PENTAX® 6X7

AUTO EXTENSION TUBES
EXTENSION TUBES

Auto Extension Tubes (for 55mm ~ 300mm lenses)

No. 1

No. 2

No. 3

Extension Tubes (for 400mm ~ 1000mm lenses)

No. 1

No. 2

Auto Extension Tubes

The Auto Extension Tubes mount to the inner bayonet of the Pentax 6x7 camera and permit automatic diaphragm operation with all 6x7 lenses from 45mm ~ 300mm focal length.
The tubes can be used individually or in any combination, permitting a wide range of close up possibilities, as indicated in Tables 1 ~ 8 of this booklet.

Usable Lenses:	SMC Pentax and SMC Takumar interchangeable lenses from 55mm thru 300mm.		
	No. 1	**No. 2**	**No. 3**
Length:	14mm	28mm	56mm
Weight:	75g	90g	125g

Extension Tubes

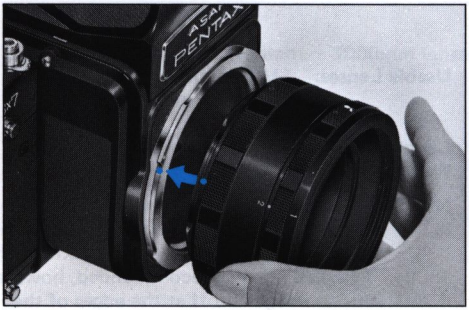
The extension tubes mount to the outer bayonet of the Pentax 6x7 camera and are designed for use with non-automatic diaphragm 6x7 lenses (i.e. all 6x7 lenses from 400mm thru 1000mm, excluding the 500mm f/4 lens).
The tubes may be used together or separately and permit the various close-up possibilities indicated in Tables 9 ~ 12.

Usable Lenses:	SMC Takumar 6x7 lenses from 400mm ~ 1000mm.	
	No. 1	**No. 2**
Length:	23mm	46mm
Weight:	110 g	150g

NOTE: The SMC Pentax 500mm lens fits to the inner bayonet mount of the 6x7 camera and will mount with the Auto Extension Tubes. Use is not recommended, however, due to image cutoff at the edges of the picture.

Attaching Tubes to Camera/Lens:
Align the red dot of the tube to be attached directly to the camera with the red dot on body mount and turn the tube clockwise until it locks in place. Jiggle slightly to test that it is bayoneted properly. Repeat with other tubes. Mount lens to last tube in same manner.
IMPORTANT: When using the TTL Pentaprism Finder on the camera, the Lens' depth-of-field preview lever must be set to MAN. and metering stopped down in order to obtain a reading. You may also take the photo with the lever set at MAN., but for brighter focusing and use of automatic diaphragm, set the lever back to AUTO when using three tubes or less (with more than three tubes it must be left at MAN.).

Releasing the Lens from Tubes:
To remove the lens from the extension tubes, press the bayonet lock release on the side of the tube, turn lens counter-clockwise and slide out of mount.



HOW TO USE THE CLOSE-UP TABLES

Depending on the requirements of the type of close-up work you are doing, you will have to first determine either (a) the picture area (b) the film-to-subject distance or (c) the magnification, then select the appropriate extension tube combination from the data given in the tables. **NOTE: Data is vaild only with the lens distance scale set at minimum focus.**

Determine the Magnification First:
when you wish to magnify or reduce a subject to a specific image size. For example, to photograph the image at half the actual subject size, use magnification 0.5X. To photograph at twice the subject size, use 2X. Look up the magnification in the table for the lens in use and use the extension tube combination indicated.

Determine the Picture Area First:
when you wish to photograph a given area. Measure the length and width of the area you wish to photograph, then refer to the picture area column of the various tables and select the lens and extension tube combination which most nearly approximates the area you wish to photograph.

Determine the Film-to-Subject Distance First:
when it's difficult to get close to your subject. After selecting a suitable working distance from the possibilities available, go through the film-to-subject distance column of the Close-up Tables and choose a lens that most closely approximates the required distance. As focal length also affects picture area, be sure your choice also best approximates your requirements and use the extension tube combination indicated.

Exposure Factors
Exposure Factors (loss of light entering the lens due to the addition of the extension tubes) vary according to the combination of lens and extension tube used. These are automatically compensated for when metering with the TTL Pentaprism Finder. But when external exposure meters are used, compensation is required for exposure factors as indicated in the exposure factor column of the appropriate Table.

NOTE: For magnifications greater than 1X, sharper images will be obtained by mounting the lens in reverse in conjunction with the 67mm Reverse Adaptor—see page 20.

Table 1: Pentax 45mm f/4

(distance scale at 0.37m)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.22	(lens alone)	255.4×320.4	37.0	×1.3
0.51	1	108.1×135.6	25.6	×1.6
0.80	2	68.5× 86.0	23.6	×2.0
1.10	2+1	50.2× 62.9	23.4	×2.5
1.39	3	39.6× 49.6	23.9	×2.9
1.68	3+1	32.7× 41.0	24.7	×3.5
1.98	3+2	27.8× 34.9	25.7	×4.0
2.27	3+2+1	24.2× 30.4	26.8	×4.6

Table 2: Pentax 55mm f/4

(distance scale at 0.45m)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.20	(lens alone)	346.9×276.5	45.0	×1.2
0.45	1	153.7×122.5	30.7	×1.6
0.70	2	98.7× 78.7	27.7	×2.0
0.95	2+1	72.7× 58.0	27.0	×2.4
1.20	3	57.6× 45.9	27.1	×2.9
1.45	3+1	47.6× 38.0	27.7	×3.4
1.70	3+2	40.6× 32.4	28.5	×3.9
1.95	3+2+1	35.4× 28.0	29.5	×5.0

Table 3: Takumar 75mm f/4.5 (bold letters)
Pentax Shift 75mm f/4.5 (in parentheses)

(distance scale at 0.7m)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.15(0.15)	(lens alone)	**375.0**×**470.5**(359.1×450.5)	**69.5**(70.0)	×**1.2**(1.2)
0.33(0.34)	1	**165.0**×**207.0**(161.9×203.1)	**42.3**(44.5)	×**1.6**(1.4)
0.52(0.53)	2	**105.8**×**132.7**(104.5×131.1)	**35.6**(38.1)	×**1.9**(1.7)
0.71(0.71)	2+1	**77.8**×**97.6**(77.1×96.8)	**33.2**(35.7)	×**2.3**(2.0)
0.89(0.90)	3	**61.6**×**77.2**(61.1×76.7)	**32.4**(35.0)	×**2.8**(2.3)
1.08(1.09)	3+1	**50.9**×**63.9**(50.6×63.5)	**32.3**(35.0)	×**3.3**(2.7)
1.27(1.27)	3+2	**43.4**×**54.5**(43.2×54.2)	**32.7**(35.3)	×**3.8**(3.1)
1.45(1.46)	3+2+1	**37.8**×**47.5**(37.7×47.3)	**33.3**(36.0)	×**4.3**(3.5)

Table 4: Takumar 90mm f/2.8 (bold letters)
Pentax 90mm f/2.8 (in parentheses)

(distance scale at 0.85m)
(distance scale at 0.65m)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.14 (0.20)	(lens alone)	**497.1** × **396.2** (341.1 × 271.9)	**83.5** (65.0)	× **1.2** (1.4)
0.29 (0.36)	1	**234.5** × **186.9** (194.3 × 154.9)	**50.6** (46.9)	× **1.5** (1.7)
0.45 (0.51)	2	**153.4** × **122.3** (135.9 × 108.3)	**41.4** (40.6)	× **1.9** (2.0)
0.61 (0.66)	2 + 1	**114.0** × **90.9** (104.4 × 83.2)	**37.7** (37.8)	× **2.3** (2.4)
0.76 (0.81)	3	**90.7** × **72.3** (84.8 × 67.6)	**36.0** (36.6)	× **2.7** (2.8)
0.92 (0.97)	3 + 1	**75.3** × **60.0** (71.4 × 56.9)	**35.4** (36.2)	× **3.1** (3.2)
1.07 (1.12)	3 + 2	**64.4** × **51.3** (61.7 × 49.2)	**35.4** (36.3)	× **3.6** (3.7)
1.23 (1.27)	3 + 2 + 1	**56.2** × **44.8** (54.3 × 43.2)	**35.7** (36.7)	× **4.1** (4.2)

Table 5: Takumar 105mm f/2.4

(distance scale at 1m)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.13	(lens alone)	517.5×412.5	100.5	×1.3
0.27	1	258.7×206.2	62.4	×1.6
0.40	2	172.5×137.5	50.7	×1.9
0.53	2+1	129.4×103.1	45.6	×2.2
0.67	3	103.5× 82.5	43.1	×2.6
0.80	3+1	86.2× 68.7	41.8	×3.0
0.93	3+2	73.9× 58.9	41.4	×3.5
1.07	3+2+1	64.7× 51.6	41.4	×3.9

Table 6: Pentax 165mm f/2.8

(distance scale at 1.6m)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.13	(lens alone)	417.1×523.3	160.0	×1.3
0.22	1	253.8×318.4	112.4	×1.6
0.30	2	182.4×228.8	92.4	×1.9
0.39	2+1	142.3×178.6	81.8	×2.1
0.47	3	116.7×146.4	75.5	×2.5
0.56	3+1	98.9×124.1	71.5	×2.8
0.64	3+2	85.8×107.7	69.0	×3.1
0.73	3+2+1	75.8× 95.1	67.4	×3.5

Table 7: Takumar 200mm f/4 (distance scale at 2.5m)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.09	(lens alone)	726.5×579.0	253.0	×1.3
0.16	1	418.2×333.3	165.2	×1.5
0.23	2	293.6×234.0	130.4	×1.8
0.30	2+1	226.2×179.5	112.3	×2.1
0.37	3	184.0×146.7	101.5	×2.4
0.44	3+1	155.1×123.6	94.5	×2.7
0.51	3+2	133.0×106.8	89.8	×3.0
0.58	3+2+1	118.0× 94.0	86.5	×3.4

Table 8: Takumar 300mm f/4

(distance scale at 5m)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.07	(lens alone)	985.7×785.7	503.6	×1.3
0.11	1	608.8×485.3	341.0	×1.6
0.16	2	422.5×336.7	261.5	×1.9
0.21	2+1	328.6×261.9	222.0	×2.1
0.26	3	268.8×214.3	197.5	×2.5
0.30	3+1	227.5×181.3	180.9	×2.8
0.35	3+2	197.1×157.1	169.1	×3.1
0.40	3+2+1	174.0×138.7	160.4	×3.5

Table 9: Macro Takumar 135mm f/4

(distance scale at min. focus)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.31	(lens alone)	222.0×177.0	74.9	×1.9
0.41	1	166.5×132.7	65.4	×2.2
0.52	2	133.2×106.2	60.3	×2.6
0.62	2+1	88.5×111.0	57.4	×3.1
0.73	3	95.1× 75.8	55.7	×3.5
0.76	3+1	91.4× 72.9	55.3	×3.6
0.93	3+2	74.0× 59.0	54.3	×4.5
1.04	3+2+1	66.6× 53.1	54.3	×5.1

EXTENSION TUBES (for 400mm ~ 1000mm lens*)

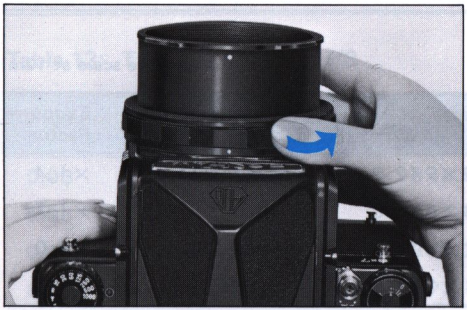
Assembly:

Place the collar ring of the extension tube to be attached to the camera over the outer bayonet mount of the camera body and fix tube in place by turning ring counterclockwise as shown. Test to see if mounted properly.

Lens/Tube Removal:

To remove the lens from tube or tube from body, hold both camera and lens side firmly to prevent dropping, then loosen the appropriate collar ring and remove.

* Except 500mm f/4



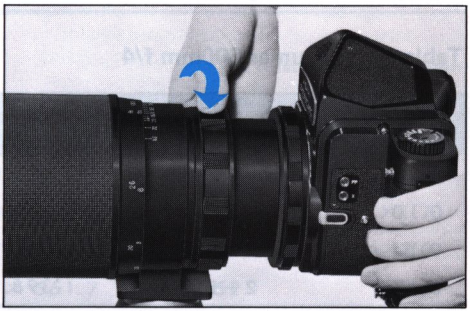


Table 10: Takumar 400mm f/4

(distance scale at 8m)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.06	(lens alone)	1216.9×970.0	800.0	×1.2
0.11	1	604.2×481.6	447.0	×1.5
0.17	2	401.9×320.3	332.0	×1.8
0.23	2+1	301.0×240.0	275.9	×2.1

Table 11: Takumar 600mm f/4

(distance scale at 12m)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.06	(lens alone)	1182.9×942.9	1210.5	×1.4
0.10	1	713.8×569.0	804.9	×1.7
0.14	2	511.1×407.4	631.0	×2.0
0.17	2+1	398.1×317.3	535.0	×2.3

Table 12: Takumar 800mm f/4

(distance scale at 20m)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.04	(lens alone)	1577.1×1257.1	2011.9	×1.3
0.07	1	951.7× 758.6	1289.0	×1.5
0.10	2	681.5× 543.2	978.0	×1.7
0.13	2+1	530.8× 423.1	805.6	×1.9

Table 13: Takumar 1000mm f/8

(distance scale at 35m)

Magnification	Required extension tube combination	Picture area (mm)	Film-to-subject distance (cm)	Exposure Factor
0.03	(lens alone)	2248.0×1791.9	3500.1	×1.4
0.05	1	1285.1×1024.3	2106.8	×1.7
0.08	2	899.7× 717.1	1550.6	×2.0
0.10	2+1	692.1× 551.7	1252.1	×2.4

ACCESSORIES FOR CLOSE-UP WORK

Each of these units must be purchased separately.

TTL Pentaprism Finder

A through-the-lens, open-aperture-metering accessory finder unit which automatically couples with the shutter-dial permitting "zero method" exposure control and the option of preselecting either shutter-speed or aperture. The meter averages the total amount of light entering the lens, eliminating the need to compensate for exposure factors when using extension tubes or other close-up lens accessories. Open aperture metering permits bright viewing and focusing with automatic diaphragm lenses. Separate battery not required.

Folding Focusing Hood

A compact, folding finder unit offering ultra-bright waist-level viewing. Ideal for macrophotography, close-ups and use with super telephotos. Built-in 1.6X magnifier folds out for critical focusing and composition using full screen. The Folding Focusing Hood also shows 100% of the negative on the screen and simplifies low-angle shooting.

Rigid Magnifying Hood

A delux waist-level finder unit which completely shields the focusing screen from ambient light for crisp, clear viewing. The 1.3X magnifier is adjustable to match viewer's eyesight, permitting maximum viewing comfort. The entire focusing screen is visible with 100% of the image reproduced on the negative.

Auto Bellows

A high precision close-up and macrophoto accessory which enables you to maintain the automatic diaphragm action of the lens by means of the supplied double-cable release. Bellows has a large extension ratio and reverse lens mounting board for automatic diaphragm operation even with lens mounted in reverse. Tripod seat is also adjustable. When used in conjunction with optional Slide Copier unit permits precision copying of both 6x7-format and 35mm-format slides and film strips. Scale also provided.

Helicoid Extension Tube

A single extension tube unit which fits to the inner bayonet mount of the 6x7 camera and offers continuously variable extension for precise control of image size. Range covered equals that of the No. 2 Auto Extension Tube at minimum extension and the No. 3 Tube at maximum extension, plus everything in-between. Magnification ranges with the 105mm f/2.4 lens is from 0.30X - 0.63X, making it possible to frame a kingsize pack of cigarettes. Used in conjunction with the Auto Extension Tubes, high magnification close-up and copy work is possible.

Slide Holder K

This is an extremely handy copying unit which permits duplication of 35mm transparencies on 6x7 film. Used in conjunction with the Helicoid Extension Tube, 49mm Reverse Adaptor and 35mm format macro lenses, it permits high quality reproduction of 35mm color slides, making internegatives for color prints or positives from black and white slides.

49mm Reverse Adaptor

Permits 35mm-format lenses which offer a greater angle of view for close-up work, to be mounted in reverse in conjunction with the Helicoid Extension Tube for copy and close-up work in the 6x7 format. The adaptor is designed for dual-use with the following S-mount Takumar and bayonet-mount SMC Pentax 35mm-format lenses.

S-Mount: 28mm f/3.5, 35mm f/3.5, 50mm f/1.4, 50mm Macro f/4 **Bayonet Mount:** 28mm f/2, 28mm f/2.8, 28mm f/3.5, 40mm f/2.8, 50mm f/1.4 and f/1.7, Macro 50mm f/4.
(Note: With lens having the 52mm filter size, the 52–49mm Adaptor Ring must also be used.)

67mm Reverse Adaptor

This reverse adaptor ring makes it possible to mount 6x7-format 90mm, 105mm and 135mm lenses in reverse in conjunction with the Helicoid Extension Tube, Auto Extension Tubes and Auto Bellows for high quality optical reproduction when working at greater-than-life-size magnifications.

Magnifier

Enlarges the image in the center of the focusing screen to 2X for critical focusing. The magnifier eyepiece has built-in diopter adjustment to meet the individual requirements of eyeglass wearers. The top is hinged, allowing it to be raised out of the way for a final check of overall composition.

Large Copying Stand II

A rigid copying unit with metal supports and a wooden baseboard to offer the degree of support needed for the 6x7 camera. A highly convenient device for copy work and macro-photography when camera and lens are used in conjunction with extension tube, bellows and other close-up units.

Right-Angle Finder

Attaches to the eyepiece of the standard and TTL pentaprism finders for low-angle photography. The image is both laterally correct and unreversed. The entire focusing screen, as well as the exposure meter indicator needle of the Pentaprism Finder, is visible. The adjustable eyepiece accepts the accessory Eyecup.

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