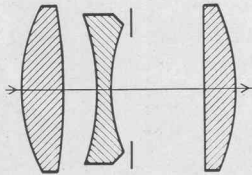


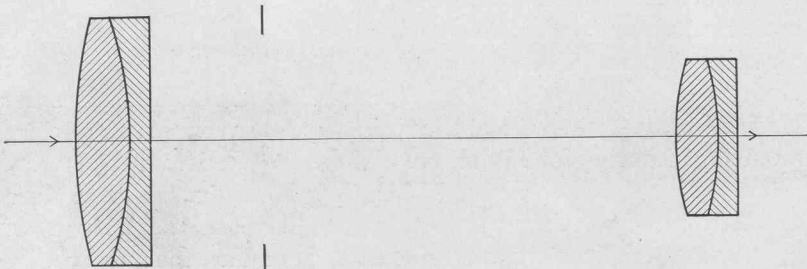
f/1.9 25M.M. LENS



f/2.7 15M.M. LENS  
(WIDE-ANGLE)



f/3.5 2 IN. LENS



f/2.7 2 1/2 IN. LENS  
f/2.7 4 IN. LENS



f/4.5 3 IN. LENS  
f/4.5 4 1/2 IN. LENS  
f/4.5 6 IN. LENS  
(TELEPHOTO)

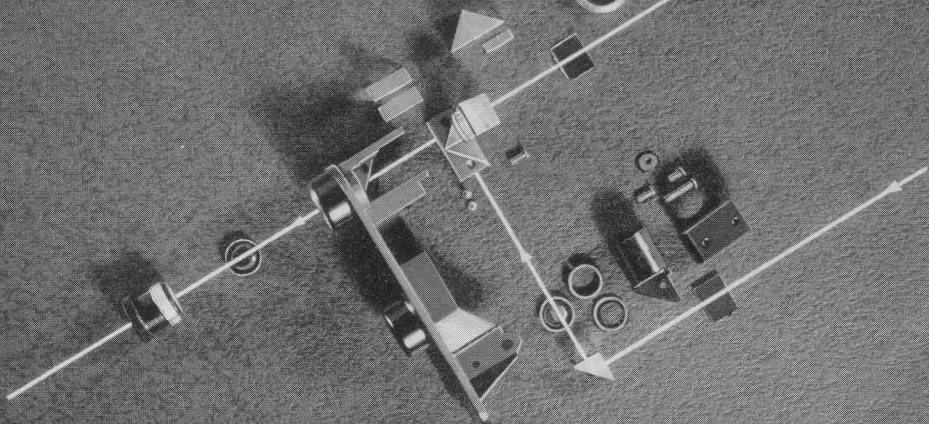
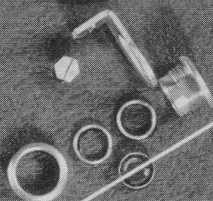
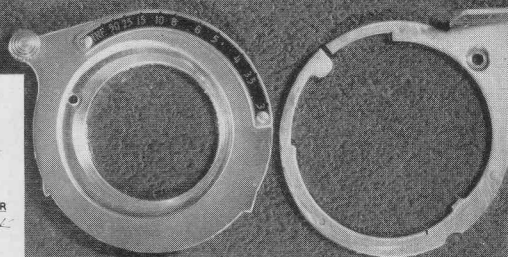
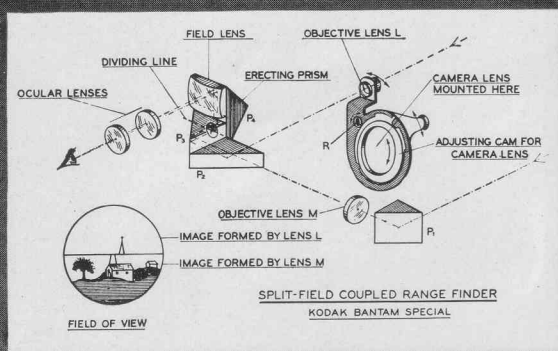
16 M.M. CINÉ-KODAK LENS TYPES

## RANGE FINDERS

As an aid to accurate focusing, certain Kodaks, notably the Kodak Bantam Special, have range finders coupled to the camera lenses. For cameras not so equipped, the Kodak Pocket Range Finder is available. Basically, range finders measure the angle of convergence between two beams of light coming from the same subject point and separated at the camera by the distance between the two range finder apertures. The range finder operates by changing the direction of one beam to bring the two in coincidence in the eye piece. In coupled range finders the movable prism or other means for deflecting the one beam is mechanically linked to focus the lens for the point of convergence of the two beams. The illustration below shows the two beams as coming from a distant object. The Kodak Pocket Range Finder contains a scale which translates angle of convergence to linear distance directly.

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- *Diagrammatic layout of the parts comprising the coupled range finder on the Kodak Bantam Special.*

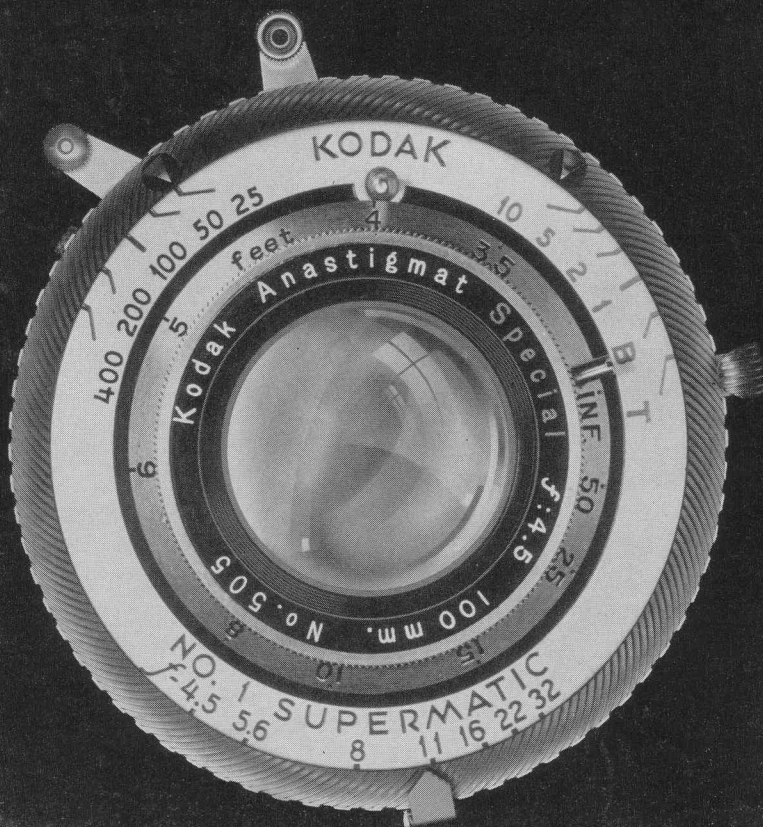


## KODAK SHUTTERS

KODAK shutters range from the Kodak Supermatic Shutter with a wide range of shutter settings to the Rotary Shutter, a simple, single speed shutter.

Precision shutters, employing many of the principles of fine watches, must be made to extremely close tolerances and assembled with great care. Kodak shutters and the dependability they represent are the result of careful design, selection of materials, precision manufacturing methods, craftsmen skilled in assembling, and careful final testing with the most accurate and modern instruments.

Kodak shutters are made of the finest materials available. For example, in the Supermatic Shutter, the bed or base plate is of nickel silver, and the gears are of polished nickel silver. The base plate is carefully milled and drilled to close tolerances. The gears are cut, after being cut are checked for accuracy of tooth shape, and are carefully scratchbrushed to remove all traces of burrs, filings, etc. The



actual assembly is done by craftsmen, many of whom were leading watchmakers. During the shutter assembly, each part is inspected and carefully fitted in place.

The speeds of the shutters are checked on several types of instruments designed for the purpose. In one type the shutter is mounted in an iris holder directly over a photocell. The shutter speed adjustment ring is

then set for the speed being tested. The shutter is tripped, and the amount of light passing through the shutter is determined by the amount of electrical energy produced by the light passing through the shutter and activating the photocell. The instrument is calibrated in such a way that the shutter speed is read directly on a dial. Other types of testing equipment are used to check the opening and closing time and over-all efficiency of the shutter.

- *The efficiency of each shutter is checked carefully on special testing apparatus.*



### **THE KODAK SUPERMATIC SHUTTER**

THIS is the newest and by far the most versatile of the Kodak shutters. It has a speed range of from 1 second to 1/400 second, time, and bulb and is of the gear-train retard, pre-setting type. The exposure time, or shutter speed, is controlled by two variables: 1, the chosen length of the geared sector of one member of the gear-train retard; and 2, the speed of the gears of the train which is controlled by the position of a small oscillating pallet relative to a ratchet wheel, a system similar in principle to a fine watch escapement. These two variables are controlled by cams adjusted by the shutter speed setting ring.

The five blades of the Supermatic Shutter are made of spring steel only .0015 inch thick. These very thin blades have very little inertia and are easily opened and closed in the minutest fraction of a second, which results in very high over-all efficiency and accuracy. An ad-

justable iris diaphragm, of course, is an integral part of the shutter.

A special feature of the Kodak Supermatic Shutter is the two-color speed adjusting ring. Speed settings up to and including 1/10 second are marked in red, indicating that such exposures require a tripod or other firm support. Speed settings from 1/25 to 1/400 second are marked in black and can be used for hand-held exposures. A delayed-action device is incorporated which when desired automatically operates the shutter from 12 to 15 seconds after the release lever has been tripped.

The Kodak Supermatic Shutter easily meets any formerly accepted high standard of between-the-lens shutter efficiency. It is tested under rigorous conditions, and these tests prove that the shutter maintains its accuracy throughout periods of long and continual usage.

**The Kodamatic Shutter** is also a gear-train retard, pre-setting type of shutter. It has five speeds from 1/10 to 1/200 second, time, and bulb. The Kodamatic Shutter is a highly accurate, rim-set shutter. It is also equipped with a built-in adjustable iris diaphragm and delayed-action device.

**The Diomatic Shutter** is a gear-train retard, pre-setting type of shutter with built-in iris diaphragm and delayed-action device. The speed range is from 1/25 to 1/150 second, time, and bulb. In this shutter, because of the shorter shutter speed range, the speed of the gear-train retard can be controlled effectively by the inertia of a small flywheel instead of by a ratchet and pallet.

**The Kodex Shutter** is a simple type of automatic or self-setting shutter. It has three speeds from 1/25 to 1/100 second, time, and bulb. In this shutter, the speeds are controlled by the inertia of a small slip-off toggle and by careful adjustment of the spring tension. This shutter also has a built-in iris diaphragm.

#### **SHUTTERS FOR SIMPLE CAMERAS**

THE Rotary Shutter is a single blade, single speed shutter (approximately 1/30 second), used on Brownies and other simple cameras. The shutters on the Eastman Bullet camera, the Kodak Bantam Doublet,  $f/8$ , and  $f/6.3$ , are also of this type, but have been speeded to approximately 1/50 second. A modification of the Rotary Shutter is used on the simplest folding Kodaks.

The dependability of all Kodak shutters, from the simplest to the most versatile, is one of the contributing factors to the excellent results secured with cameras of Eastman manufacture.

### CARE OF LENSES

FOR best performance of a lens:

Do not allow a lens to fall or to get a sudden jar.

Protect the lens as much as possible from dust and fingermarks.

Use a carrying case and keep folding cameras closed when they are not in use.

Do not subject a lens to sudden and extreme temperature changes, nor keep it near a steam pipe.

Do not expose for long periods to direct rays of the sun.

Avoid keeping a lens in damp places.

Never use acids, alcohol, or other solvents for cleaning.

Occasional cleaning is not only advisable, but also very necessary when the lenses show dust, fingermarks, or moisture on the surfaces. Kodak Lens Cleaner and Kodak Lens Tissue are supplied for this purpose and are especially recommended.

If the inner surfaces require cleaning, return the lens to the manufacturer. Never attempt to take a lens apart.

Should a lens or mounting require more attention than the above, return it to the manufacturer.

## KODAK LENS SPECIFICATIONS

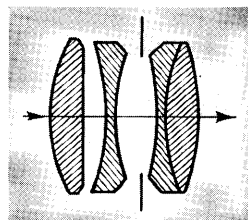
THE following pages contain data intended for use in working with Kodak Lenses. All data pertinent to any one lens are on the same page and include attachment size, angle of view, field sizes, depth of field, shutter data, and a cross-sectional diagram of the lens. A table of dimensions for lenses supplied as separate units is on page 50. These data are included to assist in the mounting and use of such lenses.

The following pages also contain a number of optical formulas for use in specialized work such as small-object photography and some projection setups. These formulas apply to ordinary camera and enlarger lenses with practical accuracy if distances are measured to the center of the lens. This approximation does not apply to telephoto lenses in which the principal planes may be some distance in front of the lens.

## Specifications:

### EASTMAN EKTAR $f/6.3$ , 14-INCH

This lens is intended primarily for making direct color transparencies on Kodachrome Professional Film or color separation negatives. Although designed specifically for color work, its use is by no means limited; it is suitable for all types of photography where image size on the plate is not larger than  $\frac{1}{3}$  the subject size. This lens has been exceedingly well corrected for all lens aberrations such as coma, astigmatism, distortion, curvature of field, and spherical and chromatic aberration both lateral and longitudinal. This lens is available either in barrel or shutter.



**Lens Speed:**  $f/6.3$  with marked relative apertures of  $f/6.3$ ,  $f/8$ ,  $f/11$ ,  $f/16$ ,  $f/22$ ,  $f/32$ , and  $f/45$ . In barrel the diaphragm setting ring has "click" stops. As each marked  $f$ /number passes the index mark, a distinct click is heard and felt. This is helpful when the diaphragm scale cannot be seen conveniently.

**Focal Length:** 14 inches.

**Angle of View and Negative Size:** This lens covers a field of more than  $53^\circ$  which is adequate for a 10 x 12 film. It is intended, however, for use on the Eastman Commercial View Camera (All-Metal) or cameras of similar type and size. When used with a film or plate size of 8 x 10 inches, full use can be made of rising and falling fronts and swing backs. Angle of view when focused for infinity and for 8 x 10 negative size,  $32^\circ \times 40^\circ$ .

**Focusing Range:** From infinity to  $\frac{1}{3}$  subject-size by ground glass. This lens on enlargers or projection printers is not recommended for color work.

**Shutter Speeds:** 1, 1/2, 1/5, 1/10, 1/25, 1/50, T, and B.

**Attachments Available:** Wratten Filters, and Eastman Pola-Screens Type I with Eastman Lens Hood and Screen Holder.

**Depth of Field:** For Critical Definition.

Distance Focused Upon	Approximate Field Size 8 x 10 Neg.	DEPTH OF FIELD—IN FEET. Circle of Confusion, $f/2000$				
		$f/6.3$	$f/11$	$f/16$	$f/22$	$f/45$
INF.	$32^\circ \times 40^\circ$	310 to inf.	180 to inf.	124 to inf.	92 to inf.	45 to inf.
400 feet	$228' \times 285'$	172 to inf.	114 to inf.	92 to inf.	74 to inf.	40 to inf.
200 feet	$113' \times 142'$	128 to 540	93 to inf.	78 to inf.	63 to inf.	36 to inf.
100 feet	$56' \times 71'$	76 to 146	65 to 230	56 to inf.	48 to inf.	31 to inf.
50 feet	$28' \times 35'$	44 to 59	38 to 69	36 to 84	32 to 110	24 to inf.
25 feet	$14' \times 17'$	23 to 27	22 to 29	21 to 31	19 to 34	16 to 61
15 feet	$8' \times 10'$	$14\frac{1}{2}$ to 16	14 to $16\frac{1}{2}$	13 to 17	13 to 18	11 to 25
10 feet	$5' \times 6\frac{1}{2}'$	$9\frac{1}{2}$ to $10\frac{1}{2}$	$9\frac{1}{2}$ to $10\frac{1}{2}$	9 to 11	9 to $11\frac{1}{2}$	8 to 13
8 feet	$3\frac{1}{2}' \times 4\frac{1}{2}'$	$7\frac{1}{2}$ to $8\frac{1}{2}$	$7\frac{1}{2}$ to $8\frac{1}{2}$	7 to $8\frac{1}{2}$	7 to $8\frac{1}{2}$	6 to $9\frac{1}{2}$
6 feet	$2\frac{1}{2}' \times 3\frac{1}{2}'$	$5\frac{1}{2}$ to 6	$5\frac{1}{2}$ to 6	5 to $6\frac{1}{2}$	5 to $6\frac{1}{2}$	5 to $6\frac{1}{2}$
5 feet	$2\frac{1}{4}' \times 2\frac{3}{4}'$	$4\frac{1}{2}$ to $5\frac{1}{2}$	$4\frac{1}{2}$ to $5\frac{1}{2}$	4 to $5\frac{1}{2}$	4 to $5\frac{1}{2}$	4 to $5\frac{1}{2}$
4 feet	$1\frac{3}{4}' \times 2'$	$3\frac{1}{2}$ to $4\frac{1}{2}$	$3\frac{1}{2}$ to $4\frac{1}{2}$	3 to $4\frac{1}{2}$	3 to $4\frac{1}{2}$	3 to $4\frac{1}{2}$
$3\frac{1}{2}$ feet	$1\frac{1}{2}' \times 1\frac{3}{4}'$	$3\frac{1}{2}$ to $3\frac{1}{2}$	$3\frac{1}{2}$ to $3\frac{1}{2}$	3 to $3\frac{1}{2}$	3 to $3\frac{1}{2}$	3 to $3\frac{1}{2}$

The depth is not given for  $f/8$  or  $f/32$ . For these openings depth can be estimated by comparison.

● **Effective Aperture for Close-ups** differs from the indicated aperture for any lens. This is especially important when long focus lenses are used for Kodachrome.

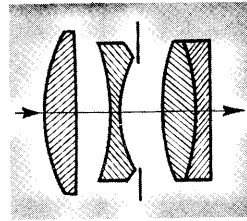
$$\text{Effective } f\text{-number (for any subject distance)} = \frac{v \times f}{f}$$

where  $v$  = lens-to-film distance, or focal length plus lens extension from infinity focus  
 and  $f/$  = indicated  $f$ -number of aperture  
 and  $f$  = focal length

For close-ups, allow this aperture correction, or increase exposure time by  $v^2/f^2$ .

**Specifications:**

**No. 772 KODAK EKTAR**  
**f/3.7, 107 mm.**



This lens has been designed for use on press and reflex cameras of Speed Graphic and Graflex types and is supplied in the OS Compur-Rapid Shutter. It has been corrected for all the usual lens aberrations. Residual astigmatism has been reduced to an absolute minimum. Flare and loss of light by surface reflection have been overcome to a large degree by keeping the glass-air surface down to a minimum (only 6 glass-air surfaces). Lens corrections are maintained from infinity to  $\frac{1}{3}$  subject size at f/3.7. The performance of this lens, like other Ektars, is unsurpassed by any lens of similar type. This lens is especially suited for use with Kodachrome Professional Film.

**Lens Speed:** f/3.7 with marked relative apertures of f/3.7, f/4.5, f/5.6, f/6.3, f/8, f/11, f/16, f/22, and f/32.

**Focal Length:** 107 mm., Back Focus,\* 86 mm.

**Lens Flange Mounting Hole:**  $1\frac{3}{8}$  inches diameter.

**Shutter Speeds:** 1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100, 1/250, 1/500, T, and B.

**Negative Size:**  $2\frac{1}{4} \times 3\frac{1}{4}$  inches.

**Angle of View:** When focused for infinity,  $31^\circ \times 42^\circ$ .

**Attachment Size:**  $1\frac{1}{2}$  in., 38 mm., No. 23.

**Attachments Available:** Kodak Combination Lens Attachments Series VI with Wratten Filters, Kodak Pola-Screens Type 1A and Lens Hood.

**Depth of Field:** For Critical Definition.

Distance Focused Upon	Approximate Field Size with $2\frac{1}{4} \times 3\frac{1}{4}$ " neg.	DEPTH OF FIELD—IN FEET. Circle of Confusion, f/2000					
		f/3.7	f/5.6	f/8	f/11	f/16	f/32
INF.	$31^\circ \times 42^\circ$	170 to inf.	110 to inf.	77 to inf.	55 to inf.	38 to inf.	19 to inf.
100 feet	$53' \times 77'$	63 to 220	52 to inf.	43 to inf.	36 to inf.	28 to inf.	16 to inf.
50 feet	$26\frac{1}{2}' \times 38\frac{1}{2}'$	39 to 70	34 to 92	30 to 145	26 to inf.	21 to inf.	14 to inf.
25 feet	$13\frac{1}{2}' \times 19\frac{1}{2}'$	22 to 29	20 to 32	19 to 37	17 to 44	15 to 73	$10\frac{1}{2}$ to inf.
15 feet	$7\frac{7}{8}' \times 11\frac{1}{8}'$	13 to $16\frac{1}{2}$	$13\frac{1}{2}$ to $17\frac{1}{2}$	$12\frac{1}{2}$ to 19	11 to 22	$10\frac{1}{2}$ to 27	$8\frac{1}{2}$ to 90
10 feet	$5\frac{1}{2}' \times 7\frac{1}{2}'$	9 to $10\frac{1}{2}$	$9\frac{1}{2}$ to 11	9 to $11\frac{1}{2}$	$8\frac{1}{2}$ to $12\frac{1}{2}$	8 to $13\frac{1}{2}$	$6\frac{1}{2}$ to 19
8 feet	$4\frac{1}{2}' \times 5\frac{1}{2}'$	7 to 8	$7\frac{1}{2}$ to 8	$7\frac{1}{2}$ to 9	7 to 9	6 to 10	5 to $13\frac{1}{2}$
6 feet	$3\frac{3}{4}' \times 4\frac{3}{4}'$	5 to 6	$5\frac{1}{2}$ to 6	$5\frac{1}{2}$ to 6	5 to 6	5 to 7	4 to 8
5 feet	$2\frac{1}{2}' \times 3\frac{1}{2}'$	4 to 5	$4\frac{1}{2}$ to 5	$4\frac{1}{2}$ to 5	4 to 5	4 to 5	4 to 6
4 feet	$2\frac{1}{2}' \times 2\frac{1}{2}'$	3 to 4	3 to 4	$3\frac{1}{2}$ to 4	3 to 4	3 to 4	$3\frac{1}{2}$ to 5
$3\frac{1}{2}$ feet	$1\frac{3}{4}' \times 2\frac{1}{2}'$	$3\frac{1}{2}$ to $3\frac{1}{2}$	$3\frac{1}{2}$ to $3\frac{1}{2}$	$3\frac{1}{2}$ to $3\frac{1}{2}$	3 to $3\frac{1}{2}$	$3\frac{1}{2}$ to 3	3 to 4

The depth is not given for f/4.5 or f/22. For these openings it can be estimated by comparison.  
\*Back focus is measured from the rear glass surface to the focal plane.

● **Formulas for approximate position of subject and image:**

f = focal length                      u = subject distance                      h = height of subject  
m = magnification                      v = image distance                      h' = height of image  
x' = distance of image from focal point, or distance lens is moved from infinity setting

$$v = \frac{fu}{u-f} = mu = (m+1)f \quad u = \frac{fv}{v-f} = \frac{v}{m} = \left\{ \frac{1}{m} + 1 \right\} f \quad x' = \frac{f^2}{u-f}$$

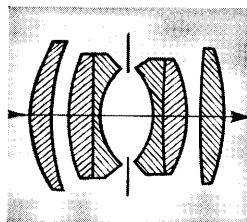
$$m = \frac{h'}{h} = \frac{v}{u} = \frac{v-f}{f} = \frac{f}{u-f} \quad u+v = \frac{(m+1)^2}{m} f$$

Practical accuracy results if u and v are measured from the lens center.

## Specifications:

### KODAK EKTAR $f/2.0$ , 45 mm.

(as used on the Kodak Bantam Special)



This lens, the fastest Kodak Ektar of this focal length, is unexcelled in design and performance. It is made with the newest of optical glasses and mounted with greatest precision. It has an exceptionally wide angle of view, and the field is sharp at all focusing distances. It is well corrected for all aberration.

**Lens Speed:**  $f/2.0$ , marked apertures— $f/2.0$ ,  $f/2.8$ ,  $f/4$ ,  $f/5.6$ ,  $f/8$ ,  $f/11$ , and  $f/16$ .

**Focal Length:** 45 mm.

**Focusing Range:** Infinity to 3 feet, coupled range finder, marked distances of infinity, 50, 25, 15, 10, 8, 6, 5, 4,  $3\frac{1}{2}$ , and 3 feet.

**Shutter Speeds:** 1,  $\frac{1}{2}$ ,  $\frac{1}{5}$ ,  $\frac{1}{10}$ ,  $\frac{1}{25}$ ,  $\frac{1}{50}$ ,  $\frac{1}{100}$ ,  $\frac{1}{250}$ ,  $\frac{1}{500}$  sec., T, and B.

**Negative Size:** 28 x 40 mm.

**Angle of View:** When focused for infinity,  $35^\circ \times 48^\circ$ .

**Attachment Size:**  $1\frac{1}{4}$  in., 31.5 mm., No. 5A.

**Attachments Available:** Portrait Attachment, Supplementary Lenses II+ and III+, Diffusion Portrait Attachment, Pictorial Diffusion Disk, Sky Filter, Color Filter, Kodak Combination Lens Attachments, Series VI with Wratten Filters, Kodak Pola-Screens Type 1A, and Lens Hood VI A.

### Working Distance and Field Size with Portrait Attachment and Supplementary Lenses:

With the Focus Set At	Portrait Attachment ( $\frac{2}{3}$ Diopter or 52.5 in. focal length)		Supplementary Lens II+ (2 Diopters or $19\frac{1}{2}$ in. focal length)		Supplementary Lens III+ (3 Diopters or $13\frac{1}{2}$ in. focal length)	
	Distance Subject to Shutter	Field Size	Distance Subject to Shutter	Field Size	Distance Subject to Shutter	Field Size
INF.	55 $\frac{1}{8}$ in.	34 $\frac{1}{2}$ x 49 $\frac{1}{2}$ in.	19 $\frac{1}{2}$ in.	12 $\frac{1}{2}$ x 17 $\frac{1}{2}$ in.	13 $\frac{1}{2}$ in.	8 $\frac{1}{2}$ x 12 $\frac{1}{2}$ in.
50 feet	50 $\frac{1}{8}$ in.	31 $\frac{1}{2}$ x 44 in.	19 $\frac{1}{2}$ in.	11 $\frac{1}{2}$ x 16 $\frac{1}{2}$ in.	13 $\frac{1}{2}$ in.	8 $\frac{1}{2}$ x 11 in.
25 feet	46 $\frac{1}{8}$ in.	29 x 41 $\frac{1}{2}$ in.	18 $\frac{1}{2}$ in.	11 $\frac{1}{2}$ x 16 $\frac{1}{2}$ in.	13 $\frac{1}{2}$ in.	8 x 11 in.
15 feet	42 $\frac{1}{8}$ in.	26 $\frac{1}{2}$ x 37 in.	17 $\frac{1}{2}$ in.	11 x 15 $\frac{1}{2}$ in.	12 in.	7 x 11 in.
10 feet	37 $\frac{1}{4}$ in.	23 $\frac{1}{2}$ x 33 in.	17 in.	10 $\frac{3}{4}$ x 14 $\frac{1}{2}$ in.	12 in.	7 x 10 in.
8 feet	35 in.	21 x 30 in.	16 $\frac{1}{2}$ in.	10 x 14 $\frac{1}{2}$ in.	11 in.	7 x 10 in.
6 feet	31 $\frac{1}{4}$ in.	19 x 27 in.	15 $\frac{1}{2}$ in.	9 $\frac{3}{4}$ x 13 $\frac{3}{4}$ in.	11 in.	7 x 9 in.
5 feet	28 $\frac{1}{2}$ in.	17 x 24 in.	14 $\frac{1}{2}$ in.	8 $\frac{3}{4}$ x 12 $\frac{1}{2}$ in.	11 in.	6 $\frac{3}{4}$ x 9 in.
4 feet	25 $\frac{1}{2}$ in.	15 x 22 in.	14 in.	8 $\frac{1}{2}$ x 11 $\frac{1}{2}$ in.	10 $\frac{1}{2}$ in.	6 $\frac{1}{2}$ x 9 in.
3 $\frac{1}{2}$ feet	23 $\frac{1}{2}$ in.	14 x 20 in.	13 $\frac{1}{2}$ in.	8 x 11 $\frac{1}{2}$ in.	10 in.	6 x 8 in.
3 feet	20 $\frac{1}{2}$ in.	12 x 17 in.	12 $\frac{1}{2}$ in.	7 $\frac{1}{2}$ x 10 $\frac{1}{2}$ in.	9 in.	5 x 8 in.

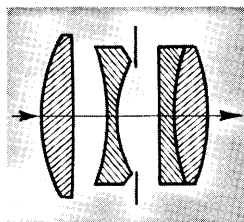
### Depth of Field:

Distance Focused Upon	Approximate Field Size	DEPTH OF FIELD—IN FEET. Circle of Confusion, $\frac{1}{500}$ inch.				
		$f/2.0$	$f/4$	$f/8$	$f/11$	$f/16$
INF.	$35^\circ \times 48^\circ$	65 to inf.	32 to inf.	16 to inf.	12 to inf.	8 to inf.
50 feet	30 $\frac{1}{4}$ x 42 $\frac{1}{2}$ '	28 to inf.	19 to inf.	12 $\frac{1}{2}$ to inf.	9 $\frac{3}{4}$ to inf.	7 to inf.
25 feet	15 $\frac{1}{2}$ x 22'	18 to 40	14 to 106	10 to inf.	8 to inf.	6 to inf.
15 feet	9 $\frac{3}{4}$ x 13 $\frac{1}{2}$ '	12 to 19	10 $\frac{1}{2}$ to 27	8 to inf.	6 $\frac{3}{4}$ to inf.	5 $\frac{1}{2}$ to inf.
10 feet	6 $\frac{3}{4}$ x 8 $\frac{1}{2}$ '	8 $\frac{1}{2}$ to 12	7 $\frac{3}{8}$ to 14 $\frac{1}{2}$	6 $\frac{1}{2}$ to 25	5 $\frac{1}{2}$ to 62	4 $\frac{1}{2}$ to inf.
8 feet	4 $\frac{3}{8}$ x 6 $\frac{1}{2}$ '	7 to 9	6 $\frac{1}{2}$ to 10 $\frac{3}{4}$	5 $\frac{1}{2}$ to 15 $\frac{3}{4}$	4 $\frac{1}{2}$ to 24	4 to inf.
6 feet	3 $\frac{3}{8}$ x 5 $\frac{1}{2}$ '	5 to 6 $\frac{3}{4}$	5 to 7 $\frac{1}{2}$	4 $\frac{1}{2}$ to 9 $\frac{3}{4}$	4 to 12 $\frac{1}{2}$	3 $\frac{1}{2}$ to 24
5 feet	3' x 4 $\frac{1}{2}$ '	4 to 5 $\frac{3}{4}$	4 $\frac{1}{2}$ to 6	3 $\frac{3}{4}$ to 7 $\frac{3}{4}$	3 $\frac{1}{2}$ to 8 $\frac{3}{4}$	3 $\frac{1}{2}$ to 13 $\frac{1}{2}$
4 feet	2 $\frac{3}{4}$ x 3 $\frac{1}{2}$ '	3 to 4 $\frac{1}{2}$	3 to 4 $\frac{1}{2}$	3 $\frac{1}{2}$ to 5 $\frac{3}{4}$	3 to 6 $\frac{3}{4}$	2 $\frac{3}{4}$ to 8 $\frac{3}{4}$
3 $\frac{1}{2}$ feet	2 $\frac{1}{2}$ x 3'	3 $\frac{1}{2}$ to 3 $\frac{3}{4}$	3 $\frac{1}{2}$ to 4	2 $\frac{1}{2}$ to 4 $\frac{1}{2}$	2 $\frac{1}{2}$ to 5	2 $\frac{1}{2}$ to 6 $\frac{1}{2}$
3 feet	1 $\frac{3}{4}$ x 2 $\frac{1}{2}$ '	2 $\frac{1}{2}$ to 3 $\frac{3}{4}$	2 $\frac{1}{2}$ to 3 $\frac{1}{2}$	2 $\frac{1}{2}$ to 3 $\frac{1}{2}$	2 $\frac{1}{2}$ to 4	2 $\frac{1}{2}$ to 5

The depth is not given for  $f/2.8$  or  $f/5.6$ . For these two openings depth can be estimated.

**Specifications:****KODAK EKTAR  $f/3.5$ , 50 mm.****(as used on the Kodak Retina I)**

This fast lens, properly used, is capable of producing excellent negatives under greatly varying light conditions. The aberrations have been corrected and balanced to a high degree, and the lens maintains the correction throughout the focusing range. The Kodak Ektar is unexcelled in its particular field.

**Lens Speed:**  $f/3.5$ , marked apertures— $f/3.5$ ,  $f/4$ ,  $f/5.6$ ,  $f/8$ ,  $f/11$ , and  $f/16$ .**Focal Length:** 50 mm.**Focusing Range:** Infinity to  $3\frac{1}{2}$  feet with marked distances of infinity, 50, 25, 15, 12, 10, 8, 6, 5, 4, and  $3\frac{1}{2}$  feet.**Shutter Speeds:** 1 to 1/500, T, and B, with marked instantaneous speeds of 1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100, 1/250, and 1/500 second.**Negative Size:** 24 x 36 mm.**Angle of View:** When focused for infinity,  $27^\circ \times 40^\circ$ .**Attachment Size:**  $1\frac{1}{8}$  in., 27 mm., No. 17 (slip-on), and  $\frac{5}{8}$  in., 21.7 mm., No. 21 (screw-in).

**Attachments Available:** Portrait Attachments A, B, and C in screw-in mounts, Diffusion Portrait Attachment, Pictorial Diffusion Disk, Kodak Combination Lens Attachments Series V with Wratten Filters, Kodak Pola-Screens Type 1A, and Lens Hood.

**Working Distances and Field Sizes with Portrait Attachments:**

With the Focus Set At	Portrait Attachment A		Portrait Attachment B		Portrait Attachment C	
	Distance Subject to Shutter	Field Size	Distance Subject to Shutter	Field Size	Distance Subject to Shutter	Field Size
INF.	41 in.	19 x 29 in.	25 in.	12 x 17½ in.	16 in.	7½ x 11 in.
50 feet	39 in.	18 x 28 in.	24 in.	11½ x 17 in.	15½ in.	7¾ x 11¼ in.
25 feet	36 in.	17 x 25 in.	23 in.	11 x 16½ in.	15 in.	7½ x 11 in.
15 feet	34 in.	16 x 24½ in.	22 in.	10½ x 16 in.	15½ in.	7½ x 10½ in.
12 feet	32 in.	15 x 22 in.	21 in.	10 x 15½ in.	15 in.	7½ x 10 in.
10 feet	31 in.	14 x 22 in.	21 in.	9½ x 14½ in.	14 in.	7 x 10½ in.
8 feet	29 in.	13 x 20½ in.	20 in.	9 x 14 in.	14 in.	6½ x 10 in.
6 feet	26 in.	12 x 18 in.	18½ in.	8½ x 12½ in.	13 in.	6 x 9 in.
5 feet	24 in.	11 x 16 in.	18 in.	8 x 12 in.	13 in.	6¼ x 9 in.
4 feet	22 in.	10 x 15 in.	17 in.	7½ x 11½ in.	12 in.	5½ x 8½ in.
3½ feet	21 in.	9 x 14½ in.	16 in.	7 x 11 in.	12 in.	5 x 8 in.

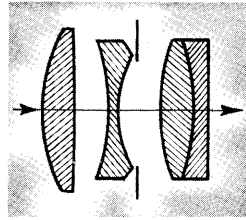
**Depth of Field:**

Distance Focused Upon	Approximate Field Size	DEPTH OF FIELD—IN FEET. Circle of Confusion, 1/500 inch.			
		$f/3.5$	$f/5.6$	$f/11$	$f/16$
INF.	$27^\circ \times 39^\circ$	40 to inf.	27 to inf.	14 to inf.	9 to inf.
50 feet	$24' \times 36'$	24 to inf.	18½ to inf.	11 to inf.	8 to inf.
25 feet	$12' \times 18'$	16½ to 55	13½ to inf.	9 to inf.	7 to inf.
15 feet	$7' \times 10\frac{3}{4}'$	11½ to 22	9 to 30	7 to inf.	6 to inf.
12 feet	$5\frac{3}{4}' \times 8\frac{1}{2}'$	9 to 17	8 to 21	6 to 60	5½ to inf.
10 feet	$4\frac{1}{2}' \times 7\frac{1}{2}'$	8 to 12½	7 to 15½	5 to 31	5 to inf.
8 feet	$3\frac{1}{2}' \times 5\frac{1}{2}'$	6 to 9	6½ to 11	5 to 17½	4½ to 38
6 feet	$2\frac{3}{4}' \times 4\frac{1}{2}'$	5 to 6	5 to 7½	4 to 10	3½ to 15
5 feet	$2\frac{1}{2}' \times 4'$	4 to 5	4 to 6	3 to 7	3 to 10
4 feet	$1\frac{1}{2}' \times 2\frac{1}{2}'$	3 to 4	3 to 4	3 to 5	2 to 6
3½ feet	$1\frac{1}{2}' \times 2\frac{1}{2}'$	3 to 3	3 to 3	3 to 4	2 to 5

The depth is not given for  $f/4$  or  $f/8$ . For these openings depth can be estimated by comparison.

**Specifications:**

**KODAK ANASTIGMAT SPECIAL f/3.5,  
51 mm. (as used on Kodak 35)**



This lens is ideal for both black-and-white and Kodachrome photography. Its speed is great enough for fast action shots in sunlight and for instantaneous exposures indoors with Photoflood Lamps.

**Lens Speed:** *f/3.5*, marked apertures—*f/3.5, f/4, f/5.6, f/8, f/11, and f/16*.

**Focal Length:** 51 mm.

**Focusing Range:** Infinity to 4 feet with marked distances of infinity, 50, 25, 15, 10, 8, 6, 5, and 4 feet.

**Shutter Speeds:** 1/10, 1/25, 1/50, 1/100, 1/200, T, and B.

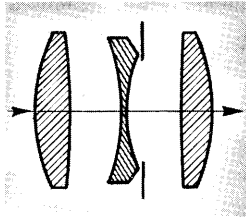
**Negative Size:** 24 x 36 mm.

**Angle of View:** When focused for infinity, 27° x 39°.

**Attachment Size:** 1¼ in., 31.5 mm., No. 5A.

**Attachments Available:** Portrait Attachment, Diffusion Portrait Attachment, Pictorial Diffusion Disk, Sky Filter, Color Filter, Kodak Combination Lens Attachments Series VI with Wratten Filters, Kodak Pola-Screen Type 1A and Lens Hood.

**KODAK ANASTIGMAT f/4.5, 51 mm.  
(as used on the Kodak 35)**



This lens has ample speed for most types of outdoor photography and for indoor work with Kodak Super-XX Film with Photoflood Lamps. It has excellent image quality, and its corrections permit the making of excellent Kodachrome transparencies.

**Lens Speed:** *f/4.5* with marked relative apertures of *f/4.5, f/5.6, f/8, f/11, and f/16*.

**Focal Length:** 51 mm.

**Focusing Range:** Infinity to 4 feet with marked distances of infinity, 50, 25, 15, 10, 8, 6, 5, and 4 feet.

**Shutter Speeds:** 1/25, 1/50, 1/100, 1/150, T, and B.

**Negative Size:** 24 x 36 mm.

**Angle of View:** When focused for infinity, 27° x 39°.

**Attachment Size:** 1¼ in., 31.5 mm., No. 5A.

**Attachments Available:** Portrait Attachment, Diffusion Portrait Attachment, Pictorial Diffusion Disk, Sky Filter, Color Filter, Kodak Combination Lens Attachments Series VI with Wratten Filters, Kodak Pola-Screens Type 1A, and Lens Hood.

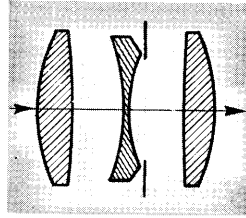
**Depth of Field:**

Distance Focused Upon	Approximate Field Size	DEPTH OF FIELD—IN FEET. Circle of Confusion, 1/500 inch.					
		<i>f/3.5</i>	<i>f/4</i>	<i>f/5.6</i>	<i>f/8</i>	<i>f/11</i>	<i>f/16</i>
INF.	27° x 39'	42 to inf.	37 to inf.	27½ to inf.	19½ to inf.	14½ to inf.	9½ to inf.
50 feet	23½ x 35'	24 to inf.	22 to inf.	18½ to inf.	14½ to inf.	11½ to inf.	8½ to inf.
25 feet	11 x 17½'	16½ to 54	15½ to 65	13½ to inf.	11½ to inf.	9½ to inf.	7½ to inf.
15 feet	6 x 10½'	11½ to 22	11½ to 24	9½ to 30½	8½ to 58½	7½ to inf.	6 to inf.
10 feet	4 x 6½'	8½ to 12½	8 to 13½	7½ to 15½	6½ to 19½	5½ to 31½	5 to inf.
8 feet	3 x 5½'	6½ to 9½	6½ to 10	6½ to 11	5½ to 13½	5 to 17½	4½ to 38½
6 feet	2 x 4'	5½ to 6½	5½ to 7	5 to 7½	4½ to 8½	4 to 10½	3½ to 15½
5 feet	2 x 3½'	4½ to 5½	4½ to 5½	4½ to 6	4 to 6½	3 to 7½	3 to 10½
4 feet	1½ x 2½'	3½ to 4½	3½ to 4½	3½ to 4½	3½ to 5	3 to 5½	2½ to 6½

**Specifications:**

**KODAK ANASTIGMAT f/5.6, 50 mm.**

(as used on Kodak Bantam and Kodak 35)



This lens, designed solely for use on these miniature Kodaks, has moderate speed for action shots out of doors and for Kodachrome pictures under good light conditions.

**Lens Speed:** f/5.6 with marked relative apertures of f/5.6, f/8, f/11, and f/16.

**Focal Length:** 50 mm.

**Focusing Range:** Infinity to 4 feet with marked distances of infinity, 50, 25, 15, 12, 10, 8, 6, 5, and 4 feet.

**Shutter Speeds:** 1/25, 1/50, 1/100, T, and B.

**Negative Size:** Kodak Bantam, 28 x 40 mm.; Kodak 35, 24 x 36 mm.

**Angle of View:** When focused for infinity  $\left\{ \begin{array}{l} 31^\circ \times 44^\circ \text{ on Kodak Bantam} \\ 27^\circ \times 39^\circ \text{ on Kodak 35} \end{array} \right.$

**Attachment Size:**  $\left\{ \begin{array}{l} \text{Bantam } \frac{15}{16} \text{ in., 23.5 mm., No. 3} \\ \text{Kodak 35 } 1\frac{1}{16} \text{ in., 33 mm., No. 7A} \end{array} \right.$

**Attachments Available:** Portrait Attachment, Diffusion Portrait Attachment, Pictorial Diffusion Disk, Sky Filter, Color Filter, Kodak Combination Lens Attachments with Wratten Filters, Kodak Pola-Screens Type 1A, and Lens Hood.

**Depth of Field:**

Distance Focused Upon	Approx. Field Size Bantam	Approx. Field Size "35"	DEPTH—IN FEET. Circle of Confusion, 1/500 inch.			
			f/5.6	f/8	f/11	f/16
INF.	31° x 44°	27° x 39°	27½ to inf.	19½ to inf.	14½ to inf.	9½ to inf.
50 feet	27½ x 40'	24' x 36'	18½ to inf.	14½ to inf.	11½ to inf.	8½ to inf.
25 feet	13½ x 19½'	12' x 18'	13½ to 180	11½ to inf.	9½ to inf.	7½ to inf.
15 feet	8½ x 12'	7' x 10½'	9½ to 30½	8½ to 58½	7½ to inf.	6 to inf.
10 feet	5½ x 7½'	4½ x 7½'	7½ to 15½	6½ to 19½	5½ to 31½	5 to inf.
8 feet	4½ x 6½'	3½ x 5½'	6½ to 11	5½ to 13½	5½ to 17½	4½ to 38½
6 feet	3½ x 4½'	2½ x 4½'	5 to 7½	4½ to 8½	4½ to 10½	3½ to 15½
5 feet	2½ x 3½'	2½ x 3½'	4½ to 6	4 to 6½	3½ to 7½	3½ to 10½
4 feet	2½ x 3'	1½ x 2½'	3½ to 4½	3½ to 5	3½ to 5½	2½ to 6½

● **Viewing Distance for Correct Perspective:** The nearest practical approach to true perspective for single images is obtained when the viewing distance is equal to the product of the focal length of the camera lens by the degree of enlargement of the print. For example, if a print is to be viewed at 10 inches (which is normal) and the camera lens has a focal length of 4 inches, the negative should be enlarged 2½ times for best perspective. This principle holds for transparencies and moving pictures projected onto a screen. For the usual 1-inch Ciné-Kodak lens and 2-inch Kodascope lens, the audience should sit halfway between Kodascope and screen.

● **Angle of View:** The angle of view or angular field may be applied variously to (1) the diagonal of the picture size, (2) the long, (3) or the short sides of the picture. When a single value of angle of view is given it usually refers to the angle subtended at the lens by the diagonal of the picture.

Angle of view when focused for infinity:

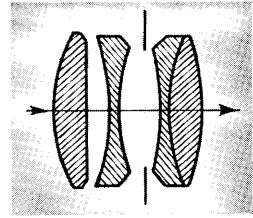
$$\frac{\frac{1}{2} \text{ negative dimensions}}{f} = \text{tangent of } \frac{1}{2} \text{ angle of view}$$

$$\text{Angle of view for close-ups: } \frac{\frac{1}{2} \text{ negative dimensions}}{v} = \text{tangent of } \frac{1}{2} \text{ angle}$$

To find angle of view consult table of trigonometric functions.

**Specifications:**

**KODAK ANASTIGMAT SPECIAL, f/4.5,  
47 mm. (as used on Kodak Bantam)**



The excellent design of this lens and the degree to which the aberrations have been corrected make the lens suitable for black-and-white or Kodachrome pictures. The lens is mounted in a front-element-focusing mount and produces negatives of extreme sharpness throughout the entire focusing range.

**Lens Speed:** f/4.5, marked apertures—f/4.5, f/5.6, f/8, f/11, and f/16.

**Focal Length:** 47 mm.

**Focusing Range:** Infinity to 4 feet with marked distances of infinity, 50, 25, 15, 10, 8, 6, 5, and 4 feet.

**Shutter Speeds:** 1/25, 1/50, 1/100, and 1/200 second, T, and B.

**Negative Size:** 28 x 40 mm.

**Angle of View:** When focused for infinity, 33° x 46°.

**Attachment Size:** 15/16 in., 23.5 mm., No. 3.

**Attachments Available:** Portrait Attachment, Diffusion Portrait Attachment, Pictorial Diffusion Disk, Sky Filter, Color Filter, Kodak Combination Lens Attachments Series V with Wratten Filters, Kodak Pola-Screens Type 1A, and Lens Hood.

**Depth of Field:**

Distance Focused Upon	Approximate Field Size	DEPTH OF FIELD—IN FEET. Circle of Confusion, 1/500 inch.				
		f/4.5	f/5.6	f/8	f/11	f/16
INF.	33° x 46°	35 to inf.	29 to inf.	20 to inf.	14 to inf.	10 to inf.
50 feet	29½' x 42'	21 to inf.	18 to inf.	14 to inf.	11½ to inf.	8½ to inf.
25 feet	14½' x 21'	14 to 81	13½ to 180	11 to inf.	9½ to inf.	7½ to inf.
15 feet	8½' x 12½'	10 to 25½	10 to 31	8½ to 57	7½ to inf.	6 to inf.
10 feet	5½' x 8½'	7 to 13½	7½ to 15	6½ to 19½	6 to 31	5 to inf.
8 feet	4½' x 6½'	6 to 10½	6½ to 11½	5½ to 13	5½ to 17½	4½ to 35½
6 feet	3½' x 5'	5 to 7½	5 to 7½	4½ to 8½	4½ to 10	3 to 14½
5 feet	2½' x 4'	4 to 5½	4½ to 6	4 to 6½	3½ to 7½	3 to 9½
4 feet	2¼' x 3¼'	3 to 4½	3½ to 4½	3½ to 5	3½ to 5½	2½ to 6½

● **Depth of Field Computations** can be made on the basis of a fixed circle of confusion or on a circle of confusion equal to a fraction of the focal length. When the latter method is used, all lenses of equal effective diameter (not relative aperture) have the same depth of field when the image is viewed at the distance for normal perspective.

*Method A, fixed circle of confusion:*

f = focal length of lens

u = distance for which camera is focused

f/ = f number of relative aperture

d = diameter of circle of confusion

H = hyperfocal distance

$$H = \frac{f \times f}{f / \times d}$$

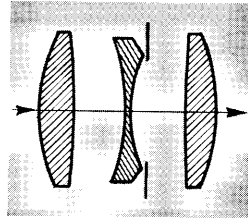
Near limit of depth of field (measured from camera lens) =  $\frac{H \times u}{H + (u - f)}$

Far limit of depth of field (measured from camera lens) =  $\frac{H \times u}{H - (u - f)}$

**Specifications:**

**KODAK ANASTIGMAT f/3.5, 75 mm.**

**(as used on the Kodak Duo Six-20, Series II)**



This lens is designed expressly for use on the Kodak Duo Six-20, the miniature type Kodak which makes album-sized prints. The lens is highly corrected for all aberrations resulting in excellent negatives from which good enlargements of considerable size can be made.

**Lens Speed:** f/3.5, marked apertures—f/3.5, f/4, f/5.6, f/8, f/11, f/16, and f/22.

**Focal Length:** 75 mm.

**Focusing Range:** Infinity to 3½ feet with marked distances of infinity, 50, 25, 15, 12, 10, 8, 6, 5, 4, and 3½ feet.

**Shutter Speeds:** 1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100, 1/250, 1/500, T, and B.

**Negative Size:** 1⅝ x 2¼ inches.

**Angle of View:** When focused for infinity, 35° x 45°.

**Attachment Size:** 1⅞ in., 27 mm., No. 17.

**Attachments Available:** Portrait Attachment, Diffusion Portrait Attachment, Pictorial Diffusion Disk, Kodak Combination Lens Attachments including Wratten Filters, Kodak Pola-Screens Type 1A, and Lens Hood.

**Depth of Field: Kodak Anastigmat, f/3.5, 75 mm.**

Distance Focused Upon	Approximate Field Size	DEPTH OF FIELD—IN FEET. Circle of Confusion, 1/500 inch.				
		f/3.5	f/5.6	f/8	f/11	f/22
INF.	35° x 45°	100 to inf.	65 to inf.	45½ to inf.	33 to inf.	16½ to inf.
50 feet	27½' x 37¾'	28 to 100	25 to inf.	21 to inf.	18½ to inf.	11½ to inf.
25 feet	13¾' x 19'	20 to 33	18½ to 40	16 to 56	14 to 100	10 to inf.
15 feet	8¾' x 11¼'	13 to 17½	12½ to 19½	11½ to 22	10½ to 27	8 to 200
12 feet	5¾' x 7½'	10½ to 13½	10½ to 14½	9½ to 16	8½ to 19	7½ to 45
10 feet	4¾' x 5½½'	9½ to 11	8½ to 11½	8½ to 12	7½ to 14½	6 to 25
8 feet	4¼' x 4½'	7½ to 8½	7 to 9	6½ to 9	6 to 10½	5 to 15½
6 feet	3¾' x 3¾'	5 to 6½	5 to 6½	5 to 6	5 to 7½	4 to 9½
5 feet	2¾' x 3¾'	4 to 5½	4 to 5½	4 to 5	4 to 5	3 to 7
4 feet	2½' x 2½'	3 to 4½	3 to 4½	3 to 4	3 to 4	3 to 5½
3½ feet	1¾' x 2½'	3 to 3½	3 to 3½	3 to 3	3 to 3	3 to 4½

The depth is not given for f/4 or f/16. For these openings depth can be estimated by comparison. This table is computed for more critical definition than the depth calculator on the camera.

*Method B, circle of confusion a fraction of the focal length of the Lens:*

u = distance focused upon

θ = angular size of circle of confusion (in cases where critical definition is required, a common value for θ is 2 minutes of arc [tan 2' = .00058], or approximately f/2000)

$$l = \text{effective diameter of lens} = \frac{f}{l}$$

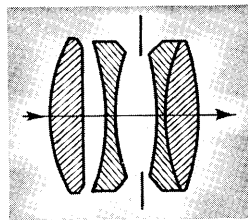
Near limit of depth of field (measured from plane focused upon) =  $\frac{u^2 \tan \theta}{l + u \tan \theta}$  Far limit of depth of field (measured from plane focused upon) =  $\frac{u^2 \tan \theta}{l - u \tan \theta}$

All distances must be expressed in the same units, such as feet, inches, etc.

## Specifications:

# KODAK ANASTIGMAT $f/4.5$ , 105 mm. and 135 mm., For Kodak Recomars 18 and 33

(The 105-mm. lens also supplied in a No. O5 Compur Shutter as the No. 770 Kodak Anastigmat for  $2\frac{1}{4} \times 3\frac{1}{4}$  Speed Graphic and Graflex Cameras.)



These lenses are designed for use on ground-glass focusing-type cameras. The requirements of such a lens are somewhat different than the lenses used on scale-focused folding cameras. The lens must be suitable for picture taking not only out of doors where all distances normally encountered are from 4 feet to infinity but also indoors where it is often desirable to make 1:1 reproductions, etc. These lenses show excellent image quality throughout the entire range of distances. Lens corrections are maintained from infinity to  $\frac{1}{2}$  subject size at  $f/4.5$ . For greater magnification use  $f/16$  or smaller. Equipped with these lenses, the Kodak Recomars, with ground-glass focusing, double extension bellows, and Miniature Kodachrome Adapters, are accepted generally as being among the most versatile cameras available.

**Lens Speed:**  $f/4.5$ , marked apertures— $f/4.5$ ,  $f/5.6$ ,  $f/8$ ,  $f/11$ ,  $f/16$ ,  $f/22$ , and  $f/32$ .

**Focal Length:** 105 mm. for Kodak Recomar 18; 135 mm. for Kodak Recomar 33.

**Focusing Range:** Infinity to 4 feet by scale with marked distances of infinity, 50, 25, 15, 10, 8, 6, 5, and 4 feet, and from infinity to 1:1 magnification by rack and pinion and ground-glass visual focusing.

**Shutter Speeds:** 1 to 1/250, T, and B on Recomar 18; 1 to 1/200 T, and B on Recomar 33. Marked instantaneous speeds of 1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100, and 1/200 or 1/250.

### Negative Size and Angle of View:

When focused for infinity { 105-mm.—film size 6.5 x 9 cm.,  $35^\circ \times 46^\circ$   
135-mm.—film size  $3\frac{1}{4} \times 4\frac{1}{4}$  in.,  $35^\circ \times 44^\circ$ . 9 x 12 cm.,  $37^\circ \times 48^\circ$

**Attachment Size:** 105 mm.:  $1\frac{1}{4}$  in., 31.5 mm., No. 5A  
135 mm.:  $1\frac{1}{32}$  in., 42 mm., No. 16

**Attachments Available:** Portrait Attachment, Diffusion Portrait Attachment, Pictorial Diffusion Disk, Kodak Sky Filter, Kodak Color Filter, Kodak Combination Lens Attachments Series VI with Wratten Filters, Kodak Pola-Screens Type 1A, and Lens Hood.

**Supplementary Lenses:** Three available for each Kodak Recomar. Lenses A and B increase the focal length of the camera lens and therefore can be used for telephoto work and home portraiture. Lens D for the Kodak Recomar 18 and lens E for the Kodak Recomar 33 decrease the focal length of the camera lens and thus are adapted to wide-angle work, and for obtaining greater than 1:1 magnification in extreme close-ups. The table below gives the focal lengths with the supplementary lenses as well as the exposure factors to be followed when these lenses are used. When these supplementary lenses are used, the effective relative apertures differ from those marked on the shutter. Focusing must be done by means of the ground glass.

Kodak Recomars	Focal lengths with $f/4.5$ Lenses	Focal lengths with Supplementary Lenses			
		Lens A	Lens B	Lens D	Lens E
No. 18	10.5 cm.	13.8 cm.	17 cm.	9 cm.	
No. 33	13.5 cm.	18 cm.	23 cm.		11 cm.
Exposure Multiplying Factor		1.8 X	2.7 X	0.7 X	0.67 X
Picture Enlargement or Reduction		1.3 X	1.6 X	0.85 X	0.8 X

When ordering lenses A and B specify whether for the 18 or for the 33 Kodak Recomar.

Closest distance from lens to subject, Lens D with 105 mm. =  $9\frac{3}{8}$  inches; magnification = 1:1.30 X.

Closest distance from lens to subject, Lens E with 135 mm. =  $11\frac{7}{16}$  inches; magnification = 1:1.45 X.

**Depth of Field: Kodak Anastigmat, f/4.5, 105 mm.**

Distance Focused Upon	Approximate Field Size $2\frac{1}{4} \times 3\frac{1}{4}$ in.	DEPTH OF FIELD—IN FEET. Circle of Confusion, 1/200 inch.				
		f/4.5	f/5.6	f/11	f/16	f/22
INF.	$31^\circ \times 43^\circ$	63 to inf.	51 to inf.	26 to inf.	18 to inf.	13 to inf.
50 feet	$27' \times 39'$	28 to 238	25 to inf.	17 to inf.	13 to inf.	9 to inf.
25 feet	$13\frac{3}{4}' \times 19\frac{1}{4}'$	18 to 41	17 to 49	$12\frac{3}{4}$ to inf.	$10\frac{1}{2}$ to inf.	$8\frac{1}{2}$ to inf.
15 feet	$8' \times 11\frac{1}{2}'$	12 to $19\frac{3}{4}$	$11\frac{1}{2}$ to $21\frac{1}{2}$	$9\frac{1}{2}$ to $35\frac{1}{2}$	8 to 95	7 to inf.
10 feet	$5\frac{1}{4}' \times 7\frac{3}{4}'$	$8\frac{3}{4}$ to 12	8 to $12\frac{1}{2}$	$7\frac{1}{4}$ to $16\frac{3}{4}$	$6\frac{1}{2}$ to $22\frac{1}{2}$	$5\frac{3}{8}$ to 44
8 feet	$4\frac{1}{2}' \times 6'$	7 to $9\frac{1}{2}$	6 to $9\frac{3}{4}$	6 to $11\frac{1}{2}$	$5\frac{1}{2}$ to $14\frac{1}{2}$	5 to 21
6 feet	$3\frac{3}{4}' \times 4\frac{3}{4}'$	$5\frac{1}{2}$ to $6\frac{3}{4}$	5 to 7	5 to 8	$4\frac{1}{2}$ to $9\frac{1}{4}$	$4\frac{1}{8}$ to $11\frac{3}{8}$
5 feet	$2\frac{3}{4}' \times 3\frac{3}{4}'$	$4\frac{3}{4}$ to $5\frac{3}{4}$	4 to $5\frac{1}{2}$	$4\frac{1}{4}$ to $6\frac{1}{4}$	4 to 7	3 to $8\frac{1}{2}$
4 feet	$2\frac{1}{2}' \times 2\frac{1}{2}'$	$3\frac{1}{4}$ to $4\frac{1}{4}$	3 to $4\frac{1}{2}$	3 to $4\frac{3}{4}$	$3\frac{1}{2}$ to $5\frac{1}{4}$	3 to 6

The depth of field is not given for f/8 or f/32. The depth for these two openings can be estimated by comparison.

**Depth of Field: Kodak Anastigmat, f/4.5, 135 mm.**

Distance Focused Upon	Approximate Field Size $3\frac{1}{4} \times 4\frac{1}{4}$ in.	DEPTH OF FIELD—IN FEET. Circle of Confusion, 1/200 inch.				
		f/4.5	f/5.6	f/11	f/16	f/22
INF.	$35^\circ \times 44^\circ$	104 to inf.	84 to inf.	43 to inf.	$29\frac{1}{2}$ to inf.	$21\frac{1}{2}$ to inf.
50 feet	$31' \times 40'$	33 to 95	31 to 123	23 to inf.	$18\frac{1}{2}$ to inf.	15 to inf.
25 feet	$15' \times 20'$	21 to 32	$19\frac{1}{2}$ to $35\frac{1}{2}$	$15\frac{3}{4}$ to 60	$13\frac{1}{2}$ to 167	$11\frac{1}{2}$ to inf.
15 feet	$8\frac{3}{4}' \times 12'$	13 to $17\frac{1}{2}$	$12\frac{1}{2}$ to $18\frac{1}{2}$	11 to 23	10 to $30\frac{1}{2}$	9 to 50
10 feet	$5\frac{3}{4}' \times 7\frac{3}{4}'$	9 to 11	9 to $11\frac{1}{2}$	8 to 13	$7\frac{1}{2}$ to 15	7 to $18\frac{1}{2}$
8 feet	$4\frac{3}{4}' \times 6'$	7 to $8\frac{3}{4}$	7 to 9	$6\frac{3}{4}$ to 10	6 to $11\frac{1}{2}$	6 to 13
6 feet	$3\frac{3}{4}' \times 4\frac{1}{2}'$	5 to $6\frac{1}{2}$	$5\frac{1}{2}$ to $6\frac{3}{4}$	5 to 7	5 to 7	$4\frac{3}{4}$ to 8
5 feet	$2\frac{3}{4}' \times 3\frac{3}{4}'$	4 to $5\frac{1}{4}$	$4\frac{1}{2}$ to $5\frac{1}{2}$	4 to $5\frac{1}{4}$	4 to 6	4 to 6
4 feet	$2\frac{1}{2}' \times 2\frac{1}{2}'$	3 to $4\frac{1}{4}$	3 to $4\frac{1}{2}$	3 to 4	3 to $4\frac{3}{8}$	3 to 5

The depth of field is not given for f/8 or f/32. The depth for these two openings can be estimated by comparison.

• **Approximate Formulas for Supplementary Lenses**, for special applications.

These formulas hold for positive supplementary lenses, and also for negative supplementary lenses provided  $f_s$  is treated as a negative value.

f = focal length of camera lens.

$f_s$  = focal length of supplementary lens.

$f_c$  = focal length of the combination.

u = distance from supplementary lens to subject.

v = distance from center of camera lens to film.

m = magnification on film (image size/subject size).

S = distance indicated on focusing scale.

$$\frac{1}{f_c} = \frac{1}{f} + \frac{1}{f_s}$$

$$u = \frac{f_c v}{v - f_c}; \quad v = \frac{f_c u}{u - f_c}$$

$$m = \frac{v}{u} = \frac{f_c}{u - f_c}$$

$$S = \frac{f_c}{f_s - u}$$

$$\text{Effective } f \text{ number} = \text{Indicated } f \text{ number} \times \frac{v}{f}$$

When camera lens is set for infinity,

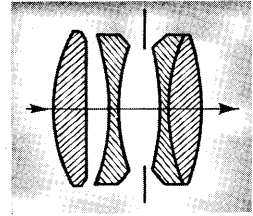
$v = f$ ;  $u = f_s$ ; effective  $f$ -number = indicated  $f$ -number.

For very distant objects,

$$v = f_c; \text{ effective } f\text{-number} = \text{indicated } f\text{-number} \times \frac{f_c}{f}$$

**Specifications:**

**KODAK ANASTIGMAT SPECIAL  $f/4.5$ ,  
100 mm. and 127 mm. (as used on the  
Kodak Specials Six-20 and Six-16)**



The Kodak Anastigmat Special Lenses are designed and manufactured to be unexcelled in their class. The use of new types of glass and meticulous care in the optical design are evidenced by the high quality of the image at all distances focused upon, even at full aperture.

**Lens Speed:**  $f/4.5$ , marked apertures— $f/4.5$ ,  $f/5.6$ ,  $f/8$ ,  $f/11$ ,  $f/16$ ,  $f/22$ , and  $f/32$ .

**Focal Length:** 100 mm. on Six-20 model, and 127 mm. on Six-16 model.

**Focusing Range:** Infinity to  $3\frac{1}{2}$  feet on Six-20 model, and infinity to 4 feet on Six-16 model, with marked distances of infinity, 50, 25, 15, 12, 10, 8, 6, 5, 4 feet, and on the Six-20 model,  $3\frac{1}{2}$  feet.

**Shutter Speeds:** 1/10, 1/25, 1/50, 1/200, T, and B.

**Negative Size:** 100 mm.— $2\frac{1}{4} \times 3\frac{3}{4}$  inches, 127 mm.— $2\frac{1}{2} \times 4\frac{1}{4}$  inches.

**Angle of View:** When focused for infinity  $\left\{ \begin{array}{l} \text{Six-20, } 32^\circ \times 44^\circ \\ \text{Six-16, } 28^\circ \times 46^\circ \end{array} \right.$

**Attachment Size:**

Six-20 model,  $1\frac{1}{4}$  in., 31.5 mm., No. 5A.  
Six-16 model,  $1\frac{5}{8}$  in., 33 mm., No. 7A.

**Attachments Available:** Portrait Attachment, Diffusion Portrait Attachment, Pictorial Diffusion Disk, Sky Filter, Color Filter, Kodak Combination Lens Attachments Series VI with Wratten Filters, Kodak Pola-Screens Type 1A, and Lens Hood.

**Depth of Field: Kodak Anastigmat Special,  $f/4.5$ , 100 mm.**

Distance Focused Upon	Approximate Field Size	DEPTH OF FIELD—IN FEET. Circle of Confusion, 1/200 inch.				
		$f/4.5$	$f/5.6$	$f/11$	$f/16$	$f/22$
INF.	$32^\circ \times 44^\circ$	57 to inf.	46 to inf.	24 to inf.	17 to inf.	12 to inf.
50 feet	$28\frac{1}{2} \times 47'$	28 to inf.	25 to inf.	$16\frac{1}{2}$ to inf.	13 to inf.	$10\frac{1}{2}$ to inf.
25 feet	$14' \times 20'$	$17\frac{1}{2}$ to $42\frac{1}{2}$	$16\frac{1}{2}$ to 51	13 to inf.	$10\frac{1}{2}$ to inf.	$8\frac{1}{2}$ to inf.
15 feet	$8\frac{1}{2} \times 12\frac{1}{2}'$	12 to 20	$11\frac{1}{2}$ to $21\frac{1}{2}$	$9\frac{1}{2}$ to 35	8 to 85	7 to inf.
10 feet	$5\frac{1}{2} \times 8\frac{1}{2}'$	8 $\frac{1}{2}$ to 12	$8\frac{1}{2}$ to $12\frac{1}{2}$	$7\frac{1}{2}$ to 16	6 to 22	$5\frac{1}{2}$ to 41
8 feet	$4\frac{1}{2} \times 6\frac{3}{4}'$	$7\frac{1}{2}$ to $8\frac{3}{8}$	7 to $9\frac{1}{2}$	$6\frac{1}{2}$ to 12	5 to 15	5 to 22
6 feet	$3\frac{3}{4} \times 4\frac{3}{4}'$	$5\frac{1}{2}$ to $6\frac{3}{8}$	$5\frac{1}{2}$ to 7	5 to 8	$4\frac{1}{2}$ to 9	$4\frac{1}{2}$ to 12
5 feet	$2\frac{3}{4} \times 3\frac{3}{4}'$	$4\frac{3}{4}$ to 5 $\frac{1}{2}$	4 to $5\frac{1}{2}$	$4\frac{1}{2}$ to $6\frac{1}{2}$	4 to $7\frac{1}{2}$	$3\frac{3}{4}$ to $8\frac{3}{4}$
4 feet	$2\frac{1}{2} \times 3'$	$3\frac{3}{4}$ to $4\frac{1}{2}$	$3\frac{3}{4}$ to $4\frac{1}{2}$	$3\frac{3}{4}$ to $4\frac{1}{2}$	3 to $5\frac{1}{2}$	$3\frac{1}{2}$ to 6
$3\frac{1}{2}$ feet	$1\frac{1}{2} \times 2\frac{1}{2}'$	$3\frac{1}{2}$ to $3\frac{3}{4}$	$3\frac{1}{2}$ to $3\frac{3}{4}$	3 to $4\frac{1}{2}$	3 to $4\frac{1}{2}$	$2\frac{3}{8}$ to 5

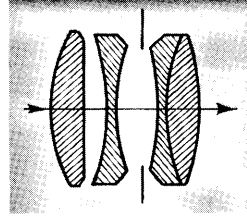
**Depth of Field: Kodak Anastigmat Special,  $f/4.5$ , 127 mm.**

Distance Focused Upon	Approximate Field Size	DEPTH OF FIELD—IN FEET. Circle of Confusion, 1/200 inch.				
		$f/4.5$	$f/5.6$	$f/11$	$f/16$	$f/22$
INF.	$28^\circ \times 46^\circ$	91 to inf.	73 to inf.	37 to inf.	25 to inf.	19 to inf.
50 feet	$24\frac{1}{2} \times 42'$	32 to 110	30 to inf.	21 to inf.	17 to inf.	$13\frac{1}{2}$ to inf.
25 feet	$12\frac{1}{2} \times 21'$	19 to 34	18 to 38	15 to 75	12 to inf.	$10\frac{1}{2}$ to inf.
15 feet	$7\frac{1}{2} \times 13\frac{1}{2}'$	13 to 18	$12\frac{1}{2}$ to 19	$10\frac{1}{2}$ to 25	$9\frac{1}{2}$ to 36	$8\frac{1}{2}$ to 76
10 feet	$4\frac{1}{2} \times 8\frac{1}{2}'$	9 to $11\frac{1}{2}$	$8\frac{1}{2}$ to $11\frac{1}{2}$	$7\frac{1}{2}$ to $13\frac{1}{2}$	$7\frac{1}{2}$ to $16\frac{1}{2}$	$6\frac{1}{2}$ to 21
8 feet	$3\frac{3}{4} \times 6\frac{3}{4}'$	$7\frac{1}{2}$ to 8 $\frac{3}{8}$	$7\frac{1}{2}$ to 9	6 to $10\frac{1}{2}$	6 to $13\frac{1}{2}$	$5\frac{1}{2}$ to 14
6 feet	$2\frac{3}{4} \times 4\frac{3}{4}'$	$5\frac{1}{2}$ to $6\frac{3}{8}$	$5\frac{1}{2}$ to $6\frac{1}{2}$	5 to 7 $\frac{1}{2}$	5 to 8	$4\frac{1}{2}$ to $9\frac{1}{2}$
5 feet	$2\frac{1}{2} \times 3\frac{3}{4}'$	4 to 5 $\frac{1}{2}$	4 to $5\frac{1}{2}$	4 to $5\frac{1}{2}$	$4\frac{1}{2}$ to $6\frac{1}{2}$	4 to 7
4 feet	$1\frac{1}{2} \times 3'$	$3\frac{3}{8}$ to $4\frac{1}{4}$	$3\frac{3}{8}$ to $4\frac{1}{4}$	3 to $4\frac{1}{2}$	$3\frac{1}{2}$ to $4\frac{1}{2}$	$3\frac{1}{2}$ to $5\frac{1}{2}$

The depth of field is not given for  $f/8$  or  $f/32$ . The depth for these two openings can be estimated by comparison.

**Specifications:**

**KODAK ANASTIGMAT f/4.5, 103 mm. and 126 mm. (as used on folding Kodaks Six-20 and Six-16)**



These lenses, for use on folding Kodaks, are mounted in front-element-focusing mounts. The design and optical properties of the lenses have been carefully worked out to assure crisp, sharp negatives from which excellent contact prints or enlargements can be made.

**Lens Speed:** f/4.5 marked apertures—f/4.5, f/5.6, f/8, f/11, f/16, f/22, and f/32.

**Focal Length:** 103 mm. on Six-20 models and 126 mm. on Six-16 models.

**Focusing Range:** Infinity to 3½ feet on Six-20 models and infinity to 4 feet on Six-16 models, with marked distances of infinity, 50, 25, 15, 10, 8, 6, 5, 4 feet, and on Six-20 models, 3½ feet.

**Shutter Speeds:** 1/10, 1/25, 1/50, 1/100, 1/200, T, and B.

**Negative Size:** 103 mm., 2¼ x 3¼ inches, 126 mm., 2½ x 4¼ inches.

**Angle of View:** When focused for infinity {Six-20, 32° x 44°  
Six-16, 29° x 47°

**Attachment Size:**

Kodak Juniors, Series III {Six-20 Models, 1¼ in., 31.5 mm., No. 5A.  
Six-16 Models, 1½ in., 38 mm., No. 23.

Kodak Seniors {Six-20 Models, 1¼ in., 31.5 mm., No. 5A.  
Six-16 Models, 1½ in., 33 mm., No. 7A.

**Attachments Available:** Portrait Attachment, Diffusion Portrait Attachment, Pictorial Diffusion Disk, Sky Filter, Color Filter, Kodak Combination Lens Attachments, Series VI with Wratten Filters, Kodak Pola-Screens Type 1A and Lens Hood.

**Depth of Field: Kodak Anastigmat, f/4.5, 103 mm.**

Distance Focused Upon	Approximate Field Size	DEPTH OF FIELD—IN FEET. Circle of Confusion, 1/200 inch.				
		f/4.5	f/5.6	f/11	f/16	f/22
INF.	32° x 44°	57 to inf.	46 to inf.	24 to inf.	17 to inf.	12 to inf.
50 feet	28' x 40'	28 to inf.	25 to inf.	16½ to inf.	13 to inf.	10½ to inf.
25 feet	13½' x 19½'	17 to 42½	16½ to 51	13 to inf.	10½ to inf.	8 to inf.
15 feet	8' x 11½'	12 to 20	11½ to 21	9½ to 35	8 to 85	7 to inf.
10 feet	5½' x 7½'	8 to 12	8½ to 12	7½ to 16	6½ to 22	5½ to 41
8 feet	4½' x 6½'	7 to 8½	7 to 9½	6½ to 12	5½ to 15	5 to 22
6 feet	3½' x 4½'	5 to 6	5 to 6	5 to 8	4½ to 9	4 to 12
5 feet	2½' x 3½'	4 to 5	4½ to 5	4 to 6	4 to 7½	3 to 8½
4 feet	2' x 3'	3 to 4	3½ to 4	3 to 4	3 to 5	3 to 6
3½ feet	1½' x 2½'	3 to 3½	3 to 3½	3 to 4	3 to 4½	2 to 5

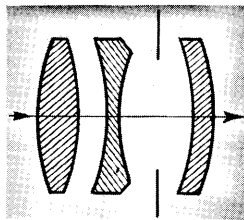
**Depth of Field: Kodak Anastigmat, f/4.5, 126 mm.**

Distance Focused Upon	Approximate Field Size	DEPTH OF FIELD—IN FEET. Circle of Confusion, 1/200 inch.				
		f/4.5	f/5.6	f/11	f/16	f/22
INF.	29° x 47°	91 to inf.	73 to inf.	37 to inf.	25 to inf.	19 to inf.
50 feet	25' x 43'	32 to 110	30 to inf.	21 to inf.	17 to inf.	13 to inf.
25 feet	12½' x 21'	19 to 34	18 to 38	15 to 75	12 to inf.	10 to inf.
15 feet	7½' x 12½'	13 to 18	12½ to 19	10½ to 25	9 to 36	8 to 76
10 feet	4½' x 8½'	9 to 11½	8½ to 11½	7½ to 13	7 to 16½	6 to 21
8 feet	3½' x 6½'	7 to 8	7 to 9	6 to 10	5 to 14	5 to 14
6 feet	2½' x 4½'	5 to 6	5 to 6	5 to 7	5 to 8	4 to 9½
5 feet	2' x 3½'	4 to 5	4½ to 5	4 to 5	4 to 6	4 to 7
4 feet	1½' x 3½'	3 to 4	3 to 4	3 to 4	3 to 4	3 to 5

The depth of field is not given for f/8 or f/32. The depth for these two openings can be estimated.

## Specifications:

### KODAK ANASTIGMAT *f*/6.3, 102 mm. and 128 mm. (as used on folding Kodaks Six-20 and Six-16)



These moderately fast Kodak lenses adequately cover most of the situations met in outdoor photography. They have good covering power, and astigmatism has been reduced to a very low level.

**Lens Speed:** *f*/6.3, marked apertures—*f*/6.3, *f*/8, *f*/11, *f*/16, *f*/22, and *f*/32.

**Focal Length:** 102 mm. on Six-20 models and 128 mm. on Six-16 models.

**Focusing Range:** Infinity to 3½ feet with marked distances of infinity, 50, 25, 15, 10, 8, 6, 5, 4, and 3½ feet.

**Shutter Speeds:** 1/25, 1/50, 1/100, T, and B on Kodak Juniors Series III, and 1/25, 1/50, 1/100, 1/150, T, and B on Kodak Seniors.

**Negative Size:** 102 mm., 2¼ x 3¼ inches, 128 mm., 2½ x 4¼ inches.

**Angle of View:** When focused for infinity, 32° x 44° for the Six-20's and 28° x 46° for the Six-16's.

#### Attachment Size:

Kodak Juniors, Series III	{ Six-20, 1⅞ in., 28.5 mm., No. 6A
	{ Six-16, 1¼ in., 31.5 mm., No. 5A
Kodak Seniors	{ Six-20, 1¼ in., 31.5 mm., No. 5A
	{ Six-16, 1⅝ in., 33 mm., No. 7A

**Attachments Available:** Portrait Attachment, Diffusion Portrait Attachment, Pictorial Diffusion Disk, Sky Filter, Color Filter, Kodak Combination Lens Attachments, Series V for Kodak Junior Series III Six-20 *f*/6.3, and Series VI for Kodak Junior Series III Six-16 and Kodak Seniors Six-20 and Six-16 with Wratten Filters, Kodak Pola-Screens Type 1A, and Lens Hood.

#### Depth of Field: Kodak Anastigmat, *f*/6.3, 102 mm.

Distance Focused Upon	Approximate Field Size	DEPTH OF FIELD—IN FEET. Circle of Confusion, 1/200 inch.				
		<i>f</i> /6.3	<i>f</i> /8	<i>f</i> /11	<i>f</i> /16	<i>f</i> /32
INF.	32° x 44°	42 to inf.	33 to inf.	24 to inf.	16½ to inf.	8½ to inf.
50 feet	28½ x 41'	23 to inf.	20 to inf.	16 to inf.	13 to inf.	7 to inf.
25 feet	14' x 20'	16 to 55	15 to 80	13 to inf.	10½ to inf.	6½ to inf.
15 feet	8½ x 12½'	11½ to 22	10½ to 26	9½ to 35	8 to 85	5 to inf.
10 feet	5½ x 8'	8 to 12½	7½ to 13½	7½ to 16	6½ to 22	4 to inf.
8 feet	4½ x 6½'	6 to 9½	6 to 10½	6½ to 12	5½ to 15	4 to 122
6 feet	3½ x 4½'	5 to 7	5½ to 7½	5 to 8	4½ to 9	3 to 20
5 feet	2½ x 3½'	4 to 5½	4½ to 6	4 to 6½	3½ to 7½	3 to 14
4 feet	2' x 3'	3 to 4½	3½ to 4½	3½ to 4½	3½ to 5½	2 to 8½
3½ feet	1½ x 2½'	3 to 3½	3½ to 3½	3½ to 4½	2½ to 4½	2 to 6½

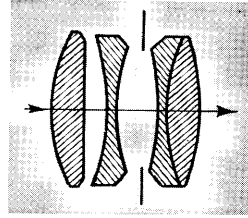
#### Depth of Field: Kodak Anastigmat, *f*/6.3, 128 mm.

Distance Focused Upon	Approximate Field Size	DEPTH OF FIELD—IN FEET. Circle of Confusion, 1/200 inch.				
		<i>f</i> /6.3	<i>f</i> /8	<i>f</i> /11	<i>f</i> /16	<i>f</i> /32
INF.	28° x 46°	66 to inf.	52 to inf.	38 to inf.	26 to inf.	13 to inf.
50 feet	24½ x 42'	28 to inf.	25½ to inf.	21½ to inf.	17 to inf.	10½ to inf.
25 feet	12½ x 21'	18 to 40½	16½ to 48½	15 to 75½	12½ to inf.	8 to inf.
15 feet	7½ x 13½'	12 to 19½	11 to 21½	10½ to 25	9 to 36½	6 to inf.
10 feet	4½ x 8½'	8 to 11½	8 to 12½	7½ to 13½	7½ to 16½	5 to 45½
8 feet	3½ x 6½'	7 to 9½	7 to 9½	6½ to 10½	6 to 13½	5 to 21½
6 feet	2½ x 4½'	5 to 6½	5½ to 6½	5½ to 7½	5 to 8	4½ to 12
5 feet	2½ x 3½'	4 to 5½	4½ to 5	4½ to 5½	4½ to 6½	3½ to 8½
4 feet	1½ x 3'	3 to 4	3 to 4	3½ to 4	3½ to 4½	3 to 5½
3½ feet	1½ x 2½'	3 to 3½	3½ to 3½	3½ to 3½	3½ to 4	2½ to 4½

The depth of field is not given for *f*/22. The depth for this opening can be estimated by comparison.

**Specifications:**

**KODAK ANASTIGMAT, f/4.5**  
(For press, commercial, and studio cameras)



The Kodak Anastigmat f/4.5 is as fine a lens as it is possible to produce for the size of film or plate covered at the f/4.5 aperture. It has very good definition and exceptional flatness of field and is so perfectly corrected that the point of accurate focus is easily determined. This is a distinct advantage especially in those types of photographic work where the success of the picture depends upon quick and accurate focusing. This lens is recommended for any type of work which requires the fine definition of an anastigmat and is especially suitable for home or studio portraiture, architectural, landscape, and sports photography. Lens corrections are maintained from infinity to 1/3 subject size at f/4.5. These lenses are available in shutters or barrels. See page 50.

**Lens Speed:** f/4.5, marked apertures—f/4.5, f/5.6, f/8, f/11, f/16, f/22, f/32, f/45.

**Focal Length, Negative Size, and Angle of View:** When focused for infinity.

Lens No.	Size of Film or Plate Covered at f/4.5	Equivalent Focus in Inches	Angle of View
No. 771	2 1/4 x 3 1/4	5	26° x 36°
No. 31	3 1/4 x 4 1/4	5 1/2	33° x 42°
No. 32	4 x 5	6 3/8	35° x 42°
No. 33	5 x 7	7 1/2	37° x 53°
No. 34	5 x 8	8 1/2	33° x 50°
No. 35	6 1/2 x 8 1/2	10	36° x 46°
No. 36	8 x 10	12	37° x 45°

**Attachments Available:** Wratten Filters, Eastman Portrait Diffusion Disks, Eastman Pola-Screens Type I, and Eastman Lens Hood and Screen Holder.

**Depth of Field:** For Critical Definition **No. 771 K. A., f/4.5, 5-inch (127 mm.)**

Distance Focused Upon	Approximate Field Size with 2 1/4 x 3 1/4 Neg.	DEPTH OF FIELD—IN FEET. Circle of Confusion, f/2000				
		f/4.5	f/8	f/11	f/16	f/32
INF.	26° x 36°	155 to inf.	90 to inf.	65 to inf.	45 to inf.	22 to inf.
100 feet	45' x 65'	61 to 195	48 to inf.	41 to inf.	31 to inf.	18 to inf.
50 feet	22' x 32'	38 to 73	32 to 110	29 to inf.	24 to inf.	15 to inf.
25 feet	11' x 16'	21 to 30	19 to 34	18 to 40	16 to 60	12 to inf.
15 feet	6 3/4' x 9 3/4'	14 to 16 1/2	13 to 18	12 to 20	11 to 24	9 to 54
10 feet	4 3/4' x 6 1/2'	9 to 10 1/2	9 to 11 1/2	8 1/2 to 12	8 1/2 to 13	7 to 17
8 feet	3 3/4' x 5'	7 to 8	7 to 8 1/2	7 1/2 to 9 1/2	6 3/4 to 9 3/4	5 1/2 to 12 1/2
6 feet	2 3/4' x 3 3/4'	5 to 6	5 to 6 1/2	5 1/2 to 6 3/4	5 1/2 to 6 3/4	4 3/4 to 8 1/2
5 feet	2' x 3 1/2'	4 to 5	4 to 5 1/2	4 1/2 to 5 1/2	4 1/2 to 5 1/2	4 to 6 3/4
4 feet	1 3/4' x 2 1/2'	3 to 4	3 to 4 1/2	3 3/4 to 4 1/2	3 3/4 to 4 1/2	3 3/4 to 4 3/4
3 1/2 feet	1 1/2' x 2'	3 to 3 1/2	3 to 3 3/4	3 1/2 to 3 3/4	3 1/2 to 3 3/4	3 to 4 1/4

The depth of field is not given for f/5.6 or f/22. The depth for these openings can be estimated.

**Depth of Field:** For Critical Definition **No. 31 K. A., f/4.5, 5 1/2-inch**

Distance Focused Upon	Approximate Field Size with 3 1/4 x 4 1/4 Neg.	DEPTH OF FIELD—IN FEET. Circle of Confusion, f/2000				
		f/4.5	f/8	f/11	f/22	f/45
INF.	33° x 42°	175 to inf.	100 to inf.	71 to inf.	35 to inf.	17 to inf.
100 feet	59' x 77'	63 to 185	50 to inf.	42 to inf.	27 to inf.	15 to inf.
50 feet	28' x 38'	39 to 70	33 to 100	30 to inf.	21 to inf.	13 to inf.
25 feet	14' x 19'	22 to 29	20 to 33	18 to 38	15 to 85	10 to inf.
15 feet	8' x 11'	14 to 16	13 to 18	12 to 19	10 1/2 to 28	8 to 130
10 feet	5' x 7 1/2'	9 1/2 to 10 1/2	9 to 11 1/2	8 1/2 to 11 3/4	7 1/2 to 13 3/4	6 1/2 to 20
8 feet	4' x 5 1/2'	7 1/2 to 8	7 to 8 1/2	7 to 9	6 1/2 to 10 1/2	5 1/2 to 15
6 feet	3' x 4 1/2'	5 1/2 to 6 1/2	5 to 6 1/2	5 to 6 3/4	5 to 7 1/2	4 1/2 to 10 1/2
5 feet	2' x 3 1/2'	4 1/2 to 5	4 to 5 1/2	4 to 5 1/2	4 to 5 1/2	4 to 7 1/2
4 feet	1 3/4' x 2 1/2'	3 1/2 to 4	3 to 4 1/2	3 to 4 1/2	3 to 4 1/2	3 to 5 1/2
3 1/2 feet	1 1/2' x 2'	3 1/2 to 3 3/4	3 to 3 3/4	3 to 3 3/4	3 to 3 3/4	3 to 4 1/4

The depth of field is not given for f/5.6, f/16, or f/32. The depth for these openings can be estimated.

**Depth of Field: For Critical Definition No. 32 K. A., f/4.5, 6 3/8-inch**

Distance Focused Upon	Approximate Field Size with 4 x 5 Neg.	DEPTH OF FIELD—IN FEET. Circle of Confusion, f/2000				
		f/4.5	f/8	f/11	f/22	f/45
INF.	35° x 42°	200 to inf.	110 to inf.	80 to inf.	40 to inf.	20 to inf.
100 feet	62' x 78'	67 to 197	53 to inf.	45 to inf.	30 to inf.	17 to inf.
50 feet	31' x 39'	40 to 66	35 to 90	31 to 130	23 to inf.	15 to inf.
25 feet	15' x 18'	22 to 29	20 to 32	19 to 36	16 to 65	11 to inf.
15 feet	9' x 11'	14 to 16 1/2	13 to 17	12 1/2 to 18	11 to 26	8 1/2 to 52
10 feet	6' x 7 1/2'	9 1/2 to 10 1/2	9 1/2 to 11	9 to 11 1/2	8 1/2 to 13	6 to 17
8 feet	4 3/4' x 5 3/8'	7 1/2 to 8 1/2	7 1/2 to 8 1/2	7 1/2 to 8 1/2	6 to 10	5 to 13
6 feet	3 3/4' x 4 3/8'	5 to 6 1/2	5 to 6 1/2	5 1/2 to 6 1/2	5 to 7	4 to 8
5 feet	2 3/4' x 3 3/8'	4 to 5 1/2	4 1/2 to 5 1/2	4 1/2 to 5 1/2	4 to 5 1/2	4 to 6 1/2
4 feet	2 1/4' x 2 3/8'	3 to 4 1/2	3 to 4 1/2	3 to 4 1/2	3 to 4 1/2	3 to 5
3 1/2 feet	1 3/4' x 2 1/8'	3 to 3 1/2	3 to 3 1/2	3 to 3 1/2	3 to 3 1/2	3 to 4 1/2

**Depth of Field: For Critical Definition No. 33 K. A., f/4.5, 7 1/2-inch**

Distance Focused Upon	Approximate Field Size with 5 x 7 Neg.	DEPTH OF FIELD—IN FEET. Circle of Confusion, f/2000				
		f/4.5	f/8	f/11	f/22	f/45
INF.	37° x 53°	220 to inf.	130 to inf.	100 to inf.	50 to inf.	25 to inf.
200 feet	113' x 186'	135 to inf.	81 to inf.	68 to inf.	40 to inf.	22 to inf.
100 feet	66' x 93'	70 to 175	58 to 215	50 to inf.	33 to inf.	19 to inf.
50 feet	33' x 46'	42 to 63	36 to 80	33 to 100	25 to inf.	16 to inf.
25 feet	16' x 23'	23 to 28	21 to 31	20 to 33	17 to 52	13 to inf.
15 feet	10' x 13'	14 to 16	13 1/2 to 17	13 to 18	12 to 23	9 to 50
10 feet	6 1/4' x 8 1/2'	9 1/2 to 10 1/2	9 1/2 to 11	9 to 11	8 1/2 to 12 1/2	7 to 17
8 feet	4 3/4' x 6 1/2'	7 1/2 to 8 1/2	7 to 8 1/2	7 to 8 1/2	6 to 9 1/2	6 to 12
6 feet	3 3/4' x 5'	5 1/2 to 6 1/2	5 to 6 1/2	5 to 6 1/2	5 to 6 1/2	4 to 8
5 feet	3 1/4' x 4 1/2'	4 1/2 to 5 1/2	4 to 5 1/2	4 to 5 1/2	4 to 5 1/2	4 to 6 1/2
4 feet	2 3/4' x 3 3/4'	3 1/2 to 4 1/2	3 to 4 1/2	3 to 4 1/2	3 to 4 1/2	3 to 4 1/2
3 1/2 feet	1 3/4' x 2 1/2'	3 to 3 1/2	3 to 3 1/2	3 to 3 1/2	3 to 3 1/2	3 to 4 1/2

**Depth of Field: For Critical Definition No. 34 K. A., f/4.5, 8 1/2-inch**

Distance Focused Upon	Approximate Field Size with 5 x 7 Neg.	DEPTH OF FIELD—IN FEET. Circle of Confusion, f/2000				
		f/4.5	f/8	f/11	f/22	f/45
INF.	33° x 50°	250 to inf.	150 to inf.	110 to inf.	56 to inf.	24 to inf.
200 feet	117' x 187'	120 to inf.	86 to inf.	72 to inf.	43 to inf.	22 to inf.
100 feet	58' x 93'	73 to 158	60 to 295	52 to inf.	36 to inf.	20 to inf.
50 feet	29' x 52'	42 to 61	37 to 75	34 to 92	27 to inf.	17 to inf.
25 feet	14' x 23'	23 to 27	22 to 30	20 to 32	17 to 44	13 to inf.
15 feet	8 1/4' x 13 1/2'	14 to 16	13 to 17	13 to 17 1/2	12 to 22	9 1/2 to 55
10 feet	5 1/2' x 8 1/2'	9 1/2 to 10 1/2	9 to 11	9 to 11	8 1/2 to 12	7 to 18
8 feet	4 1/4' x 6 1/2'	7 1/2 to 8 1/2	7 to 8 1/2	7 to 8 1/2	7 to 9 1/2	5 to 12
6 feet	3 1/4' x 5'	5 1/2 to 6 1/2	5 to 6 1/2	5 to 6 1/2	5 to 6 1/2	4 to 8 1/2
5 feet	2 3/4' x 4'	4 1/2 to 5 1/2	4 to 5 1/2	4 to 5 1/2	4 to 5 1/2	4 to 6 1/2
4 feet	2' x 3 1/4'	3 1/2 to 4 1/2	3 to 4 1/2	3 to 4 1/2	3 to 4 1/2	3 to 4 1/2
3 1/2 feet	1 3/4' x 2 1/2'	3 to 3 1/2	3 to 3 1/2	3 to 3 1/2	3 to 3 1/2	3 to 4 1/2

**Depth of Field: For Critical Definition No. 35 K. A., f/4.5, 10-inch**

Distance Focused Upon	Approximate Field Size with 6 1/2 x 8 1/2" Neg.	DEPTH OF FIELD—IN FEET. Circle of Confusion, f/2000				
		f/4.5	f/8	f/11	f/22	f/45
INF.	36° x 46°	315 to inf.	178 to inf.	130 to inf.	65 to inf.	30 to inf.
400 feet	259' x 339'	175 to inf.	125 to inf.	100 to inf.	57 to inf.	29 to inf.
200 feet	129' x 169'	128 to 550	95 to inf.	79 to inf.	48 to inf.	26 to inf.
100 feet	65' x 85'	78 to 144	64 to 220	57 to inf.	40 to inf.	24 to inf.
50 feet	32' x 42'	43 to 59	38 to 69	36 to 81	28 to inf.	19 to inf.
25 feet	16' x 21'	23 to 27	22 to 29	21 to 31	18 to 40	14 to 115
15 feet	9' x 12'	14 to 16	14 to 16 1/2	13 to 17	12 to 20	10 to 29
10 feet	6' x 8'	9 1/2 to 10 1/2	9 to 10 1/2	9 to 11	9 to 12	7 to 14
8 feet	4 3/4' x 6'	7 1/2 to 8 1/2	7 to 8 1/2	7 to 8 1/2	7 to 9 1/2	6 to 10 1/2
6 feet	3 3/4' x 4 1/2'	5 1/2 to 6 1/2	5 to 6 1/2	5 to 6 1/2	5 to 6 1/2	5 to 7 1/2
5 feet	2 3/4' x 3 3/4'	4 1/2 to 5 1/2	4 to 5 1/2	4 to 5 1/2	4 to 5 1/2	4 to 6
4 feet	2' x 2 3/4'	3 to 4 1/2	3 to 4 1/2	3 to 4 1/2	3 to 4 1/2	3 to 4 1/2
3 1/2 feet	1 3/4' x 2 1/4'	3 to 3 1/2	3 to 3 1/2	3 to 3 1/2	3 to 3 1/2	3 to 4 1/2

The depth of field is not given for f/5.6, f/16, or f/32. The depth for these openings can be estimated.

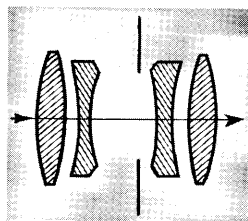
**Depth of Field:** For Critical Definition **No. 36 K. A., f/4.5, 12-inch**

Distance Focused Upon	Approximate Field Size 8 x 10 Neg.	DEPTH OF FIELD—IN FEET. Circle of Confusion, f/2000				
		f/4.5	f/8	f/11	f/22	f/45
INF.	37° x 45°	370 to inf.	213 to inf.	154 to inf.	74 to inf.	40 to inf.
400 feet	266' x 332'	185 to inf.	140 to inf.	115 to inf.	67 to inf.	35 to inf.
200 feet	133' x 166'	135 to 425	110 to 425	93 to inf.	58 to inf.	32 to inf.
100 feet	66' x 83'	81 to 135	72 to 178	67 to 194	45 to 310	22 to inf.
50 feet	33' x 41'	45 to 57	41 to 65	38 to 74	31 to 135	28 to inf.
25 feet	16' x 20'	24 to 26	23 to 26	21 to 30	19 to 37	15 to 26
15 feet	9 1/2' x 12'	14 1/2 to 15 1/2	14 to 16	13 1/2 to 17	12 to 19	11 to 20
10 feet	6' x 7 1/2'	9 1/2 to 10 1/2	9 1/2 to 10	9 1/2 to 11	8 to 12	8 to 14
8 feet	4 1/2' x 5 3/4'	7 1/2 to 8 1/2	7 1/2 to 8	7 1/2 to 8	7 to 8	6 to 10
6 feet	3 1/2' x 4 3/4'	5 1/2 to 6 1/2	5 1/2 to 6	5 to 6	5 to 6	5 to 7
5 feet	2 1/2' x 3 3/4'	4 1/2 to 5 1/2	4 1/2 to 5	4 to 5	4 to 5	4 to 5
4 feet	2' x 2 3/4'	3 1/2 to 4 1/2	3 1/2 to 4	3 to 4	3 to 4	3 to 4
3 1/2 feet	1 1/2' x 2'	3 1/2 to 3 1/2	3 1/2 to 3 1/2	3 to 3	3 to 3	3 to 3

The depth is not given for f/5.6, f/16, or f/32. For these openings depth can be estimated by comparison.

**Specifications:**

**No. 70 KODAK ANASTIGMAT f/7.7, 8-inch.**  
(For use on the Eastman 2D View Camera and other 5 x 7 cameras.)



This lens is of the symmetrical, air-spaced type which retains its corrections to a high degree when used for extreme close-ups. It gives extremely sharp definition over the whole field for all subject distances. This lens is supplied in a No. 1 Compur Shutter.

**Lens Speed:** f/7.7, marked apertures—f/7.7, f/11, f/16, f/22, f/32, f/45.

**Focal Length:** 8 inches, 203 mm.

**Shutter Speeds:** 1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100, 1/200 sec., T, and B.

**Negative Size and Angle of View:** 5 x 7 inches; 35° x 47° when focused for infinity.

**Attachment Size and Attachments Available:** 1-5/16 in., 33 mm., No. 7A. Kodak Combination Lens Attachments, Series VI (with Wratten Filters, Kodak Pola-Screens Type 1A, and Lens Hood).

**Depth of Field:** For Critical Definition

Distance Focused Upon	Approximate Field Size 5 x 7 Neg.	DEPTH OF FIELD—IN FEET. Circle of Confusion, f/2000				
		f/7.7	f/11	f/16	f/22	f/45
INF.	35° x 47°	150 to inf.	105 to inf.	72 to inf.	53 to inf.	26 to inf.
200 feet	124' x 174'	90 to inf.	71 to inf.	55 to inf.	42 to inf.	23 to inf.
100 feet	62' x 87'	60 to 200	51 to inf.	43 to inf.	35 to inf.	21 to inf.
50 feet	31' x 43'	37 to 75	34 to 96	30 to 180	26 to inf.	17 to inf.
25 feet	15' x 21'	21 to 30	20 to 33	18 to 38	17 to 48	13 to inf.
15 feet	8 1/2' x 12 1/2'	14 to 17	13 to 18	12 1/2 to 19	11 1/2 to 23	9 1/2 to 40
10 feet	5 1/2' x 8 1/2'	9 to 10 1/2	9 to 11 1/2	8 1/2 to 11 1/2	8 to 12 1/2	7 1/2 to 16 1/2
8 feet	4 1/2' x 6 3/4'	7 to 8 1/2	7 to 8 3/4	7 1/2 to 9	6 to 9	6 to 11
6 feet	3 1/2' x 4 3/4'	5 to 6 1/2	5 to 6 1/2	5 to 6 1/2	5 to 6	4 to 8
5 feet	2 1/2' x 3 3/4'	4 to 5 1/2	4 to 5 1/2	4 to 5 1/2	4 to 5	4 to 6
4 feet	2' x 2 3/4'	3 to 4 1/2	3 to 4 1/2	3 to 4 1/2	3 to 4	3 to 4
3 1/2 feet	1 1/2' x 2'	3 to 3 1/2	3 to 3 1/2	3 to 3 1/2	3 to 3	3 to 4

The depth is not given for f/8 or f/32. For these openings depth can be estimated by comparison.

**Dimensions for Kodak Anastigmats Supplied Separately in Barrels or Shutters for Use on Commercial, Portrait, Press, and View Cameras with Interchangeable Lens Boards**

LENS	Equivalent Focal Length (inches)	Back Focus (inches)	Plate or Film Size (inches)	Angle of View when Focused for it, and with Recommended Film Size	Diameter of Front Lens Mount		Filter-Cell Size No.	Diameter of Lens Board Mounting Hole		Shutter	Over-All Length of Lens Mount (inches)
					(inches)	(mm.)		(inches)	(mm.)		
K. Ektar. <i>f</i> /3.7; 4½ in. (107 mm.) In Shutter.....	4½	3½	2½ x 3½	31° x 42°	1½	38	23	1½	35	Compu-Rapid No. OS	2½½
K.A. <i>f</i> /4.5; 4½ in. (105 mm.) In Shutter.....	4½	3½	2½ x 3½	31° x 43°	1½	31.5	5A	1½	32	Compu-Rapid No. OS	1½
K.A. <i>f</i> /4.5; 5 in. (127 mm.) In Shutter.....	5	4½	2½ x 3½ or 3½ x 4½	26° x 36° 36° x 46°	1½	33	7	1½	32	Compu-Rapid No. OS	1½
K.A. <i>f</i> /4.5; 5½ in., No. 31 In Barrel In Shutter }.....	5½	4½½	2½ x 3½ or 3½ x 4½ 4 x 5	23° x 33° 33° x 42° 40° x 49°	1½	39.5 42.5	31 32	1½	39.5 42.5	None IIR411 Compu	1½
K.A. <i>f</i> /4.5; 6½ in., No. 32 In Barrel In Shutter }.....	6½	5½	4 x 5	35° x 42°	1½	44.5 42.5	32 32	1½	44.5 42.5	None IIR411 Compu	1½
K.A. <i>f</i> /4.5; 7½ in., No. 33 In Barrel In Shutter }.....	7½	6½	5 x 7	37° x 53°	2	50.5	33	2½	60 60	None IIR611 Compu	1½
K.A. <i>f</i> /4.5; 8½ in., No. 34 In Barrel In Shutter }.....	8½	7½	5 x 7	33° x 50°	2½	60	34	2½	67 64	None Compound	1½
K.A. <i>f</i> /4.5; 10 in., No. 35 In Barrel In Shutter }.....	10	9	6½ x 8½	36° x 46°	2½	68	Ezsteman Adjustable Filter Holder Case	2½	73 70	None Compound	2½
K.A. <i>f</i> /4.5; 12 in., No. 36 In Barrel In Shutter }.....	12	10½	8 x 10	37° x 45°	3½	85.5			3½	92 81	None Compound
K. Ektar. <i>f</i> /6.3; 14 in. In Barrel In Shutter }.....	14	12½	8 x 10	32° x 40°	2½	75		3½	81	None	2½
K.A. <i>f</i> /7.7; 8 in. (203 mm.) In Shutter.....	8	7½	5 x 7	35° x 47°	1½	33	7A	1½	42	No. 1 Compu	2½