

ORTAL LENSES

TO

TV88 SPECIFICATION

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The British Broadcasting Corporation have undertaken the specification of desirable features of a range of lenses suitable for use on "Studio" Image Orthicon cameras. This specification which is quite widely known, is referred to as TV88, and Taylor-Hobson have designed one version of their Ortal range to conform to this requirement.

SALIENT FEATURES

It should be noticed that many of the features described hereunder have been specifically evolved for television camera requirements and are not found on lenses produced for photographic use.

Specification TV88 calls for stringent requirements with regard to lens performance, and in this respect the ORTAL lenses without exception exceed the minimum specified performance standards. See leaflet TV30 for performance details.

An important feature of the mounting details is the iris diaphragm control mechanism which provides for complete interchangeability between lenses on camera turrets fitted with remote control of the lens diaphragm. This provision is independent of focal length or maximum aperture.

The mechanism provides a linear relationship between the rotation of the index ring and the size of the diaphragm aperture; the f /scale is, therefore, absolutely linear between all stops. Overall rotation of the index ring, as well as rotation between marked aperture values, is common to all lenses irrespective of focal length or maximum aperture. When the lens is used on a camera turret incorporating iris-drive the index ring thus becomes the lens gear ring.

The maximum torque required to drive the gear ring is 15 inch ounces per lens, and movement is smooth and free. The mechanism is totally enclosed within the lens iris barrel to prevent ingress of foreign matter which might cause deterioration of the movement.

By the use of annular reisses, carefully placed baffles and matt blacking of all internal surfaces the mounts are designed to reduce internal flare to a minimum. Rayshades are also provided which give effective shading of the glasses without vignetting the lens and permit reasonable combinations of focal length of lenses on a camera turret. The fitting of the rayshades to the lens barrel is accomplished by means of a spring-loaded bayonet-type fitting which allows for speedy and silent removal if required.

A cavity is provided on the mount for filters of British or American standard dimensions and a screw-in filter retainer is fitted which is easily accessible when the rayshade is removed.

The design ensures a very low electrical resistance between the rayshade and the camera adapter, gives good electrical contact between mount and turret when in use and disposes of static charge on the lenses.

To give good balance on the camera turret, ensuring smooth rotation, all lenses below 12½ inch are balanced at a standard weight of 1.13 kg. (2½ lb.) to a tolerance of 10%. See separate drawings for weights and dimensions of 12½, 16, and 22 inch lenses.

Focal lengths are:

1 $\frac{3}{8}$ inch $f/2.8$ (T3)

2 inch $f/2$ (T2.3)

3 inch $f/2$ (T2.3)

5 inch $f/2.8$ (T3.1)

8 inch $f/4$ (T4.5)

12 $\frac{1}{2}$ inch $f/4$ (T4.5)

16 inch $f/4$ (T4.5)

22 inch $f/5.6$ (T6.2)

The 22 inch lens is at present only available with manually operated iris drive (*i.e.* no gear is provided to connect with the camera iris control).



13 inch to 8 inch Orals in mounts to Specification TV88 (B.B.C.)

DIMENSIONS IN INCHES

LENS	A	B	C	D	E	F	G	H	K
1 $\frac{3}{8}$ INCH	83	4.25	32°	1.84	1.692 ± 0.005	1.338	2.45	3.65	1.64
2 INCH	1.42	3.50	22°	1.12	1.692 ± 0.005	1.338	2.67	3.72	2.55
3 INCH	—	3.50	15°	1.70	1.750 ± 0.005	—	2.79	4.69	2.82
5 INCH	—	3.50	9°	1.79	1.750 ± 0.005	—	3.84	7.89	4.74
8 INCH	—	3.50	5 $\frac{3}{4}$ °	2.00	1.750 ± 0.005	—	5.51	11.22	6.47

DIMENSIONS IN MILLIMETRES

LENS	A	B	C	D	E	F	G	H	K
35 mm.	21.08	107.95	32°	46.74	42.98 ± 0.127	34.00	62.23	92.71	41.66
50 mm.	36.07	88.90	22°	28.45	42.98 ± 0.127	34.00	67.82	94.49	64.77
75 mm.	—	88.90	15°	43.18	44.45 ± 0.127	—	70.87	119.13	71.63
127 mm.	—	88.90	9°	45.47	44.45 ± 0.127	—	97.24	200.41	120.40
203 mm.	—	88.90	5 $\frac{3}{4}$ °	50.80	44.45 ± 0.127	—	139.95	282.20	164.34

INDEX RING ROTATION FROM $f/22$ APERTURE

LENS	MAX. APERTURE	OVERTRAVEL BEYOND $f/22$	$f/22$	$f/16$	$f/11$	$f/8$	$f/5.6$	$f/4$	$f/2.8$	$f/2$	OVERTRAVEL BEYOND FULL APERTURE
1 $\frac{3}{8}$ INCH	$f/2.8$	3° (MIN)	0°	12 $\frac{1}{2}$ °	25°	37 $\frac{1}{2}$ °	50°	62 $\frac{1}{2}$ °	75°	—	TO 90 $\frac{1}{2}$ ° (MIN)
2 INCH	$f/2$	3° (MIN)	0°	12 $\frac{1}{2}$ °	25°	37 $\frac{1}{2}$ °	50°	62 $\frac{1}{2}$ °	75°	87 $\frac{1}{2}$ °	TO 90 $\frac{1}{2}$ ° (MIN)
3 INCH	$f/2$	3° (MIN)	0°	12 $\frac{1}{2}$ °	25°	37 $\frac{1}{2}$ °	50°	62 $\frac{1}{2}$ °	75°	87 $\frac{1}{2}$ °	TO 90 $\frac{1}{2}$ ° (MIN)
5 INCH	$f/2.8$	3° (MIN)	0°	12 $\frac{1}{2}$ °	25°	37 $\frac{1}{2}$ °	50°	62 $\frac{1}{2}$ °	75°	—	TO 90 $\frac{1}{2}$ ° (MIN)
8 INCH	$f/4$	3° (MIN)	0°	12 $\frac{1}{2}$ °	25°	37 $\frac{1}{2}$ °	50°	62 $\frac{1}{2}$ °	—	—	TO 90 $\frac{1}{2}$ ° (MIN)

TURRET INTERFERENCE CHARTS

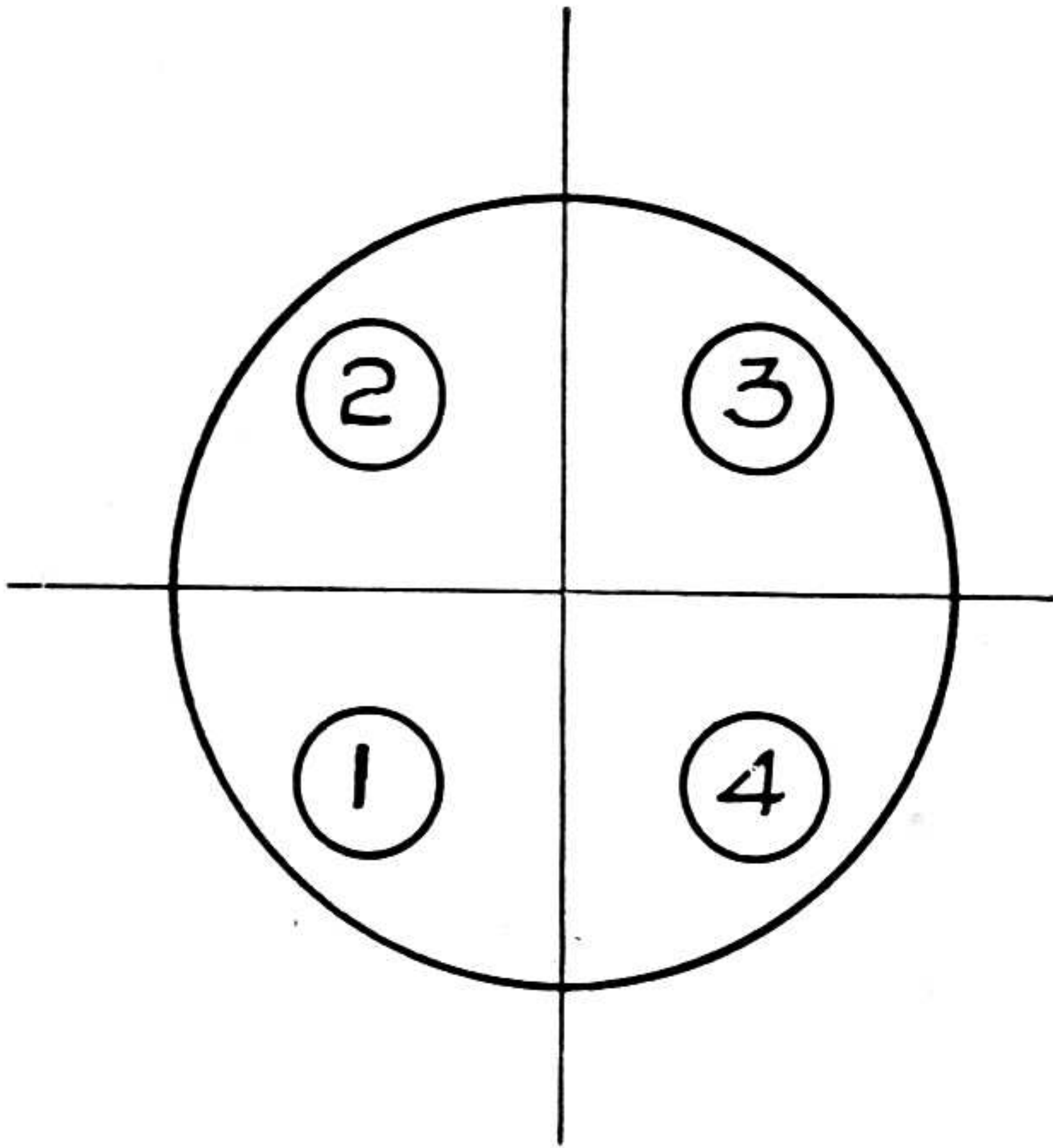
Read charts thus: Lenses listed on each horizontal line can be mounted together on the turret without causing optical interference with each other providing they are in the position on the turret indicated in the vertical columns.

MARCONI Mk. III CAMERA

Any combination of $1\frac{3}{8}$ inch, 2 inch, 3 inch, 5 inch and 8 inch lenses or 2 inch, 3 inch, 5 inch and $12\frac{1}{2}$ inch lenses can be mounted on the turret together.

Further combinations thus:

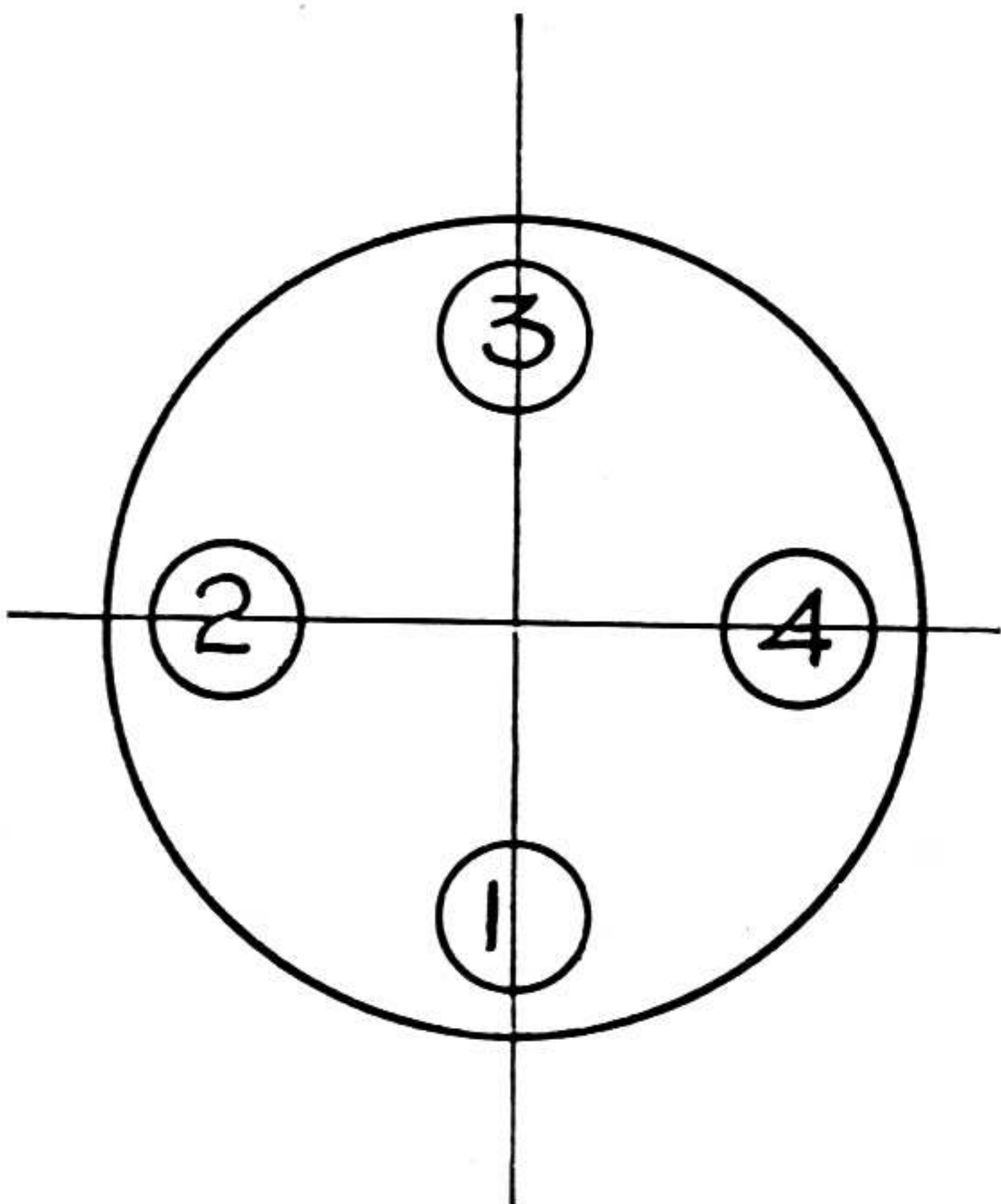
LENS POSITION			
1	2	3	4
$1\frac{3}{8}$ in.	2 in. or 3 in.	$12\frac{1}{2}$ in.	5 in. or 8 in.
$1\frac{3}{8}$ in.	5 in.	$12\frac{1}{2}$ in.	8 in.
2 in.	5 in. or 8 in. or $12\frac{1}{2}$ in.	16 in.	3 in.
2 in.	5 in.	16 in.	8 in. or $12\frac{1}{2}$ in.
2 in.	8 in.	16 in.	$12\frac{1}{2}$ in.
3 in.	16 in.	5 in.	8 in. or $12\frac{1}{2}$ in.
5 in.	8 in.	$12\frac{1}{2}$ in.	16 in.
5 in. or 8 in.	$12\frac{1}{2}$ in.	22 in.	16 in.



MARCONI Mk. IV CAMERA

Combinations which can be mounted together thus:

LENS POSITION			
1	2	3	4
$1\frac{3}{8}$ in.	2 in.	3 in.	5 in.
$1\frac{3}{8}$ in.	3 in.	8 in.	5 in.
$1\frac{3}{8}$ in.	5 in.	$12\frac{1}{2}$ in.	—
2 in.	3 in.	8 in. or $12\frac{1}{2}$ in.	5 in.
2 in.	—	16 in.	—
3 in.	5 in.	$12\frac{1}{2}$ in.	8 in.
3 in.	8 in.	16 in.	—
5 in.	8 in.	16 in.	$12\frac{1}{2}$ in.
5 in.	$12\frac{1}{2}$ in.	22 in.	—
8 in.	$12\frac{1}{2}$ in.	22 in.	16 in.

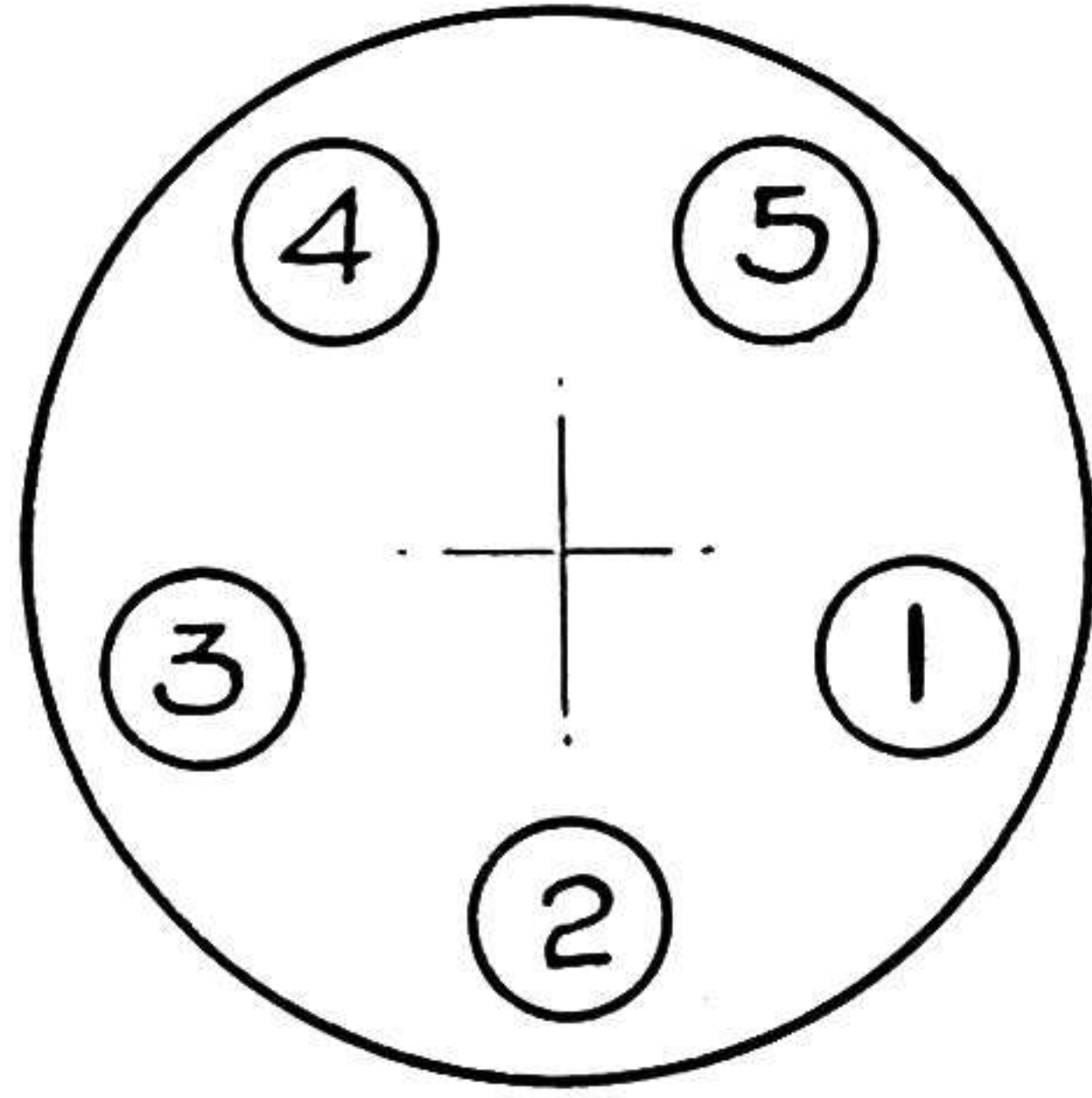


E.M.I. TYPE 203 CAMERA

Lens position 5 is the test projector position or a 5th lens which is coupled to the iris system.

Combinations which can be mounted together thus:

LENS POSITION				
1	2	3	4	5
1 $\frac{3}{8}$ in.	2 in.	3 in. or 5 in.	5 in. or 8 in.	3 in.
1 $\frac{3}{8}$ in.	3 in.	5 in.	8 in.	2 in.
1 $\frac{3}{8}$ in.	2 in. or 3 in.	5 in.	12 $\frac{1}{2}$ in.	—
2 in.	3 in.	5 in. or 8 in.	8 in. or 12 $\frac{1}{2}$ in.	5 in.
2 in.	5 in.	12 $\frac{1}{2}$ in.	8 in.	3 in.
2 in.	3 in. or 5 in.	8 in.	16 in.	—
2 in.	5 in.	12 $\frac{1}{2}$ in.	16 in.	—
3 in.	5 in.	8 in. or 12 $\frac{1}{2}$ in.	12 $\frac{1}{2}$ in. or 16 in.	8 in.
3 in.	8 in.	16 in.	12 $\frac{1}{2}$ in.	5 in.
5 in.	8 in.	12 $\frac{1}{2}$ in.	16 in.	—
5 in.	8 in. or 12 $\frac{1}{2}$ in.	—	22 in.	—
8 in.	12 $\frac{1}{2}$ in. or 16 in.	—	22 in.	—



PYE Mk. V CAMERA (CONE TURRET)

The 2 inch, 3 inch, 5 inch, 8 inch, 12 $\frac{1}{2}$ inch, 16 inch and 22 inch lenses are interchangeable in any turret position without causing optical interference with each other.

The 1 $\frac{3}{8}$ inch, 2 inch, 3 inch, 5 inch, 8 inch, 12 $\frac{1}{2}$ inch and 16 inch can be mounted together providing the 1 $\frac{3}{8}$ inch is not mounted in an adjacent turret position to the 12 $\frac{1}{2}$ inch or 16 inch lenses.

RAYSHADES

2 INCH, 3 INCH, 5 INCH AND 8 INCH LENSES ONLY, CAN BE FITTED WITH SPECIAL RAYSHADES FOR STUDIO USE (I.E. FOR USE BETWEEN f/4 AND f/22 ONLY).

These lenses can be mounted together on any of the following cameras providing that the 2 inch and 3 inch lenses are not mounted adjacent to each other:

Marconi Mk. III and IV

E.M.I. Mk. IV

Pye Mk. V

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