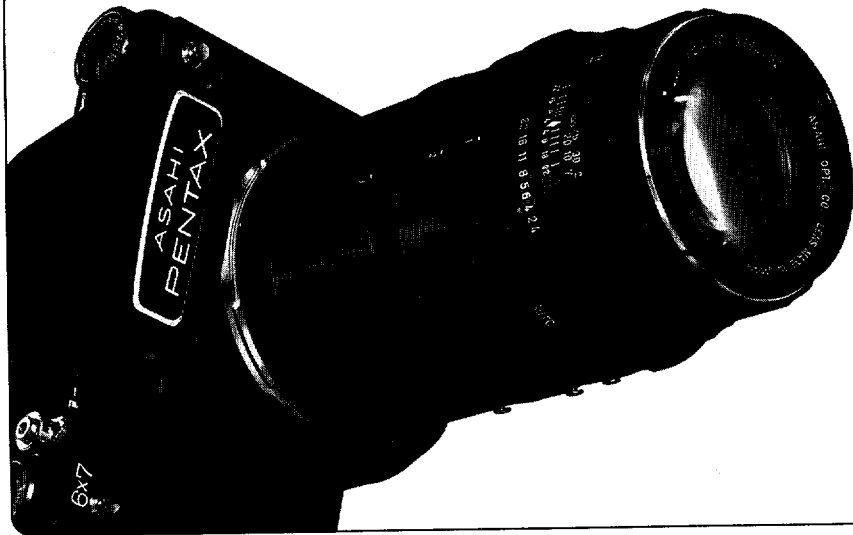


**ASAHI
PENTAX**



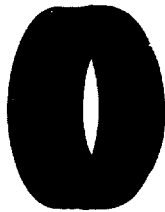
EXTENSION TUBES OPERATING MANUAL



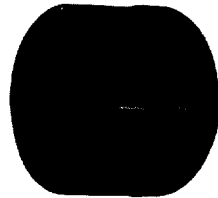
EXTENSION 1



1



2

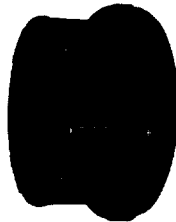


3

A



B



SPECIFICATIONS

Auto Extension Tubes (Inner Bayonet)

Camera: Asahi Pentax 6×7

Lenses: 6×7 interchangeable lenses from 55mm to 300mm

Length: #1—14mm (0.55 in.) #2—28mm (1.10 in.) #3—56mm (2.21 in.)

Weight: #1—75g (2.65 oz.) #2—90g (3.17 oz.) #3—125g (4.41 oz.)

The 6×7 Auto Extension Tube is designed for use with Takumar/6×7 interchangeable lenses from 55mm to 300mm. The Auto Extension Tubes can be used individually or in any combination, utilizing the fully automatic diaphragm of the lenses. For close-up data on each lens, refer to Tables 1~6 (pages 4~9).

Extension Tubes (Outer Bayonet)

Camera: Asahi Pentax 6×7

Lenses: 6×7 interchangeable lenses from 400mm to 1000mm

Length: A—23mm (0.91 in.) B—46mm (1.81 in.)

Weight: A—110g (3.88 oz.) B—150g (5.29 oz.)

Extension Tubes A and B are for Takumar/6×7 lenses from 400mm to 1000mm. For close-up data on each lens, refer to Tables 7~9 (Pages 11~13).

HOW TO USE THE AUTO EXTENSION TUBES

Assembly

Align the red dot on the Auto Extension Tube with that on the body mount and turn the tube clockwise until it automatically locks. Make sure that the tube is completely locked.

Disassembly

When detaching the lens from the tube, press the bayonet locking pin on the tube and turn the lens counter-clockwise until the red dot on the lens matches that on the tube.



HOW TO USE THE CLOSE-UP TABLES

Depending on your particular close-up situation, determine first 1) the picture area, 2) the film-to-subject distance, or 3) the magnification. Then select the most suitable Extension Tube combination according to the data in the tables.

Determine the magnification first

When you want to magnify or reduce a subject to a specific image size, determine the magnification first. For example, if the image size is half the size of the subject, the magnification is 0.5. If the image is twice as large as the actual subject, the magnification is 2. The close-up table will show which Extension Tube combination to use.

Determine the picture area first

When the subject area to photograph is determined, measure its length and width. Then refer to the picture area column in the close-up table and select the most suitable lens plus Extension Tube combination.

Determine the film-to-subject distance first

When it is difficult to get closer to your subject, determine the desired film-to-subject distance first. As the picture area varies with the focal length of each lens, select the most suitable lens plus Extension Tube combination by referring to the data in the close-up table.

Exposure Factor

In close-up photography, you must adjust the exposure according to the length of the Extension Tube, as the amount of light decreases as it passes through a greater distance. Exposure varies according to the combination of lens and Extension Tubes. Refer to the data in the close-up table for the exposure factor that shows how much to compensate for correct exposure. No exposure factor compensation is needed when the exposure reading is made with the 6×7 TTL Pentaprism which will be available in the near future.

Table 1 **55mm f/3.5**

(Distance scale set at 0.45m)

Magnification	Extension tube combination	Picture Area		Film-to-subject distance		Exposure factor
		cm	inches	cm	inches	
0.20	Not used	35.14 × 28.01	13.85 × 11.04	45.0	17.73	× 1.3
0.45	1	15.38 × 12.26	6.06 × 4.83	30.6	12.06	× 1.6
0.70	2	9.85 × 7.85	3.88 × 3.09	27.5	10.84	× 2.0
0.95	2+1	7.24 × 5.77	2.85 × 2.27	26.8	10.56	× 2.5
1.21	3	5.73 × 4.56	2.26 × 1.80	27.0	10.64	× 3.0
1.46	3+1	4.74 × 3.77	1.87 × 1.49	27.6	10.87	× 3.5
1.71	3+2	4.04 × 3.22	1.59 × 1.27	28.5	11.23	× 4.1
1.96	3+2+1	3.52 × 2.80	1.39 × 1.10	29.4	11.58	× 4.8

Table 2 75mm f/4.5

(Distance scale set at 0.7m)

Magnification	Extension tube combination	Picture Area		Film-to-subject distance		Exposure factor
		cm	inches	cm	inches	
0.15	Not used	47.48 × 37.85	18.71 × 14.91	70.0	27.58	× 1.2
0.33	1	20.78 × 16.57	8.19 × 6.53	42.3	16.67	× 1.6
0.52	2	13.30 × 10.60	5.24 × 4.18	35.6	14.03	× 1.9
0.71	2+1	9.78 × 7.80	3.85 × 3.07	33.1	13.04	× 2.3
0.89	3	7.74 × 6.17	3.05 × 2.43	32.4	12.77	× 2.8
1.08	3+1	6.40 × 5.10	2.52 × 2.01	32.3	12.73	× 3.2
1.27	3+2	5.45 × 4.35	2.15 × 1.71	32.7	12.88	× 3.8
1.45	3+2+1	4.75 × 3.79	1.87 × 1.49	33.3	13.12	× 4.3

Table 3 **105mm f/2.4**

Magnification	Extension tube combination	Picture Area		Film-to-subject distance		Exposure factor
		cm	inches	cm	inches	
0.13	Not used	51.38 × 40.95	20.24 × 16.13	100.0	39.40	× 1.3
0.27	1	25.78 × 20.55	10.16 × 8.10	62.4	24.59	× 1.6
0.40	2	17.21 × 13.72	6.78 × 5.41	50.7	19.98	× 1.9
0.53	2+1	12.91 × 10.29	5.09 × 4.05	45.6	17.97	× 2.2
0.67	3	10.33 × 8.24	4.07 × 3.25	43.1	16.98	× 2.6
0.80	3+1	8.61 × 6.87	3.39 × 2.71	41.8	16.47	× 3.0
0.93	3+2	7.38 × 5.89	2.91 × 2.32	41.4	16.31	× 3.5
1.07	3+2+1	6.46 × 5.15	2.55 × 2.03	41.4	16.31	× 3.9

Table 4 150mm f/2.8

(Distance scale set at 1.5m)

Magnification	Extension tube combination	Picture Area		Film-to-subject distance		Exposure factor
		cm	inches	cm	inches	
0.13	Not used	55.35 × 44.12	21.81 × 17.38	150.0	59.10	× 1.3
0.22	1	31.65 × 25.23	12.47 × 9.94	99.7	39.28	× 1.6
0.31	2	22.16 × 17.67	8.73 × 6.96	80.5	31.72	× 1.9
0.41	2+1	17.05 × 13.59	6.72 × 5.35	70.8	27.90	× 2.2
0.50	3	13.86 × 11.04	5.46 × 4.35	65.3	25.73	× 2.6
0.59	3+1	11.67 × 9.30	4.60 × 3.66	61.9	24.39	× 2.9
0.69	3+2	10.08 × 8.03	3.97 × 3.16	59.8	23.56	× 3.3
0.78	3+2+1	8.87 × 7.07	3.49 × 2.79	58.6	23.09	× 3.7

Table 5 **200mm f/4**

Magnification	Extension tube combination	Picture Area		Film-to-subject distance		Exposure factor
		cm	inches	cm	inches	
0.10	Not used	71.50 × 57.00	28.17 × 22.46	250.0	98.50	× 1.3
0.17	1	41.44 × 33.03	16.33 × 13.01	164.1	64.66	× 1.5
0.24	2	29.18 × 23.26	11.50 × 9.16	129.9	51.18	× 1.8
0.31	2+1	22.51 × 17.95	8.87 × 7.07	112.0	44.13	× 2.1
0.38	3	18.33 × 14.61	7.22 × 5.76	101.3	39.91	× 2.4
0.45	3+1	15.45 × 12.32	6.09 × 4.85	94.4	37.19	× 2.7
0.52	3+2	13.36 × 10.65	5.26 × 4.20	89.7	35.34	× 3.0
0.59	3+2+1	11.77 × 9.38	4.64 × 3.70	86.5	34.08	× 3.4

Table 6 300mm f/4

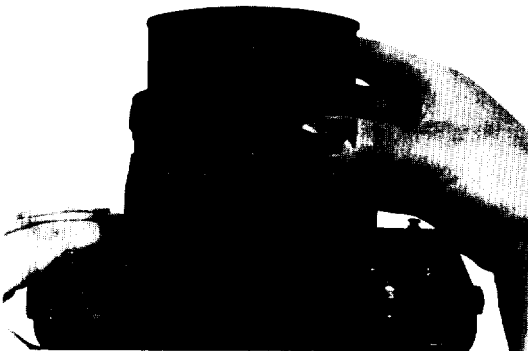
(Distance scale set at 5m)

Magnification	Extension tube combination	Picture Area		Film-to-subject distance		Exposure factor
		cm	inches	cm	inches	
0.07	Not used	97.87 × 78.02	38.56 × 30.74	500.0	197.0	× 1.3
0.12	1	58.89 × 46.94	23.20 × 18.49	332.5	131.0	× 1.6
0.16	2	42.12 × 33.57	16.60 × 12.83	260.9	102.79	× 1.9
0.21	2+1	32.78 × 26.13	12.92 × 10.30	221.7	87.35	× 2.1
0.26	3	26.83 × 21.39	10.57 × 8.43	197.3	77.74	× 2.5
0.30	3+1	22.71 × 18.10	8.95 × 7.13	180.7	71.20	× 2.8
0.35	3+2	19.69 × 15.69	7.76 × 6.18	169.0	66.59	× 3.1
0.40	3+2+1	17.37 × 13.85	6.84 × 5.46	160.3	63.16	× 3.5

HOW TO USE THE EXTENSION TUBE (WITH LENS BAYONET)

Assembly

Place the tightening ring of the Extension Tube on the outer bayonet of the camera body. Then turn the tightening ring counter-clockwise, as shown. Make sure that the bayonets are completely engaged.



Disassembly

When detaching the lens or Extension Tubes from the camera body, follow the reverse order of assembly. Either the tightening ring on the Extension Tube or the lens may be loosened. Be sure to hold the camera body firmly.



Table 7 400mm f/4

(Distance scale set at 8m)

Magnification	Extension tube combination	Picture Area		Film-to-subject distance		Exposure factor
		cm	inches	cm	inches	
0.06	Not used	121.59 × 96.92	47.91 × 38.19	800.0	315.20	× 1.2
0.11	A	60.39 × 48.14	23.79 × 18.97	446.9	176.08	× 1.5
0.17	B	40.17 × 32.02	15.83 × 12.62	332.0	130.81	× 1.8
0.23	B+A	30.10 × 23.99	11.86 × 9.45	275.9	108.70	× 2.1

Table 8 **600mm f/4**

(Distance scale set at 12m)

Magnification	Extension tube combination	Picture Area		Film-to-subject distance		Exposure factor
		cm	inches	cm	inches	
0.06	Not used	117.28 × 93.48	46.21 × 36.83	1200.0	472.80	× 1.4
0.10	A	71.01 × 56.60	27.98 × 22.30	801.8	315.91	× 1.7
0.14	B	50.92 × 40.59	20.06 × 15.99	629.4	247.98	× 2.0
0.17	B+A	39.69 × 31.64	15.64 × 12.47	534.0	210.40	× 2.3

Table 9 800mm f/4

(Distance scale set at 20m)

Magnification	Extension tube combination	Picture Area		Film-to-subject distance		Exposure factor
		cm	inches	cm	inches	
0.04	Not used	156.37 × 124.65	61.61 × 49.11	2000.0	788.0	× 1.2
0.07	A	94.68 × 75.47	37.30 × 29.74	1283.4	505.66	× 1.3
0.10	B	67.90 × 54.12	26.75 × 21.32	975.1	384.19	× 1.4
0.13	B+A	52.92 × 42.19	20.85 × 16.62	803.8	316.70	× 1.5



Folding Focusing Hood

The Folding Focusing Hood, for waist-level viewing, is used when the pentaprism is detached. This four-sided focusing hood is equipped with a 1.6× focusing magnifier for more accurate focusing.



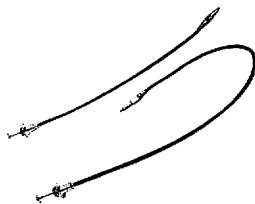
Rigid Magnifying Hood

This waist-level rigid viewfinder has an adjustable 1.3× magnifier for critical focusing. It is completely light-tight and is equipped with an adjustable eyepiece. As with the Folding Focusing Hood, 100% of the picture area can be seen.



Magnifier

This is a 2× magnifier for super-critical focusing. It is designed for magnifying the central portion of the viewfinder. Hinge at top allows the magnifier to be lifted for full viewing through the viewfinder.



Cable Release II and Long Cable Release

When shooting at slow shutter speeds or when taking close-ups or macrophotography, the cable release is a necessary accessory. Both the Pentax Cable Release II and the Long Cable Release have special locking collars for making time exposures.



ASAHI OPTICAL CO., LTD. C.P.O. 895, Tokyo 100-91, JAPAN

ASAHI OPTICAL EUROPE S.A. Freight Bldg., Brussels National Airport, 1930 Zaventem, BELGIUM

ASAHI OPTICAL EUROPE S.A. (Hamburg Office) 2000 Hamburg 50, Koenigstrasse 28, WEST GERMANY

ASAHI OPTICAL (AMERICA) INC. 31 East 28th Street, New York, New York 10016, U.S.A.

ASAHI OPTICAL BRASILEIRA IND. E COM. LTDA. Cx. Postal 7839—São Paulo, BRASIL