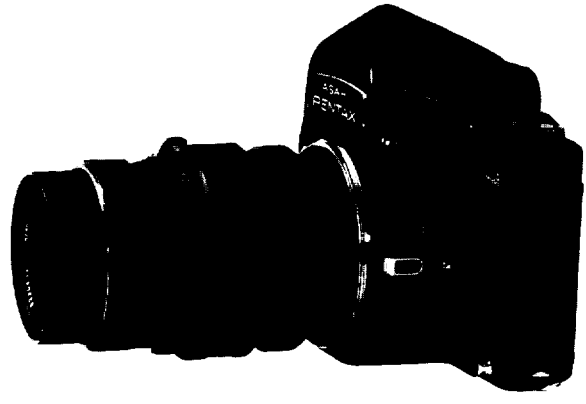
HELICOID EXTENSION TUBE

The Helicoid Extension Tube is a handy 6x7 camera accessory which permits free variation of subject magnification, thus making it extremely handy for close-up and copy work with the Pentax 6x7. It fits between the camera body and the lens in use and permits focusing and composition while viewing directly through the viewfinder. Minimum and maximum magnifications obtained with the Helicoid Extension Tube vary in relation to the lens in use, as do film-to-subject distance, picture area and exposure factors. The magnifications obtained with different lenses are given in the Close-Up Table on the back of these instructions.



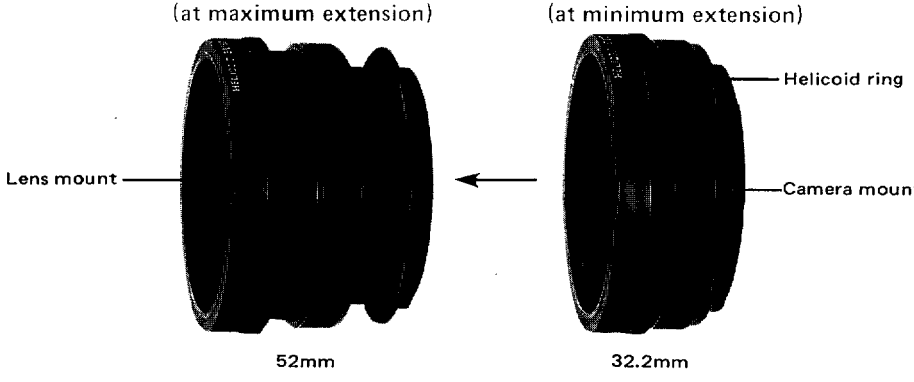
Mounting
The Helicoid Extension Tube attaches directly to the camera body. When mounted in the normal manner, the lens then attaches to the open end of the extension tube. When reverse adaptor units are used, the adaptor unit is mounted to the Helicoid Extension Tube, and then the reversed lens is mounted to the adaptor unit. Two adaptors are available: the 49mm Reverse Adaptor (for 35mm format lenses with 49mm threads) and the 67mm Reverse Adaptor (for 6x7 lenses with 67mm threads.)

Weight: 190 grams (6.7 ozs.) **Max. Diameter:** 89mm (3.5 in.)

Lenses
All Pentax 6x7 lenses in the 55m to 200mm range are adequate for close-up work without reversal. When high quality close-ups with ultra sharp resolution are desired to bring out the fine details of the subject, use of the 135mm f/4 Macro Takumar Lens, optimized for close-up and copy work, is recommended.

Focusing
With automatic diaphragm lenses, set the AUTO/MAN. selector to AUTO and focus at open aperture. (The helicoid ring of the Helicoid Extension Tube is also used in conjunction with the lens' focusing ring for fine adjustments in close-up work.) After focusing, set the AUTO/MAN. selector to MAN., stop the lens down to shooting aperture and preview the depth of field in the viewfinder. Make adjustments accordingly. Then, take an exposure reading and shoot. Use a sturdy tripod in combination with a cable release to insure against camera shake.

Helicoid Extension Tube



Exposure

When the TTL Pentaprism Finder is used, exposure factor increase is automatically compensated by the through-the-lens exposure system. First, select the lens aperture and set the AUTO/MAN. selector lever to MAN. Then, switch the meter on and adjust the shutter speed until the needle centers in the metering brackets inside the viewfinder. If light is insufficient to center the needle with a small aperture, open the lens up to a wider aperture so that you can make the exposure reading. Then, stop down to a smaller aperture and make the exposure at a slower shutter speed where equal exposure value is obtained. If your reading is f/4 at 1/4 sec., for example, select the appropriate small-aperture/slow-shutter-speed combination on the basis of the following.

Aperture	f/4	f/5.6	f/8	f/11	f/16	f/22
Shutter speed	¼ sec.	½ sec.	1 sec.	2 sec.	4 sec.	8 sec.

With exposure longer than 1 sec., make a time exposure at the "B" setting in conjunction with a cable release.

Exposure Factors

The greater the extension of the lens, the greater the distance between the front lens element and the film plane. Thus, there is light fall off when shooting with the Helicoid Extension Tube. Although this is automatically compensated for with the TTL Pentaprism Finder, when using a handheld exposure meter the exposure factors given in the Close-Up Table on the back of these instructions must be considered. With ultra close-ups using 2 or 3 extension tubes together, the lens must be reversed for high quality results. (Exposure factors that apply when the lens is reversed, are given in the Close-Up Tables accompanying the reverse adaptor unit.)

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Close-Up Table

Lens	Magnification	Lens Extension		Picture Area	Film-to-Subject Distance	Exposure Factor
		Tube	Lens	(mm)	(cm)	
55mm F3.5	0.58	Min.	At ∞	120 x 95	28.5	X1.8
	0.78	Min.	At Min. Focus	89 x 71	27.2	X2.2
	0.94	Max.	At ∞	74 x 59	26.8	X2.5
	1.14	Max.	At Min. Focus	61 x 48	26.9	X2.9
75mm F4.5	0.43	Min.	At ∞	162 x 129	38.0	X1.7
	0.57	Min.	At Min. Focus	120 x 96	34.6	X2.0
	0.69	Max.	At ∞	100 x 79	33.3	X2.3
	0.84	Max.	At Min. Focus	82 x 66	32.5	X2.6
***90mm F2.8**	0.36	Min.	At ∞	194 x 155	45.9	X1.7
	0.50	Min.	At Min. Focus	138 x 110	39.9	X2.0
	0.58	Max.	At ∞	120 x 95	38.2	X2.2
	0.72	Max.	At Min. Focus	96 x 76	36.3	X2.6
105mm F2.4	0.30	Min.	At ∞	226 x 181	58.0	X1.6
	0.44	Min.	At Min. Focus	158 x 126	48.9	X2.0
	0.50	Max.	At ∞	139 x 111	46.7	X2.1
	0.63	Max.	At Min. Focus	110 x 88	43.6	X2.5
150mm F2.8	0.21	Min.	At ∞	323 x 258	101.2	X1.6
	0.34	Min.	At Min. Focus	203 x 162	76.9	X2.0
	0.35	Max.	At ∞	199 x 159	76.1	X2.0
	0.47	Max.	At Min. Focus	146 x 116	66.5	X2.5
200mm F4	0.16	Min.	At ∞	431 x 344	168.8	X1.5
	0.25	Min.	At Min. Focus	271 x 216	124.2	X1.9
	0.26	Max.	At ∞	265 x 212	122.8	X1.9
	0.35	Max.	At Min. Focus	194 x 155	104.1	X2.3

* The lens shutter may not be employed when the Helicoid Extension Tube is used.

Macrophoto Lens

Macro Takumar 135mm F4	0.24	Min.	At ∞	291 x 232	87.5	X1.7
	0.39	Max.	At ∞	179 x 143	67.5	X2.1
	0.53	Min.	At Min. Focus	131 x 105	60.0	X2.7
	0.67	Max.	At Min. Focus	103 x 82	56.4	X3.3

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