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**USE OF YOUR**

**RE ZOOM AUTO-TOPCOR**

**F/4.7 87~205mm**

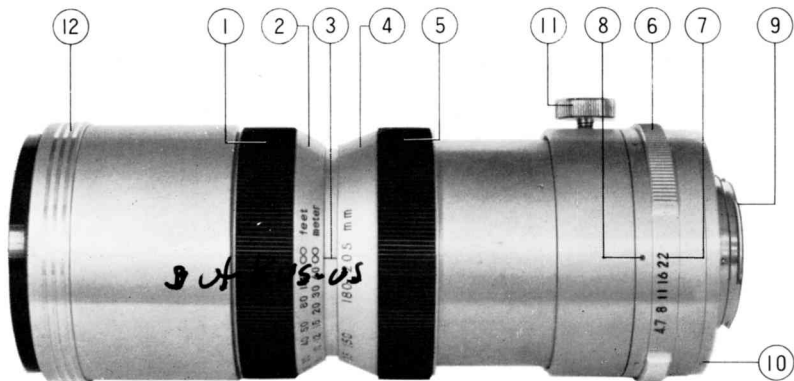
*Botkusius*



**TOKYO OPTICAL CO., LTD.**

# RE Zoom Auto-Topcor F 4.7 87~205mm

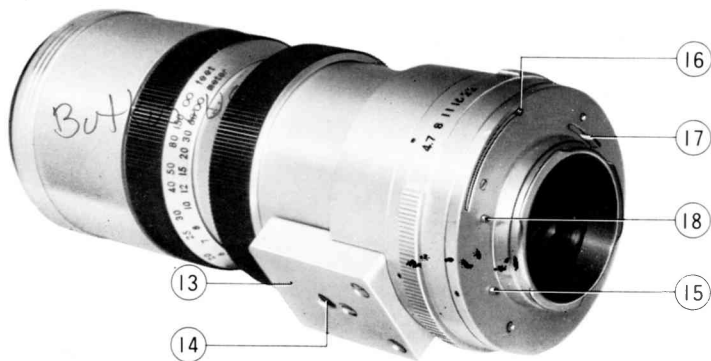
## 1) Nomenclature



- ① Distance focusing ring
- ② Distance scale (meters/feet)
- ③ Distance/zooming index

- ④ Focal length scale
- ⑤ Zooming ring
- ⑥ Aperture ring

- ⑦ Aperture scale
- ⑧ Aperture index
- ⑨ Bayonet lens mount



- ⑩ Camera alignment red dot
- ⑪ Rotating tripod socket fixing screw
- ⑫ Collapsible lens hood
- ⑬ Tripod socket plate
- ⑭ Tripod socket screw mount
- ⑮ Attachment fixing pin
- ⑯ Lens diaphragm coupling pin
- ⑰ Automatic lens diaphragm lever
- ⑱ Attachment alignment pin

## 2) Lens Construction & Specifications

### Specifications:

Focal lengths	87 to 205mm
Maximum aperture	F4.7
Lens construction	13 elements in 8 groups
Angles of field	12° (f=205mm) to 28° (f=87mm)
Zooming ratio	2.4×
Zooming system	Cam compensating mechanical revolution type
Focusing system	Rotating helical type
Minimum aperture	F22
Focal length scale	87, 100, 120, 135, 150, 180 and 205mm
Minimum focusing distance	2.5 meters (2.5 to 1.4 meters with close-up attachment lens)
Lens diaphragm	Fully automatic instant opening lens diaphragm action
Exposure meter coupling system	Through-the-lens; full aperture exposure reading
Filter mount	Screw-in 58mm diameter; P=0.75mm
Lens hood	Collapsible built-in type
Overall length	165mm
Maximum diameter	65mm
Weight	710 grams

### 3) Changes in Angle of Field and Background with Zooming Action



87mm



105mm



135mm



150mm



180mm



205mm

Subject is framed freely  
from 87mm focal length ( $28^\circ$  angle of field)  
to 205mm focal length ( $12^\circ$  angle of field),  
without any change in the camera position.

Shooting distance remains unchanged but depth of field decreases as the focal length is increased.

87mm 1 : 5.6



205mm 1 : 5.6



Subject size remains unchanged (shooting distance has changed) but perspective decreases as the focal length is increased.

87mm 1 : 5.6



205mm 1 : 5.6





## 4) Operation

### \* **Attachment to the Camera:**

The lens is attached to the camera with great ease and simplicity, as with other TOPCOR interchangeable lenses. Simply line up the red dot (10) on the rear end of the lens barrel with a similar dot on the body flange, with the lens mount and body mount absolutely parallel to each other, and insert carefully. When wellseated, turn the lens clockwise until a full stop is made and it clicks into position.

Do not touch the reflex mirror when interchanging lenses.

The TOPCON bayonet mount permits speedy, simple and accurate exchanges of the interchangeable lenses but care must be exercised to prevent damage to the bayonet mounts.

### \* **Focusing and Zooming (Changing Focal Lengths):**

Either focusing or zooming may be undertaken first. However, in general, focusing should be taken care of, first of all, with the focal length set at 205mm, after which the lens may be zoomed.

Focusing is much more accurate, in this case, because an enlarged image, with shallow depth of field, is used for focusing, and shifting in focus will be very small as the lens is zoomed in to the 87mm focal length. For greatest accuracy, however, focus at the focal length required.

Focus with the distance focusing ring (1) and zoom with the zooming ring (5).

### \* **Attachment to the Tripod:**

Screw the tripod screw into the tripod socket screw mount (14), of the tripod socket plate (13), and fix the lens firmly to the tripod.

The lens may be rotated so that the camera can be used for taking either vertical or horizontal format pictures. There are clickstops at three positions 90 degrees apart, for obtaining vertical or horizontal formats, and the camera may be fixed firmly at any positions with the fixing screw (11).

A strong and sturdy tripod should be used to prevent camera vibration and a tripod mount without rubber pad should be used, so that attachment will be made directly against the metal surface or a plastic pad surface.

\* **Exposure :**

Photography with the zoom lens requires a little over-exposure adjustment of the reading taken with the conventional exposure meter, but, of course, there are no worries when taking exposure measurements with the TOPCON RE Super and RE-2 because of the thru-the-lens mirror-metering feature of these cameras. (Read the instruction manual for the camera.) When taking pictures of the open landscape, however, point the lens down at the ground at about a 30° inclination to get less sky in the reading. When the subject is back-lighted and dark, or the surrounding is dark with the subject very light, move in close to the main subject for the reading or zoom the lens to 205mm for a reading of the dark or light subject area only, which would also apply when taking wide-angle photographs.

\* **Depth of Field:**

When a subject is focused at a certain distance, the lens presents an apparently sharp

image not only at the precise focused distance but also at somewhat farther and nearer distances, and this zone of apparent sharpness is known as the depth of field.

The depth of field is greatest as the lens diaphragm is closed down and least as it is opened up. It is greater as the subject-to-camera distance is increased and least at close focusing distances. The depth of field also increases at the shorter focal lengths and decreases at the longer focal lengths. Finally, the depth of field is greater in the background and shallower in the foreground but grows progressively equal as the focal distance is decreased.

The depth of field preview lever of the TOPCON RE Super permits actual previewing of the depth of field for a selected aperture, especially when used in combination with a groundglass focusing screen.

When it is required to ascertain the depth of field for certain focal lengths, refer to the depth of field table for the focal length being used, on the following pages.

Depth of Field Table (distances in feet)

RE Zoom Auto-Topcor F4.7/87~205mm

f=205mm

Feet \ F	4.7	5.6	8.0	11.0	16.0	22.0
∞	∞~882	∞~740	∞~519	∞~378	∞~260	∞~190
150	180~129	187~125	210~117	247~108	352~95.8	715~84.4
80	87.7~73.5	89.4~72.4	94.1~69.6	101~66.4	114~61.7	137~56.8
50	52.8~47.5	53.4~47.0	55.1~45.8	57.2~44.4	61.3~42.3	67.0~40.0
40	41.8~38.4	42.1~38.1	43.1~37.3	44.4~36.4	46.8~35.0	50.0~33.4
30	31.0~29.1	31.2~28.9	31.7~28.5	32.4~28.0	33.6~27.1	35.2~26.2
25	25.7~24.4	25.8~24.3	26.1~24.0	26.6~23.6	27.4~23.0	28.4~22.4
20	20.4~19.6	20.5~19.5	20.7~19.4	21.0~19.1	21.4~18.7	22.1~18.3
17	17.3~16.7	17.3~16.7	17.5~16.5	17.7~16.4	18.0~16.1	18.4~15.8
15	15.2~14.8	15.3~14.8	15.4~14.7	15.5~14.5	15.8~14.3	16.1~14.1
13	13.2~12.8	13.2~12.8	13.3~12.7	13.4~12.7	13.5~12.5	13.8~12.3
12	12.1~11.9	12.2~11.9	12.2~11.8	12.3~11.7	12.5~11.6	12.6~11.4
10	10.1~9.92	10.1~9.90	10.1~9.86	10.2~9.81	10.3~9.72	10.4~9.63
9	9.07~8.94	9.08~8.92	9.11~8.89	9.16~8.85	9.23~8.78	9.32~8.71

## Depth of Field Table (distances in meters)

RE Zoom Auto-Topcor F4.7/87~205mm

 $f=205\text{mm}$ 

m \ F	4.7	5.6	8.0	11.0	16.0	22.0
$\infty$	$\infty \sim 269$	$\infty \sim 226$	$\infty \sim 158$	$\infty \sim 115$	$\infty \sim 79.3$	$\infty \sim 57.8$
60	77.0~49.2	81.5~47.5	96.3~43.7	125~39.6	246~34.4	$\infty \sim 29.6$
30	33.7~27.1	34.5~26.6	36.8~25.3	40.3~23.9	47.8~21.9	61.7~19.9
20	21.5~18.7	21.9~18.4	22.8~17.8	24.0~17.1	26.5~16.1	30.2~15.0
15	15.8~14.2	16.0~14.1	16.5~13.8	17.1~13.4	18.3~12.7	20.0~12.0
12	12.5~11.5	12.6~11.4	12.9~11.2	13.3~10.9	14.0~10.5	14.9~10.1
10	10.4~9.67	10.4~9.61	10.6~9.45	10.9~9.26	11.3~8.96	11.9~8.63
8	8.22~7.79	8.26~7.75	8.38~7.65	8.54~7.53	8.81~7.33	9.16~7.11
7	7.17~6.84	7.20~6.81	7.29~6.74	7.40~6.64	7.60~6.49	7.86~6.32
6	6.12~5.89	6.14~5.87	6.21~5.81	6.29~5.74	6.43~5.63	6.60~5.51
5	5.08~4.92	5.10~4.91	5.14~4.87	5.19~4.82	5.28~4.75	5.40~4.66
4.5	4.56~4.44	4.58~4.43	4.61~4.40	4.65~4.36	4.72~4.30	4.81~4.23
4	4.05~3.95	4.06~3.94	4.08~3.92	4.12~3.89	4.17~3.85	4.24~3.79
3.5	3.54~3.47	3.54~3.46	3.56~3.44	3.58~3.42	3.62~3.38	3.67~3.34
3	3.02~2.98	3.03~2.97	3.04~2.96	3.06~2.94	3.09~2.92	3.12~2.89
2.5	2.52~2.48	2.52~2.48	2.53~2.47	2.54~2.46	2.56~2.45	2.58~2.43

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Depth of Field Table (distances in feet)

RE Zoom Auto-Topcor F4.7/87~205mm

f=180mm

feet \ F	4.7	5.6	8.0	11.0	16.0	22.0
$\infty$	$\infty \sim 680$	$\infty \sim 571$	$\infty \sim 400$	$\infty \sim 291$	$\infty \sim 201$	$\infty \sim 146$
150	192~123	203~119	239~109	308~99.4	594~86.3	$\infty \sim 74.5$
80	90.4~71.8	92.7~70.4	99.5~66.9	110~63.1	132~57.6	175~52.2
50	53.8~46.7	54.6~46.1	56.9~44.6	60.0~42.9	66.0~40.3	75.1~37.6
40	42.4~37.9	42.9~37.5	44.2~36.5	46.1~35.4	49.5~33.6	54.4~31.7
30	31.3~28.8	31.6~28.6	32.3~28.0	33.2~27.4	34.9~26.3	37.3~25.2
25	25.9~24.2	26.1~24.0	26.5~23.6	27.2~23.2	28.3~22.4	29.8~21.6
20	20.5~19.5	20.7~19.4	21.0~19.1	21.3~18.8	22.0~18.4	22.9~17.8
17	17.4~16.6	17.5~16.6	17.7~16.4	17.9~16.2	18.4~15.8	19.0~15.4
15	15.3~14.7	15.4~14.7	15.5~14.5	15.7~14.4	16.1~14.1	16.5~13.8
13	13.2~12.8	13.3~12.8	13.4~12.7	13.5~12.5	13.8~12.3	14.1~12.1
12	12.2~11.8	12.2~11.8	12.3~11.7	12.4~11.6	12.6~11.4	12.9~11.2
10	10.1~9.88	10.1~9.86	10.2~9.80	10.3~9.73	10.4~9.62	10.6~9.48
9	9.09~8.91	9.11~8.89	9.16~8.85	9.22~8.79	9.33~8.70	9.46~8.59

### Depth of Field Table (distances in meters)

RE Zoom Auto-Topcor F4.7/87~205mm

f=180mm

m \ F	4.7	5.6	8.0	11.0	16.0	22.0
∞	∞~207	∞~174	∞~122	∞~88.8	∞~61.1	∞~44.6
60	84.2~46.6	91.3~44.7	118~40.3	185~35.9	3761~30.4	∞~25.7
30	35.0~26.3	36.1~25.7	39.6~24.2	45.1~22.5	58.5~20.3	91.3~18.1
20	22.1~18.3	22.5~18.0	23.8~17.3	25.7~16.4	29.5~15.2	35.9~13.9
15	16.1~14.0	16.4~13.9	17.0~13.4	17.9~12.9	19.7~12.1	22.3~11.3
12	12.7~11.4	12.8~11.3	13.2~11.0	13.8~10.6	14.8~10.1	16.2~9.56
10	10.5~9.57	10.6~9.49	10.8~9.28	11.2~9.04	11.8~8.67	12.7~8.26
8	8.30~7.72	8.36~7.67	8.52~7.54	8.73~7.38	9.12~7.14	9.63~6.86
7	7.22~6.79	7.27~6.75	7.39~6.65	7.55~6.53	7.83~6.34	8.20~6.12
6	6.16~5.85	6.19~5.82	6.28~5.75	6.39~5.66	6.59~5.51	6.84~5.35
5	5.11~4.90	5.13~4.88	5.19~4.83	5.26~4.76	5.39~4.66	5.56~4.55
4.5	4.59~4.42	4.60~4.40	4.65~4.36	4.71~4.31	4.81~4.23	4.94~4.14
4	4.07~3.94	4.08~3.92	4.12~3.89	4.16~3.85	4.24~3.79	4.34~3.72
3.5	3.55~3.45	3.56~3.44	3.59~3.42	3.62~3.39	3.68~3.34	3.75~3.29
3	3.04~2.97	3.04~2.96	3.06~2.94	3.08~2.92	3.12~2.89	3.17~2.85
2.5	2.52~2.48	2.53~2.47	2.54~2.46	2.55~2.45	2.58~2.42	2.61~2.40

### Depth of Field Table (distances in feet)

RE Zoom Auto-Topcor F4.7/87~205mm

f=150mm

feet \ F	4.7	5.6	8.0	11.0	16.0	22.0
∞	∞~472	∞~396	∞~278	∞~202	∞~139	∞~102
150	219~114	241~109	325~97.7	581~86.5	∞~72.6	∞~60.9
80	96.1~68.6	99.9~66.8	112~62.4	132~57.6	187~51.2	379~45.1
50	55.8~45.3	57.0~44.5	60.7~42.6	66.0~40.3	77.4~37.1	97.6~33.8
40	43.6~37.0	44.3~36.5	46.5~35.1	49.5~33.6	55.6~31.3	65.3~29.0
30	31.9~28.3	32.3~28.0	33.5~27.2	35.0~26.3	37.9~24.9	42.1~23.4
25	26.3~23.8	26.6~23.6	27.3~23.0	28.3~22.4	30.2~21.4	32.8~20.3
20	20.8~19.2	21.0~19.1	21.4~18.7	22.0~18.3	23.1~17.6	24.6~16.9
17	17.6~16.5	17.7~16.4	18.0~16.1	18.4~15.8	19.2~15.3	20.2~14.7
15	15.4~14.6	15.5~14.5	15.8~14.3	16.1~14.1	16.6~13.7	17.4~13.2
13	13.3~12.7	13.4~12.6	13.6~12.5	13.8~12.3	14.2~12.0	14.7~11.7
12	12.3~11.7	12.3~11.7	12.5~11.6	12.7~11.4	13.0~11.2	13.4~10.9
10	10.2~9.82	10.2~9.79	10.3~9.70	10.4~9.59	10.7~9.42	10.9~9.22
9	9.15~8.86	9.18~8.83	9.25~8.76	9.35~8.68	9.52~8.54	9.74~8.38



Depth of Field Table (distances in meters)

RE Zoom Auto-Topcor F4.7/87~205mm

f=150mm

m \ F	4.7	5.6	8.0	11.0	16.0	22.0
∞	∞~144	∞~121	∞~84.7	∞~61.7	∞~42.5	∞~31.0
60	103~42.4	119~40.2	206~35.2	2473~30.5	∞~25.0	∞~20.5
30	37.8~24.9	39.8~24.1	46.3~22.2	58.2~20.3	102~17.7	1140~15.4
20	23.2~17.6	23.9~17.2	26.1~16.2	29.4~15.2	37.5~13.7	56.2~12.3
15	16.7~13.6	17.1~13.4	18.1~12.8	19.7~12.1	23.0~11.2	28.8~10.2
12	13.1~11.1	13.3~11.0	13.9~10.6	14.8~10.1	16.6~9.43	19.4~8.74
10	10.7~9.38	10.9~9.27	11.3~8.98	11.9~8.66	13.0~8.16	14.6~7.64
8	8.45~7.60	8.54~7.53	8.79~7.34	9.13~7.13	9.76~6.79	10.7~6.43
7	7.34~6.69	7.40~6.64	7.59~6.50	7.84~6.33	8.30~6.06	8.93~5.78
6	6.24~5.78	6.29~5.74	6.43~5.63	6.60~5.50	6.92~5.31	7.35~5.09
5	5.16~4.85	5.20~4.82	5.29~4.74	5.40~4.66	5.61~4.52	5.88~4.36
4.5	4.63~4.38	4.66~4.35	4.73~4.29	4.82~4.22	4.98~4.11	5.20~3.98
4	4.10~3.90	4.12~3.89	4.18~3.84	4.25~3.78	4.37~3.69	4.53~3.59
3.5	3.58~3.43	3.59~3.41	3.63~3.38	3.68~3.33	3.78~3.26	3.89~3.19
3	3.05~2.95	3.07~2.94	3.09~2.91	3.13~2.88	3.20~2.83	3.28~2.77
2.5	2.54~2.46	2.54~2.46	2.56~2.44	2.59~2.42	2.63~2.38	2.68~2.34

## Depth of Field Table (distances in feet)

RE Zoom Auto-Topcor F4.7/87~205mm

f = 135mm

feet \ F	4.7	5.6	8.0	11.0	16.0	22.0
∞	∞ ~ 383	∞ ~ 321	∞ ~ 225	∞ ~ 164	∞ ~ 113	∞ ~ 82.5
150	246 ~ 108	281 ~ 103	449 ~ 90.3	1820 ~ 78.6	∞ ~ 64.8	∞ ~ 53.5
80	101 ~ 66.3	106 ~ 64.2	124 ~ 59.3	156 ~ 54.0	274 ~ 47.1	3520 ~ 40.9
50	57.3 ~ 44.3	59.0 ~ 43.4	64.0 ~ 41.1	71.5 ~ 38.5	89.1 ~ 34.9	127 ~ 31.4
40	44.5 ~ 36.3	45.5 ~ 35.7	48.4 ~ 34.1	52.6 ~ 32.4	61.4 ~ 29.8	77.1 ~ 27.2
30	32.5 ~ 27.9	33.0 ~ 27.5	34.4 ~ 26.6	36.5 ~ 25.5	40.5 ~ 23.9	46.7 ~ 22.2
25	26.7 ~ 23.5	27.0 ~ 23.3	28.0 ~ 22.6	29.3 ~ 21.8	31.8 ~ 20.7	35.5 ~ 19.4
20	21.0 ~ 19.1	21.2 ~ 18.9	21.8 ~ 18.5	22.6 ~ 17.9	24.1 ~ 17.2	26.1 ~ 16.3
17	17.7 ~ 16.3	17.9 ~ 16.2	18.3 ~ 15.9	18.8 ~ 15.5	19.8 ~ 14.9	21.1 ~ 14.3
15	15.6 ~ 14.5	15.7 ~ 14.4	16.0 ~ 14.1	16.4 ~ 13.8	17.1 ~ 13.4	18.1 ~ 12.9
13	13.4 ~ 12.6	13.5 ~ 12.5	13.7 ~ 12.4	14.0 ~ 12.1	14.5 ~ 11.8	15.2 ~ 11.4
12	12.3 ~ 11.7	12.4 ~ 11.6	12.6 ~ 11.5	12.9 ~ 11.3	13.3 ~ 11.0	13.8 ~ 10.6
10	10.2 ~ 9.78	10.3 ~ 9.73	10.4 ~ 9.63	10.6 ~ 9.49	10.9 ~ 9.28	11.2 ~ 9.04
9	9.19 ~ 8.82	9.22 ~ 8.79	9.32 ~ 8.70	9.45 ~ 8.59	9.67 ~ 8.42	9.96 ~ 8.23

### Depth of Field Table (distances in meters)

RE Zoom Auto-Topcor F4.7/87~205mm

f=135mm

m \ F	4.7	5.6	8.0	11.0	16.0	22.0
∞	∞~117	∞~97.9	∞~68.6	∞~50.0	∞~34.5	∞~25.1
60	123~39.7	155~37.3	484~32.1	∞~27.4	∞~22.0	∞~17.8
30	40.3~23.9	43.1~23.0	53.1~21.0	74.9~18.8	239~16.1	∞~13.8
20	24.1~17.1	25.1~16.7	28.1~15.6	33.2~14.4	47.5~12.7	99.4~11.2
15	17.2~13.3	17.7~13.1	19.1~12.4	21.3~11.6	26.4~10.5	37.1~9.48
12	13.3~10.9	13.6~10.7	14.5~10.3	15.7~9.74	18.3~8.97	22.8~8.20
10	10.9~9.24	11.1~9.10	11.6~8.77	12.4~8.38	14.0~7.82	16.4~7.23
8	8.56~7.51	8.68~7.42	9.01~7.20	9.46~6.94	10.3~6.55	11.6~6.14
7	7.42~6.62	7.51~6.56	7.76~6.38	8.08~6.18	8.70~5.87	9.59~5.54
6	6.31~5.72	6.37~5.67	6.54~5.55	6.77~5.39	7.19~5.16	7.78~4.90
5	5.21~4.81	5.25~4.77	5.36~4.68	5.52~4.58	5.79~4.41	6.16~4.22
4.5	4.67~4.35	4.70~4.32	4.79~4.24	4.91~4.16	5.12~4.02	5.41~3.87
4	4.13~3.88	4.15~3.86	4.22~3.80	4.32~3.73	4.48~3.62	4.69~3.50
3.5	3.60~3.41	3.62~3.39	3.67~3.35	3.74~3.29	3.86~3.21	4.01~3.11
3	3.07~2.93	3.08~2.92	3.12~2.89	3.17~2.85	3.25~2.79	3.36~2.72
2.5	2.55~2.46	2.56~2.45	2.58~2.43	2.61~2.40	2.67~2.36	2.74~2.31

## Depth of Field Table (distances in feet)

RE Zoom Auto-Topcor F4.7/87~205mm

f=120mm

feet \ F	4.7	5.6	8.0	11.0	16.0	22.0
∞	∞~302	∞~254	∞~178	∞~130	∞~89.4	∞~65.3
150	297~100	366~94.5	965~81.7	∞~69.8	∞~56.3	∞~45.7
80	108~63.4	116~61.0	145~55.4	209~49.7	797~42.5	∞~36.2
50	59.7~43.0	62.0~41.9	69.2~39.2	80.9~36.3	113~32.3	217~28.6
40	45.9~35.4	47.3~34.7	51.3~32.8	57.5~30.8	71.9~27.9	103~25.1
30	33.2~27.4	33.9~26.9	35.9~25.8	38.8~24.5	44.8~22.7	55.0~20.9
25	27.2~23.2	27.6~22.8	28.9~22.0	30.7~21.1	34.4~19.7	40.1~18.3
20	21.3~18.8	21.6~18.6	22.4~18.1	23.5~17.5	25.5~16.5	28.5~15.5
17	18.0~16.1	18.1~16.0	18.7~15.6	19.4~15.1	20.8~14.4	22.7~13.7
15	15.7~14.3	15.9~14.2	16.3~13.9	16.8~13.5	17.8~13.0	19.2~12.4
13	13.5~12.5	13.6~12.4	13.9~12.2	14.3~11.9	15.0~11.5	16.0~11.0
12	12.5~11.6	12.5~11.5	12.8~11.3	13.1~11.1	13.7~10.7	14.5~10.3
10	10.3~9.71	10.4~9.66	10.5~9.52	10.7~9.36	11.1~9.09	11.6~8.80
9	9.24~8.77	9.29~8.73	9.42~8.62	9.59~8.48	9.89~8.27	10.3~8.03

Depth of Field Table (distances in meters)

RE Zoom Auto-Topcor F4.7/87~205mm

f=120mm

m \ F	4.7	5.6	8.0	11.0	16.0	22.0
∞	∞~92.2	∞~77.4	∞~54.3	∞~39.5	∞~27.3	∞~19.9
60	172~36.4	268~33.9	∞~28.6	∞~23.9	∞~18.8	∞~15.0
30	44.4~22.7	48.9~21.7	67.0~19.4	125~17.1	∞~14.4	∞~12.0
20	25.5~16.5	26.9~15.9	31.6~14.7	40.3~13.4	75.7~11.6	∞~10.1
15	17.9~12.9	18.5~12.6	20.6~11.8	24.0~10.9	33.2~9.75	61.8~8.63
12	13.8~10.7	14.1~10.4	15.3~9.87	17.1~9.26	21.3~8.40	30.2~7.56
10	11.2~9.05	11.4~8.89	12.2~8.49	13.3~8.03	15.7~7.38	20.0~6.73
8	8.73~7.39	8.89~7.28	9.33~7.01	9.96~6.70	11.2~6.24	13.2~5.77
7	7.55~6.53	7.67~6.44	7.99~6.23	8.44~5.99	9.33~5.62	10.7~5.24
6	6.40~5.65	6.48~5.59	6.71~5.43	7.02~5.25	7.62~4.97	8.48~4.67
5	5.27~4.76	5.32~4.72	5.48~4.60	5.68~4.47	6.06~4.27	6.59~4.05
4.5	4.71~4.31	4.76~4.27	4.88~4.18	5.04~4.07	5.33~3.90	5.73~3.72
4	4.17~3.85	4.20~3.82	4.29~3.75	4.42~3.66	4.64~3.53	4.94~3.38
3.5	3.63~3.38	3.65~3.36	3.72~3.31	3.81~3.24	3.97~3.14	4.18~3.02
3	3.09~2.92	3.11~2.90	3.16~2.86	3.22~2.81	3.33~2.73	3.48~2.65
2.5	2.56~2.44	2.57~2.43	2.61~2.40	2.65~2.37	2.72~2.32	2.81~2.25

Depth of Field Table (distances in feet)

RE Auto-Topcor F4.7/87~205mm

f=100mm

feet \ F	4.7	5.6	8.0	11.0	16.0	22.0
∞	∞~210	∞~177	∞~124	∞~90.2	∞~62.3	∞~45.5
150	525~87.8	1010~81.3	∞~68.0	∞~56.6	∞~44.2	∞~35.1
80	129~58.1	146~55.2	226~48.8	734~42.6	∞~35.2	∞~29.2
50	65.4~40.5	69.5~39.1	83.5~35.8	112~32.4	260~28.0	∞~24.1
40	49.2~33.7	51.5~32.8	58.8~30.4	71.5~27.9	112~24.6	357~21.5
30	34.9~26.4	36.0~25.8	39.4~24.3	44.6~22.7	57.5~20.5	88.4~18.3
25	28.3~22.4	29.0~22.0	31.1~20.9	34.3~19.7	41.4~18.0	55.2~16.4
20	22.0~18.3	22.4~18.1	23.7~17.3	25.5~16.5	29.1~15.3	35.3~14.1
17	18.4~15.8	18.7~15.6	19.6~15.0	20.8~14.4	23.1~13.5	26.8~12.6
15	16.1~14.1	16.3~13.9	17.0~13.5	17.8~13.0	19.5~12.2	22.0~11.5
13	13.8~12.3	14.0~12.2	14.4~11.8	15.0~11.5	16.2~10.9	17.9~10.3
12	12.7~11.4	12.8~11.3	13.2~11.0	13.7~10.7	14.7~10.2	16.0~9.65
10	10.5~9.59	10.5~9.51	10.8~9.32	11.1~9.09	11.8~8.73	12.6~8.34
9	9.36~8.67	9.43~8.61	9.63~8.45	9.90~8.26	10.4~7.97	11.0~7.65

Depth of Field Table (distances in meters)

RE Zoom Auto-Topcor F4.7/87~205mm

$f=100\text{mm}$

m \ F	4.7	5.6	8.0	11.0	16.0	22.0
$\infty$	$\infty \sim 64.1$	$\infty \sim 53.8$	$\infty \sim 37.7$	$\infty \sim 27.5$	$\infty \sim 19.0$	$\infty \sim 13.9$
60	982~31.1	$\infty \sim 28.4$	$\infty \sim 23.2$	$\infty \sim 18.9$	$\infty \sim 14.5$	$\infty \sim 11.3$
30	56.3~20.5	67.7~19.3	148~16.8	$\infty \sim 14.4$	$\infty \sim 11.7$	$\infty \sim 9.54$
20	29.0~15.3	31.7~14.6	42.5~13.1	73.8~11.6	$\infty \sim 9.81$	$\infty \sim 8.26$
15	19.5~12.2	20.7~11.8	24.8~10.8	32.9~9.77	73.0~8.45	$\infty \sim 7.28$
12	14.7~10.1	15.4~9.85	17.5~9.16	21.2~8.41	32.7~7.42	95.0~6.50
10	11.8~8.68	12.2~8.47	13.5~7.95	15.6~7.39	21.0~6.61	36.3~5.88
8	9.10~7.14	9.35~7.00	10.1~6.64	11.2~6.25	13.7~5.69	18.8~5.14
7	7.83~6.34	8.01~6.22	8.54~5.94	9.31~5.63	11.0~5.17	14.0~4.72
6	6.59~5.51	6.72~5.42	7.09~5.21	7.61~4.97	8.68~4.61	10.5~4.25
5	5.40~4.66	5.48~4.60	5.72~4.44	6.06~4.27	6.71~4.01	7.71~3.73
4.5	4.82~4.22	4.89~4.17	5.07~4.05	5.33~3.90	5.83~3.68	6.56~3.45
4	4.25~3.78	4.30~3.74	4.44~3.64	4.64~3.52	5.00~3.35	5.53~3.16
3.5	3.69~3.33	3.72~3.30	3.83~3.23	3.97~3.13	4.23~2.99	4.60~2.84
3	3.13~2.88	3.16~2.86	3.24~2.80	3.33~2.73	3.51~2.63	3.76~2.51
2.5	2.59~2.42	2.61~2.40	2.66~2.36	2.72~2.31	2.84~2.24	2.99~2.16

Depth of Field Table (distances in feet)

RE Auto-Tocor F4.7/87~205mm

f=87mm

feet \ F	4.7	5.6	8.0	11.0	16.0	22.0
∞	∞~159	∞~134	∞~93.8	∞~68.4	∞~47.3	∞~34.6
150	2720~77.5	∞~70.9	∞~57.9	∞~47.2	∞~36.1	∞~28.2
80	160~53.4	199~50.3	555~43.4	∞~37.1	∞~29.9	∞~24.3
50	72.6~38.2	79.5~36.6	107~32.8	187~29.1	∞~24.5	∞~20.7
40	53.2~32.1	56.8~31.0	69.3~28.2	96.0~25.5	272~21.9	∞~18.8
30	36.8~25.4	38.5~24.6	43.8~22.9	53.0~21.0	82.1~18.6	246~16.3
25	29.5~21.7	30.6~21.2	33.8~19.9	39.0~18.5	52.7~16.6	91.6~14.7
20	22.8~17.9	23.4~17.5	25.2~16.6	28.0~15.6	34.3~14.2	47.2~12.9
17	18.9~15.4	19.4~15.2	20.6~14.5	22.4~13.8	26.2~12.7	33.1~11.6
15	16.5~13.8	16.8~13.6	17.7~13.0	19.0~12.4	21.7~11.6	26.1~10.7
13	14.1~12.1	14.3~11.9	15.0~11.5	15.9~11.0	17.7~10.4	20.5~9.63
12	12.9~11.2	13.1~11.1	13.6~10.7	14.4~10.3	15.8~9.72	18.0~9.08
10	10.6~9.46	10.7~9.36	11.1~9.12	11.6~8.83	12.5~8.39	13.8~7.92
9	9.49~8.56	9.59~8.49	9.86~8.29	10.2~8.05	10.9~7.68	11.9~7.29

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### Depth of Field Table (distances in meters)

RE Zoom Auto-Topcor F4.7/87~205mm

f=87mm

m \ F	4.7	5.6	8.0	11.0	16.0	22.0
∞	∞~48.5	∞~40.8	∞~28.6	∞~20.9	∞~14.4	∞~10.5
60	∞~26.9	∞~24.3	∞~19.4	∞~15.5	∞~11.7	∞~9.00
30	78.6~18.6	114~17.3	∞~14.7	∞~12.4	∞~9.79	∞~7.85
20	33.9~14.2	39.1~13.5	66.7~11.8	58.4~10.3	∞~8.44	∞~6.96
15	21.6~11.5	23.6~11.0	31.4~9.90	53.8~8.79	∞~7.42	∞~6.26
12	15.9~9.66	16.9~9.32	20.6~8.51	28.2~7.68	74.6~6.62	∞~5.68
10	12.5~8.33	13.2~8.07	15.3~7.46	19.1~6.82	32.9~5.97	267~5.20
8	9.53~6.90	9.90~6.73	11.0~6.30	12.9~5.84	17.9~5.21	34.0~4.62
7	8.14~6.15	8.40~6.01	9.20~5.67	10.4~5.29	13.5~4.77	20.9~4.27
6	6.81~5.37	6.99~5.26	7.53~5.00	8.34~4.71	10.2~4.29	13.8~3.89
5	5.54~4.56	5.66~4.48	6.01~4.29	6.51~4.08	7.55~3.77	9.39~3.45
4.5	4.93~4.14	5.03~4.08	5.29~3.92	5.67~3.74	6.45~3.48	7.73~3.21
4	4.34~3.71	4.41~3.67	4.61~3.54	4.89~3.39	5.45~3.18	6.34~2.96
3.5	3.75~3.28	3.80~3.24	3.95~3.15	4.16~3.03	4.55~2.86	5.14~2.68
3	3.18~2.84	3.22~2.81	3.32~2.74	3.46~2.65	3.73~2.52	4.11~2.38
2.5	2.62~2.39	2.65~2.37	2.71~2.32	2.81~2.26	2.97~2.17	3.21~2.06

\* **Lens Hood, Filters and Close-Up Attachment Lens:**

The lens hood is built-in and simply extended for use and collapsed for storage.

The TOPCON 58mm screw mount lens filter should be used on front of the lens, in both black-and-white and color photography.

The screw-in close-up attachment lens is supplied together with the lens and permits close-ups from 2.5 to 1.4 meters.



\* **Infrared Photography:**

Since the infrared rays are not visible colors but are longer in wavelength than the visible white light rays, adjustments must be made in focus for the longer wavelength by extending the lens to compensate for the difference.

The lens extension required for compensation differs with the focal length and is, for example, 0.4mm with the 205mm focal length, 2.2mm with the 87mm focal length, etc.

Best results are obtained in infrared photography over 200mm and, thus, in the case the

lens is used at 205mm focal length, the distance setting obtained by focusing in the normal manner should be shifted a distance equal to the spacing between the infinity and 60 meters scale markings.

Read the instructions given in the TOPCON RE Super and RE-2 manuals, as well as the instructions enclosed with the film, but, in any case, try to use a shutter speed which will permit stopping down the lens diaphragm.