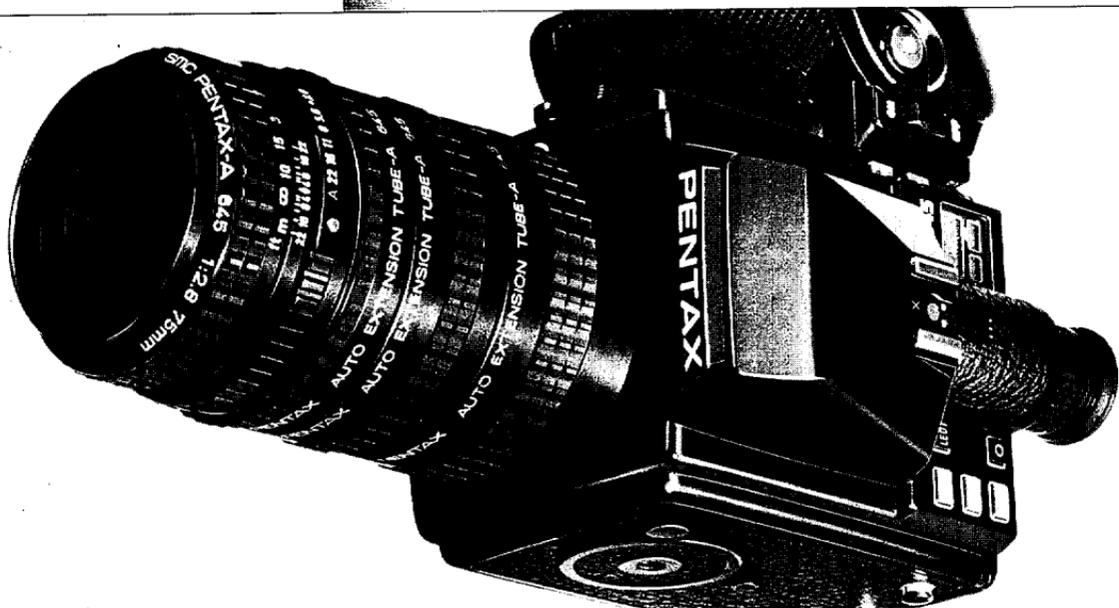


PENTAX®
645

AUTO EXTENSION TUBE-A 645 SET



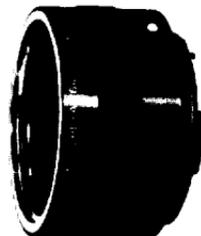
AUTO EXTENSION TUBE-A 645 SET



No. 1



No. 2



No. 3

AUTO EXTENSION TUBE-A 645 SET

Specifications

Camera: Pentax 645

Lens: SMC Pentax 645 and 67 lenses

- When using an A645 lens, automatic aperture control is possible at the A (auto) position.
- The lens shutter built in the 645 LS 75mm f/2.8 also functions when this tube is combined with the LS lens.

	No. 1	No. 2	No. 3
Length:	13.3mm	26.6mm	39.9mm.
Weight:	88g	130g	155g

Accessory: Case (HG-115D)

Features

The Auto Extension Tube-A 645 is a set of close-up and copying accessories, which are designed to be coupled with the 645 camera body and any of the 645 lenses. Provision of lens information contacts allows using the A (Auto) setting of the A645 lens. Tubes No. 1, No. 2 and No. 3 are usable in any combination or individually, permitting open aperture metering. Various close-up data is given in tables 1—16 for the various close-up possibilities of each lens. This data is obtained when the lens distance scale has been set to its minimum focusing distance. Through the combination with the Adapter 645 for 67 Lens, a 67 lens can be attached to this auto extension tube. The aperture ring of the lens should be set to the respective f-stops.

- * The distance scale and the depth-of-field scale cannot be used when the auto extension tubes are attached.

HOW TO SET UP

1



1. Remove the lens from the camera body and attach the auto extension tube to be used. As the illustration shows, fit the tube to the body mount while aligning two dots. Turn the tube clockwise until it locks in place. Turn lightly counterclockwise to test that it is bayoneted properly. When another tube is used additionally, perform the same process.
2. Mount the lens to the extension tube in the same manner. To remove the lens or another tube from the mounted tube, turn the lens or tube counterclockwise by 65° while pressing the bayonet lock release button (indicated by arrow mark) on the tube. Please note that the bayonet lock release of extension tube differs from that of the camera body in appearance and location.

2



Caution

Be careful not to hurt or soil the lens information contacts on the mount of the tube. Smudges should be wiped off with a clean, soft cloth.

2



HOW TO USE CLOSE-UP TABLES

Depending on the requirements of the type of close-up work you are doing, first determine:

a) the picture area, b) the film-to-subject distance, or c) the magnification, all of which are provided in tables for your reference.

Determine the Magnification First

This is recommended when you wish to magnify or reduce a subject to a film image of specified size. For example, to photograph a subject of 10cm in actual size as an image reduced to 3cm on 35mm film, using the 75mm f/2.8 lens, the magnification will be calculated at $3/10=0.3X$. Table 3 suggests using No. 1 tube at distance scale set between the closest and infinity (∞).

Determine the Picture Area First

In this case, decide the subject area to be photographed, and find it through the view-finder. For instance, to photograph a 60 x 80mm area as a full frame image using the 75mm f/2.8 lens, look up the Picture Area in Table 3. It will tell you that No. 3 tube or No. 1 tube + No. 2 tube will give the desired image at distance scale set between the closest and the infinity (∞).

Determine the Film-to-Subject Distance First
When it is difficult to get close to your subject, predetermine the desired film-to-subject distance. For example, to photograph a subject at more than 1m away in a predetermined magnification of more than 0.2X, go through the Film-to-Subject Distance column of the close-up tables and you will find that a focal length longer than 150mm is required for the purpose, in Table 4.

Exposure Factors

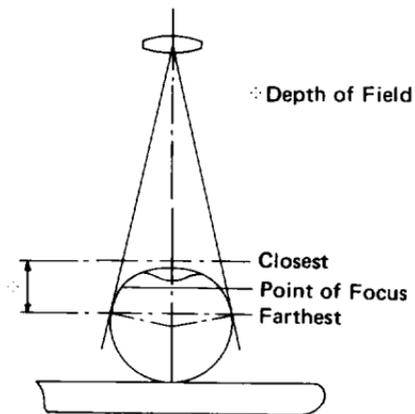
As the Pentax 645 camera is provided with a TTL (through-the-lens) exposure meter, you will get proper exposure if you follow the dictates of the meter. For this reason, exposure factor data given in the close-up tables may be less important in actual shooting. However, if there is far more white than black in the picture area, or vice versa, compensate for the exposure according to the data given in the tables.

FOCUSING, METERING EXPOSURE

Auto Extension Tube-A 645 permits you to focus any of your 645 lenses with the aperture fully opened, as you do with the lens when it is mounted directly to the camera body. When focusing with a higher magnification, you may sometimes find it difficult to focus correctly using only the focusing ring operation. In such cases, you will find the focusing easier if you move the camera body.

Exposure can be determined in open aperture metering. Both metered manual mode and automatic exposure control modes are applicable. Whenever the auto extension tube is used together with a reversely attached lens (by using the Reverse Adapter 645 and the Reverse Attachment for 645 Lens), the exposure is measured at the shooting aperture.

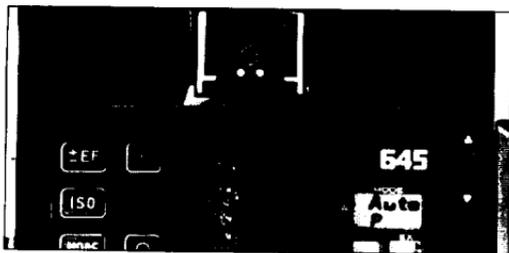




Depth-of-Field in Close-Up Photography
 Depth-of-field becomes shallower as the lens-to-subject distance decreases. Even if the aperture of your standard lens is stopped down to the minimum $f/22$, sometimes it may not be possible to obtain the desired depth of field; it is necessary to be extremely careful in focusing. In close-up photography, the depth-of-field is the same in the foreground (lens side of the subject) and background (in back of the subject away from the lens). Therefore, it is advisable to focus on the intermediate point between the furthest and closest possible points of focus on your subject, as illustrated in the drawing on the left.

Position of Film Plane

There is no film plane indication on the Pentax 645 camera body. You can locate it approximately at the red mark on the top cover. If you know film-to-subject distance from the close-up tables, you can easily set this distance by measuring from the above-mentioned red mark to the subject, using a ruler.





CLOSE-UP TABLES (645 lenses)**Table 1 A645 45mm F2.8**

(Distance scale set at 0.45m)

Magnification	Extension tube combination	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.15	Not used	285 × 384	450	× 1.1
0.44	1	95 × 128	255	× 1.4
0.73	2	57 × 77	227	× 1.7
1.02	3	41 × 55	222	× 2.0
1.02	1 + 2	41 × 55	222	× 2.0
1.32	1 + 3	32 × 43	226	× 2.3
1.61	2 + 3	26 × 35	233	× 2.7
1.90	1 + 2 + 3	22 × 29	241	× 3.1

Table 2 A645 55mm F2.8

(Distance scale set at 0.45m)

Magnification	Extension tube combination	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.19	Not used	221 × 298	450	× 1.3
0.43	1	98 × 132	297	× 1.6
0.66	2	63 × 85	263	× 2.1
0.90	3	46 × 62	254	× 2.5
0.90	1 + 2	46 × 62	254	× 2.5
1.14	1 + 3	37 × 49	254	× 3.1
1.37	2 + 3	30 × 41	259	× 3.6
1.61	1 + 2 + 3	26 × 35	266	× 4.3

Table 3 A645 75mm F2.8

(Distance scale set at 0.45m)

Magnification	Extension tube combination	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.18	Not used	236 × 319	600	× 1.3
0.35	1	119 × 160	396	× 1.7
0.52	2	79 × 107	337	× 2.1
0.70	3	60 × 80	313	× 2.6
0.70	1 + 2	60 × 80	313	× 2.6
0.87	1 + 3	48 × 64	305	× 3.1
1.04	2 + 3	40 × 54	303	× 3.6
1.22	1 + 2 + 3	34 × 46	306	× 4.2

Table 4 645 LS 75mm F2.8

(Distance scale set at 0.45m)

Magnification	Extension tube combination	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.13	Not used	320×431	750	×1.2
0.30	1	137×185	426	×1.6
0.48	2	87×117	347	×2.0
0.65	3	64×86	317	×2.4
0.65	1+2	64×86	316	×2.4
0.82	1+3	50×68	303	×2.9
1.00	2+3	42×56	303	×3.5
1.17	1+2+3	35×48	305	×4.0

Table 5 A645 150mm F2.8

(Distance scale set at 0.45m)

Magnification	Extension tube combination	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.14	Not used	299 × 404	1400	× 1.4
0.23	1	182 × 246	992	× 1.7
0.32	2	131 × 177	820	× 2.1
0.41	3	103 × 138	729	× 2.4
0.41	1 + 2	103 × 138	729	× 2.4
0.49	1 + 3	84 × 113	676	× 2.8
0.58	2 + 3	71 × 96	643	× 3.3
0.67	1 + 2 + 3	62 × 83	622	× 3.7

Table 6 A645 300mm F4

(Distance scale set at 0.45m)

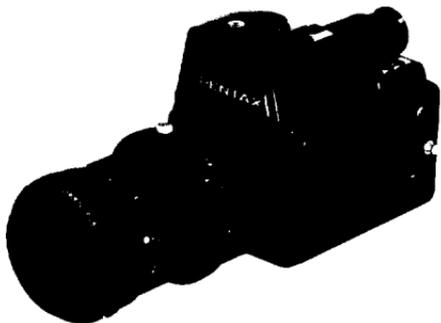
Magnification	Extension tube combination	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.11	Not used	366 × 494	3000	× 1.0
0.16	1	254 × 343	2295	× 1.2
0.21	2	195 × 263	1926	× 1.4
0.26	3	158 × 213	1702	× 1.7
0.26	1 + 2	158 × 213	1702	× 1.7
0.31	1 + 3	133 × 179	1554	× 1.9
0.36	2 + 3	114 × 154	1451	× 2.2
0.41	1 + 2 + 3	100 × 136	1375	× 2.5

GREATER-THAN-LIFE-SIZE CLOSE-UP PHOTOGRAPHY

58mm Reverse Adapter 645



Reverse Attachment 645



In greater-than-life-size (1X) close-up photography, improved picture quality is obtained by reversing the lens. To mount your lens in reverse, use the optional accessories: 58mm Reverse Adapter 645 and Reverse Attachment 645.

58mm Reverse Adapter 645 is an auxiliary ring to attach a Pentax 645 lens (filter size 58mm) in reverse to the 645 camera body.

Reverse Attachment 645 is a functional ring which is attached to the mount of the reversed lens in order to activate the diaphragm control mechanism. The front side of this attachment is threaded to accept a 58mm filter.

※ When the lens is reversed, the lens does not move to focus even if you turn the focusing ring. To focus the lens, move either the whole camera or the subject back and forth, or use the Helicoid Extension Tube 645 in combination.

※ Automatic aperture control will not function even if the aperture ring is set to A (auto) position; use the respective f-stops for aperture control. Light metering is performed with the aperture stopped down.

Table 7 A645 55mm F2.8 (Reversed)

Magnification	Extension tube combination	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
1.15	Not used	36 × 49	254	× 3.3
1.38	1	30 × 41	259	× 4.2
1.62	2	26 × 35	266	× 5.2
1.86	3	22 × 30	275	× 6.3
1.86	1 + 2	22 × 30	275	× 6.3
2.09	1 + 3	20 × 27	285	× 7.6
2.33	2 + 3	18 × 24	296	× 9.0
2.57	1 + 2 + 3	16 × 22	307	× 10.4

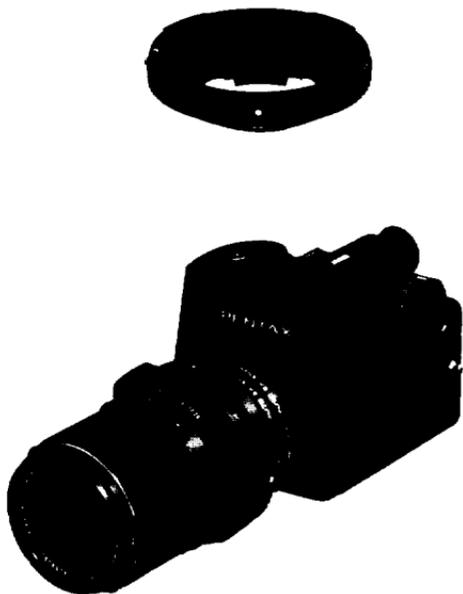
Table 8 A 645 75mm F2.8 (Reversed)

Magnification	Extension tube combination	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.42	Not used	99 × 133	364	× 1.7
0.59	1	70 × 94	324	× 2.1
0.77	2	54 × 73	308	× 2.7
0.94	3	44 × 59	303	× 3.3
0.94	1 + 2	44 × 59	303	× 3.3
1.12	1 + 3	37 × 50	304	× 3.9
1.29	2 + 3	32 × 43	308	× 4.6
1.46	1 + 2 + 3	28 × 38	314	× 5.4

Table 9 645 LS 75mm F2.8 (Reversed)

Magnification	Extension tube combination	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.58	Not used	72×97	327	×2.1
0.75	1	55×75	309	×2.6
0.92	2	45×61	304	×3.2
1.10	3	38×51	304	×3.9
1.10	1+2	38×51	304	×3.9
1.27	1+3	33×44	306	×4.6
1.45	2+3	29×39	314	×5.3
1.62	1+2+3	26×35	321	×6.2

USING PENTAX 67 LENS



Adapter 645 for 67 Lens

When using a 67 interchangeable lens with Pentax 645 body, first attach the Adapter 645 for 67 Lens to the Auto Extension Tube-A, and mount a Pentax 67 Lens on the adapter. Automatic aperture control and open-aperture metering can be used in photographing. Two 67 lenses: LS 90mm f/2.8 and Shift 75mm f/4 (when the lens is shifted) are not compatible with this adapter.

CLOSE-UP TABLES (67 lenses)**Table 10 67 90mm F2.8**

(Distance scale set at 0.45m)

Magnification	Extension tube combination	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.20	Not used	205 × 277	650	× 1.4
0.35	1	119 × 161	474	× 1.7
0.49	2	84 × 114	410	× 2.0
0.64	3	65 × 88	381	× 2.3
0.64	1 + 2	65 × 88	381	× 2.3
0.78	1 + 3	53 × 72	367	× 2.7
0.93	2 + 3	45 × 60	362	× 3.1
1.07	1 + 2 + 3	39 × 52	362	× 3.5

Table 11 67 105mm F2.4

(Distance scale set at 0.45m)

Magnification	Extension tube combination	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.13	Not used	309 × 417	1000	× 1.3
0.26	1	159 × 215	633	× 1.5
0.39	2	107 × 145	515	× 1.8
0.51	3	81 × 109	462	× 2.2
0.51	1 + 2	81 × 109	462	× 2.2
0.64	1 + 3	65 × 87	435	× 2.5
0.77	2 + 3	54 × 73	421	× 2.9
0.89	1 + 2 + 3	46 × 63	415	× 3.3

Table 12 67 MACRO 135mm F4

(Distance scale set at 0.45m)

Magnification	Extension tube combination	Picture area (mm)	Film-to-subject distance (mm)	Exposure factor
0.31	Not used	134 × 181	751	× 1.9
0.41	1	102 × 137	659	× 2.2
0.51	2	82 × 111	607	× 2.6
0.61	3	69 × 93	577	× 3.0
0.61	1 + 2	69 × 93	577	× 3.0
0.70	1 + 3	59 × 80	559	× 3.4
0.80	2 + 3	52 × 70	549	× 3.8
0.90	1 + 2 + 3	46 × 62	544	× 4.3



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