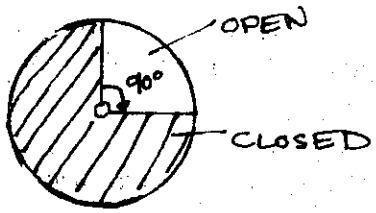
With A variable Shutter the angle can be changed. Therefore if we halved the shutter angle (from 180^0 to 90^0) the exposure time at 24 F.P.S. would be:

$E = 24 \times (360^0 - 90^0)$

$= 24 \times 4$

$= 96$

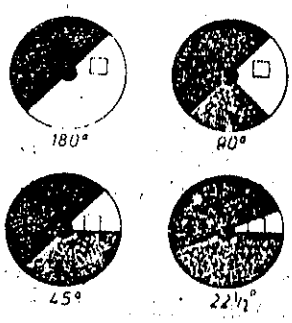
= 1/96th second (or roughly 1/100th)



Because only half as much light is being let through in the same amount of time we are losing 1 stop of exposure, and you would need to compensate on the Lens Aperture Ring,

ADJUSTABLE SHUTTERS

Effect of shutter opening (cut out) on exposure
180° = normal exposure;
90° = half normal exposure (add 1 stop);
45° = quarter normal exposure (add 2 stops);
22½° = eighth normal exposure (add three stops).



Exposure times at various shutter angles (24fps)

Shutter angle (degrees)	Exposure at 24 fps (nearest whole number)	Effect on exposure	Shutter angle (degrees)	Exposure at 24 fps (nearest whole number)	Effect on exposure
220	1/39	Increase 1/3 stop	120	1/72	Decrease 2/3 stop
210	1/41	" 1/3 "	110	1/79	" 2/3 "
200	1/43	" 1/6 "	100	1/86	" 2/3 "
190	1/45	" 1/6 "	90	1/96	" 1 "
180	1/48 (1/50 at 25 fps)	Normal	80	1/108	" 1 "
175	1/49	"	70	1/123	" 1 1/3 "
172·8	1/50	"	60	1/144	" 1 2/3 "
170	1/51	"	50	1/173	" 2 "
160	1/54	"	40	1/216	" 2 1/3 "
150	1/58	Decrease 1/3 stop	30	1/288	" 2 2/3 "
144	1/60	" 1/3 "	20	1/432	" 3 "
140	1/62	" 1/2 "	10	1/844	" 4 "
130	1/66	" 1/2 "	5	1/1728	" 5 "

The 1/> of a sec. exposure at 24 fps may easily be found (using an electronic calculator) by dividing 8640 by the shutter angle (9000 for 25 fps).

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H4.

Considerations of Shutter Angle

1) The wider the shutter opening the greater the image blur of a moving subject, making it possible to do faster pans without strobing. (this is because each individual frame is being exposed for a larger amount of time as the camera is panning and therefore each individual image is not very sharp. meaning that the difference in each image as it passes across large distances will be less distinct.)

2) Even though variations of shutter opening do not in themselves effect depth of field, a variable shutter could be used to control depth of field. (By closing down the shutter you would need to open up the lens aperture, which is what would decrease the depth of field).

3) By controlling the shutter opening you may be able to work at the best point on the lens for optimum optical definition (most lenses produce their best definition at an aperture 2 or 3 stops down from maximum, i.e. wide open, and performance falls off at the smallest opening of f16 and f22).

4) Adjusting the variable shutter while filming is also preferable if you wanted to compensate for a change in light levels, say, as you panned from the bright view outside a window, to the dim interior or a room.

If you opened up the lens aperture, as you panned, you would also be changing all sorts of optical characteristics of the lens, (including depth of field) that wouldn't be effected by changing the shutter opening.

Often the shutter will also act as a mirror to reflect the view (that is coming in through the lens) up to the eye-piece.

This is only the case with the first of the following two viewfinder systems.

1) Moving Mirror Reflex system (which allows all the light coming in through the lens to reach both the film and the eye-piece, (alternatively).

This mirror may be either part of the shutter (most common) or rotating separately but in sync with it.

Theoretically, what happens is that at the moment that the shutter is closed to the film, the mirror is reflecting the view up through the eye-piece.

When the shutter is open to the gate, and the film is being exposed, the shutter has rotated around and is closed to the eye-piece. This movement is usually so fast that we don't even notice the flicker. The only time that the shutter speed needs to be taken into account, regarding flicker, is when filming a T.V.Monitor, or Strobe or H.M.I. Lighting.

..... /6

2) Beam Splitter (Partial Reflectors)

A Beam Splitter is a block of glass (pellicule) on which there is a thin metallic coating that reflects part of the light to the view-finding system - the rest of it passed through to the film.

(Note : as the pellicule is an integral part of the optical system, optimum care must be taken not to touch or damage it)

FOCUSING THE ADJUSTABLE VIEWFINDER EYEPIECE

A) For cameras with interchangeable lenses and ground glass screens:-

- take off the lens and focus on a bright source, several feet away, by means of the moveable diopter, until the grains or cross hairs on the ground glass are as sharp as possible.

B) For fixed lens cameras (usually those with a fixed zoom lens) or with no ground glass screen:-

- turn to the longest focal length and adjust to the widest lens opening, and then focus on infinity. Focus on a distant object, turning the diopter until the object is as sharp as possible.

APERTURE SIZE - FILM FORMAT

The size of a film 35mm, 16mm, 8mm, also usually determines the dimensions of the image (the format)

In super 8 & 16mm, the format is usually what's known as academy which has a height to width raio of 1 : 1.33.

However, anything could be masked to what's considered as widescreen which is either 1 : 1.66, 1 : 1.75 or 1 : 1.85 and which is what 35mm films are usually shot at.

LENSES.

When white light travels through a prism into the spectrum of different colours. Each of these colours has a different wave-lenghth, and as each particular part of the specturm is refracted it disperses. It is impossible for all the wave lengths to be focused onto the same point.

Therefore, lenses form the image by combining 2 types of prisms :-

a) image forming/positive (thicker at the centre of the lens than at the edges)

b) Image forming/negative (thicker at the edges).

Neither of these particular types of elements can form an image by themselves and therefore are used in conjunction with each other in varying complex systems.

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FOCAL LENGTH

Focal length determines the size of the image. it is the distance from the optical centre of the lens, along the axis, to the point at which a sharply focused image is formed (i.e., at the film plane).

The shorter the focal length (e.g. a 10mm lens) the wider its field of view.

The longer the focal length (e.g. a 150mm lens) the more a part of the image is being magnified to fill the whole frame.

The linear dimensions of an image is recorded in direct proportion to focal length. E.g. filming an object with a 50mm lens at 10feet = filming the same object on a 25mm lens at 5feet.

But, as the focal length decreases (e.g. from 150mm to 10mm) and an object has to be moved closer to the lens in order to fill the frame, this change in distance also causes an apparent change in depth.

Shorter focal length lenses (wide angle) give a feeling or greater depth.

Long focal length lenses compress the look of distance and make objects that may actually be quite far away from each other, appear relatively near to each other.

Because of this, too, a long focal length lens tends to slow down movement away from or towards the camera lens, and therefore tracking appears to take much more time on a longer focal length lens than on a wide angle lens.

(With wide angle lenses, the subject appears to move much more rapidly towards or away from the camera, over a given distance.)

The actual tracking time, ofcourse, remains the same whatever the lens, but in terms of viewpoint, at close range, the change in subject size is greater and the distance covered therefore seems greater.

CHANGES IN LENS FOCAL LENGTH ACCORDING TO SCREEN FORMAT

Up from 8mm - 16mm - 35mm - 65mm, the lenses used on the wider formats (i.e. 65mm) are of a longer focal length compared to ones that would give the equivalent image size in, say 16mm.

For each frame size there are what's known as the 'normal' focal lengths, which supposedly correspond to human vision, and which have a focal length twice as long as the diagonal dimension of the frame.

E.g.:	65mm film	=	100mm focal length
	35mm film	=	50mm focal length
	16mm film	=	25mm focal length
	8mm film	=	13mm focal length

Because the larger formats require longer focal length lenses they therefore

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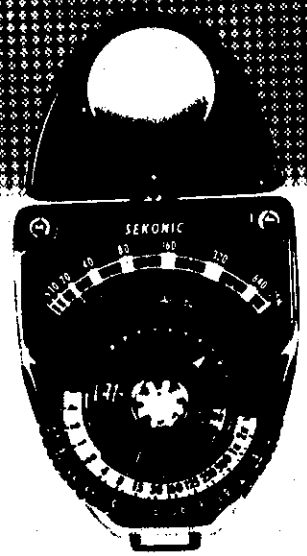
also have shallower depths of field than the narrower guages, and therefore require greater levels of illumination in order to stop down the lens aperture, to give sufficient depth of field.

SEKONIC STUDIO DELUXE



SEKONIC

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SEKONIC STUDIO DELUXE L-398
FEATURES

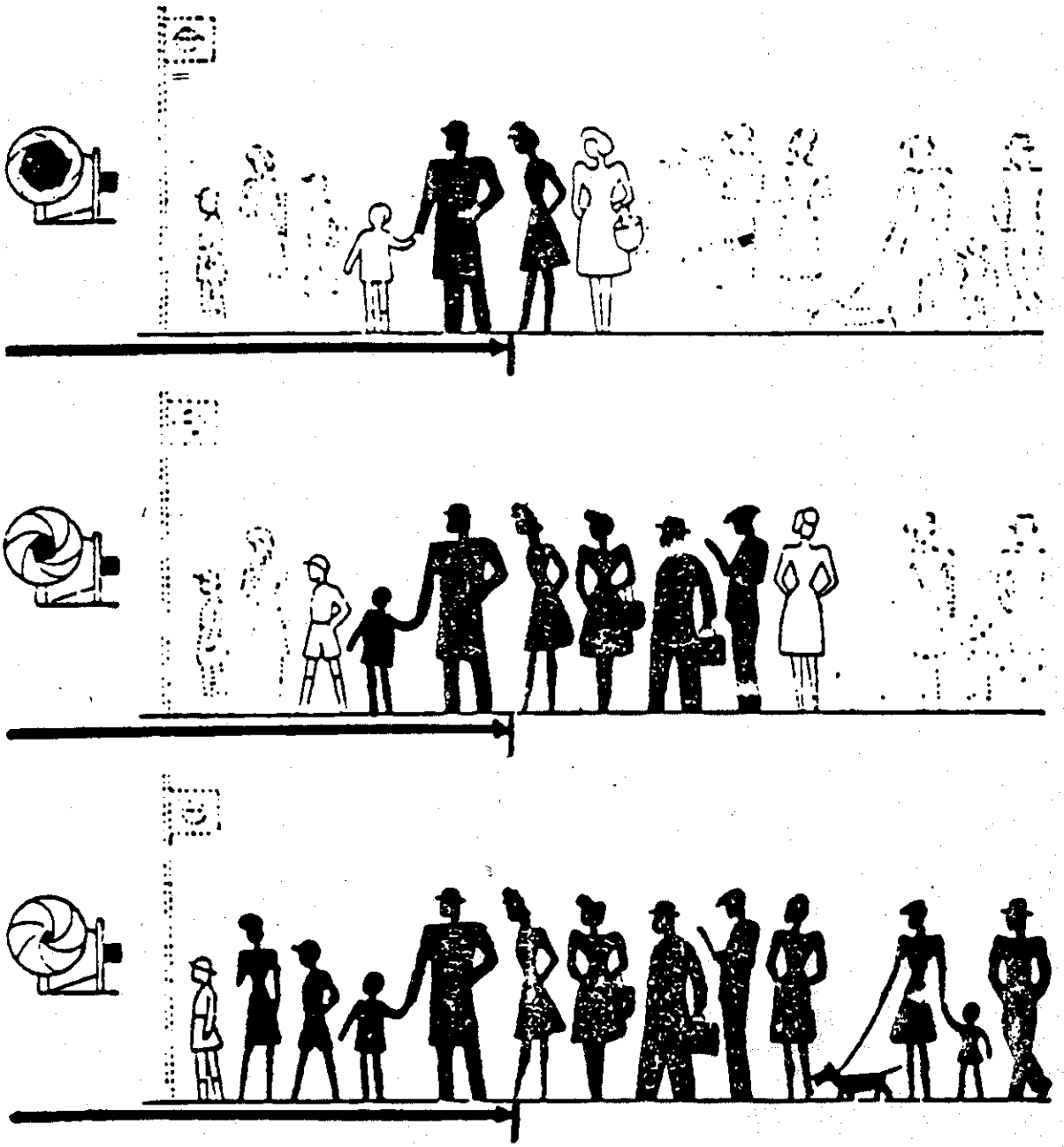
Nearly all photographic subjects combine complex variations of strongly reflecting surfaces (high reflectivity) and weakly reflecting surfaces (low reflectivity). These variations delicately influence exposure determination and to which portion the exposure is set becomes a vital factor that considerably affects the appearance of the finished photograph.

Although risk of failure can be minimized by taking maximum and minimum readings of all portions of the subject, then averaging the values, such an approach is both time consuming and tedious. The Studio Deluxe is the answer to this problem. It is designed around a standard reflectivity of 18%, which has been derived through measurements of various subjects throughout the seasons of the year.

Consequently, high effectiveness is displayed with subjects possessing reflectivities in the neighborhood of 18% (people, buildings, etc.) and when this can be considered the average value (street snapshots, trees, forest scenes, etc.).

1. Optimum exposure meter for incident light measuring method (also applicable for reflected light method).
2. Freely rotatable light sensor section for very easily performed measurements.
3. Meter stopper mechanism allows operation while hand is released from meter.
4. Meter release mechanism is also included which allows the needle to deflect freely. This provides greater convenience when determining light balance.
5. Lumisphere detects the same light as strikes the subject. Since subjects are normally 3-dimensional, according to the lighting conditions, brighter surfaces (highlights) and darker surfaces (shadows) are produced (illumination contrast). The Studio Deluxe mechanism automatically takes into account the strength of light from all directions, causing the meter to indicate a value applicable to photography. It is thus most convenient for determining typical exposures.

DEPTH OF FIELD AND APERTURE



Effect of aperture on the depth of field. As the lens is stopped down (from top to bottom) the depth of field increases. (From Depth of Focus, by A. Cox.)

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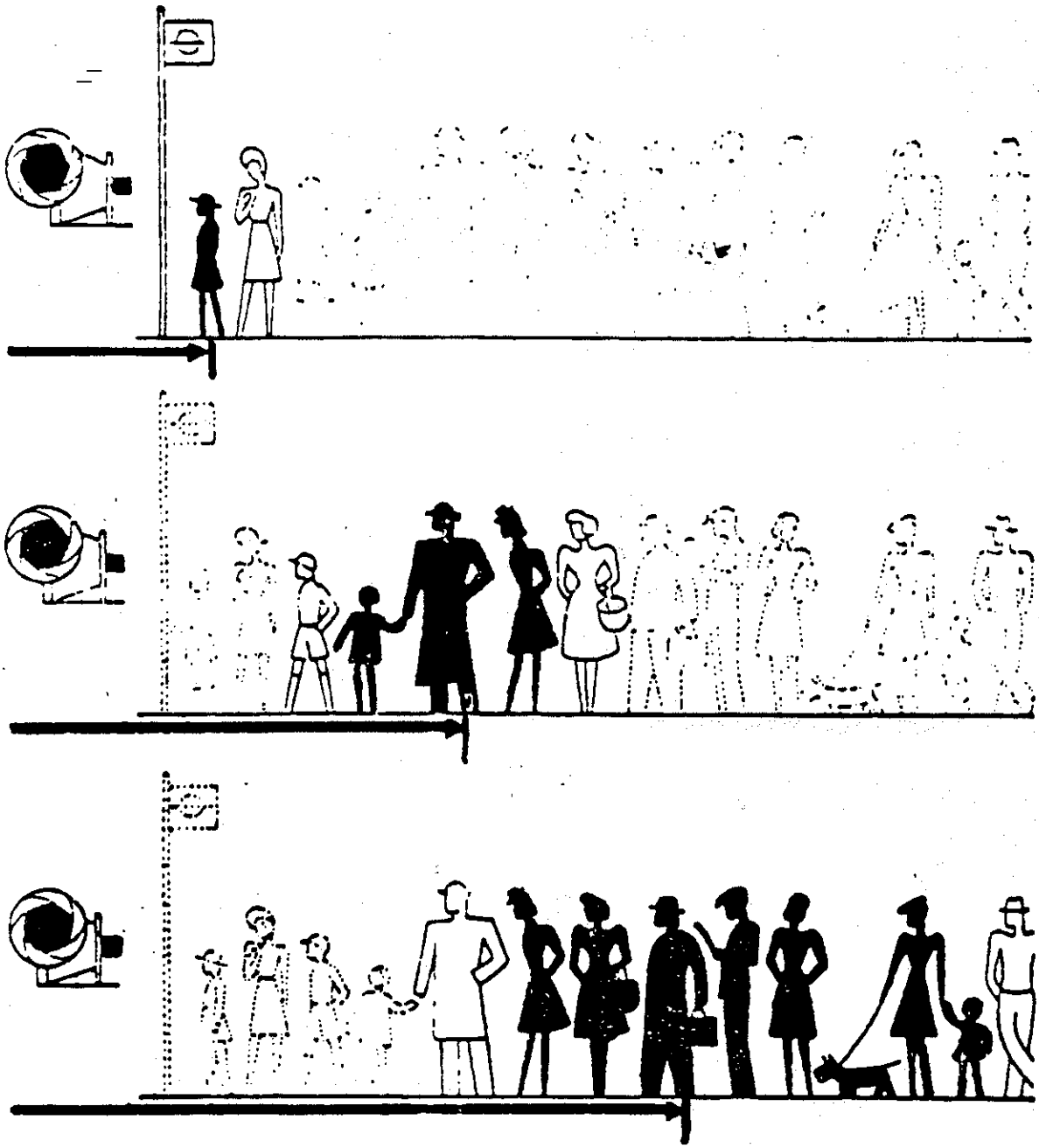
FOCAL LENGTH CONSTANT

FOCUS SETTING CONSTANT.

APERTURE CLOSED PROGRESSIVELY.

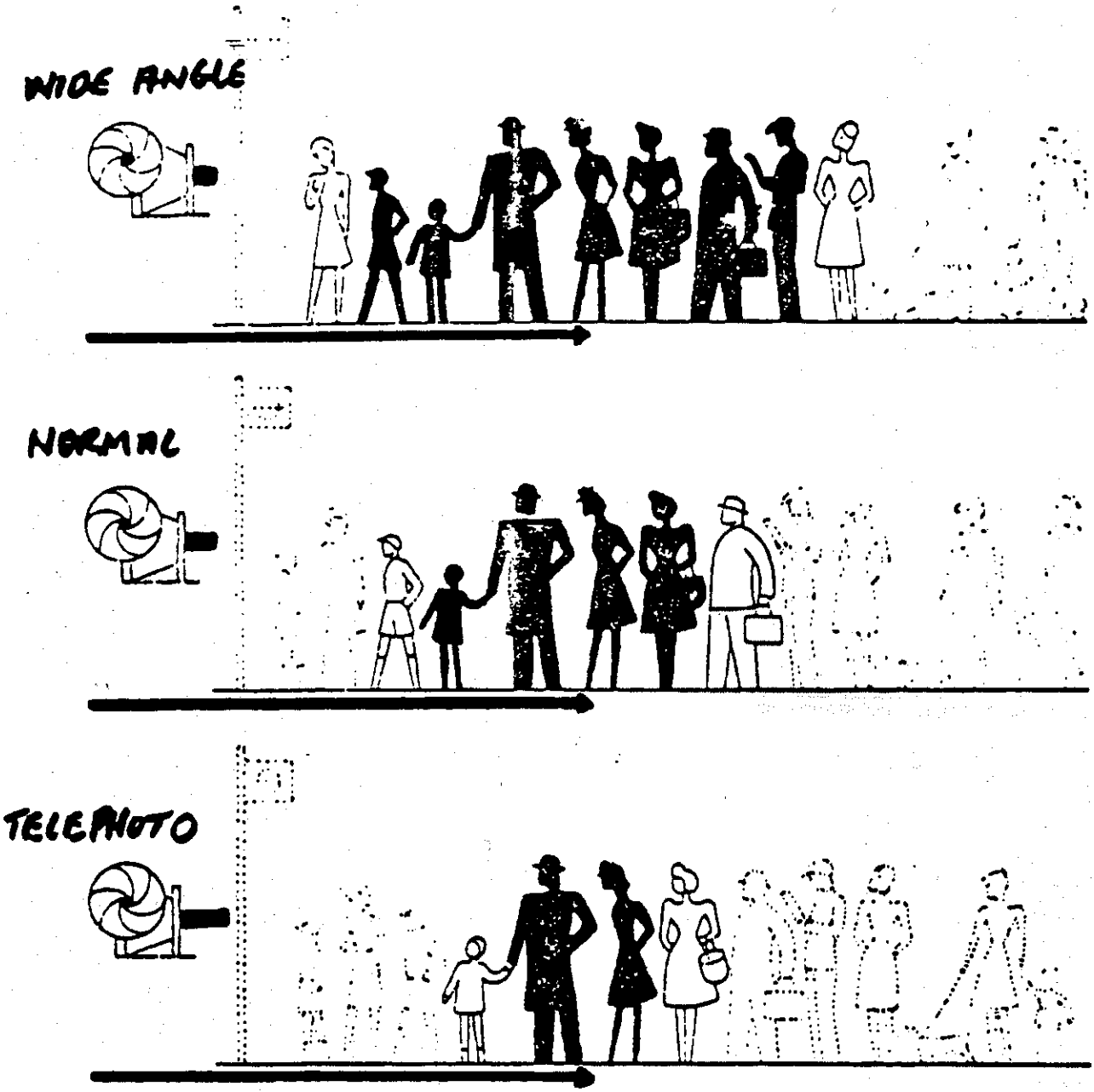
DEPTH OF FIELD AND FOCUSING DISTANCE



Effect of distance on depth of field. With a given aperture, the depth of field increases (from top to bottom) both in front of and behind the point focused on, as the focusing distance itself is increased. (From Depth of Focus, by A. Cox.)

FOCAL LENGTH CONSTANT
APERTURE CONSTANT
FOCUS POINT MOVES AWAY FROM CAMERA

DEPTH OF FIELD AND FOCAL LENGTH



Effect of focal length on depth of field. With a given lens aperture and focusing distance, the depth of field is less (from top to bottom) the longer the focal length of the lens used. (From Depth of Focus, by A. Cox.)

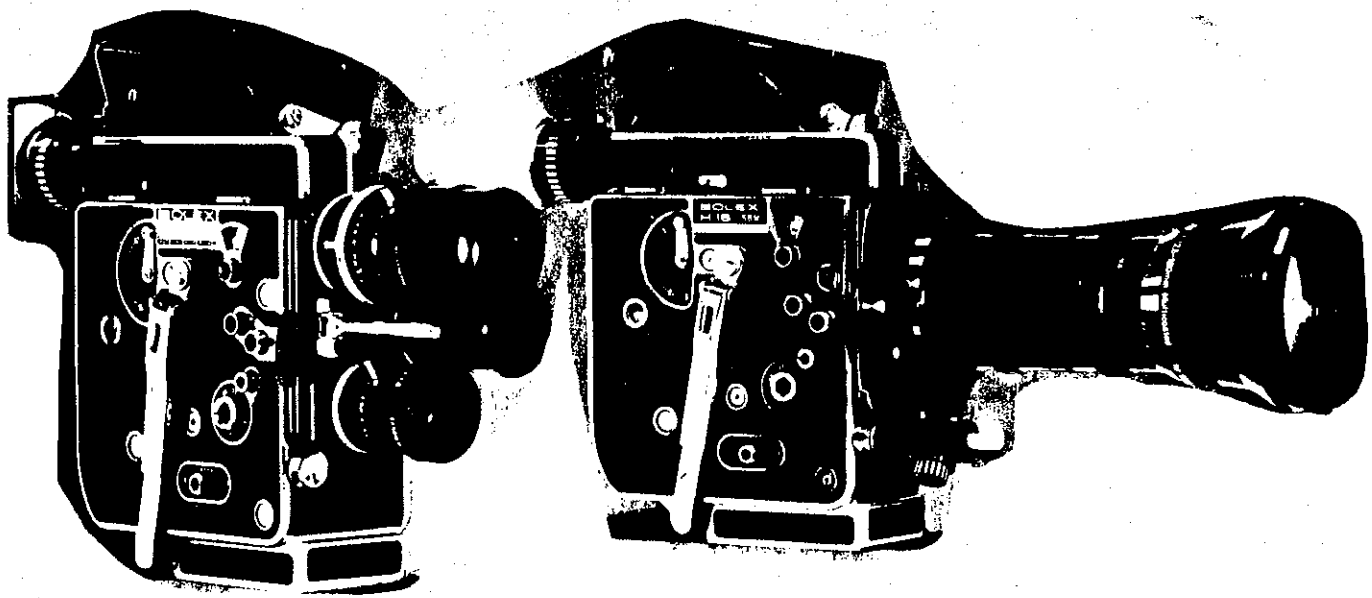
APERTURE CONSTANT

FOCUS POINT CONSTANT

FOCAL LENGTH INCREASING.

H16 RX-5/SBM

INSTRUCTIONS FOR USE



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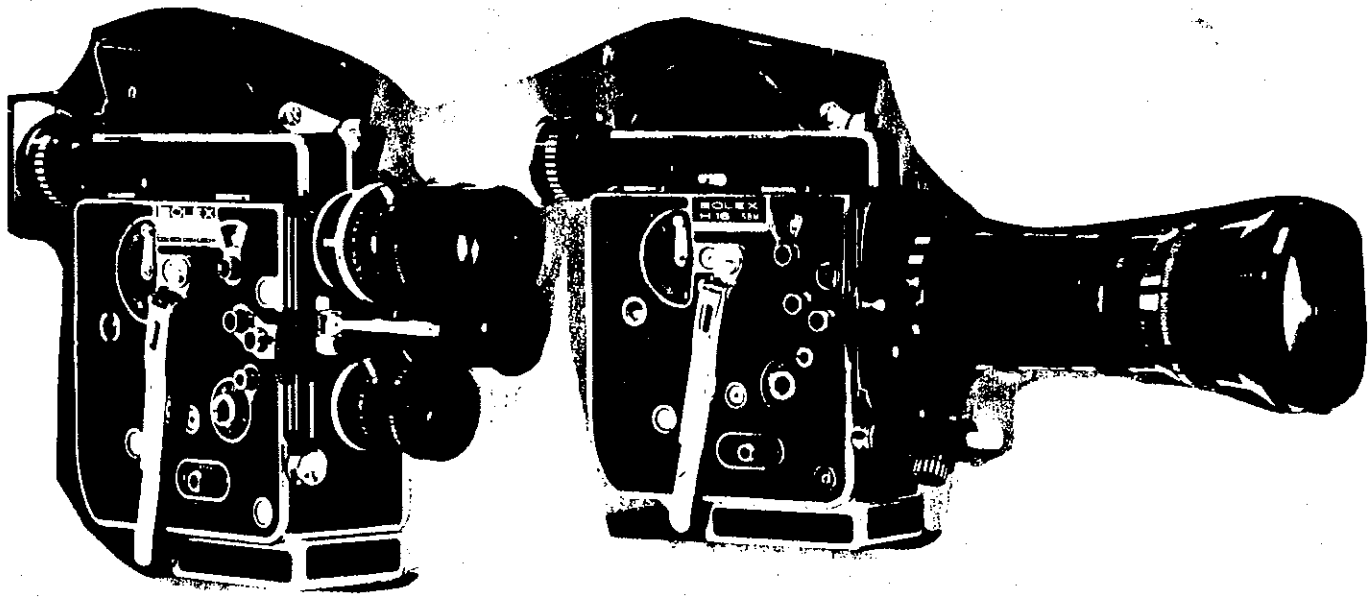
H16 RX-5/SBM

INSTRUCTIONS FOR USE



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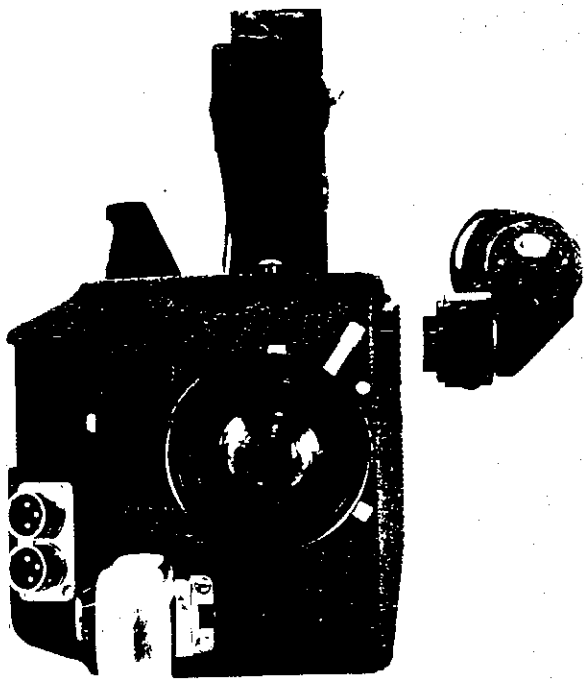
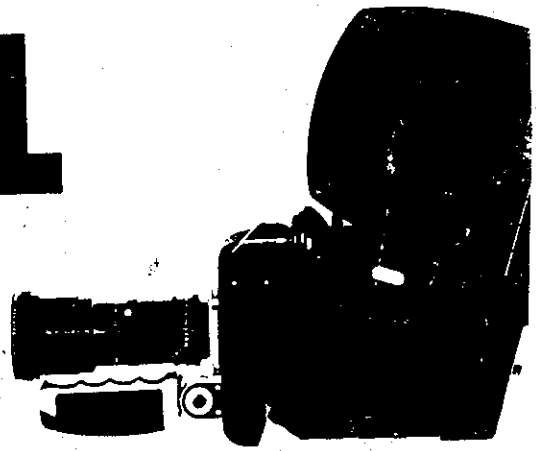


CP-16R Reflex OPERATION & MAINTENANCE MANUAL



cinema products

2037
Telepi

90025
nedevco

CP-16 proficiency test

1 Label the parts of the camera, knowing:
- control panel, film plane, sync warning light, pressure plate, gate, pull down claw, inching knob, etc.

2 Demonstrate cleaning of the camera and magazine.

3 Load the magazine in the black bag.

4 Attach magazine and battery to camera, attach the belt to the magazine.

5 Thread the film through the gate.

6 Check film for scratching and demonstrate finding the cause of a scratch.

7 Check camera is running to speed and change filming speeds.

8 Remove lens, clean and replace.

9 Change filter in camera and on the lens.

10 Focus and reposition the viewfinder.

11 Set aperture, lens and focal length.

12 Set up spreaders and tripod and attach camera.

13 PROBLEM SOLVING QUESTIONS:

What has happened if the camera will not start or runs intermittently?

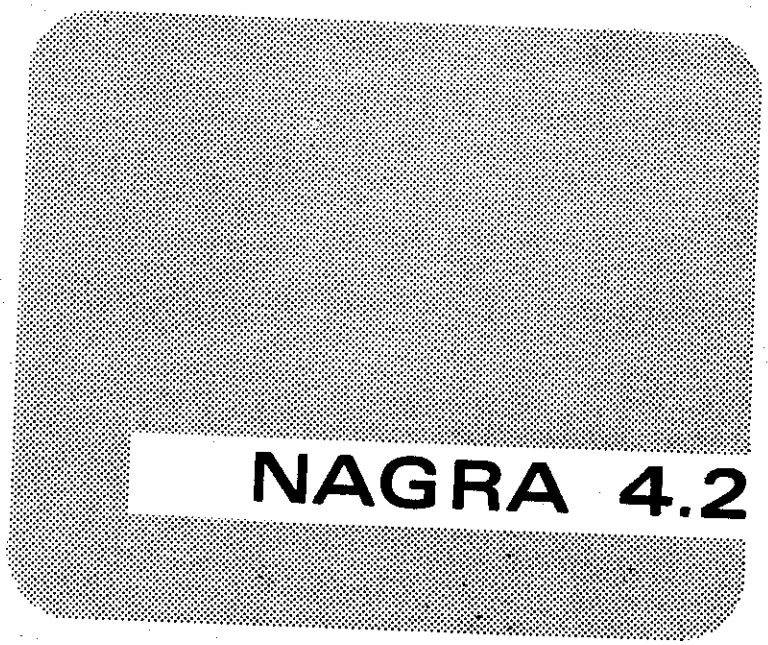
What causes film jams?

Where is the film likely to tear or puncture?

What has happened if:
- there is no take up?
- your film comes back from the lab fogged?
- your film comes back from the lab and the image is shaky and goes in and out of focus?
- the film loses the loop?
- the camera runs too fast or too slow?

NAGRA KUDELSKI

INSTRUCTION MANUAL



NAGRA 4.2