choosing the right lens for large format photography

Both the beginner and more advanced worker in large format photography can easily get bewildered by the seemingly endless variables in lens selection. Among the factors he is told he must consider are focal length, coverage, aperture, flange focal length, resolution, contrast and type of shutter to be used.

Since some of these factors are inter-related, the question of where to start frequently becomes a difficult one to answer. This booklet is designed to provide some guidelines to lens selection for newcomers to large format photography— and for more advanced view camera photographers as well.

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Since so many photographers taking up large-format photography today have experience with smaller cameras, perhaps the best way to start a discussion of lens selection is to compare lenses for view cameras with those for the smaller cameras. Lenses for 4 x 5" view cameras, for example, are related to 35mm camera lenses by a factor of 4. This means a 50mm lens for a 35mm camera would be equivalent to a 200mm lens on the 4 x 5" in terms of angle of view. Figure 1 shows the relationships between the popular camera formats in terms of focal length, based on making a print of standard proportions (4 x 5", 8 x 10", 16 x 20" etc.) A photographer going from a 2½" sq. format to 5 x 7" would find from Figure 1 that the two are related on a ratio basis of 2½:1. Therefore, to achieve the same effect as his 120mm gives on his 2¼ sq. camera, he would need a 300mm lens on the 5 x 7" (120 x 2½ = 300.)

As a rule, the "normal" lens for a 4 x 5" view camera is considered to be a 150-165mm. "Normal" for a 5 x 7" is 210 to 250mm; for an 8 x 10", 300 to 350mm; and for an 11 x 14", 360 to 500mm.

fig. 1;

Focal lengths relationships for various formats

	35mm	2¼ SQ.	4X5"	5X7"	8X10"	11X14"
35mm	1	½	¼	⅕	⅛	1/12
2¼ SQ.	2	1	½	⅖	¼	1/6
4X5"	4	2	1	⅘	⅝	5/12
5X7"	5	2½	1¼	1	⅝	5/12
8X10"	8	4	2	1.6	1	⅔
11X14"	12	6	3	2.4	1½	1

coverage

Coverage, as the name implies, relates to the ability of a lens to provide a full size image for the format selected. A lens is said to "cover" a format if it provides an image on the ground glass sufficiently large to give edge-to-edge, corner-to-corner coverage without significant fall-off of light or definition in the corners.

While any lens that will cover the format with the camera "straight on" will allow for some corrective movements, minimal coverage does not provide the ability to correct for distortion. If distortion correction (such as eliminating converging verticals) is required, a lens with additonal covering power must be used.

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a) Viewing area of a lens with considerable covering power. Such a lens would allow use of extreme corrective movements on a 4 x 5" or even a 5 x 7" camera, while acting as a very wide angle lens on an 8 x 10" view camera, with no margin for corrective movements.

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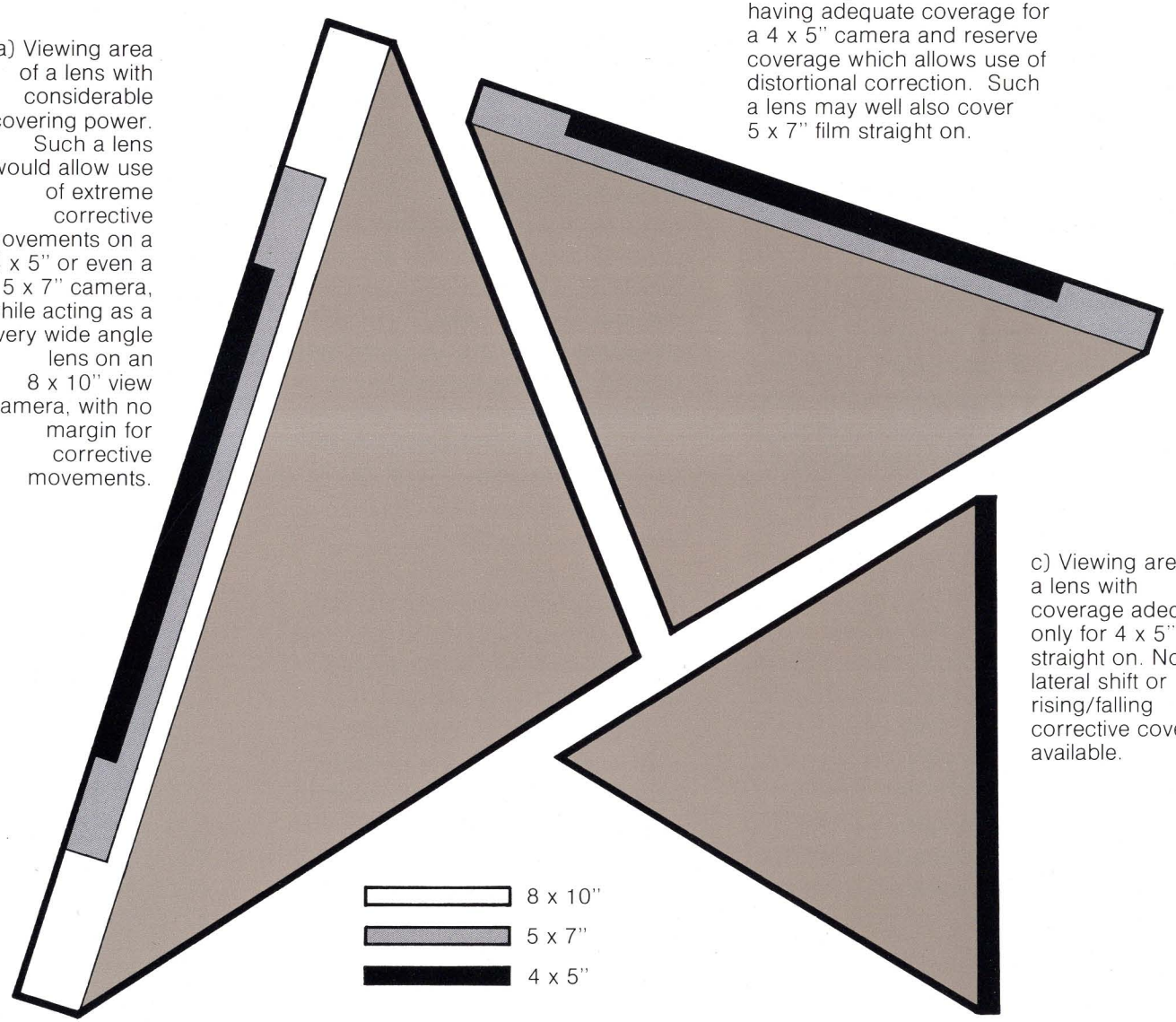

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Flange focal length is a measure of the distance from the front of the lens board to the point behind the lens at which it will develop a sharp image of an object focused at infinity. Frequently, flange focal length is not a significant factor and can be ignored.

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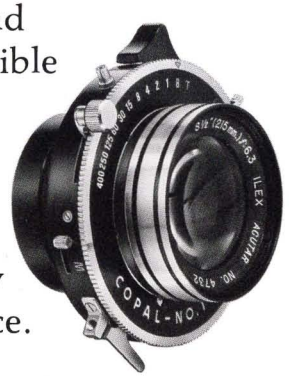

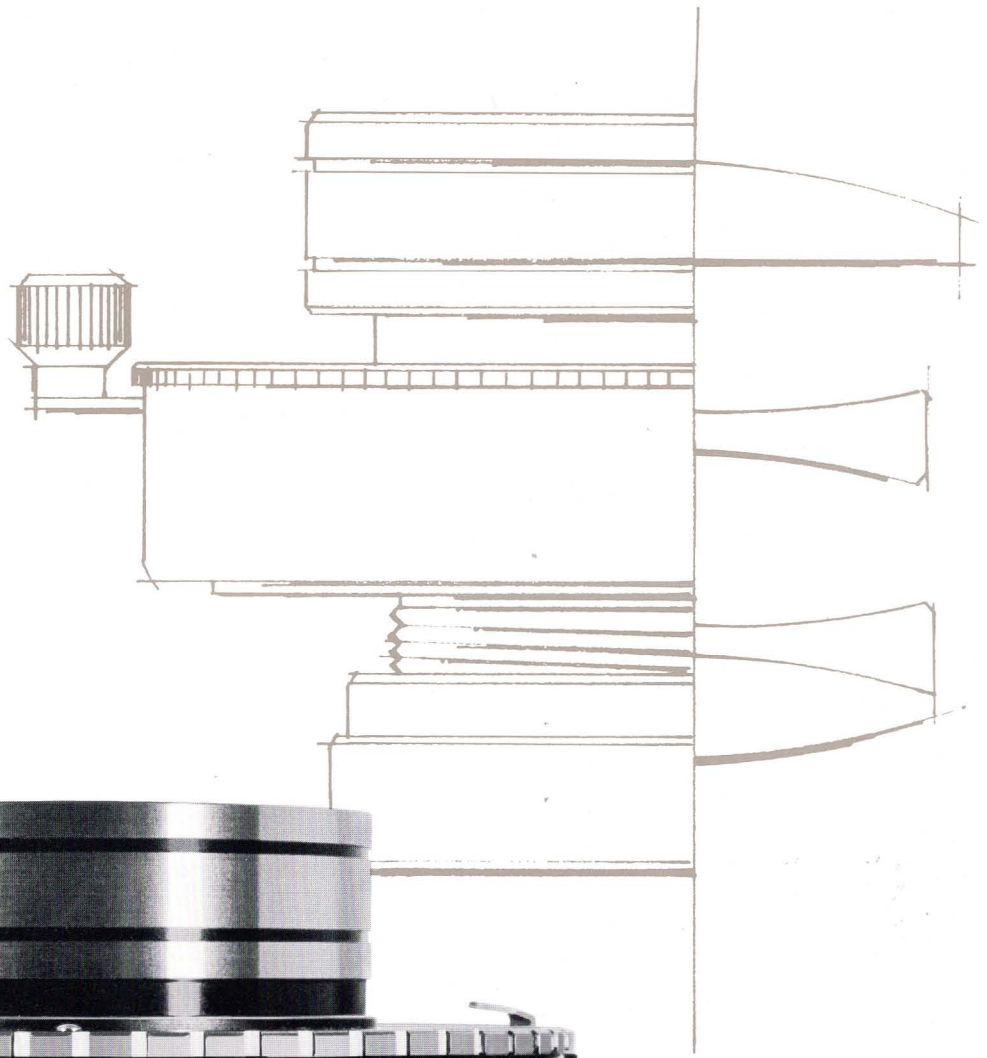

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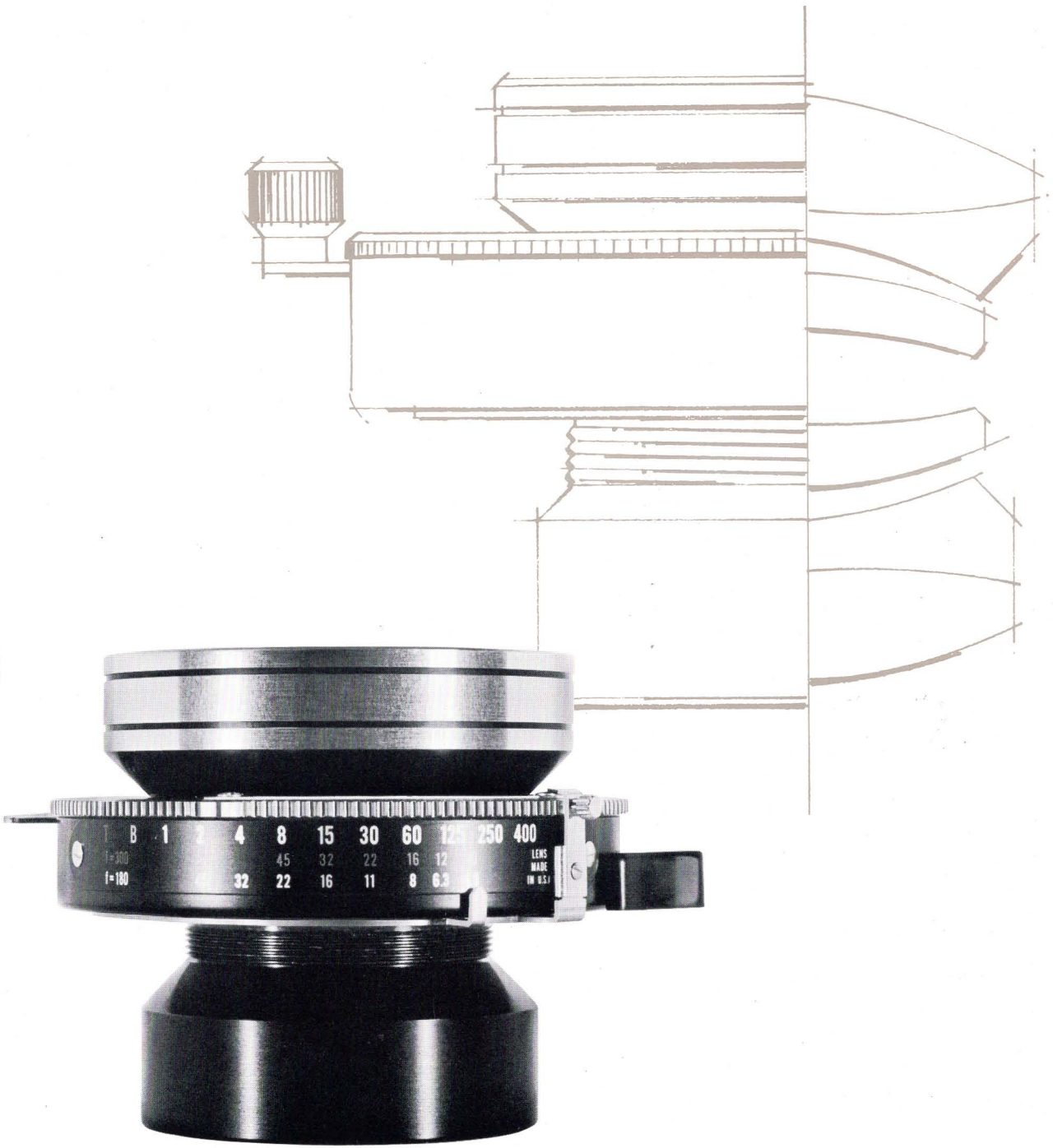

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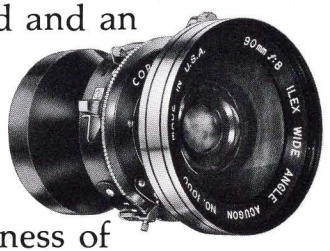

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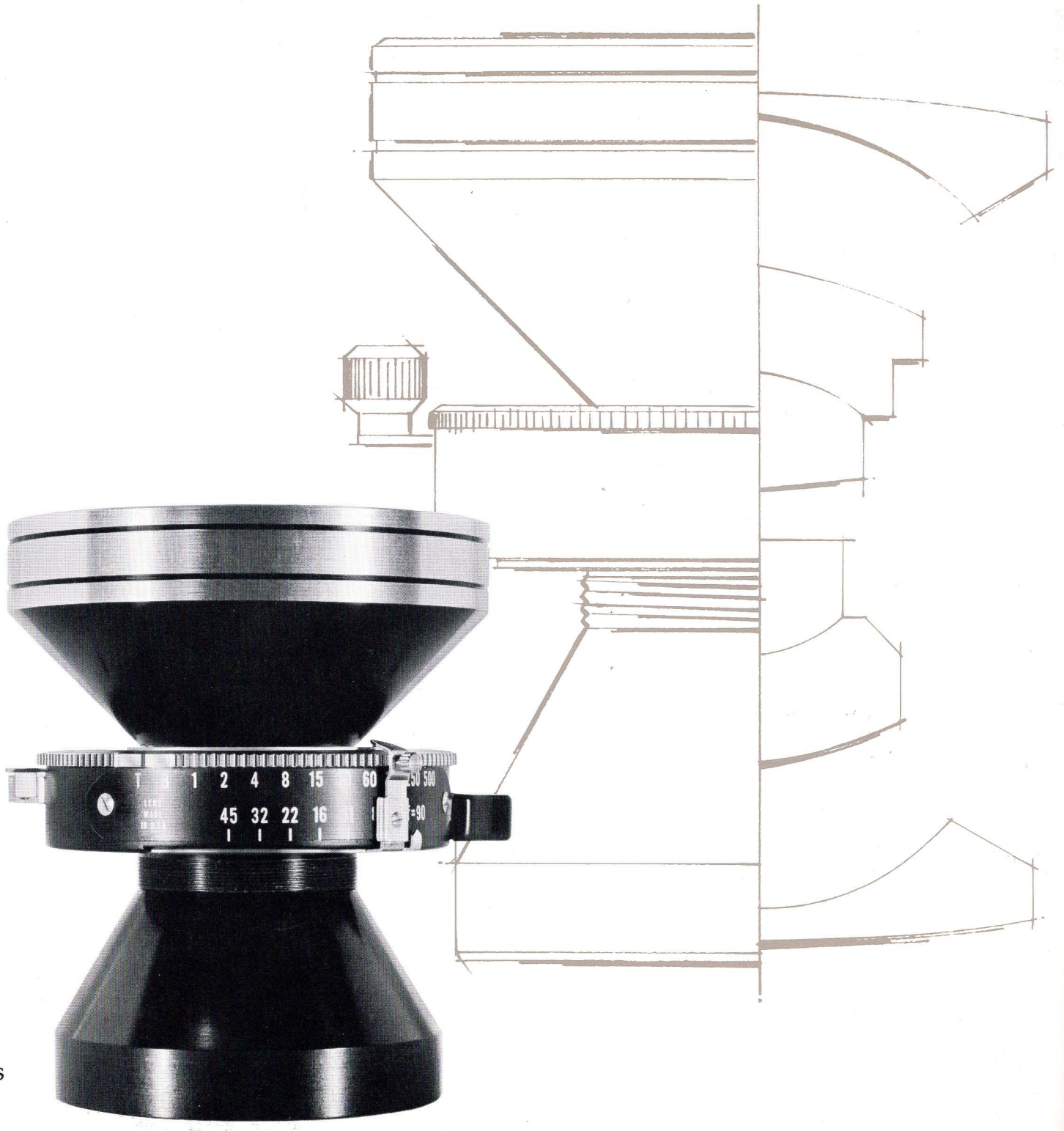

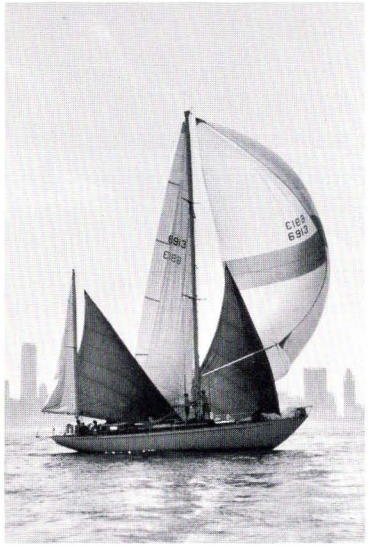

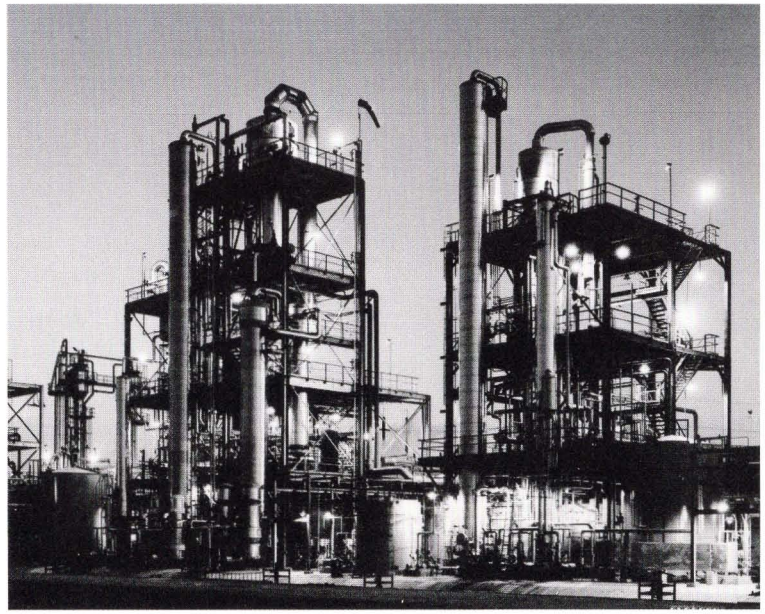

LENS TYPE	FLANGE DISTANCE (in.)	SHUTTER SPEEDS	SHUTTER MOUNTING THREAD DIA. (in.)	DIA. COVERAGE (in.)	MAX. FILM SIZE (in.)	ANGLE OF VIEW (degrees)	APERTURE RANGE	SYNCH	PRESS FOCUS	SHUTTER
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7½" (190mm) f6.3 Acutar	6.95	1-1/400 T & B	1.535	8.6	5x7	58	f6.3-f45	MX	Yes	Copal #1
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12" (305mm) f6.3 Acutar	11.06	1-1/150 T & B	2.500	12.8	8x10	58	f6.3-f45	MFX	Yes	Ilex #4 Acme Synchro
14¾" (375mm) f6.3 Acutar	13.90	1-1/50 T & B	3.232	17.8	11x14	58	f6.3-f45	MFX	Yes	Ilex #5 Acme Synchro
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47mm Acugon	1.98	1-1/500 T & B	1.280	4.30	2¼x3¼ 2½x3½	102	f8-f45	MX	Yes	Copal #0
65mm f8 Acugon	2.89	1-1/500 T & B	1.280	6.1	4x5	102	f8-f45	MX	Yes	Copal #0
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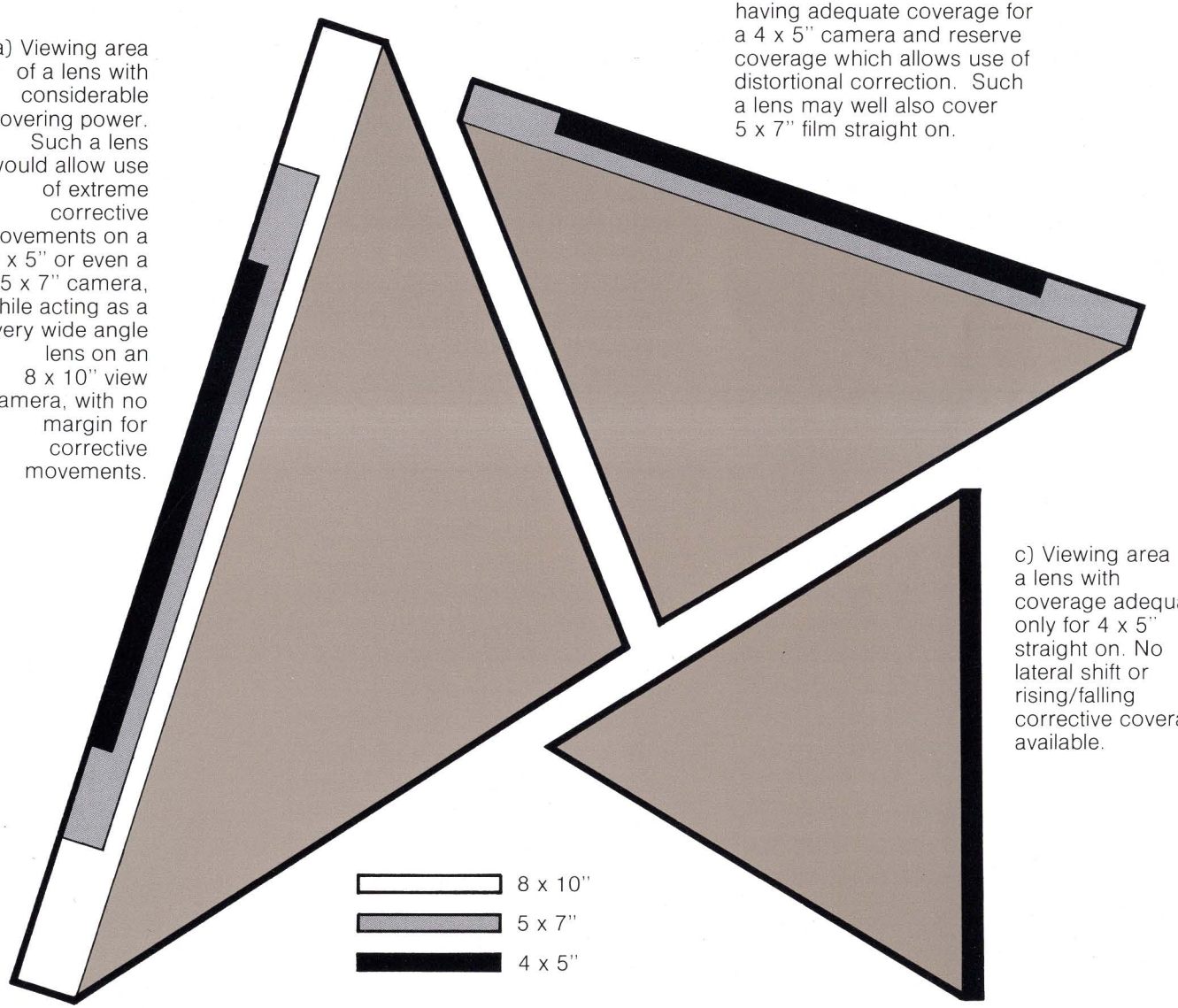

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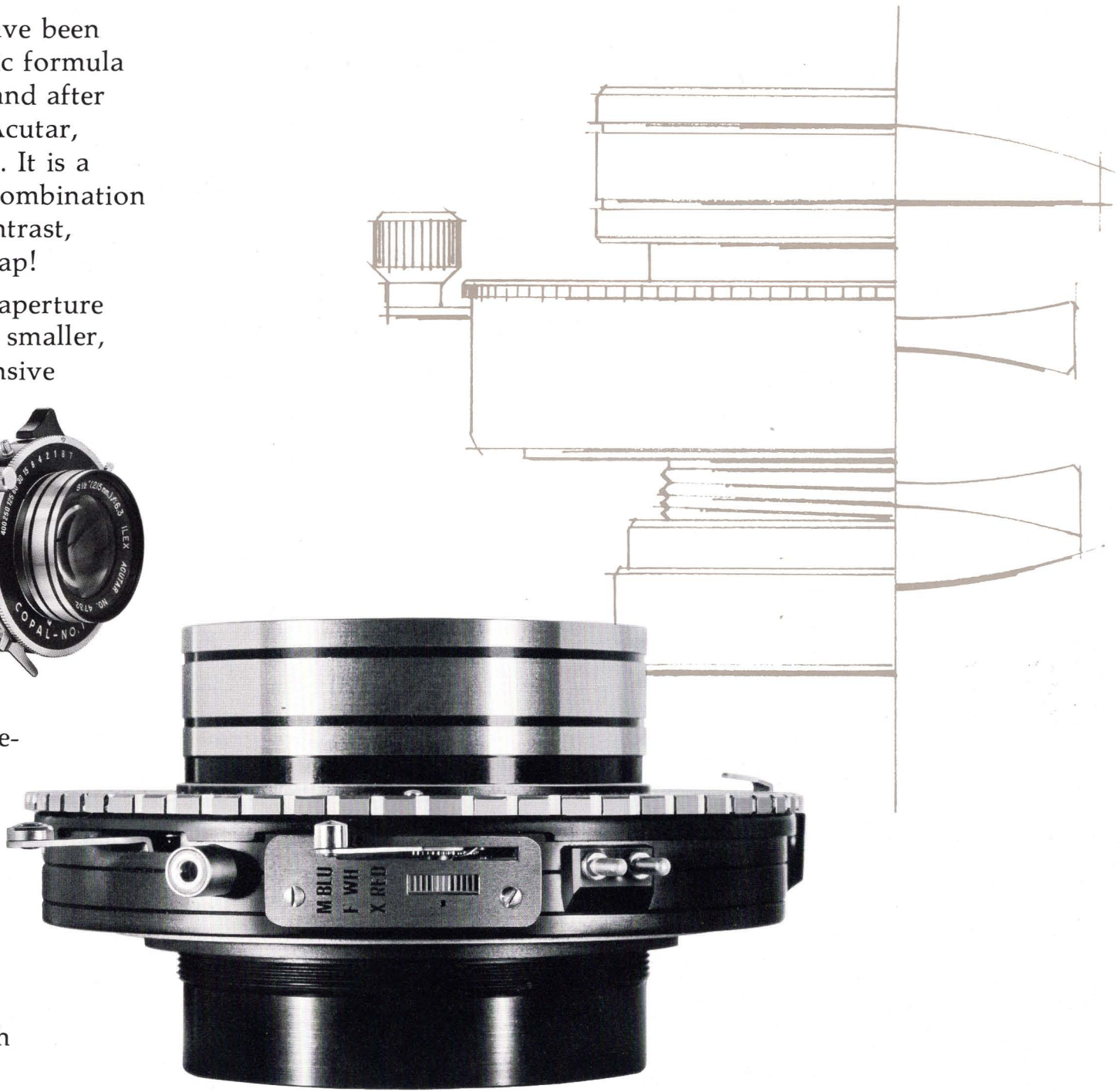

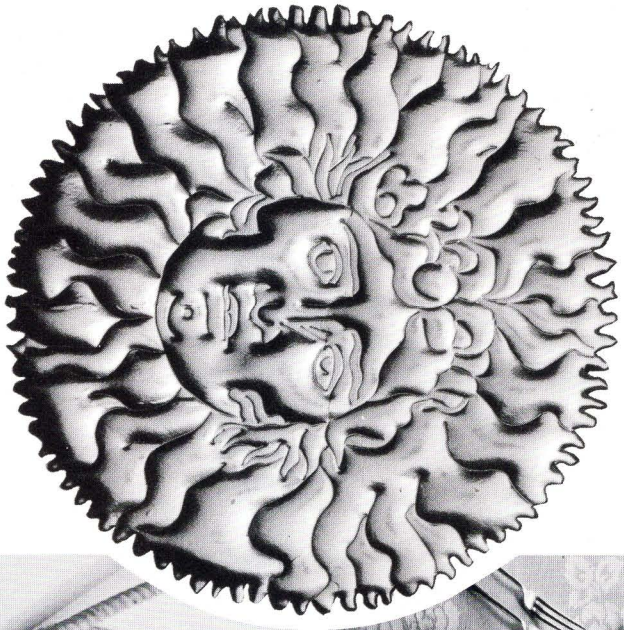

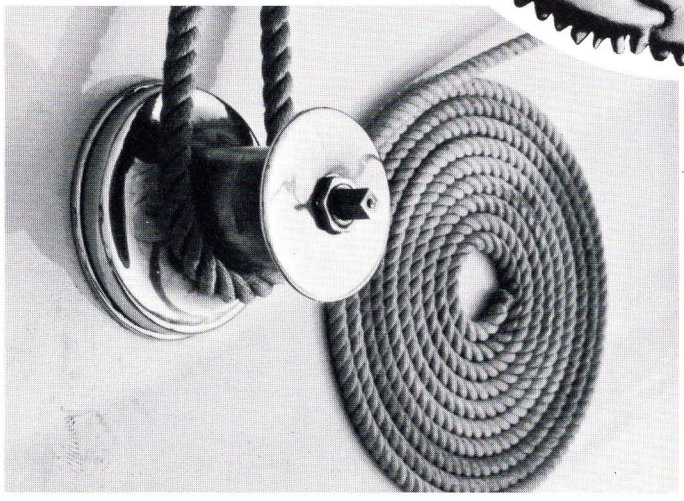

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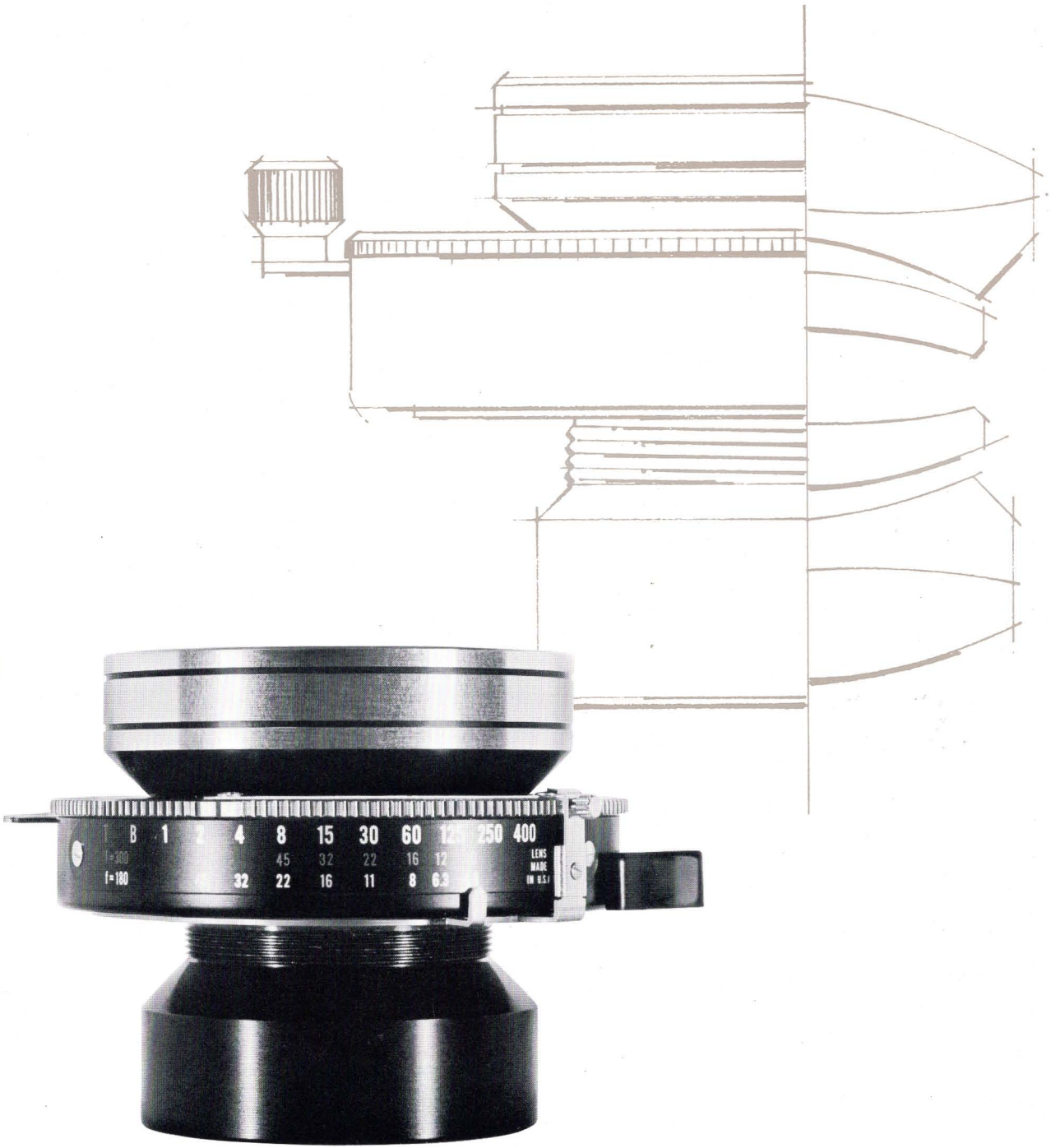

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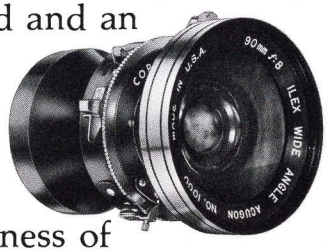

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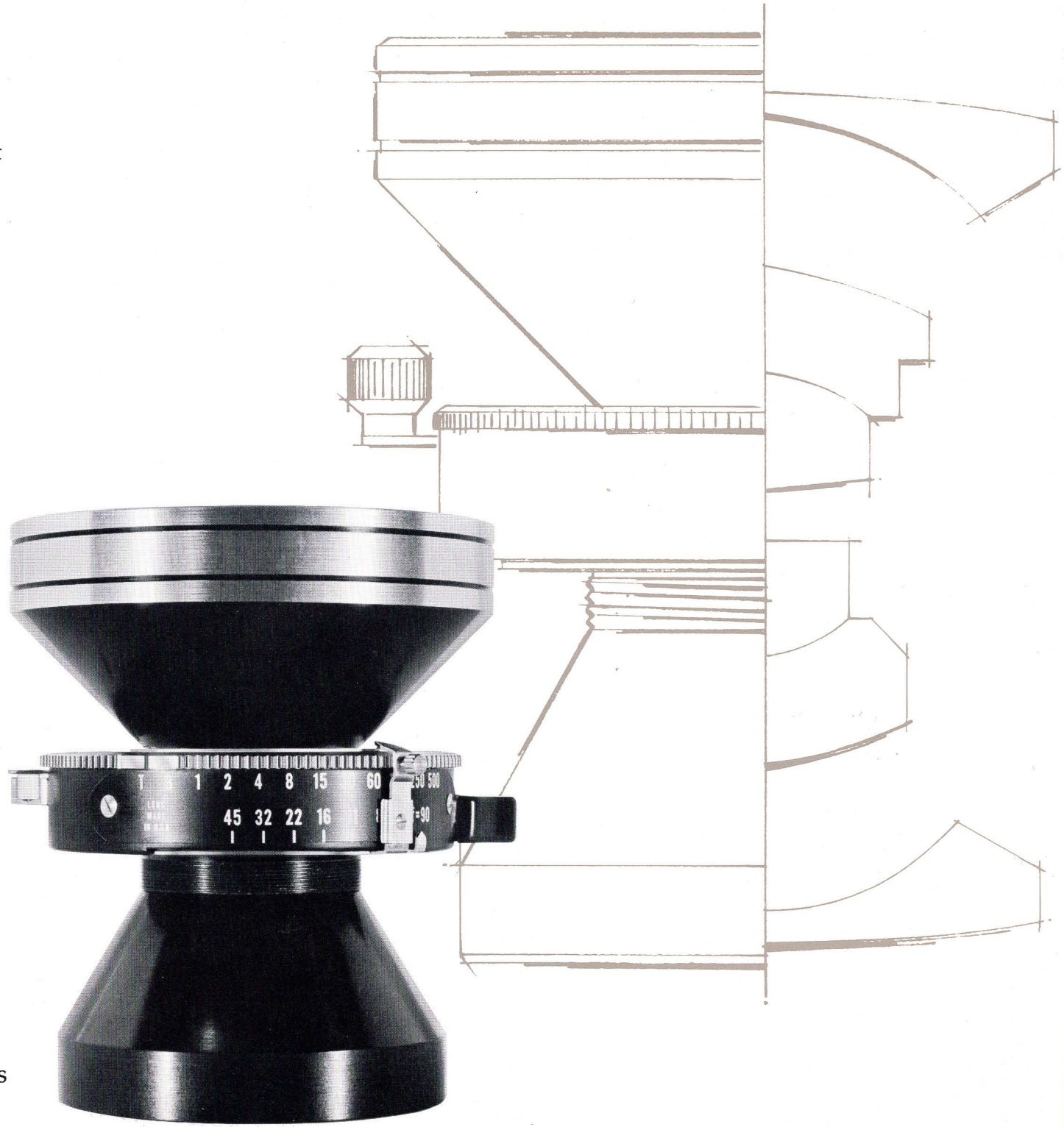

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6" (152mm) f4.8 Acuton standard convertible	5.73 11.23	1-1/400 T & B	1.535	8.2 8.6	5x7	70 48	f4.8-f45 f10-f45	MX	Yes	Copal #1
7½" (190mm) f4.8 Acuton standard convertible	7.04 13.81	1-1/400 T & B	1.535	9.9 10.5	5x7	70 47	f4.8-f45 f10-f45	MX	Yes	Copal #1
8½" (216mm) f4.8 Acuton standard convertible	8.13 15.92	1-1/150 T & B	1.913	12 12.5	8x10	70 48	f4.8-f45 f10-f45	MFX	Yes	Ilex #3 Acme Synchro
47mm Acugon	1.98	1-1/500 T & B	1.280	4.30	2¼x3¼ 2½x3½	102	f8-f45	MX	Yes	Copal #0
65mm f8 Acugon	2.89	1-1/500 T & B	1.280	6.1	4x5	102	f8-f45	MX	Yes	Copal #0
90mm f8 Acugon	4.04	1-1/500 T & B	1.280	8.6	5x7	102	f8-f45	MX	Yes	Copal #0