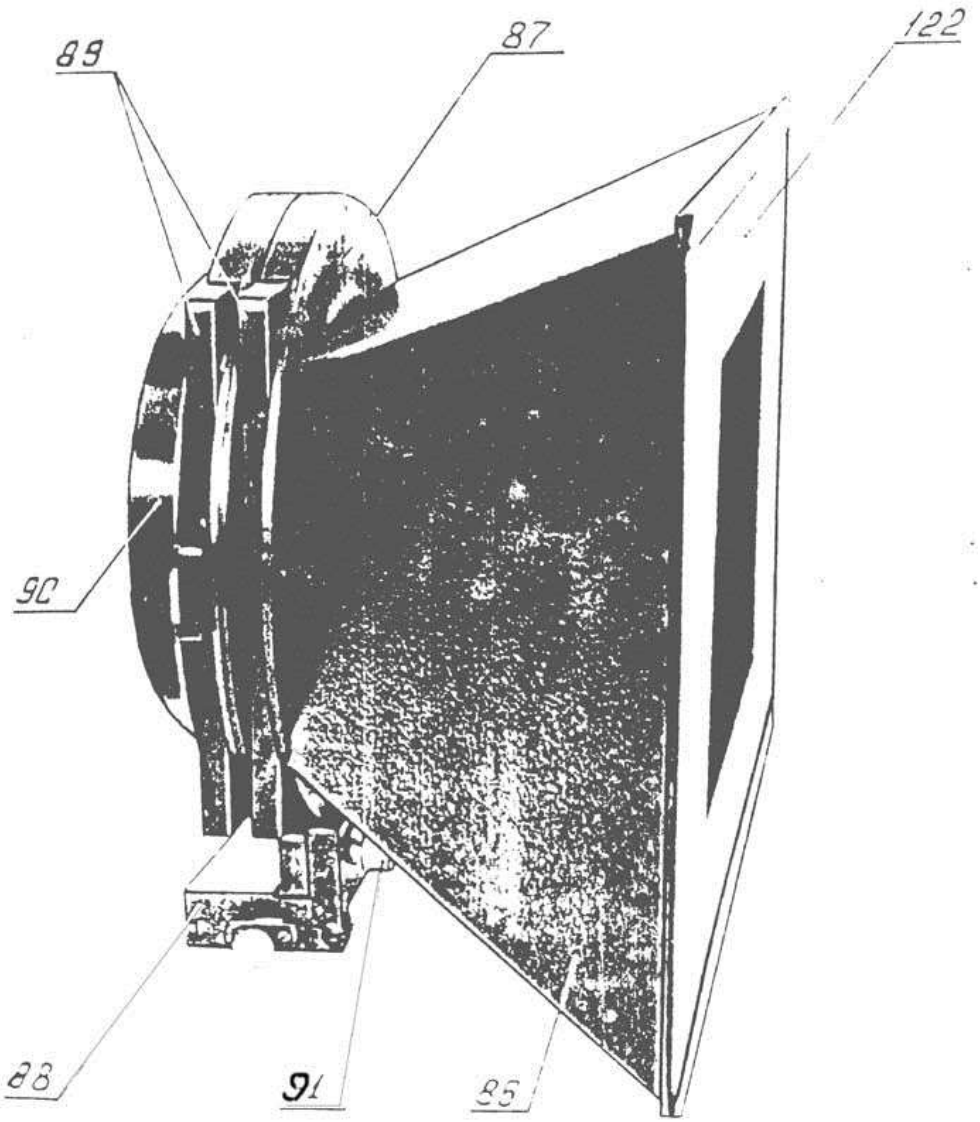

Figure 12

86 - lens hood
87 - filter holder
88 - corbel
89 - frameworks
90 - tube
91 - screw
122 - matte

6.8. Electric drive

Description of the electric drive 19EP-16APK is given in 19EP-16APK 00.000 PS.

6.9. Corbel

The corbel (figure 13) is intended for installation of the matte box 1KSR-2M, anamorphic blocks, and also (if necessary) lenses with variable focal length (zoom lenses). The corbel has a "dovetail" support. The corbel consists of two basic parts - an universal corbel (2KU) (92), and base (93) to which the cross (94) fastens.
There is screw (95) in the top part of the base for fastening it to the camera, and threaded hole (3/8") for its fastening to the tripod.

Corbel

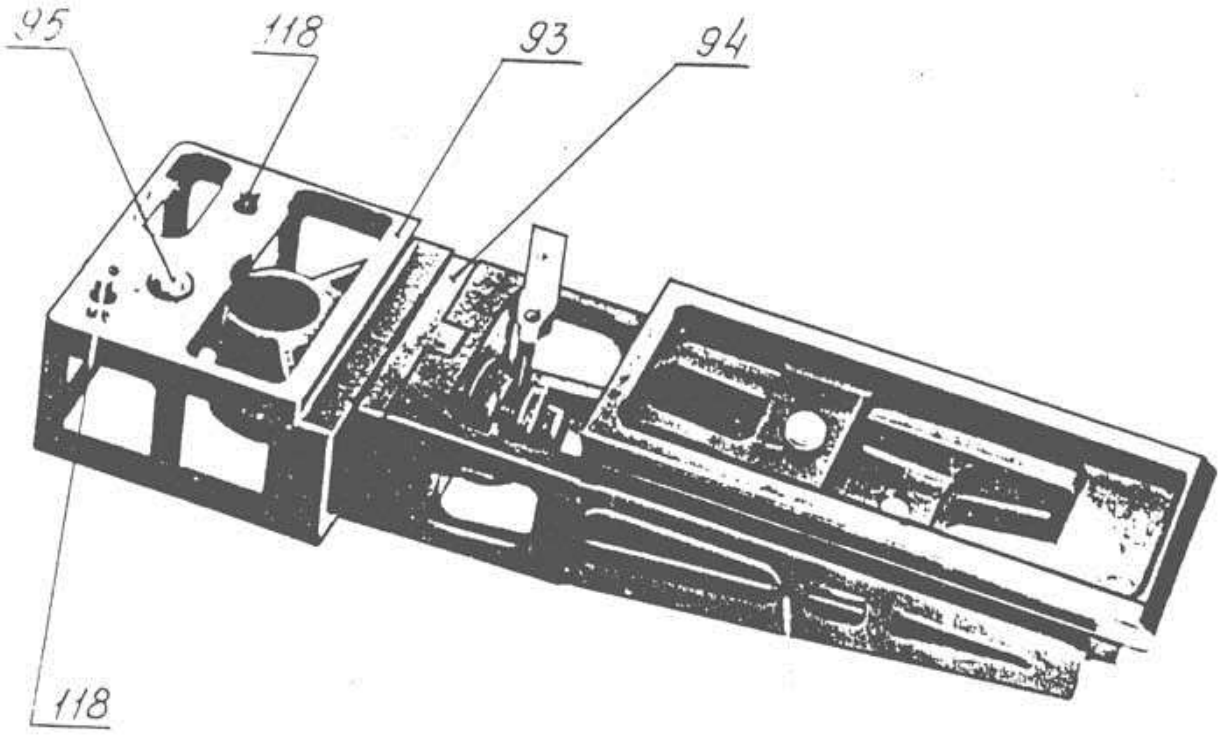

Figure 13

92 - corbel 2KU
93 - base
94 - cross
95 - screw
118 - pins

6.10. Body cork

The body cork (99) (figure 1) is intended for protection film channel from dust and dirt.

6.11. Flag

The flag (figure 14) is used for protection of taking lens from lateral light. The flag may work with any lens. It consists of the rod (100), and screen (101).
The rod (100) is telescopic; its position can be fixed with the screw (102). The screen can be rotated and inclined on the spherical hinge (103). The flag is mounted to the camera by means of the screw (104).
The flag is mounted into special place on the top part of the camera head.

Flag

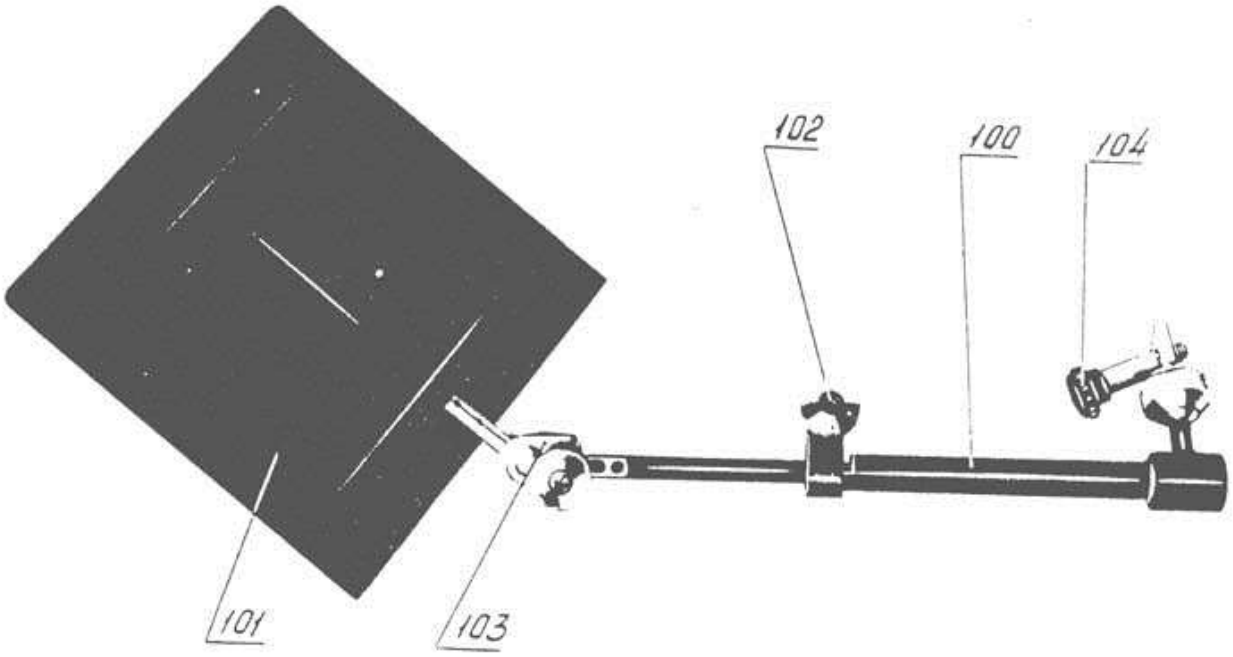

Figure 14

100 - rod
101 - screen
102 - screw
103 - hinge
104 - screw

6.12. Shoulder belt

For convenience of carrying of the camera ready for shooting, it is possible to attach a shoulder belt (105) to the brackets (39) (figure 7).

6.13. Interchangeability

There is possible to interchange basic parts between the camera outfits:
- movie lenses in focusing mounts (except for anamorphic blocks),
- matte boxes,
- flags,
- electric drives,
- corbels 2KU,
- body corks,
- lens mount corks.

7. INSTRUMENTATIONS.

The list of the instrumentations is shown in the table 2.

Table 2

Name	Purpose	Brief characteristics
1. Blimped camera	For measuring of sound level of the working camera	Volume of 72 cubic meters. Own sound level is not higher than 18 dBA
2. Vernier test IS.27.000	For the control of image instability	
3. Microscope IM 150x50B GOST 8084-82	For a quantitative estimation of the instability value	0,005; 1
4. Film projector for 35-mm film of GOST 2639	Same	

8. TOOLS AND ACCESSORIES

A case with the tools and accessories is contained in the case #1.

9. MARKING AND SEALING

The camera has a firm label with the following info:
- trade mark of the manufacturer,
- item index,
- factory number of the item, which first two digits mean year of produce.

Replaceable basic parts of the device - usual focusing magnifier, corbel 2KU, and electric drive have firm labels too.
Each suitcase has a table of packing, on which are specified:
- item index,
- factory number of the item,
- on the main suitcase - serial number of the suitcase, and after a hyphen - quantity of suitcases in the complete set,
- on the other suitcases - serial number of the suitcase.
There is layout of placing on the internal side of the suitcase covers.
Suitcases should be closed and sealed up.

10. PACKING

In order to convenient storage of the camera, and for protection from pollution and damages during transportation, the complete outfit is placed into specially intended slots of the suitcases.
For protection against influence of atmospheric moisture, and for prevention of moving of the elements of the camera in slots, they are wrapped up by the paraffined paper in accordance to GOST 9569-79.
The operational and shipping documentation is enclosed in the suitcase #1, whereas packing sheets are enclosed in other suitcases.
Suitcases are closed by the latches, sealed up and wrapped up into brown paper in accordance with GOST 8273-75.
The shipping container for the camera is made according to the documentation 1KSR-2M.00.000 UCH, 1KSR-2M.00.000 UCH1.
It is necessary to check completeness of the outfit, external surfaces of the camera and of its parts that doesn't have paint and varnish coverings Before packing. It is necessary also to lubricate camera with thin layer of lubricant PVK in accordance to GOST 19537-83, and to wrap it up with paraffined paper.
Layout of replaceable basic parts of the camera in suitcases should correspond to "layout of packing".
The camera outfit is placed in board box in accordance to GOST 2991-85 (type SH-2).

11. GENERAL INSTRUCTIONS

Use the device in strict conformity with this document.
Strictly observe terms of maintenance service, the instruction of safety measures, rules of storage and transportation of the device.
Keep the device and its components in cleanliness.
Disconnect camera from a power source when preparing it for work, changing electric drive, during routine inspection, cleaning film channel or shutter, or repairing camera.
Installing a mag into the camera, do not forget to set a tooth of the forked claw teeth to top position, as indicated on plate 106 (figure 7) of the claw-shutter mechanism.
Before removal of film gate (45), set the tooth to top position too.
Try to not to overcool camera (more than 1 hour) when using it in low air temperature (from minus 5 to minus 30 centigrade), as it will lead to great growth of power consumption.
Before running camera at temperature of air from minus 15 to minus 30 centigrade, it is necessary to turn a drive shaft manually a bit.
Before using camera at temperature of air below minus 5°C, it is necessary to carefully wash out mechanisms of the camera, mags and lens focusing mounts in pure kerosene or gasoline of GOST 1012-72.
After washing camera mechanisms, lubricate them with lubricant VNII NP-6 TU 38.001.166-79; lubricate frictionless bearings and cogwheels in mags, and focusing mounts of lenses with lubricant OKB 122-7 GOST 18179-72.
WARNING. Washing of sliding bearings is strictly forbidden! Its shold be carefully wiped with clean cloth if necessary.

12. SAFETY MEASURES

Read following documents to learn how to work with storage batteries, disconnecting devices and chargers:
- MKBI.533511.001 PS,
- UZ-M.00.000 PS,
- 2UO-12.00.000 PS.

13. PREPARATION FOR WORK

Before using the camera, inspect it, wipe and blow out a dust in such places as film channel. Make sure that camera is operable by manual turn of the motor, or by run it without mag.

13.1. Preparation for shooting of usual films

Preparation of the camera should be done in the following sequence:
13.1.1. Mounting of the lens
Set the lens (21) (figure 9) to "infinity". Turn the lens a lens keyway upwards against a lug of the lens mounting (50).
Insert the lens into lens mounting, and turn the lock bayonet ring (51) until stop.

Shake the lens slightly during inserting it into lens mounting.

13.1.2. Mounting of the focusing magnifier

Insert the usual focusing magnifier into corresponding slot of the camera, and fast it with lock (61) (figure 7).

13.1.3. Loading of the mag

Place the mag horizontally, as it shown on figure 11, and pull shield (109) (figure 10) from the mag plate.

Turn the lock handle (78) of the mag cover (69) into 'O' position, raise the cover, and take it from the mag. Pull a standard lug (109) from the right (feeding) core (75).

Coil necessary amount of the film onto the lug (the film should lay emulsion inside for the 60m mag, and emulsion outside for the 120m mag. The film length should not exceed 60m and 120m correspondingly (if film thickness S=0,15-0,16mm). If film thickness is higher than 0,16mm, afilm length should be reduced.

Pull the lever of the footage counter (74) to the wall (turning it clockwise), and place the lug with the film onto feeding core so that coil layers were counterclockwise (for 60m mag), or clockwise (for 120m mag).

Open doors (111) downwards.

Press the button (112) of the feeding sprocket, and pass the end of the film to the left of it, not releasing the button.

Stretch the film to the right for 350-500mm.

Release the button, and pass the end of the film into mag film channel (68), pushing a film channel by your fingers at first, and then pressing a clamp(113). Make sure that the film is under rails (114). It is easily probed by fingers. Release the clamp, and pass the film to the right of the sprocket, pressing the button (115) at the same time, and then stretch it inside of the mag.

Adjust a film loops so that right loop wrapped a thumb, and left loop wrapped a forefinger.

Fast the film end to the lug (77) emulsion inside, place the lug onto core of the take-up friction clutch, and rotate the lug clockwise to a tightness.

Close the mag doors. Put the mag cover on the mag, turn the lock into '3' position, and put a shield on.

13.1.4. Loading the camera

Take the body cork out of the camera. Pull a shield off the mag. Place a loaded mag into the camera, and push it until stop. Make sure that the mag is not skewed. Check the mag fastening by pulling it back. If the mag is not shifted, hence, it is fixed.

There is no need to pull out a mag lock during installing of the mag, as it works automatically.

13.1.5. Mounting of the electric drive

Insert the half-coupling of the electric drive into the jack on the camera. Align mark on the electric with the mark on the camera gear bushing. Push the electric drive until stop.

Turn the electric drive clockwise, and turn eccentric lock (116) (figure 7) in order to fast it to the camera.

13.1.6. Mounting of the camera onto support

Place the camera onto support platform, and fix the camera with the support screw (3/8" thread).

13.1.7. Mounting of the shading flag

Mount the flag (figure 14) into its place in the top part of the camera, and fix it with the screw (104).

13.2. Preparation of the camera for shooting wide-screen films

Preparation of the camera should be done in the following sequence.

13.2.1. Mounting of the anamorphic film gate "A"

Replace academic film gate (situated on the film hannel plate 106) with the wide-screen film gate (45) (figure 7). To remove a film gate, place a tooth of a clam-shell as it is specified on the panel (106). Press a bottom edge of the film gate window downwards by your forefinger, and pull the film gate out of the camera.

Mounting of the 'A' film gate should be done in reverse sequence.

13.2.2. Mounting of the corbel

The corbel (figure 13) fastens to the basic plane of the camera with the screw with 3/8" thread, and is fixed by the two pins (118) located on the basis (93) of the corbel.

13.2.3. Mounting of the anamorphic blocks

Anamorphic blocks (figures 15, 16, 17, 18) are mounted onto corbel 'dovetail'. Insert a lens into the camera lens mounting.

To adjust the anamorphic blocks by height and horizon, it is necessary to be guided by the description 2KU.000 TO.

13.2.4. Mounting of the matte box 1KSR-2M

It should be placed onto corbel 'dovetail' like an anamorphic block. Insert a mate (122) and a tube (90) into the matte box, accordingly to the used lens or anamorphic block.

Slite the matte box toward the lens so that it don't prevent a lens movement, and fix it by the screw (91).

13.2.5. Mounting of the deanamorphic focusing magnifier, loading of the mags, loading of the camera, mounting of the electric drive, mounting the camera onto support, and mounting of the shading flag should be done as described in the '*Preparation for shooting of usual films*'.

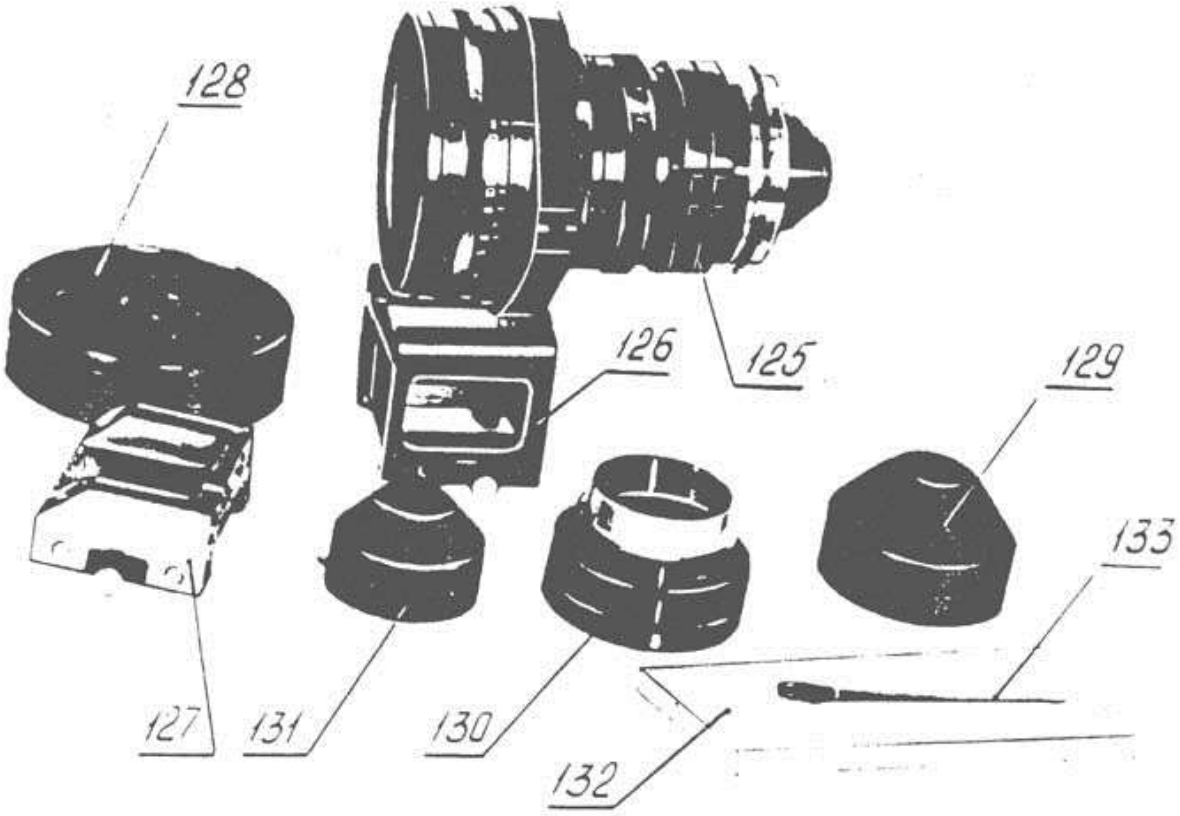

Figure 15

125 - anamorphic block
126 - corbel
127 - slider
128 - front lens cap
129 - rear lens cap
130 - transitive frame to the camera 2KOS
131 - cap of the transitive frame
132 - napkin
133 - brush

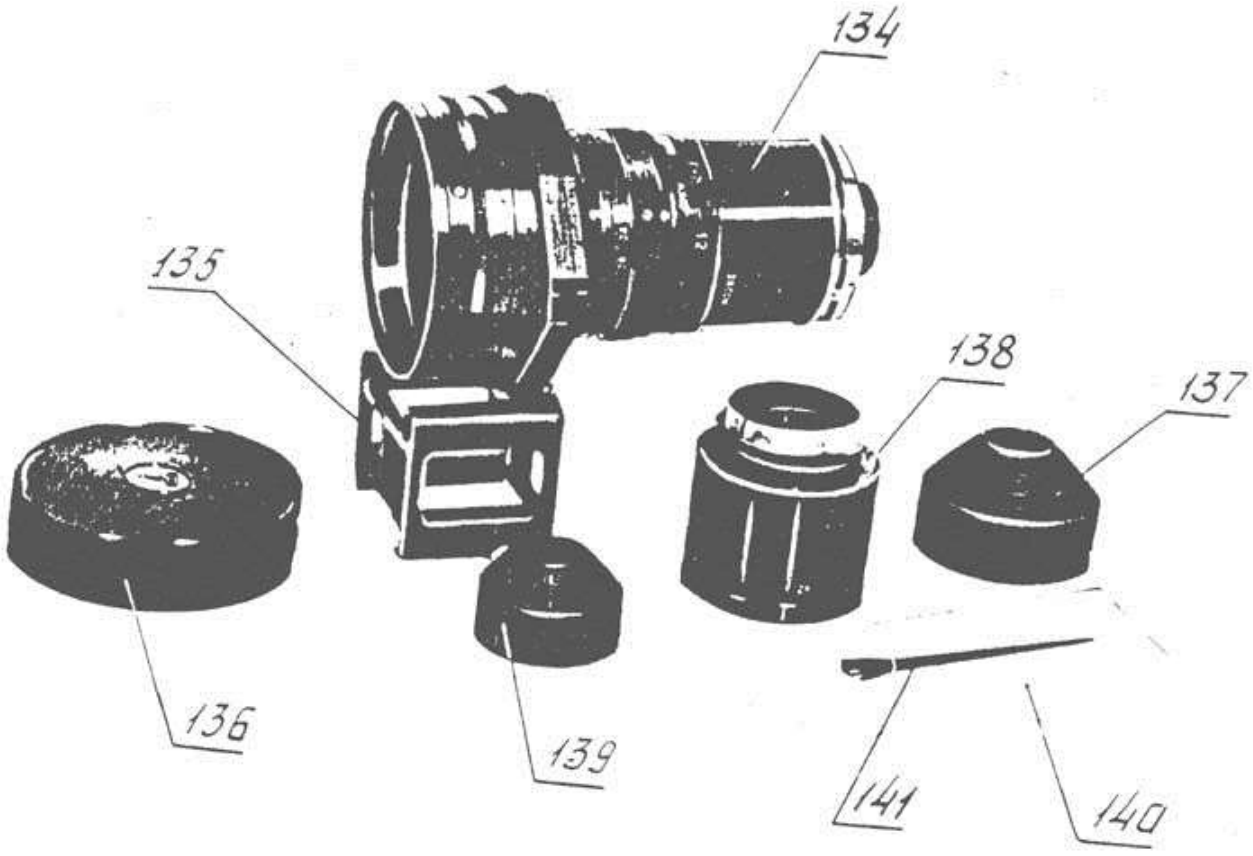

Figure 16

134 - anamorphic block
135 - corbel
136 - front lens cap
137 - rear lens cap
138 - transitive frame to the camera 2KOS
139 - cap of the transitive frame
140 - napkin
141 - brush

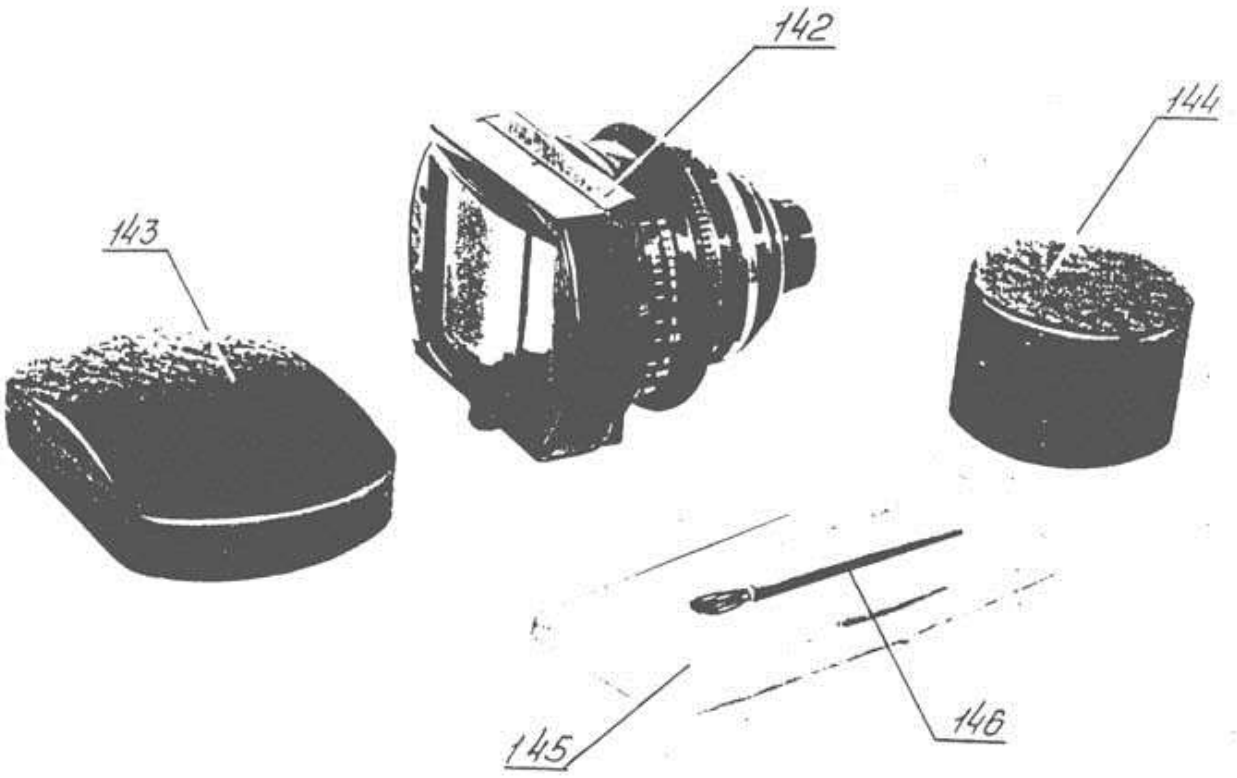

Figure 17

142 - anamorphic block
143 - front lens cap
144 - rear lens cap
145 - napkin
146 - brush

14. OPERATING PROCEDURE

14.1. Starting and stopping the camera

When using the camera from hands, keep it for the electric drive. Start and stop the camera by the button.

14.2. Setting of the shooting frequency

How to set necessary shooting frequency is described in MKBI.654273.001 PS.

14.3. Controlling of the lens

Focus a lens, turning the lens frame by your hand. It is recommended to adjust distance reducing it ('from the infinity').
You may monitor the distance on the lens scale, or at the ground glass of the focusing magnifier. Do not forget to set correct dioptric adjustment of the focusing magnifier.
To set an aperture, rotate aperture ring until align necessary value with n index.

15. MAINTAINANCE CHECK

This should be done accordingly to main parameters specified in the Table 3.

Table 3

Checked parameter	Technique	Devices and equipment
1. Sound level of the camera with loaded 60m mag, on 24 fps, with the electric drive 19EP-16APK, 50+2 dBA	see. OCT19-139-83	Blimped camera with a sound-proof floor, GOST 12.1.024-81
2. Image instability on any shooting frequency, with any mag, 0,02mm	see. OCT19-179-85	Test bench for the movie equipment 1SKP; Film projector GOST 2639-76; 30x microscope with an accuracy of +/-0,007mm.

16. LIST OF POSSIBLE MALFUNCTIONS

The list of the easily eliminated malfunctions is shown in the Table 4.

Table 4

Malfunction	Possible cause	Method of repair	Note
1. "Salad"	Too small top or bottom film loop in the mag	Reload the mag and the camera according to the maintenance instruction	
2. When camera stopped, the film being unwinded from the feeding roll	Weak spring of the feeding friction clutch in the mag	Tighten the spring of the friction clutch by the nut	
3. Scratches or frictional strips on the film	There is 'deposit' on the working surfaces of the film channel	Carefully remove the 'deposit' with a soft flannel moistened in 50% solution of spirit in water	

In case of detection of defects which repairing is impossible without the special equipment and tools, the camera should be shipped to a special repair shops.
Some complex troubles:
a) Wearing of spur cogs in the camera,
b) Mechanical damages of working surfaces of the film channel,
c) Failure of the claw mechanism.

17. MAINTENANCE SERVICE

17.1. The order and places of lubricating

Following units of the camera should be lubricated: the mechanism of the camera, the mechanism of the clam-shell, the mechanism of the shutter, the mag and the lenses.
Lubricating of the camera mechanism should be done after each 3000m of film shot.
Sliding bearings are self-lubricating. They don't require regular lubricating, as they are impregnated with lubricant VNII NP-6.
If necessary, bearings are being replaced in studio workshops.
Cogwheels should be lubricated with VNII NP-271.
Lubricating of the mechanism of the clam-shell and of shutter should be done after passage of each 1500m of film. It is necessary to lubricate following parts: throw bearing, right jaw of the shaft, eccentric staff journal, and bottom support of the

forked claw teeth (without lens mounted, through lens mounting slot with the tooth of the clam-shell placed into bottom position).
Dosage is 3 drops of oil onto each wear face.
Gearings should be lubricated with VNII NP-271.
Frictionless bearings and cogwheels of the mag should be lubricated with VNII NP-271.
Wear faces of the lenses should be lubricated with VNII NP-6.
To switch to the winter conditions of operation, remove old lubricant (washing of the camera mechanism, the mechanism of the mag and frames of lenses in pure kerosene or gasoline).
After greasing of the camera, it is necessary to check its work on 24 fps during 15-20 seconds. Extra oil, smudges and sparks should be removed.

17.2. Cleaning of the mags

Clean mags before each loading it with a film. Wipe internal surface of the mag with a flannel cloth. Clean a film channel and sprockets with a brush and syringe.
If scale is appeared in the film channel, take a film gate out of the camera, and remove the scale by wiping it with soft flannel moistened in 50% solution of spirit (GOST 5962-67) in water.
Note. Removal of the scale by firm tools, including wooden and bone ones, is forbidden.

17.3. Cleaning of the optical parts

Surfaces of the optical parts of the lenses, shutter, anamorphic blocks, and focusing magnifiers should be cleaned cautiously, without pressing, to not damage a coating layer.
Dust from the surfaces of the optical parts should be removed with a soft squirrel brush or syringe. Oil spots on the surfaces of the optics should be removed with a cotton wool moistened in ethylic ether of GOST 8981-78.
Wipe the mirrors with external aluminizing with the cotton wool moistened in pure gasoline of GOST 1012-72 or ether.
Avoid a touch to a reflecting smooth surface of the shutter, and protect it from moisture. A dust on the reflecting surface should be blowed off with syringe. Only in unusual cases (oil spots, fingerprints etc.), you may remove them by careful wiping of the polluted surface with very soft, dry and clean cotton wool. Wiping by the wadded tampon moistened in spirit is supposed; do not rub a same place, and do not press the tampon.

18. STORAGE RULES

For long storage, external surfaces of the device and accessories, not having paint and varnish coverings, should be lubricated with lubricant PVK GOST 19537-83 before stacking in suitcases.

Conditions of storage:

- Temperature of air in a room, °C 25 +/-10
- Relative humidity, % 45-80
- Atmospheric pressure, mm of mercury 630-800

At temperatures higher then 30°C, relative humidity should not higher than 70%.

Suitcases with the camera and its accessories should be stored on racks, covers upwards.

Do not storage the camera near heat sources, and do not keep it near acids, alkalis or chemically active gases and the vapors causing corrosion.

19. TRANSPORTATION

Transportation should be done at temperatures from minus 40 up to plus 50°C in the closed transport (railway cars, containers, closed motor vehicles, holds etc.).

When transporting it by air, it should be kept in the heated hermetically sealed compartments.

Do not drop shipping boxes, and observe rules of transportation.

The boxes should be fixed in the carrier, so that possibility of their moving and impacts was excluded.

Boxes should be protected from water and direct solar light.