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Instructions



35 mm REFLEX Cameras

for

**Macrophotography (Copy- and Close-up Work)
and Photomicrography
(Microscopic photography)**

*) T. M. Reg. U. S. Pat. Off.

Manufactured by PIGNONS S. A. Ballaigues (Switzerland)

P. S. A. 257 - 1 E

Printed In Switzerland

MACROPHOTOGRAPHY with the ALPA and TUBAN extension tubes, EXTENSAN mount.

The single-lens reflex system of the ALPA allows accurate framing of the image, critical focusing and exact determination of depth of field on the ground-glass, at all distances and with lenses of any focal length. For photographing still closer than provided for by the extreme extension of the special ALPA lens mount, simple and inexpensive attachments are available which offer a continuous focusing range down to ultra close-ups. In order to appreciate the nature of the problem, and before studying the tables on the following pages, the relation of distance between subject and camera back, focal length and scale of reproduction subject/image ought to be examined.

These are the extreme cases :

- 1) **Subject at infinity — Image at single focal length.**
- 2) **Subject at double focal length — Image at double focal length.**
(subject reproduced in natural size, scale of reproduction subject/image 1 : 1)
As the subject approaches from infinity to double focal length, its image shifts from single to double focal length. This is the zone of close-ups and macrophotographs.
- 3) **Subject at less than double focal length. Image at more than double focal length.**
The subject is now reproduced on an enlarged scale on the negative. This is the zone of magnified photographs. As the subject approaches from double to single focal length, its image shifts from double focal length to infinity.
- 4) **Subject at less than single focal length — Virtual image.**
The lens acts as a magnifying glass, but cannot be used for photographing any more.

The following attachments for extending the focal length of the ALPA ALNEA are available :

TUBAN A and B : Rigid intermediate rings : **A** for adapting bayonet to thread, **B** for adapting thread to bayonet.

TUBAN T₁, T₂, T₃ T₄ : Extension tubes of 6, 12, 24 and 48 mm length respectively, to be inserted between adapter rings A and B.

EXTENSAN : Helicoidal mount with a range of adjustment of 20 mm, supplied only with the interchangeable objectives of 75-180 mm focal length. When the lens is unscrewed, the TUBAN T₁, T₂, T₃ and T₄ tubes can be inserted between the Extensan mount and the lens itself.

Table III : The EXTENSAN mount can also be used for objectives of 50 mm Standard focal length (with TUBAN B at least).

All other particulars will be found in the tables. The principal column in the middle shows the scale of reproduction. On the left are the data with the unextended mount, on the right those with the mount completely extended. All the intermediate values are included. The depth of field is indicated for an aperture of $f/11$ as well as for the smallest aperture engraved on the lens used.

At a given scale of reproduction and a given aperture, the depth of field is the same whatever the focal length.

35 mm photography offers the advantage that a subject can be first reproduced on a reduced scale (and therefore with an increased depth of field), and only afterwards, by enlarging the negative is the image brought to the desired scale. If ultra-fine-grain film is used, the result will be much better than photographing directly on a negative of larger size. The possibility of obtaining the same scale of reproduction with lenses of different focal length is very useful, because as the focal length increases, the distance between the subject and the camera increases also, thereby allowing more latitude in the arrangement of the lighting.

In photographing subjects with depth, the perspective will be much more natural if the picture is taken from a greater distance.

BELLOWS ATTACHMENT : This is another ALPA accessory for long extensions from 28 to 116 mm.

For further information on this subject, see the booklet :

“Macro- and Micro Photography with the ALPA Reflex”

TABLE I

Lenses 50 mm with Tuban extension tubes.

Switar f/1.8 with automatic and clic-stop diaphragm. The smallest aperture is f/22.
*** Xenon** f/1.9 with clic-stop diaphragm. The smallest aperture is f/16.
Affinon f/2.8 with preset diaphragm. The smallest aperture is f/22.

* For Xenon f/1.9 lens with automatic diaphragm consult Table II.

Notice :

The depth of field is calculated for a circle of diffusion of 1/30 mm. In order to find the depth of field for any other aperture not indicated in these tables, it is sufficient to divide the given figure for f/11 by 11 and multiply this value by the number of aperture used.
 Example : If the depth of field indicated is 33 mm for f/11, divide it by 11 = 3 and multiply by the stop number needed, for instance by 8 = 24 mm for f/8.

Exposure factor in relation to the setting for infinity

Distance between subject and back of camera
 Extension as compared with infinity setting

Depth of field at smallest aperture

Depth of field at f/11

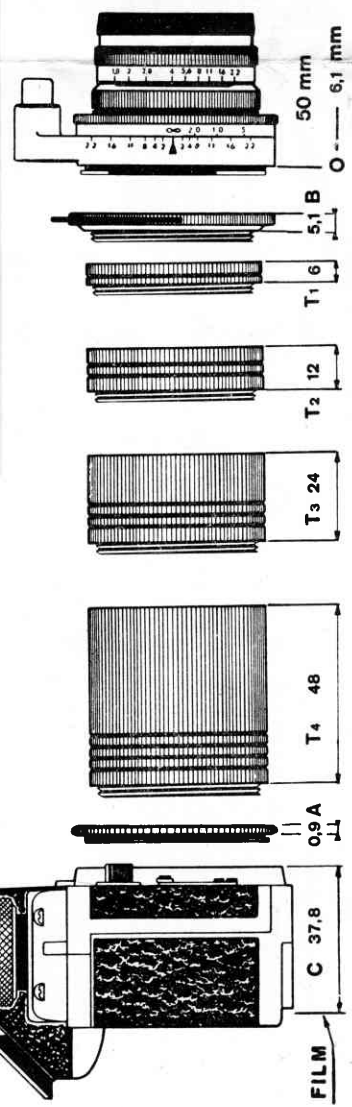
Dimensions of subject

Scale of repro. image/subject

	in cm	in mm	f/22 in mm	f/16 in mm	f/11 in mm	in mm	in mm	f/11 in mm	f/16 in mm	f/22 in mm	in mm	in mm	f/11 in mm	f/16 in mm	f/22 in mm	in mm	in cm
C	1	∞	—	—	—	∞	∞	—	—	—	∞	∞	—	—	—	∞	56
C + D	1,1	100	460	330	230	400 × 600	200 × 300	230	330	460	400 × 600	200 × 300	230	330	460	140 × 210	41,5
C + A + B	1,2	56	114	83	57	200 × 300	100 × 150	57	83	114	200 × 300	100 × 150	57	83	114	34 × 51	34
C + A + T ₁ + B	1,5	34	32	23	16	100 × 150	70 × 105	16	23	32	100 × 150	70 × 105	16	23	32	26 × 39	27,5
C + A + T ₂ + B	1,8	27,5	16	12	8	70 × 105	50 × 75	8	12	16	70 × 105	50 × 75	8	12	16	20 × 30	24
C + A + T ₁ + T ₂ + B	2,2	24	10	7,5	5	50 × 75	40 × 60	5	7,5	10	50 × 75	40 × 60	5	7,5	10	17 × 25	22,5
C + A + T ₃ + B	2,5	22,5	5	3,5	3,4	40 × 60	34 × 51	3,4	3,5	5	40 × 60	34 × 51	3,4	3,5	5	19 × 28,5	22
C + A + T ₁ + T ₃ + B	2,9	22	5	3,5	2,5	34 × 51	30 × 45	2,5	3,5	5	34 × 51	30 × 45	2,5	3,5	5	17 × 25	21,5
C + A + T ₂ + T ₃ + B	3,4	21,5	4	2,9	2	30 × 45	26 × 39	2	2,9	4	30 × 45	26 × 39	2	2,9	4	16 × 24	21
C + A + T ₁ + T ₂ + T ₃ + B	3,8	21	4	2,2	1,6	26 × 39	23 × 35	1,6	2,2	4	26 × 39	23 × 35	1,6	2,2	4	15 × 22,5	21
C + A + T ₄ + B	4,3	21	4	2,2	1,4	23 × 35	20 × 30	1,4	2,2	4	23 × 35	20 × 30	1,4	2,2	4	13 × 20	21
C + A + T ₁ + T ₄ + B	4,8	21	2,4	1,7	1,2	20 × 30	19 × 28,5	1,2	1,7	2,4	20 × 30	19 × 28,5	1,2	1,7	2,4	12,5 × 18,7	21,5
C + A + T ₂ + T ₄ + B	5,4	21,5	2	1,5	1	19 × 28,5	17 × 25	1	1,5	2	19 × 28,5	17 × 25	1	1,5	2	12 × 18	21,5
C + A + T ₁ + T ₂ + T ₄ + B	6	21,5	1,8	1,3	0,9	17 × 25	16 × 24	0,9	1,3	1,8	17 × 25	16 × 24	0,9	1,3	1,8	11 × 16	22
C + A + T ₃ + T ₄ + B	6,5	22	1,6	1,2	0,8	16 × 24	15 × 22,5	0,8	1,2	1,6	16 × 24	15 × 22,5	0,8	1,2	1,6	10 × 14	22,5
C + A + T ₁ + T ₃ + T ₄ + B	7,2	22,5	1,4	1	0,7	15 × 22,5	13 × 20	0,7	1	1,4	15 × 22,5	13 × 20	0,7	1	1,4	9 × 13	23
C + A + T ₂ + T ₃ + T ₄ + B	7,8	23	1,4	1	0,7	13 × 20	12,5 × 18,7	0,6	1	1,4	13 × 20	12,5 × 18,7	0,6	1	1,4	8 × 11	23
C + A + T ₁ + T ₂ + T ₃ + T ₄ + B	8,5	23	1,2	0,9	0,6	12,5 × 18,7	12 × 18	0,6	0,9	1,2	12,5 × 18,7	12 × 18	0,6	0,9	1,2	7 × 10	23,5

MOUNT RETRACTED

MOUNT FULLY EXTENDED



Key to abbreviations :

- C = camera body (fix distance 37.8 mm)
- D = supplementary lens + 1 dioptre (donal or donabe)
- A = Tuban A = 0.9 mm
- B = Tuban B = 5.1 mm
- T₁ = Tuban 1 = 6 mm
- T₂ = Tuban 2 = 12 mm
- T₃ = Tuban 3 = 24 mm
- T₄ = Tuban 4 = 48 mm
- O = Camera lens

TABLE II

Lenses 50 mm

*Xenon f/1.9 with automatic diaphragm
 Aflinon f/2.8 } in collapsible
 Alorax f/3.5 } mount.
 with Tuban attachments and supplementary lenses + 1 dioptry.
 ("donabe for Xenon, "donal" for the other lenses.)

Exposure factor in relation to the setting for infinity
 Distance between subject and back of camera

Extension as compared with infinity setting
 Depth of field at smallest aperture f/22

Depth of field at f/11
 Dimensions of subject

	in	cm	in	mm	f/22	f/11	in mm	Scale of reprod.	in mm	f/11	f/22	in	mm	in	cm	
	∞	100	3	0	460	1230	∞	1/17 - 1/9 - 1/8.3	400 × 600	230	460	3	100	1.1		
	56	56	6	6	114	57	200 × 300	1/8.3 - 1/6 - 1/5.8	200 × 300	57	114	6	56	1.2		
	14	41.5	9	9	56	28	140 × 210	1/5.8 - 1/5 - 1/4.3	140 × 210	28	56	9	41.5	1.4		
	1.5	34	12	12	32	16	100 × 150	1/4.3 - 1/4 - 1/3.4	100 × 150	16	32	12	34	1.5		
	1.7	30	15	15	22	11	80 × 120	1/3.4 - 1/3 - 1/2.4	80 × 120	11	22	15	30	1.7		
	1.8	27.5	18	18	16	8	70 × 105	1/2.8 - 1/2.5 - 1/2.4	70 × 105	8	16	18	27.5	1.8		
	2	25	21	21	12	6	60 × 90	1/2.4 - 1/2.1 - 1/2.0	60 × 90	6	12	21	25	2		
	2.2	24	24	24	10	5	50 × 75	1/2.1 - 1/2 - 1/1.9	50 × 75	5	10	24	24	2.2		
	2.3	23	27	27	8	4	46 × 69	1/1.9 - 1/1.7 - 1/1.7	46 × 69	4	8	27	23	2.3		
	2.5	22.5	30	30	6.8	3.4	40 × 60	1/1.7 - 1/1.5 - 1/1.5	40 × 60	3.4	6.8	30	22.5	2.5		
	2.8	22	33	33	6	3	36 × 54	1/1.4 - 1/1.4 - 1/1.4	36 × 54	3	6	33	22	2.8		
	2.9	22	36	36	5	2.5	34 × 51	1/1.4 - 1/1.3 - 1/1.3	34 × 51	2.5	5	36	22	2.9		
	3.1	22	39	39	4.6	2.3	32 × 48	1/1.3 - 1/1.2 - 1/1.2	32 × 48	2	4.6	39	22	3.1		
	3.4	21.5	42	42	4	2	30 × 45	1/1.2 - 1/1.1 - 1/1.1	30 × 45	2	4	42	21.5	3.4		
	3.6	21.5	45	45	3.6	1.8	28 × 42	1/1.1 - 1/1.1 - 1/1.1	28 × 42	1.8	3.6	45	21.5	3.6		
	3.8	21	48	48	3.2	1.6	26 × 39	1/1.1 - 1/1.1 - 1/1.1	26 × 39	1.6	3.2	48	21	3.8		
	4.1	21	51	51	3	1.5	24 × 36	1 - 1 - 1	24 × 36	1.5	3	51	21	4.1		
	4.3	21	54	54	2.8	1.4	23 × 35	1 - 1 - 1	23 × 35	1.4	2.8	54	21	4.3		
	4.6	21	57	57	2.6	1.3	22 × 33	1.1 - 1.1 - 1.1	22 × 33	1.3	2.6	57	21	4.6		
	4.8	21	60	60	2.4	1.2	20 × 30	1.2 - 1.2 - 1.2	20 × 30	1.2	2.4	60	21	4.8		
	5.1	21	63	63	2.2	1.1	19.5 × 29	1.2 - 1.2 - 1.2	19.5 × 29	1.1	2.2	63	21	5.1		
	5.4	21.5	66	66	2	1	19 × 28.5	1.3 - 1.3 - 1.3	19 × 28.5	1	2	66	21.5	5.4		
	5.7	21.5	69	69	1.8	0.9	18 × 27	1.3 - 1.3 - 1.3	18 × 27	0.9	1.8	69	21.5	5.7		
	6	21.5	72	72	1.8	0.9	17 × 25	1.4 - 1.4 - 1.4	17 × 25	0.9	1.8	72	21.5	6		
	6.2	22	75	75	1.7	0.8	16.5 × 24.5	1.4 - 1.4 - 1.4	16.5 × 24.5	0.8	1.7	75	22	6.2		
	6.5	22	78	78	1.6	0.8	16 × 24	1.5 - 1.5 - 1.5	16 × 24	0.8	1.6	78	22	6.5		
	6.9	22	81	81	1.5	0.7	16 × 24	1.5 - 1.5 - 1.5	16 × 24	0.7	1.5	81	22	6.9		
	7.2	22.5	84	84	1.5	0.7	15 × 22.5	1.6 - 1.6 - 1.6	15 × 22.5	0.7	1.5	84	22.5	7.2		
	7.5	22.5	87	87	1.4	0.7	14 × 21	1.6 - 1.6 - 1.6	14 × 21	0.7	1.4	87	22.5	7.5		
	7.8	23	90	90	1.4	0.7	14 × 21	1.7 - 1.7 - 1.7	14 × 21	0.7	1.4	90	23	7.8		
	8.2	23	93	93	1.3	0.6	13 × 20	1.7 - 1.7 - 1.7	13 × 20	0.6	1.3	93	23	8.2		
	8.5	23	96	96	1.3	0.6	12.5 × 18.7	1.8 - 1.8 - 1.8	12.5 × 18.7	0.6	1.2	96	23	8.5		
	8.9	23.5	99	99	1.2	0.6	12 × 18	1.9 - 1.9 - 1.9	12 × 18	0.6	1.2	99	23.5	8.9		

MOUNT RETRACTED

3 mm **

MOUNT FULLY EXTENDED

Key to abbreviations :

C = camera body (fix distance 37.8 mm)

D = supplementary lens + 1 dioptry (donal or donabe)

A = Tuban A = 0.9 mm

B = Tuban B = 5.1 mm

T1 = Tuban 1 = 6 mm

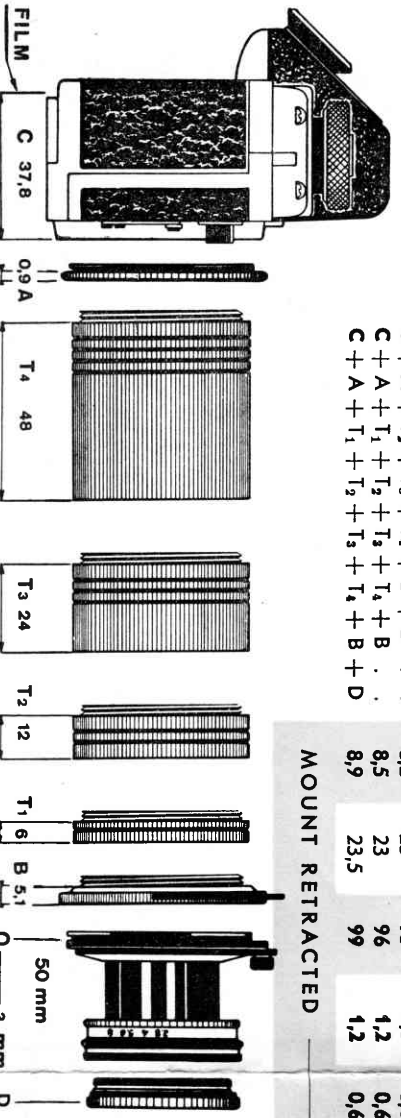
T2 = Tuban 2 = 12 mm

T3 = Tuban 3 = 24 mm

T4 = Tuban 4 = 48 mm

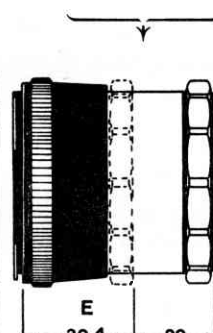
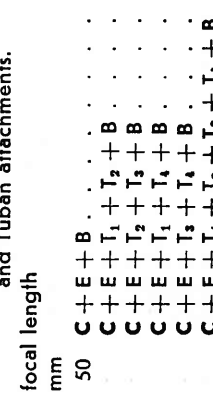
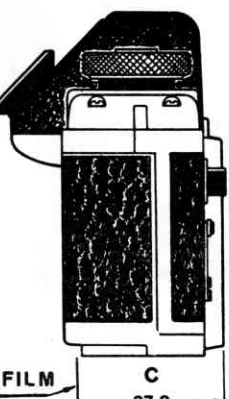
O = Camera lens

** For Xenon with autom. diaphragm 4.3 mm



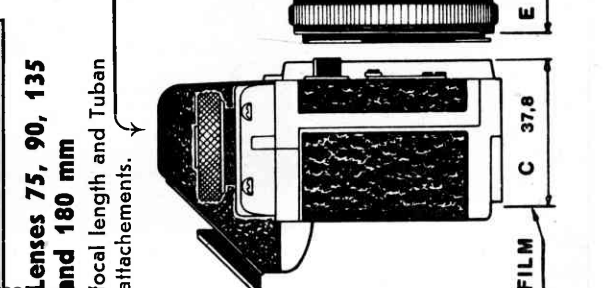
Exposure factor in relation to the setting for infinity
Distance between subject and back of camera
Extension as compared with infinity setting
Depth of field at smallest aperture *

TABLE III
Lenses 50 mm
with Extensan mount
and Tuban attachments.

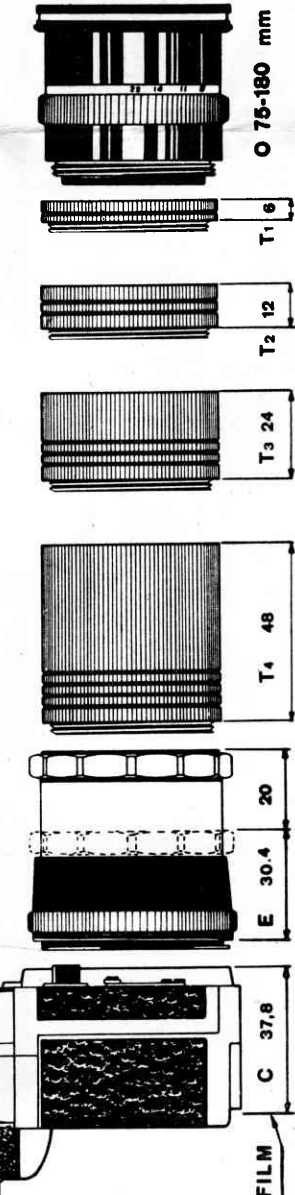


focal length mm	Depth of field at f/11		Depth of field at f/22		Depth of field at f/11		Depth of field at f/22		Depth of field at f/11		Depth of field at f/22	
	in	cm	in	mm	in	mm	in	mm	in	mm	in	mm
50	2,9	21	5	35,5	2,5	34	1,5	24	3	55,5	1,5	21
C + E + B	4,3	20,5	2,6	35,5	1,3	35	0,9	17	1,8	73,5	0,9	21
C + E + T ₁ + T ₂ + B	6	21	1,8	71,5	0,9	26	0,6	13	1,2	91,5	0,6	22
C + E + T ₁ + T ₄ + B	8	22	1,2	89,5	0,6	20	0,5	11	1	109,5	0,5	24
C + E + T ₃ + T ₄ + B	10	24	1	107,5	0,5	17	0,4	10	0,8	127,5	0,4	25
C + E + T ₁ + T ₂ + T ₃ + T ₄ + B	12	25	0,8	125,5	0,4	15	0,3	8	0,6	145,5	0,3	27
75	1	∞	*)	0	1,45	320	1,3,8	90	3,9	20	13	46
C + E + D	1,1	107	4,20	0	1,3,8	320	1,3,8	90	3,3	20	13,5	36
C + E + T ₁ + T ₂	1,5	49	16	18	1,4,2	100	1,2	48	4,3	38	4,4	34
C + E + T ₂ + T ₃	2,2	35	14	36	1,1,3	50	1,1,3	30	6,3	56	2,2	31
C + E + T ₁ + T ₄	3	31	7,1	54	1,1,4	33	1,1,4	24	4,2	74	1,5	30
C + E + T ₃ + T ₄	4	30	4,3	72	1,1,2	24	1,1,2	20	3,2	92	1,1	31
C + E + T ₁ + T ₂ + T ₃ + T ₄	5	31	3,2	90	1,1,5	20	1,1,5	16	2,3	110	0,8	32
90	1	∞	*)	0	1,4,5	120	1,4,5	108	3,6	20	18	61
C + E + D	1,4	65	4,4	18	1,2,4	60	1,2,4	58	1,2	38	6	44
C + E + T ₁ + T ₂	2	45	12,8	36	1,1,6	60	1,1,6	38	6	56	3	39
C + E + T ₂ + T ₃	2,5	39	6,6	54	1,1,2	40	1,1,2	29	4	74	2	37
C + E + T ₁ + T ₄	3	37	4,4	72	1,1,3	30	1,1,3	24	3	92	1,5	36
C + E + T ₃ + T ₄	4	36	3	90	1,1,1	24	1,1,1	20	2,2	110	1,1	37
C + E + T ₁ + T ₂ + T ₃ + T ₄	4	36	3	90	1,1,2	24	1,1,2	20	2,2	110	1,1	37
135	1	∞	*)	0	1,6,8	180	1,6,8	162	11,0	20	38	120
C + E + D	1,3	130	14,0	18	1,1,4	90	1,1,4	85	3,4	40	11,8	79
C + E + T ₁ + T ₂	1,6	82	3,7	36	1,2,4	60	1,2,4	58	6	56	6	66
C + E + T ₂ + T ₃	2	67	18,5	54	1,1,8	60	1,1,8	44	11	74	3,8	59
C + E + T ₁ + T ₄	2,5	60	11,5	72	1,1,5	45	1,1,5	36	7,8	92	2,7	56
C + E + T ₃ + T ₄	3	57	7,8	90	1,1,2	36	1,1,2	29	5,8	110	2	55
C + E + T ₁ + T ₂ + T ₃ + T ₄	3	57	7,8	90	1,1,2	36	1,1,2	29	5,8	110	2	55
180	1	∞	*)	0	1,9	250	1,9	216	18,2	20	66	200
C + E + D	1,2	229	25,5	18	1,10,5	150	1,10,5	110	5,8	38	20	125
C + E + T ₁ + T ₂	1,4	130	6,4	36	1,3,2	120	1,3,2	77	10	56	10	100
C + E + T ₂ + T ₃	1,7	102	3,2	54	1,1,9	80	1,1,9	59	6	74	6	88
C + E + T ₁ + T ₄	2	89	18,5	72	1,1,9	60	1,1,9	47	4	92	4	81
C + E + T ₃ + T ₄	2,3	82	13	90	1,1,6	48	1,1,6	40	3	110	3	77
C + E + T ₁ + T ₂ + T ₃ + T ₄	2,3	82	13	90	1,1,6	48	1,1,6	40	3	110	3	77

TABLE IV
Lenses 75, 90, 135
and 180 mm
focal length and Tuban
attachments.



Key to abbreviations:
C = camera body (fix distance 37,8 mm)
D = supplementary lens + 1 dioptre
B = Tuban B = 5,1 mm
T₁ = Tuban 1 = 6 mm
T₂ = Tuban 2 = 12 mm
T₃ = Tuban 3 = 24 mm
T₄ = Tuban 4 = 48 mm
E = Extensan mount
30,4 + max 20 = 50,4 mm
O = Camera lens



*** The smallest apertures are:**
f/32 for Xenar f/3.5 75 mm
f/22 for Tele-Xenar f/3.5 90 mm
and Altelar f/2.8 90 mm
f/32 for Aliglar f/3.2 135 mm
f/32 for Alefar f/4.5 180 mm lenses.

MOUNT RETRACTED ——— 20 mm ——— MOUNT FULLY EXTENDED

TABLE V

FOCUSING RANGE OF ALPHA-LENSES · DIRECT SETTING AND WITH ALPHA-BELLOWS
 (For use of Tuban extension tubes, see special instructions)



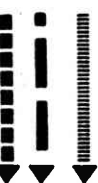
		← Normal Range (from infinity to) Close-up Range (Macrophotography) →																							
		1:17	1:14	1:12	1:10	1:9	1:8.5	1:8	1:7.3	1:6.4	1:5.7	1:4.8	1:4.5	1:3.7	1:2.8	1:2.3	1:1.9	1:1.5	1:1.1	1:2:1	1.6:1	1.9:1	3.2:1	3.7:1	
f=28 mm	RETROFOCUS	18 7/8" (46 cm)																							
															8" (20 cm)										
f=40 mm	MACRO-KILAR Mod. E																								
	Mod. D																								
f=60 mm	{ ALORAR } { ALFINON } { SWITAR } { XENON } (autom.) XENON	3 1/4" (1 m)																							
f=75 mm	XENAR	21" (53 cm)																							
f=90 mm	ALTELAR	22" (56 cm)																							
f=90 mm	MACRO-KILAR	22" (56 cm)																							
f=100 mm	APOCHROMAT	18 1/8" (46 cm)																							
f=135 mm	ALGULAR	24" (60 cm)																							
f=180 mm	ALEFAR	29" (72 cm)																							
f=360 mm	TELE-XENAR	4" (100 mm)																							

All distances are measured from the back of the camera

Normal focusing down to:

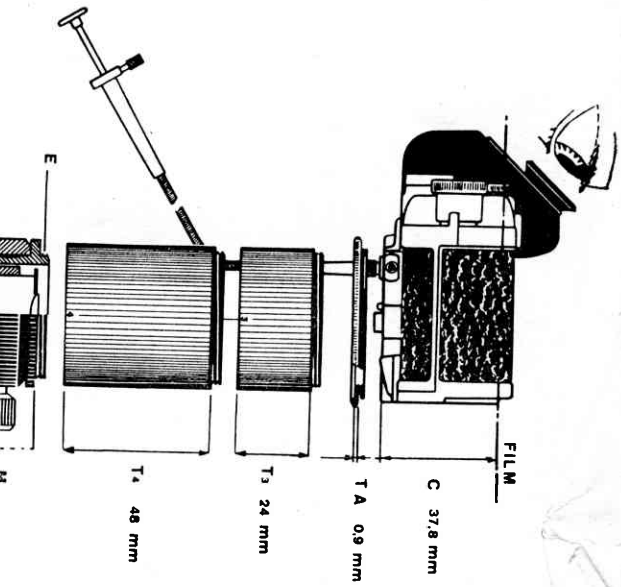
Focusing with supplementary lens + 1 diopter:

With ALPHA bellows { Complete lens: Lens less Extensan mount:



* This interval can be filled by using TUBAN extension tubes.

The ALPHA Used as Microphotographic Camera



Schematic diagram:

C = camera distance (distance from film to front plate of camera).

TA = Tuban A

T3 = Tuban 3 (24 mm)

T4 = Tuban 4 (48 mm)

M = Adapter (either Microfix or Micrano).

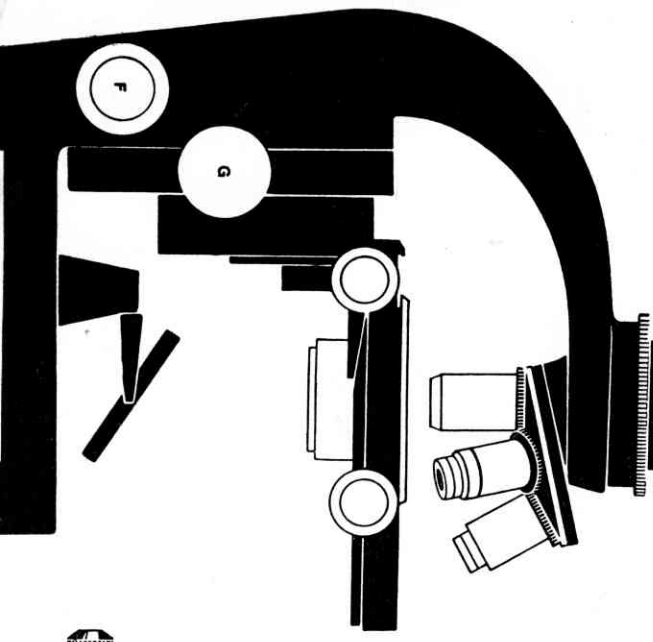
MT = Microscope eye tube

E = Exit pupil

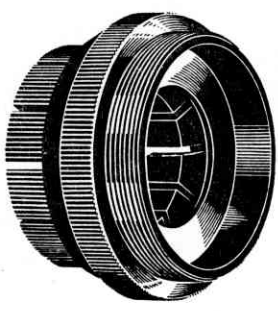
G = Coarse focusing (Knob)

F = Fine focusing (Knob)

The microscope illustrated here is particularly suitable for use with a camera, because no weight is bearing on the coarse and fine focusing movements.



Micrano adapter ring for eye tubes of abnormal diameter, is made to order (ask for questionnaire).



Microfix adapter: for eye tubes of 25 mm standard diameter fitting all modern microscopes, consists of 2 parts.



Photomicrography with the ALPHA Camera

It must be clearly understood that in photomicrography the picture quality is decisively controlled by the quality of the microscope and its objectives. The camera is used **without** camera lens and serves solely as a recording instrument which assures critical focus on the groundglass and on the film plane. The built-in prism guarantees uniform precision focusing, and its logical 45° viewing angle provides an exceptionally comfortable position of the head.

Attaching the ALPHA to the Microscope

The **Microfix** intermediate ring adapts the ALPHA to all modern microscopes with an eyetube of standard 25 mm diameter. The adapter consists of two parts: A lower ring of 25 mm aperture with a (lower) clamping screw and an upper ring threaded to match the Tuban extension tubes. An additional (upper) clamping screw keeps both parts together.

For mounting the Microfix to the microscope proceed as follows:

Remove the eyepiece, loosen the upper clamping screw, place the lower ring on the eyetube, so that the ring is just even with the top of the eyetube and tighten the lower screw until the ring holds. Put the eyepiece back into the eyetube. The upper ring is screwed into the Tuban extension tubes which are fixed to the camera by means of the Tuban A ring. The camera can now be mounted without any vibration. Firm connection is secured by tightening the upper clamping screw. When using the microscope for visual observation between exposures the upper clamping screw is loosened, and the camera can be easily and quickly removed.

Micrano : This one-piece clamping ring is made available for microscope eyetubes of other than the standard 25 mm diameter. The upper part is threaded to join the Tuban extension tubes, while the lower part is slotted into clamping jaws which have a tightening ring. This ring should, however, never be tightened, if the Micrano is not mounted on the microscope. The inside diameter of the Micrano is made to order, so as to fit the diameter of the specific microscope eyetube. This must be an exact fit within tolerances of 1/10 mm, and we urgently request that the measurement is made with a micrometer (see questionnaire).

Tuban Extension Tubes : The degree of enlargement is determined by the selection of tubes. If the distance from exit pupil to film plane is 250 mm., the photographic magnification corresponds exactly with the visual magnification, which requires 4 Tuban of 48 mm each + Tuban A and camera. For 1/3 of this distance (i. e. 83 mm) or 1/3 of the total magnification Tuban 4 + A and camera are sufficient. For 1/2 distance (125 mm) corresponding to 1/2 of the total magnification Tuban 2 + 3 + A and camera are required. (See also diagram of microscope and ALPHA accessories on page 11).