INSTRUCTIONS

for using the

Keystone

MODEL K-8

MOVIE CAMERA

8 - MILLIMETER

Manufactured by
KEYSTONE MANUFACTURING CO.
BOSTON 24, MASSACHUSETTS, U. S. A.

FOREWORD

EXPERIENCE has shown that nearly all the troubles of users of home movie cameras are traceable to failure to read and follow instructions before taking pictures. We have prepared this instruction book for your information and guidance.

Have your camera in front of you as you read this book. The illustrations are readily understandable and will help you become familiar with all the operations of the camera. It is easy to take good movies with a "Keystone," if you follow these simple instructions carefully. Get to know your camera better by referring to this book from time to time.

KEYSTONE MFG. CO.

YOUR KEYSTONE CAMERA

is constructed so that it will give you many years of uninterrupted service.

Should it become damaged due to accident or careless handling, take it to the dealer from whom you purchased it, or if this is not possible send it to the Keystone factory, well packed.

Should any defect develop due to poor material or workmanship within a period of one year, repairs will be made without charge to you under the terms of the guarantee provided your camera is registered with the Keystone factory.

Send the registration card making sure camera serial number corresponds with camera number, print name and address and send to factory.

KEYSTONE MFG. CO.
General Offices and Factory
151 HALLET STREET
BOSTON 24, MASS.

GENERAL INSTRUCTIONS

The instructions in this book are for the use of the KEYSTONE Movie Camera Model K-8

Familiarize yourself with the camera and its operation.

Study Fig. 1 on page 2 and Fig. 2 on page 3 and get acquainted with the following: wind the motor with winding key; press the operating button; turn the speed regulator knob; turn the adjustable footage indicator; look thru the view finder; rotate the knurled collar on lens and study exposure guide plate.

Open camera by lifting off cover as explained at bottom of page 3. See Fig. 3 page 4 and get acquainted with the inside parts of your camera.

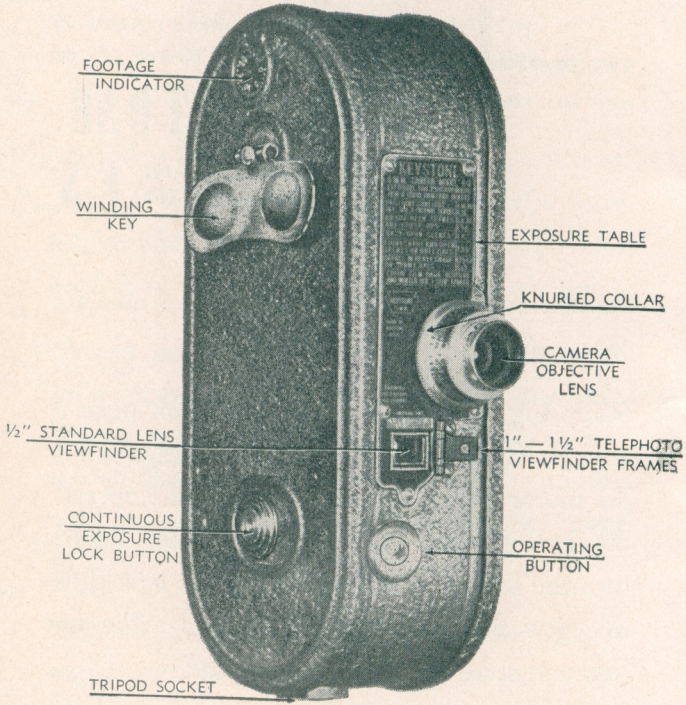

FOOTAGE INDICATOR
WINDING KEY
EXPOSURE TABLE
KNURLED COLLAR
CAMERA OBJECTIVE LENS
½" STANDARD LENS VIEWFINDER
1" — 1½" TELEPHOTO VIEWFINDER FRAMES
CONTINUOUS EXPOSURE LOCK BUTTON
OPERATING BUTTON
TRIPOD SOCKET
KEYSTONE

Fig. 1

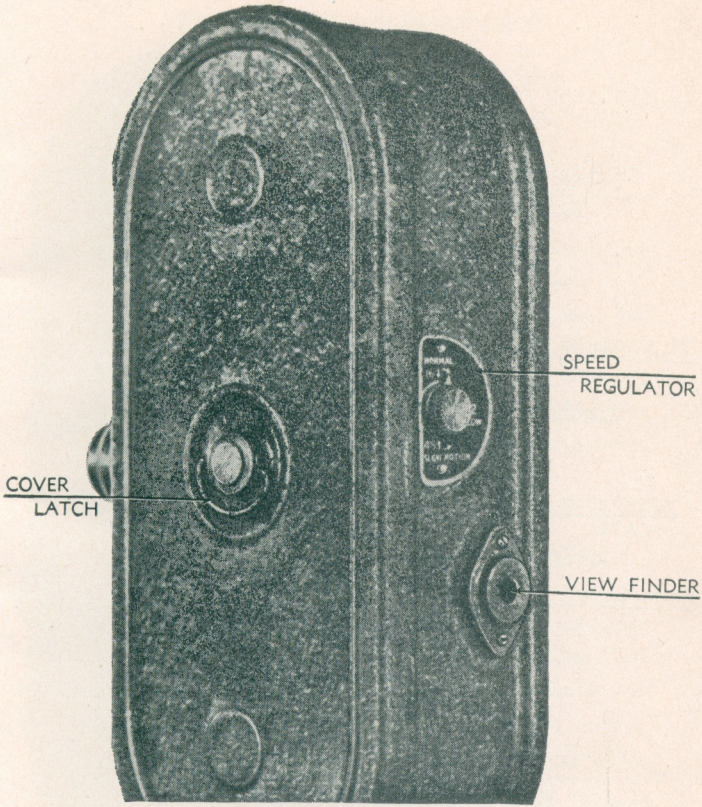


Fig. 2

To open the camera turn cover latch; Fig. 2 page 3; to the left as far as it will go, hold cover at outer edges and remove gently. Never use force to take off cover.

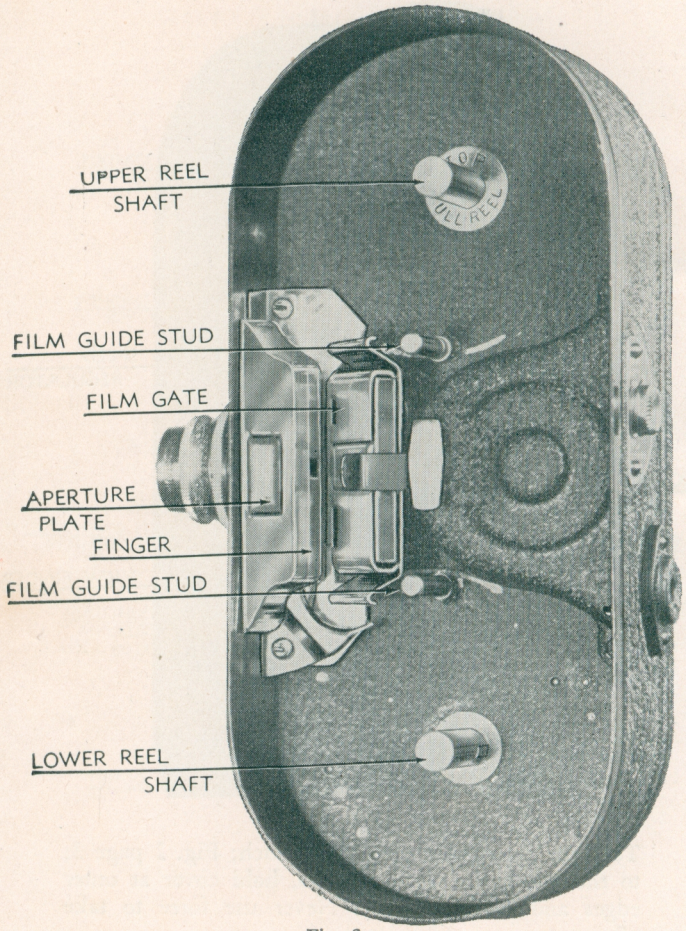

UPPER REEL SHAFT
FILM GUIDE STUD
FILM GATE
APERTURE PLATE
FINGER
FILM GUIDE STUD
LOWER REEL SHAFT

Fig. 3

FILM INFORMATION

This camera uses standard double width 8 mm. film sold by dealers handling camera equipment.

An empty spool is supplied with the camera for use with standard double width 8 mm. film only.

The cost of the film includes developing. Such film comes wound on a metal reel, and is encased in a metal container. **When you unpack the film for loading into the camera, be sure to save the metal container and cardboard carton, so they may be used later for returning the exposed film for developing to the nearest processing station shown on the film carton.**

TO LOAD THE CAMERA

Lift off the cover, then remove spool and short piece of practice film which will be found in camera. The short length of film is supplied with the camera so that you may get acquainted with the proper threading operations. Exposure cannot be made on this film.

The spool will be used as the take-up spool. Be sure the edges of the spool plates are not bent as they will cause the film to jam. Should the spool become damaged it should be straightened or replaced with a new one.

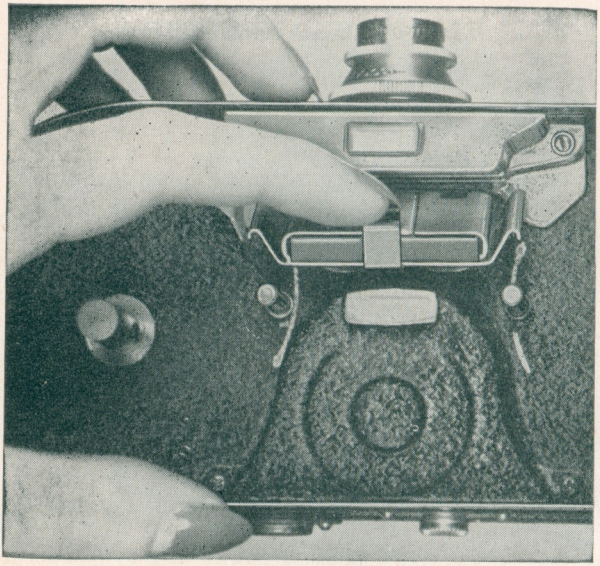


Fig. 4

Open film gate using slight pressure on film gate clip as shown in Fig. 4. If dust or emulsion is found on aperture plate remove it by blowing or brushing it off. Never use a sharp instrument as this will scratch surface on aperture plate and cause scratched film.

Raise the winding key and wind up motor spring by turning the key clockwise. Turn until the spring is wound up tight. Press the start button and when you hear the audible click from footage indicator, release button to stop motor. Turn footage indicator button clockwise until the letter "s" is under the arrow.

Remove the new full roll of film from container.

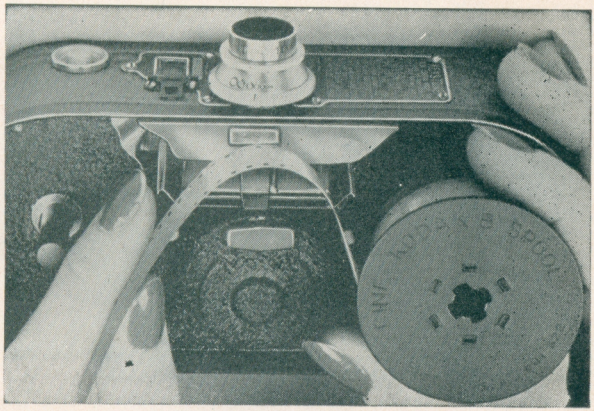


Fig. 5

Unwind about one foot of the film to be used as the leader. Be careful that film does not become loose on spool. The film is guarded at each end by about 3 feet of surplus film which makes daylight loading possible.

Place spool of film on upper spool shaft as shown in Fig. 5. While placing the spool of film in position insert the leader in the aperture plate channel; see Page 8, Fig. 6 making sure film leader passes on the outside of film guide stud. Make sure black side of film is towards the film gate and that the edge of the film is down in channel of aperture plate.

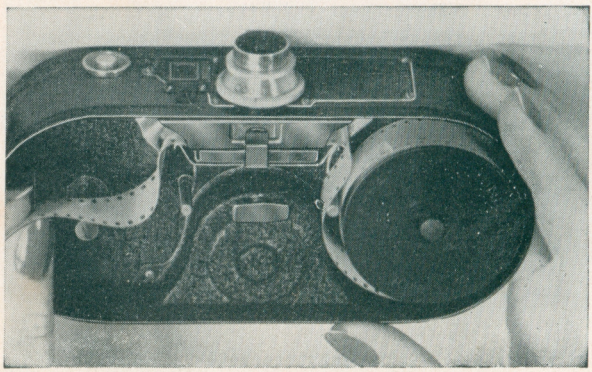


Fig. 6

Close the film gate. Press starting button and run off about 3 inches of film to see if film is feeding through properly in aperture plate.

Take the Keystone empty spool the side up marked—"Film when on this spool half exposed." Thread the end of the leader into the slot in hub of empty take-up spool as shown in Fig. 7, Page 9. Wind about 3 inches of film around the spool hub making sure it is held tight on hub.

Place spool on lower reel shaft with arrow and wording facing you, making sure that film passes on outside of film guide stud. See that take-up spool is seated properly, if necessary rotate spool slightly by hand

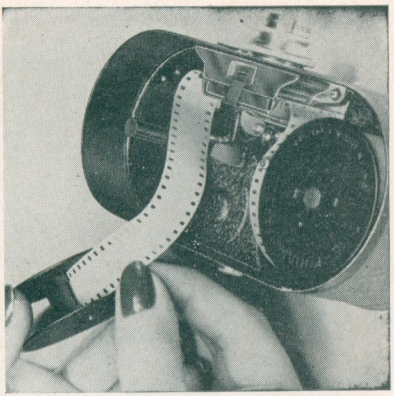


Fig. 7

until it is in proper position and at the same time take up any slack in leader. Camera when threaded properly should look like Fig. 8. After threading, check the operation of the camera by pressing starting button and allowing motor to run for a second or two. Watch the leader, closely. If the leader is running properly and take-up spool turns, stop the motor by removing your finger from start button and replace camera cover. Now run the camera until footage indicator reads 25, which means you have 25 feet of film to be exposed on one side. Your camera is now ready for use.

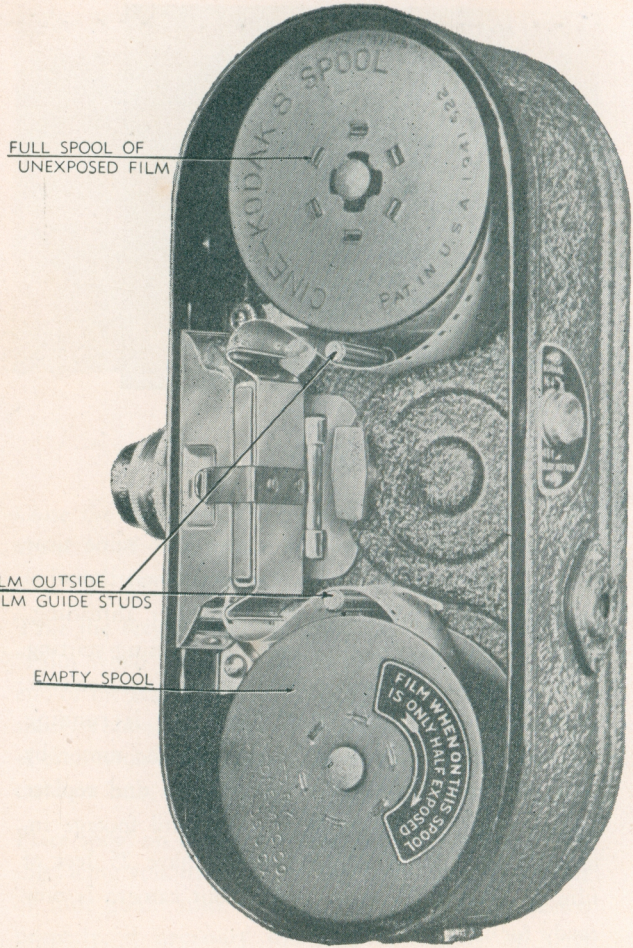

FULL SPOOL OF
UNEXPOSED FILM
FILM OUTSIDE
FILM GUIDE STUDS
EMPTY SPOOL
CINE-KODAK S SPOOL
PAT. IN U.S.A.
FILM WHEN ON THIS SPOOL IS ONLY HALF EXPOSED

Fig. 8

In taking pictures run each scene long enough, about three clicks of the audible indicator is the proper length of a scene.

The motor spring will run the camera longer, but it is advisable to wind the camera after taking each scene. When the motor sounds as if it were slowing down, stop at once and rewind the spring.

If you wish to be included in the picture, place camera on a tripod or some firm level support. Press start button and slide continuous running button Fig. 1, Page 2 forward as far as it will go, release pressure on start button and step into picture. To stop motor, step out of picture area, return to camera and slide continuous run button back.

RELOADING THE CAMERA

When the footage indicator reads 0, the usable portion of the film has all been exposed. The exposure button should now be held down until the indicator turns to the letter E. This winds up the short section of protective trailer film, which prevents any light from getting through to the exposed film and spoiling it.

Be sure to read further instructions on THREADING THE SECOND HALF.

Open the camera. All the film should be wound up on the lower spool except for the extreme end, which

will be held by the lower section of the film gate, thus preventing it from loosening on the spool and becoming light-struck. Remove both spools and proceed same as previous directions. Place the full spool of film which is only half exposed on the top spindle. The side of spool with the two pronged hole should be placed up. The wording on this spool will be underneath and invisible.

Thread the film through the camera mechanism exactly as before; **be sure light colored side of film faces lens.**

The **empty spool** will be used as a take-up spool with the black carved arrow visible.

After second half of film has been exposed and footage indicator mark reads "E", take off the cover and remove film placing it in metal container and mailing carton, sending it to the nearest processing laboratory.

TAKING THE PICTURE

Before attempting to take pictures, be sure to remove rubber lens cap. Adjust the opening of the camera lens, called the lens "stop," to match the light available for photographing. For best results, the amount of light that reaches the film through the camera lens must be kept within certain limits. If too much light reaches the film, the pictures will be too light and lack detail. If not enough light reaches the film, the pictures will be too dark with empty solid black shadows.

The light on the subject which is picked up by the camera lens varies through a very wide range, depending upon such factors as time of day, season of year, brilliance of the sun as it is affected by clouds, and amount of direct sunlight falling upon the subject. It is necessary to provide some compensation at the camera lens. This is usually done by varying the opening in the lens to admit more or less light as conditions require.

In the Keystone Model K-8 8mm. Camera this lens adjustment is made by rotating the knurled collar on the lens as shown in Fig. 1, which operates a diaphragm mechanism built into the lens. All you need know is that the smaller the number the **larger** the lens opening. It follows from this that when the light is poor, the lens must be opened to the smaller lens numbers (larger lens openings). See Page 18.

The correct lens opening for all average work is plainly marked on the camera nameplate above the lens. However, if the camera is to be used under widely varying light conditions, the table given here is a far more complete guide. After some experience one may become sufficiently expert to dispense with this table, but it is earnestly recommended that the beginner consult it frequently.

Distant scenes which appear clear in the viewfinder are often blurred on the film, due to haze. This can be corrected by using a yellow filter with black and

white film and a haze filter with Kodachrome. In order to increase the depth of field in views over 50 ft. away when using a Universal focus lens, it is recommended that stops of F.8 and smaller be used.

The carrying handle strap is held by a screw which is turned tightly in the tripod socket to prevent the camera coming loose. The strap can be removed by turning the screw with a coin or screwdriver, if needed.

Always test carrying strap screw to see if it is tight in socket when carrying camera, to prevent camera from dropping.

THE LENS SYSTEM

The outstanding advantage of the Keystone Camera is its simplicity of operation. Anybody can take home movies without previous experience or knowledge of photography. The camera lends itself admirably to use by the amateur who knows how to take full advantage of the many special lenses, filters, and auxiliary equipment that are available. These are extremely useful in broadening the scope of a camera and allow photography of interesting pictures under extreme and difficult conditions.

The Keystone Model K-8 8 mm. Camera comes equipped with an F 3.5 or F 2.5 Anastigmat lens of universal focus which requires no adjustment for distance. The camera operation has been so simplified that no lens adjustment is required beyond that of

selecting the proper lens openings. While the universal focus F 3.5 lens supplied as standard equipment will serve practically all purposes, the more advanced amateur may desire to use special large aperture lenses for taking interior pictures under extremely poor light conditions, or telephoto lenses for long distance shots.

The lens system of the Keystone 8 mm. Camera is so designed as to make lenses easily interchangeable and thus simplify the use of special lenses. It is merely necessary to unscrew the lens in the camera and substitute another one for it.

The lens must be screwed tightly into the lens holder to be in proper focus. Loose lenses will cause picture to be blurred or out of focus.

For those wishing to purchase additional lenses to increase the usefulness of their cameras, we recommend the ½ inch high speed F 1.9 lens, and the 1½ inch (38 millimeter) telephoto lens, both of which may be purchased from your Keystone Camera dealer.

USES OF F 1.9 LENS

The F 1.9 lens enables the user to take good pictures when the light is too weak for the standard F 3.5 lens. It is therefore extremely valuable if not absolutely essential, when photographing very early in the morning or very late in the afternoon, when shadows are exceptionally heavy, or when it becomes necessary to take slow motion pictures in dull light. Its greatest

usefulness, however, is in taking pictures indoors, or in artificial light.

High speed lenses, such as the F 1.9 are not of the universal focus type, so that it is necessary to adjust or "focus" the lens for distance every time a picture is taken. This is done in the following manner:

Estimate the distance of the principal object you are photographing. Suppose this is twelve feet.

Now turn the larger bright knurled ring of the lens until the number 12 is at the white calibration mark. At this position all objects twelve feet from the camera are in sharpest focus, although the latitude of focus is enough to reproduce sharply, objects several feet either side of this distance.

Similarly the lens may be focused for any distance beyond 1 foot. The 0 engraved on the knurled ring is an abbreviation of "infinity" and represents any distance beyond 100 feet.

The location seen through the view finder for close-up will differ slightly from the picture taken by the lens. See Page 20.

When conditions warrant using the diaphragm stops F.5.6, F.8, F.11 or F.16 the distance can be set at twenty-five feet and the lens will be in universal focus and can be used as follows:

F.5.6-stop—from 6 feet to infinity
F 8 -stop—from 4½ feet to infinity
F11 -stop—from 3½ feet to infinity
F16 -stop—from 2½ feet to infinity

USES OF TELEPHOTO LENS

A telephoto lens in simple, non-technical language performs exactly the same function for the camera as a pair of field glasses does for human eyes—it magnifies the image and apparently brings it much closer. Since the degree of magnification is determined by the focal length of a telephoto lens, such lenses are always rated by their focal lengths.

The most generally useful telephoto lens for all-around use with 8 millimeter cameras is one having a focal length of 1½ inches (38 millimeters). This provides a magnification of three times over the standard universal focus lens. The usefulness of this lens can be seen by referring to Fig. 11—Page 24. In this illustration the long shot was taken with the standard F 3.5 lens (½ inch focal length). The semi-closeup was obtained from the same position by using the 1½ inch telephoto lens. Then the camera was moved up to produce the semi-long shot with the F 3.5 lens, and the telephoto lens, from this second position, produced the closeup.

Telephoto lenses must be focused for distance in exactly the same manner as F 1.9 lenses.

When using a filter on a telephoto lens, we advise removing the hood before fitting the filter to the lens then screw the hood into the filter.

The use of tripod is highly recommended for all telephoto work.

Fig. 9

Fig. 9 shows the approximate size of the diaphragm openings for the various stops engraved on the knurled lens ring.

The F 3.5 and F 2.5 lens on this camera is known as a universal focus lens, the mount requiring no adjustment for distance. With each diaphragm opening we would recommend that the object be no closer than the following distance:

Diaphragm	F 2.5	F 3.5	F 4.5	F 5.6	F 8.	F 11.
Distance	8 ft.	7½ ft.	6 ft.	5½ ft.	4½ ft.	3½ ft.

HOW TO USE THE VIEWFINDER

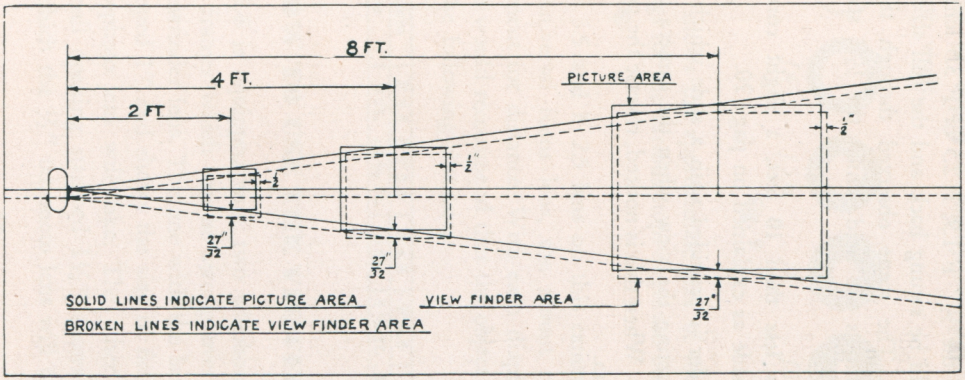
The K-8 is equipped with two telephoto lens viewfinder frames which can be swung over in front of the viewfinder lens. The one with the larger opening is stamped 1″ and shows the size of field which the 1″ telephoto lens will take. The other frame with the small opening stamped 1½″ shows the size of field which the ½″ telephoto lens will take.

When using the ½″ F 1.9, F 2.5 or F 3.5 lens, both frames should be swung back and the full size viewfinder used. The scene observed through the full viewfinder shows the field which the ½″ standard lens will take.

At distances less than 10 feet, a slight correction should be made as explained on page 20.

The viewfinder is provided with a slide which drops down, obstructing the view when the camera is held upside down. When this is noticed, reverse the position of the camera.

Diagram showing the correction required for accurate viewing of Picture on Close-ups using K-8 Camera



When using F.3.5 and F.2.5 lenses, do not use distances less than those recommended on Page 16.

The view seen through the spyglass view finder is slightly different from the picture taken on film due to the difference in the location of the view finder and the camera lens. This difference is shown in the above diagram.

At distances less than 10 feet the correction shown in the diagram should be made if an accurate view is required. As the distance increases, the difference becomes small when compared to the size of the field and may be disregarded.

FOOTAGE INDICATOR

The footage indicator records the length of unexposed film there is in the camera. Each audible click of the indicator signifies that eight inches of film has passed thru the camera. When the indicator reads "0" the usable portion of the film has been used. Run the motor until the mark "E" is at the arrow before removing the cover to reverse the spools or film.

SPEED REGULATOR

The Speed Regulator of the Keystone 8 mm. Camera, pictured in Fig. 2, may be set to operate the camera at three different running speeds, "normal," "low," and "slow motion." These three speeds have the following uses:

Normal. This is the standard camera speed (16 frames per second) and should be used in practically all cases. This speed results in the most economical use of film consistent with steady, flickerless pictures when projected on the screen.

Low. This represents a camera speed of only twelve frames per second. It should be used with a wide open lens when the light is poor, or can be used when film is running low and it is desired to use it as economically as possible.

At the low setting the film runs through the camera at ¾ normal speed, which results in somewhat longer

exposure of the film to light. Under normal light conditions this increase in exposure is not sufficient to cause any appreciable difference in the finished picture, so that is is usually unnecessary to re-adjust the lens opening when going to this speed. If perfect accuracy of exposure is desired, however, the lens opening may be reduced ⅓ of a stop by going approximately ½ of the way toward the next larger lens opening number (next size smaller stop).

When taking pictures at a speed of 12 exposures per second, the camera must be held very steadily and the subjects cautioned to move slowly and deliberately to prevent jerky pictures.

Slow Motion. This speed is extremely useful in slowing down action and therefore finds its greatest value in analyzing motion, such as a golfer's stroke, a tennis serve, or a runner's form. It may also be used to advantage in producing comedy effects.

Since the film is run through the camera 48 frames per second at this speed, exposure is only one-third normal. **The camera lens should be opened one and one-half stops to compensate for the shorter exposure.** Use slow motion only when necessary, since it is uneconomical of film.

The camera should not be run without **film** at **high** speed.

PLANNING THE PICTURE

Plan your picture before you take it. A few minutes spent in laying out the action and sequence of scenes makes all the difference between an interesting movie that can be shown to your friends with justifiable pride, and a series of unrelated, uninteresting snapshots.

Tell your subjects beforehand exactly what you want them to do and then have them rehearse it once to make sure that no hitch will develop. Caution them against looking at the camera, or in any other way showing they are posing for you. Have them move slowly but naturally.

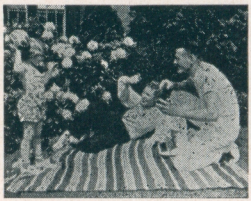
CLOSEUPS AND LONG SHOTS

You can greatly increase the value and interest of your films by following the example set by professional movie makers in shifting the camera viewpoint from long shot to closeup and back again as required to carry out the continuity and action of the story you wish to tell. There is nothing so effective as a good closeup in showing up individual characteristics and mannerisms. When interspaced properly between long or semi-long shots, closeups add freshness and interest to any picture.

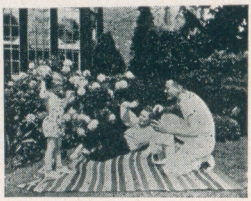
The four illustrations of Fig. 11 will give you some idea of the various effects that can be produced by careful selection of the camera position or through the proper use of telephoto lenses. Use these illus-

Closeup

Semi-Closeup



Semi-Long Shot



Long Shot

Fig. 11

trations as a guide in planning your own pictures. **In taking closeups, be sure to compensate for the picture seen in the viewfinder, as explained on page 20.**

PANORAMIC PICTURES

Panoraming is taking pictures while swinging the body around. The camera is in operation while being moved through an arc, thus obtaining a panoramic scene. This generally results in a jumpy picture due to the uneven and unsteady motion of the camera while in operation. This practice is not recommended and should only be attempted by one thoroughly experienced in using a motion picture camera. Panoraming in any case should be done by moving camera very slowly.

Photographing Moving Objects

Following moving objects by panoraming requires special rules of its own. Swing the camera about so as to keep the subject as nearly as possible in the center of the field of view, but be sure to move smoothly and deliberately. Avoid all jerky, rapid motion, even if you must sacrifice some part of the action. If necessary to swing rapidly from one view to another, take your finger off the exposure button while you do so. The quick shift of scene will be so blurred as to be unrecognizable, so you are only wasting film.

Whenever possible, station the camera so that the subject will move toward or away from the camera at an oblique angle so that a minimum of panoraming will get all the action. Avoid all motion at right angles to the camera—such scenes are almost always unsatisfactory. If the action must be at right angles to the camera, get at least twenty-five feet away before attempting the picture.

HOLDING THE CAMERA

Hold the camera level and firmly against the forehead, then locate the subect by looking thru the sight. See Fig. 12, Page 26. Be careful to keep the left hand away from the lens. Each lens is equipped with a rubber lens cap which is used to keep your lens clean. This cap must always be removed when taking pictures.

Fig. 12

To get perfectly steady pictures always use a tripod.

When replacing carrying strap make sure screw is turned up **tight** to prevent loosening and dropping camera.

This carrying strap should always be at the bottom when sighting scenes. It can also be used to help you steady the camera as it rests against your head.

Camera should always be held steady, or jumpy pictures will result.

EXPOSURE GUIDE

Correct exposure is an important factor to remember when taking motion pictures. Make it a habit to study light conditions and you will find it easy to obtain properly exposed pictures. For exposure guide table—see page 28.

The shutter speeds of your Keystone K-8 when set at the various, "frames per second," speeds. The angle of opening in shutter is 140°. At 16 frames per second the shutter speed is approximately 1/40 of a second. At 12 frames per second the shutter speed is approximately 1/31 of a second and at 48 frames per second the speed is 1/120 of a second. Check latest film speed ratings when using exposure meters. As explained on Page 29.

Outdoor Exposure Guide For Keystone Cameras

8 mm. with shutter speed of 1/40 second at 16 frames per second. See next page for film group.

LIGHT CONDITIONS		Koda-chrome	Film Group Black & White Film		
			I	III	IV
Bright sun	Sea - sky - snow	*f*.11	*f*.11	*f*.16 with 2X Filter	*f*.16 with 4X Filter
Bright sun	Average subject scenes not in shade	*f*.8	*f*.8	*f*.16	*f*.16 with 2X Filter
Bright sun Sun behind light clouds	Scenes partly in the shade Scenes not in the shade	*f*.5.6	*f*.5.6	*f*.11	*f*.16
Bright sun Sun behind light clouds Hazy sun	Scenes in the shade Scenes partly in the shade Scenes not in the shade	*f*.5.6 to *f*.3.5	*f*.5.6 to *f*.3.5	*f*.8	*f*.11
Sun behind light clouds Hazy sun Dull Day	Scenes in the shade Scenes partly in the shade Scenes not in the shade	*f*.3.5. to *f*.2.5	*f*.3.5. to *f*.2.5	*f*.5.6	*f*.8
Hazy sun Dull Day	Scenes in the shade Scenes partly in the shade	*f*.1.9 to *f*.1.5	*f*.1.9 to *f*.1.5	*f*.3.5	*f*.5.6
Dull Day	Scenes in the shade	Not recommended		*f*.2.5	*f*.3.5

These stops are for use from 3 hours after sunrise to 3 hours before sunset. Use a larger opening at other times.
At 10-12 frames per second use ½ stop smaller opening. At 48 frames per second use 1½ stops larger opening.
Stops given for Kodachrome are basic exposures. Consult chart enclosed in film package for further details.

FILM-GROUP CLASSIFICATION

The following films are grouped according to their speed rating. The exposure required for each group will vary with the light conditions. The American Standards Association rating, called "exposure index number" defines the inherent sensitivity of the film emulsion and will soon be in general use. Weston & General Electric Ratings are also shown.

	8 MM Film	Keystone Film Group	A.S.A. Index Exposure Number Daylight	Tungsten	Weston Rating Daylight	Tungsten	G. E. Rating Daylight	Tungsten
ANSCO	Triple "S" Pan	IV	100	64	100	64	125	100
	Hypan	III	32	25	32	24	48	32
KODAK	Cine-Kodak super X	III	40	32	32	24	50	40
	Cine-Kodak Pan	I	10	8	8	6	12	10
	Kodachrome Daylight Type		10	4*	8	3*	12	5*
	Kodachrome Type A		10‡	12	8‡	12	12‡	20

*With Color Film filter for photoflood.

‡With Type A Color Film filter for daylight.

ARRANGING THE LIGHTING

Well handled lighting of the subject you are about to photograph will result in a pleasing picture having almost stereoscopic depth and relief. Poorly handled lighting will give flat, unnatural and uninteresting pictures. The application of two or three simple rules, once they are clearly understood, is all that is necessary to produce very pleasing movies. For best all-around results, choose a position for the camera so that the main source of light comes at an angle of about 45° over either your right or left shoulder. Avoid full front lighting, with the sun directly at your back, since this tends to give flat, uninteresting pictures lacking in depth.

Scenes photographed about noon, with the sun directly overhead and casting practically no shadows, are less interesting than those taken either earlier or later in the day, since the longer shadows lend interest and perspective that greatly improve the pictorial value of all scenes.

When photographing people, take them out of the direct sunlight to get away from badly strained and distorted facial expressions, glaring lights and heavy black shadows. A slightly shady spot, open to the sky and well-lit is best for making close-ups having natural facial expressions and well-rounded, pleasing perspective.

Pictures taken against the sun are almost invariably flat and hazy. **Never take a picture with direct sunlight shining into the camera lens.**

INDOOR MOVIES

Home Movies can be made at night with your Keystone Camera. It is only necessary to have sufficient light. This can be obtained with Mazda Photo Flood Lamps and the Keystone Reflectors.

Light from one source will cause heavy shadows which tend to spoil the picture. It is better to arrange the lights so that the rays come from different angles—this breaks up the shadows giving clear detail to the picture. In most scenes some light should fall in the back, or, a light colored screen may be used at the rear to brighten up the back. It should be quite close to the object.

Window shades should be drawn down to prevent reflection from the glass. All bright reflections from glass doors, picture frames or glossy surfaces should be eliminated. The lamps and stands should be so located that they will not show in the picture. Cloth or parchment shades have very little reflecting power; when used with photoflood lamps see that they are placed far enough away to withstand the excess heat given off by these lamps.

The lens stop to use depends upon the distance from the lamp to the object and not the location of the camera, except, we suggest that the minimum distance for each stop be maintained, as shown in the bottom line of the table.

One No. 2 Photoflood Lamp may be substituted for two No. 1 Photoflood Lamps when referring to the table, assuming that each is mounted in its proper reflector.

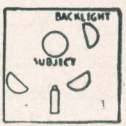
Regular Photoflood Lamps are for use with Type A Kodachrome film when used indoors.

Daylight Photoflood Lamps are for use with daylight-type Kodachrome film when used indoors.

Either lamp may be used with black and white film. The Daylight Photoflood Lamp should give the best results.

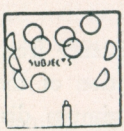
PHOTOFLOOD LIGHTING SUGGESTIONS

CLOSEUP WITH BACKLIGHTING



Relatively more light is needed for close-ups, because a small lens opening should be used to get subject sharp. Refer to diagram, noting that backlight should be above or below head, and to one side. Do not count backlight in determining exposure.

LONG SHOT WITH NORMAL LIGHTING



This is an example of employing extra lamps to the side and back for the purpose of outlining all subjects with light, thereby giving greater depth to the scene. Be sure primary source contains correct number of lamps for distance and exposure as tables specify.

The following table gives the necessary information for use with an 8 mm. Keystone Movie Camera when using photoflood lights with Keystone light units for indoor work. Normal exposure.

(For Group Number see page 29)

Number of #1 Photoflood Lamps in Proper Reflectors	FILM	DISTANCE BETWEEN OBJECTS AND LAMPS IN FEET — SIZE OF LENS OPENING						
		F 8	F 5.6	F 4.5	F 3.5	F 2.5	F 1.9	F 1.5
One lamp	Kodachrome Type A					3½′	4½′	7′
	Kodachrome Daylight with filter							3′
	Group III			3′	3½′	5′	7′	9′
Two lamps	Kodachrome Type A				3½′	4½′	7′	9′
	Kodachrome Daylight with filter						3½′	4½′
	Group III			4′	6½′	7′	11′	14′
Three lamps	Kodachrome Type A		3′	3½′	4′	6′	8½′	11′
	Kodachrome Daylight with filter					3′	4′	5′
	Group III	3′	4′	5′	7′	9′	12½′	16′
Four lamps	Kodachrome Type A		3½′	4′	4½′	7′	10½′	13½′
	Kodachrome Daylight with filter					3½′	4½′	6½′
	Group III	3½′	5′	6½′	8½′	11′	14′	18′
Minimum distance at which a Universal focus lens should be used without portrait attachment		4′	5′	6½′	7½′	8½′		

USE OF COLOR FILTERS

Scenes which often contain a color combination that is very pleasing to the eye become pictures registered in black and white or shades of black and white when photographed. The colors lose their distinction, two different colors may appear in the picture to be just one block or shape with no difference in tone or shade, lacking any detail. Black and violet will be shown as black, green and blue will be registered as a dark grey; yellow and orange as a light grey; white appearing in its true color. Much of the value of the picture will be lost due to the lack of contrast between the colors.

With the use of the proper filter, colors which would appear in the picture as the same shade will be reproduced in different tones, changing what might be a dull monotone photograph into one full of contrast giving the picture much of its original color value.

The effects of the filter on each color must be understood before selecting the one to be used. Observe closely the colors which are to be photographed, then choose the filter which will be most effective in giving contrast to the picture. In a scene where foliage predominates a green filter is required to give contrast to the foliage. A scene of dark colors such as black, purple and dark red, requires a red filter to lighten up these colors and give sufficient contrast to the picture so that each color can be readily distinguished.

The filters most generally used to give contrast are yellow, red and green, the following table shows

the shades in which each color is rendered when using panchromatic film.

SUBJECT COLOR	FILTER COLORS		
	GREEN	YELLOW	RED
	Shades rendered by the film		
black	black	black	black
violet	dark grey	very dark grey	black
blue	grey	dark grey	very dark grey
green	very light grey	grey	dark grey
yellow	light grey	very light grey	grey
orange	grey	light grey	light grey
red	dark grey	dark grey	very light grey

A haze filter is often used with Kodachrome film to clear up haze which very often appears when taking distance scenes or scenes in high altitudes.

A neutral density filter is used when photographing under extremely bright lighting conditions, to cut down the exposure.

The exposure required to form an image on the film depends upon the amount of light passing through the diaphragm. It is necessary to open the diaphragm enough to compensate for the light retarded by the filter. Each diaphragm stop approximately doubles the exposure. By adjusting the diaphragm, the correct exposure may be obtained when using a filter with ordinary lighting conditions.

The amount of light absorbed by a filter depends upon the color being photographed and the light source. Various films have different degrees of color sensitive-

ness. The exposure depends upon the intensity and type of light source and the color sensitivity of the film. It is, therefore, impossible to give a filter factor which can be applied to all conditions, and any value given would only be an approximate guide.

In general one-stop larger opening may be used for 2x Filters and two stops larger opening for 4x Filters. **A yellow filter** is the only one recommended for use with orthochromatic film.

The hood on the 8 mm. Camera is short and the filter is fitted in the hood.

A few of the uses which can be made of a filter to improve the quality of your pictures are given.

Yellow Filter

Penetrates haze, fog and mist.

Reduces glare from the sun on sand or water and gives better detail.

Improved detail in shaded structures, such as archways, doorways, stairs, etc.

Gives detail in scenes where creamy or yellow tones predominate.

Red Filter

Cuts out blue and violet haze, fog and mist, and glare of sun on the water.

Improves detail in dark colors, purple, dark red, and deep shadows, also snow scenes, tan or shaded faces.

Darkens the sky with good details of clouds and gives a lighter foreground. Over exposing will lighten the sky.

Light Yellow Green Filter

Improves the detail of foliage on any green scenes and reduces the halo caused by reflected green light. Darkens scenes of red, yellow and blue. Gives a dark sky.

COLOR FILM FILTERS

Daylight Color Film Filter is used with daylight film and Tungsten light.

Type A Color Film Filter is used with Type A film and sunlight.

CARE OF THE CAMERA

When not in use the Camera should be kept either in a carrying case or the carton in which it came. **It should be kept free from dust and dirt.**

The lens should be cleaned whenever necessary. A dirty lens causes cloudy pictures which lack brilliance and sharp focus on the screen. Wind some sort of lintless cloth around a match stick and rub the front of the lens gently, taking care that you do not scratch it by too much pressure. Do not moisten the cloth in any way. Occasional cleaning of outer surface of front and rear lenses of the view finder will insure a clear vision at all times.

The pressure plate and aperture plate should be regularly cleaned after each roll or two of film. Dirt or

small pieces of emulsion sticking to the aperture plate will cause the film to become scratched and create a rain-effect on the screen. To clean the aperture plate and pressure plate, use a small strip of chamois or similiar material.

When the camera is empty and not in use, avoid unnecessary tension on the spring by letting the motor run down.

REGARDING LUBRICATION

The bearings in the Keystone Camera are made of a special composition that should not require lubrication under normal usage more than about once a year, since the mechanism of the camera consists of gears and shafts practically like a clock. We recommend that the camera be returned to the factory about once a year for cleaning and lubricating.

TITLING

You can have your films titled by your movie camera dealer for small cost or you can purchase a titling outfit and do this work yourself. Titling adds continuity and interest to the picture and makes the sudden change from one scene to another less abrupt.

SPLICING

General practice is to splice four 50-ft. lengths of 8 mm. film together, making one 200 ft. reel, which the average projector is equipped to carry. You can

purchase splicing equipment from your dealer or you can have this work done by him for a small charge. A 200 ft. reel of 8 mm. film is equivalent to 400 ft. of 16 mm. or 1,000 feet of 35 mm., the film used in the movie theatres.

REPAIRING

Through accidents, film may tear. Your dealer has a repair service or you can purchase a small repair outfit.

Suggestions for Better Pictures

Poor results are generally due to the following causes, for which we suggest possible corrections. Plan the scene before taking the picture, select a suitable background and see that the lighting is fairly uniform.

FILM LIGHT STRUCK appears as light flashes on the film, CAUSED by rays of sun light striking the film. CORRECTION: do not allow direct light to fall on the film when loading the camera; see that the cover of the camera fits tight and that the lens is not pointed toward the sun when taking the picture. **If spool sides are even slightly bent,** light will enter between side of disks and film, causing film to become light struck throughout sections of complete film.

CAMERA JAMMING and will not run, CAUSED by film not winding up on the take-up reel, and piling up inside the case. CORRECTION: check the empty reel before using, see that the flanges are not

bent and that the space between the flanges is wide enough for the film to enter. Also, make sure film is properly attached to hub of reel.

UNDER-EXPOSED pictures are too dark and the shadows lack details, this is CAUSED by insufficient light falling on the film. CORRECTION: the lens opening recommended on the exposure guide should be used; a smaller opening gives under-exposure.

OVER-EXPOSED pictures are too light and the highlights lack details, this is CAUSED by too much light falling on the film. CORRECTION: the lens opening recommended on the exposure guide should be used; a large opening gives over-exposure. The spring motor must not be allowed to run down completely when exposure is being made.

UNSTEADY OR TILTED pictures are not pleasing to look at; they are CAUSED by the camera not being held steady and level when the picture is taken. CORRECTION: hold the camera firm and steady, stand still, and check the image in the viewfinder to see that the camera is level or use tripod.

OUT OF FOCUS pictures are blurred and not sharp; this is CAUSED by the lens not being properly fitted or set. CORRECTION: the lens should be screwed in tight; focusing lens must be set to the correct distance from the object. Universal lens should not be used at distances closer than those recommended for

various diaphragm openings — and distant shots with Universal Focus Lenses — will not be sharp with openings larger than F.8. Panoraming is not recommended and should only be done by one thoroughly experienced in using a camera.

FILM SCRATCHES are perpendicular lines running through the picture CAUSED by an accumulation of emulsion or dirt on the aperture plate. CORRECTION: clean the aperture plate and pressure plate before threading a new roll of film.

DOUBLE IMAGE or badly blurred picture; this is CAUSED by the film being pulled through continuously rather than fed through intermittently by the feed finger. CORRECTION: film should be properly inserted in the film gate and checked to see that the finger engages and moves the film, before putting on the cover.

PICTURE EDGES BLACK:—Finger or object obstructed lens when picture was taken.

PICTURE EDGES light or CLEAR:—Camera loaded in too brilliant light or film permitted to unreel while threading.

APPROXIMATE SIZE OF FIELD OBTAINED WITH A **KEYSTONE CAMERA** 8-M.M. USING ½″ LENS

DISTANCE FROM CAMERA IN FEET	SIZE OF VIEW IN FEET	
	VERTICAL Angle 14°.48′	HORIZONTAL Angle 19°.42′
1 foot with focusing mount lens only.	0′3″	0′4″
2 feet with focusing mount or with portrait attachment on fixed focus mount.	0′6″	0′8″
3 feet with focusing mount or with portrait attachment on fixed focus mount.	0′9″	0′12″
4 Feet	1′0″	1′3″
6 Feet	1′5″	2′0″
8 Feet	2′0″	2′7″
15 Feet	3′10″	4′11″
25 Feet	6′3″	8′4″
50 Feet	12′10″	17′1″
75 Feet	19′4″	25′8″
100 Feet	25′10″	34′4″
200 Feet	51′8″	68′8″
500 Feet	129′2″	171′8″

DEPTH OF FIELD TABLE

FOR USE WITH ½" CAMERA LENS FITTED WITH FOCUSING MOUNT

This table shows the distance in front of and behind the point of focus that is sharply defined. The hyperfocal distances are the nearest point in sharp focus when distance is focused upon. If the lens is focused on the hyperfocal distance the depth will then extend from a point one half of the hyperfocal to infinity.

All distances are in feet.

Distance Focused Upon	DIAPHRAGM APERTURES							
	f.1.9	*f*.2.5	*f*.3.5	*f*.4	*f*.5.6	*f*.8	*f*.11	*f*.16
2 feet	1.10 - 2.2	1.8 - 2.3	1.9 - -2.5	1.7 - 2.5	1.7 - 2.9	1.6 - 3.2	1.4 - 4.2	1.2 - 8.0
3 feet	2.8 - 3.6	2.5 - 3.7	2.5 - 4.0	2.3 - 4.2	2.2 - 4.11	1.11 - 16.0	1.8 - 18.3	1.5 - Inf.
4 feet	3.5 - 4.10	3.2 - 5.4	3 - 5.11	2.9 - 6.6	2.7 - 8.5	2.3 - 15.11	1.11 - Inf.	1.7 - Inf.
6 feet	4.9 - 8.2	4.3 - 9.8	4 - 11.10	3.9 - 14.2	3.4 - 28.6	2.10 - Inf.	2.4 - Inf.	1.10 - Inf.
8 feet	5.11 - 12.5	5.3 - 16.6	4.10 - 23.2	4.6 - 34.6	3.11 - Inf.	3.2 - Inf.	2.7 - Inf.	2.1 - Inf.
10 feet	6.11 - 18.0	6.1 - 28.5	5.6 - 56.0	5 - Inf.	4.4 - Inf.	3.5 - Inf.	2.8 - Inf.	2 - Inf.
12 feet	8.2 - 26.6	6.7 - 54.3	5.10 - Inf.	5.6 - Inf.	4.6 - Inf.	3.7 - Inf.	2.9 - Inf.	2 - Inf.
15 feet	9 - 45.0	7.6 - Inf.	6.9 - Inf.	6.1 - Inf.	5.1 - Inf.	4.2 - Inf.	3.1 - Inf.	2.3 - Inf.
25 feet	11.10 - Inf.	9.5 - Inf.	8.2 - Inf.	7.4 - Inf.	5.10 - Inf.	4.7 - Inf.	3.4 - Inf.	2.5 - Inf.
50 feet	15.6 - Inf.	11.7 - Inc.	9.10 - Inf.	8.6 - Inf.	6.4 - Inf.	4.7 - Inf.	3.5 - Inf.	2.5 - Inf.
Inf.	17.9 - Inf.	13.3 - Inf.	10.6 - Inf.	9.4 - Inf.	6.9 - Inf.	4.9 - Inf.	3.6 - Inf.	2.6 - Inf.
Hyper-focal Distance	**21.9**	**15.4**	**11.9**	**10.4**	**7.4**	**5.2**	**3.7**	**2.6**

f.3.5 and *f*.2.5 lenses are focused for 35 ft. distance

DEPTH OF FOCUS TABLES AND HYPERFOCAL DISTANCES

1½" FOCUS CINE-TELEPHOTO

Distance Focused Upon	*f*.3.5	*f*.4	*f*.5.6	*f*.8	*f*.11	*f*.16	*f*.22
5 feet	4.7 - 5.2	4.7 - 5.3	4.6 - 5.4	4.5 - 5.5	4.3 - 5.8	4.1 - 6.3	3.6 - 6.6
6 feet	5.6 - 6.4	5.6 - 6.4	5.6 - 6.7	5.4 - 6.10	5.2 - 7.3	4.9 - 8.11	4.5 - 9.3
7 feet	6.5 - 7.4	6.5 - 7.5	6.3 - 7.8	6 - 8.2	5.2 - 8.8	5.3 - 9.9	3.3 - 11.9
8 feet	7.3 - 8.9	7.3 - 8.7	7.2 - 9.1	6.10 - 9.8	6.6 - 10.5	6 - 12.2	5.5 - 15.2
10 feet	8.10 - 11.1	9.0 - 11.1	8.8 - 11.9	8.3 - 12.8	7.9 - 14.2	7. - 17.6	6.4 - 24.4
12 feet	10.9 - 13.5	10.6 - 13.7	10.2 - 14.7	9.7 - 16.2	8.10 - 18.6	7.14 - 24.7	7 - 40.10
15 feet	13.1 - 17.5	12.1 - 17.8	12.3 - 19.4	11.5 - 22.	10.5 - 26.10	9 - 42.	8 - Inf.
25 feet	20.2 - 32.7	19.7 - 34.	18 - 40.	16 - 54.	14 - 94.	12 - Inf.	10 - Inf.
50 feet	34.9 - 93.8	32.6 - Inf.	20.8 - Inf.	24.1 - Inf.	20.2 - Inf.	15.9 - Inf.	12.6 - Inf.
Hyper-focal Distance	**107**	**93.7**	**66.9**	**46.8**	**34**	**23.4**	**17**

IMPORTANT REMINDERS

1. *Remove rubber lens cap before taking pictures.*
2. *Make sure lens is clean—Do not take lens apart to clean.*
3. *Wind camera after each exposure.*
4. *Plan pictures and follow exposure instructions when setting lens stops. Shutter speed is 1/40 at 16 frames.*
5. *Check lens setting before each scene to see that it has not been moved from proper setting.*
6. *Be sure aperture plate and tension plate are clean and free from film emulsion dust or dirt. Use only a soft lintless cloth.*
7. *Check threading of film in camera before replacing cover.*
8. *Hold camera steady. Brace it against forehead or stationary objects.*
9. *Avoid panoraming. When necessary it must be done slowly and steadily.*
10. *Don't attempt to take pictures in poor light.*
11. *Never open camera until footage indicator is at "E," which indicates that all film has passed thru gate and is on take-up reel.*
12. *Hold camera vetically with carrying strap at bottom.*
13. *Make sure carrying strap screw is tight.*
14. *Don't oil camera, send it to factory.*
15. *Don't face the camera directly into the sun.*

WRITE FOR CATALOGUE

LISTING ALL KEYSTONE ACCESSORIES