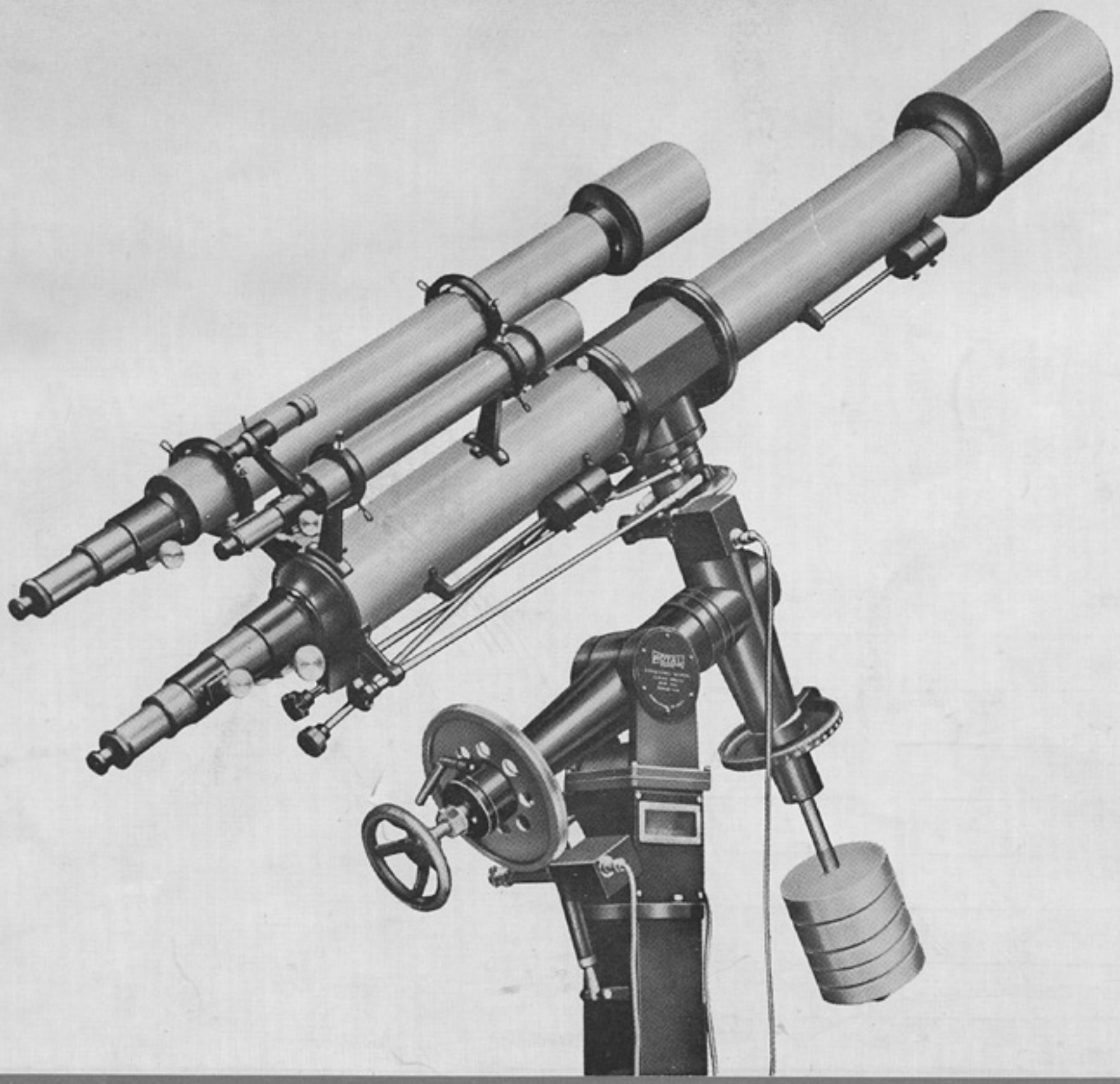
ROYAL
TOKYO

Astronomical and Terrestrial

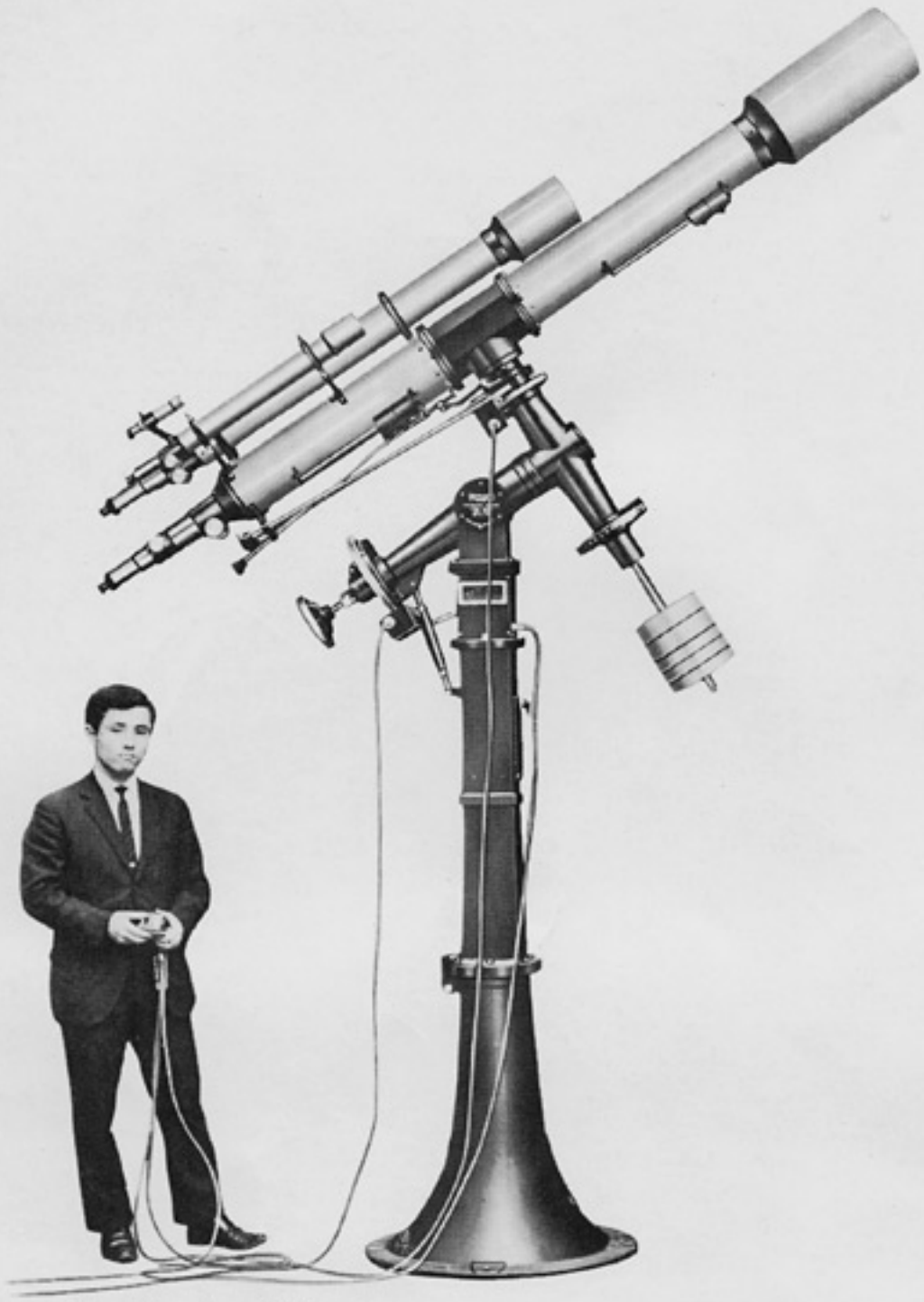
TELESCOPES



ASTRO OPTICAL IND. CO., LTD.

NOMURA BIDG., 2-2 OTE-MACHI, CHIYODA-KU, TOKYO, JAPAN

150mm Equatorial Refractor



R—151

A higher grade telescope for the use in schools, universities, observatories and public institutions.
It is the most suitable instrument for semi-professional astronomers.
The manipulation of the tube can be made automatically by an electrical device as well as by hand at the foot of the eye-end. The equatorial mounting rests on a heavy iron support which guarantes stabilitv and assures minute observation.

★ Optical effect

Objective (Fraunhofer type, Achromat, Hard coated)

Lens aperture	155mm
Clear aperture	150mm
Focal length	2250mm
Light collecting power for naked eye	460×
Resolving power with respoect to double stars	0.8"
Faintest discernible stars	12.7m
Magnifications for Astro.	565x, 375x, 250x, 188x, 90x, 56x, 45x

★ Mounting

Equatorial mount with hour and decl. circles and slow motions on iron pillar stand.

★ Driving clock

Electric clock drive with synchronous motor for rate regulation, capable of setting the speed to the diurnal motion.

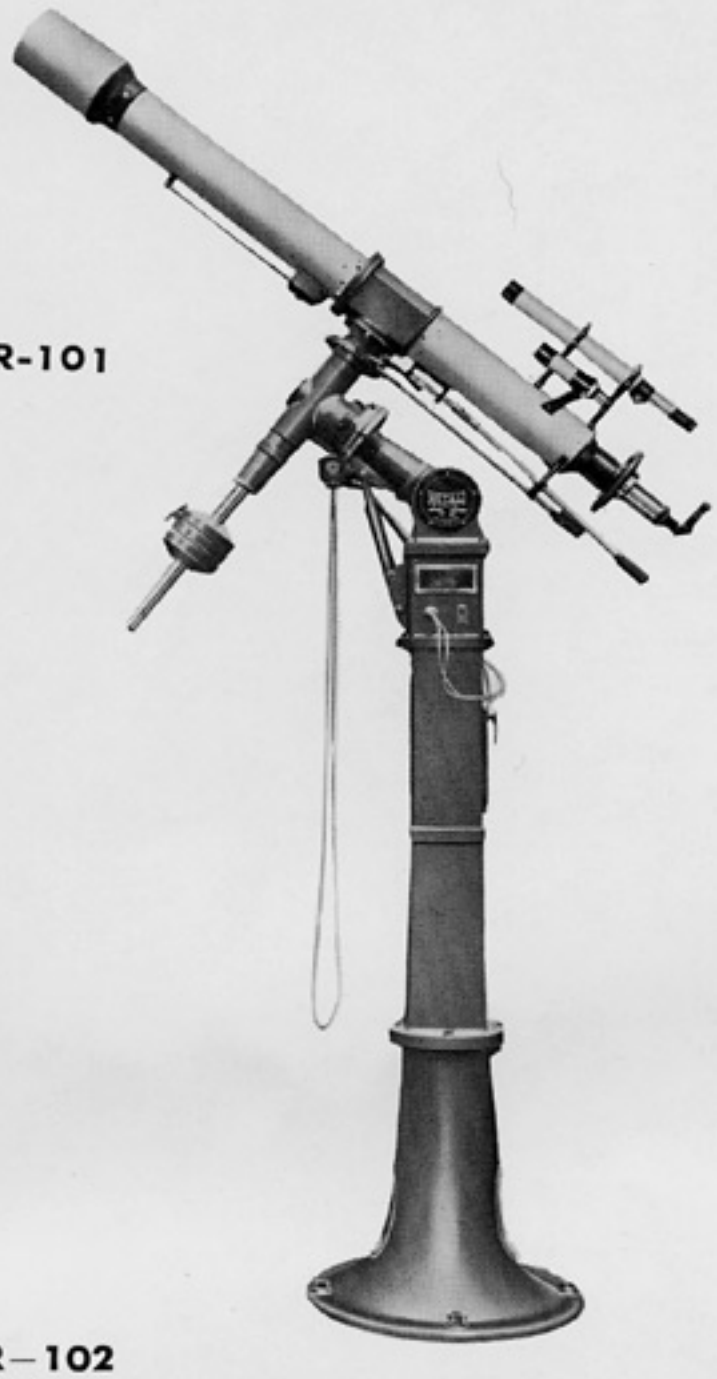
★ Accessories

6 Eye-pieces

Orthoscopic	Or	4mm
〃	Or	6mm
Huygenian	HM	9mm
Kellner	K	12mm
〃	K	25mm
Achromat Huygenian	AH	40mm
Kellner	K	50mm

1 Star finder 6×30mm 4°
1 Guide telescope D=60mm f=700mm (35x with cross-haired eyepiece)
1 Camera adapter for 35mm single lens camera
3 Sun filters
2 Moon filters
2 Star diagonal prisms
1 Sun diagonal prism
1 Sun projection screen
1 Sun stopper
1 Vinyl dust cover

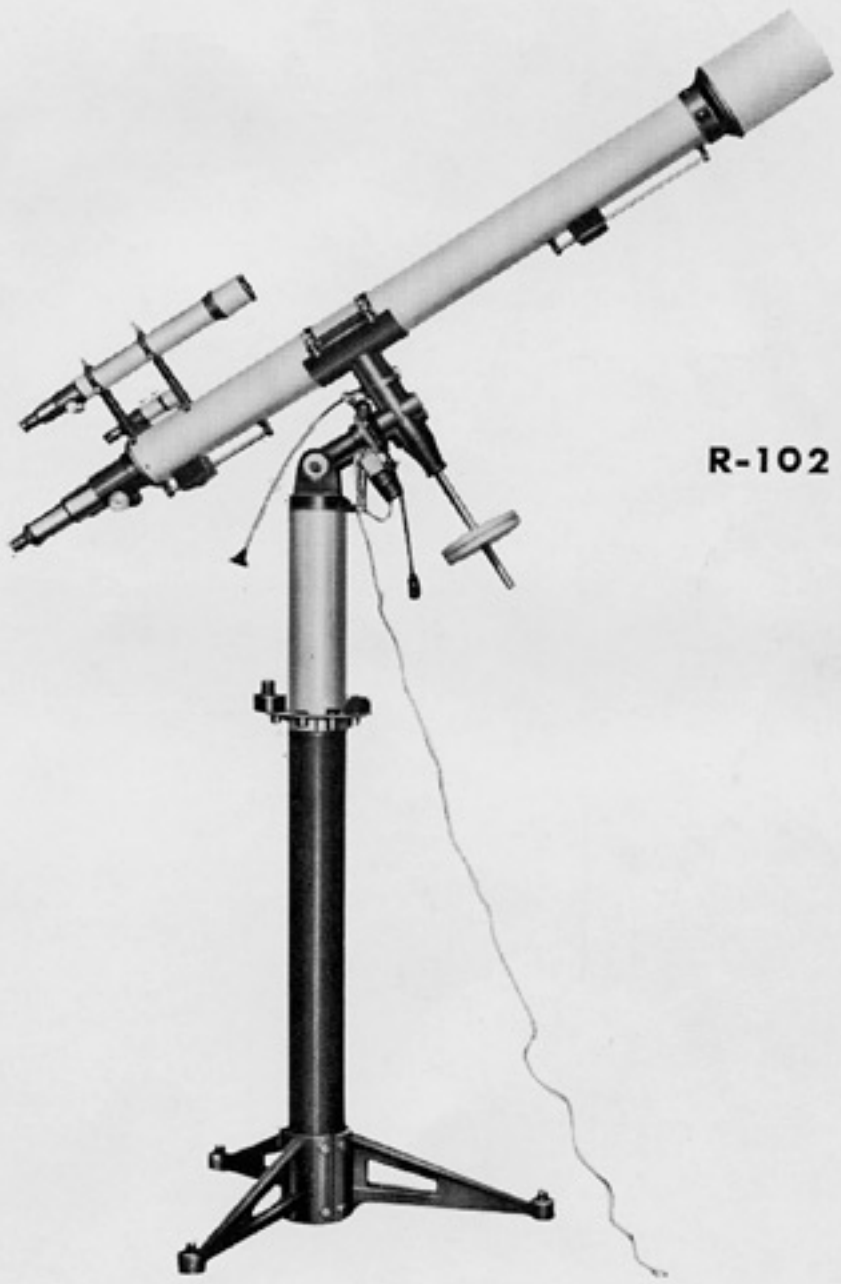
108mm Equatorial Refractor



R-101

R—101

A fine telescope of advanced design for the purpose of the use of amateur astronomers or higher school students in its dome.
The insrtument is equipped with a precise siderial drive by the electric motor driving aparatus.



R-102

R—102

An excellent telescope for home and school observatories. Complete equatorial mount with 3 setting circles, flexible slow motion controls and synchronous electric clock drive. Extra-rigid, heavy duty pedestal base with accessory tray. These are its outstanding features.

Model	Mounting	Optical effect								Accessories									
		Objective (Fraunhofer type, Achromat, Hard coated)						Magnifications		Star finder	Eyepiece	Sun glass	Moon glass	Star diagonal	Sun-diagonal	Sun projection screen	Erecting prism	Hour & decl. circle
		Lens aperture	Clear aperture	Focal length	Light collecting power for naked eye	Resolving power with respect to double stars	Faintest discernible star	Astro.	Terr.									
R101	Equatorial on iron pillar stand	mm 112	mm 108	mm 1600	X 248	" 1.8	m 11.8	400×, 267×, 178×, 133×, 64×, 32×	same as astro.	6×30 mm 4° 25×50 mm 1°	6	2	1	2	1	1	1	1
R102	Equatorial on metal pedestal base	〃	〃	〃	〃	〃	〃	400×, 267×, 133×, 64×, 40×	〃	〃	5	2	1	1	1	1	1	1

76mm Refractor



R—70

A high class telescope for amateur astronomers and school students for all-round purposes. The slow-motion mount with hour and declination circles is one of its outstanding features.





R—73

A high grade standard-size telescope designated bythe Japanese Ministry of Education for use in high schools. The eyepiece draw tube is provided with a pull-out tube and is focused by helicoid motion. The instrument has an unusually high light collecting power which displays a very bright image.

R—74

A high class telescope of superior quality for amateur astronomers and school students, for all-around observa tions. Scientific observation obtainable, according to Level, Hour and Declination circles being provided.

Model	Mounting & Tripod	Optical effect								Accesories										
		Objective (Fraunhofer type, Achromat, Hard coated)						Magnifications		Star finder	Eyepiece	Sun glass	Moonglass	Star diagonal	Sun diagonal	Sun projection screen	Erecting prism	Hour & decl. circle	Barlow lens	Carrying case
		Lens aperture	Clear aperture	Focal length	Light collecting power for naked eye	Resolving power with respect to double stars	Faintest discernible star	Astro.	Terr.											
R70	Equatorial & Alt-azimuth on field tripod	mm 79	mm 76	mm 910	× 118	× 1.6	m 11.2	225×, 152×, 73×, 35×	same as astro.	mm 6×30	4	2	1	1	1	1	1	1	—	1
R73	〃	〃	〃	1400	〃	〃	〃	350×, 233×, 156×, 112×, 56×	〃	5×25 12×40	5	2	1	1	1	1	1	1	—	3
R74	〃	〃	〃	1200	〃	〃	〃	300×, 96×, 60×, W/Barlow 600×, 192×, 120×	〃	6×30	3	1	1	1	—	1	1	1	1	1

60mm Refractor



R—61D

A slick stream-lined instrument which is patented for its trim design, new mechanism and highly convenient mounting. Its high magnifying power provides extremely sharp images and the flexible shaft enabl observation from any position.



605

A patonted Astro type astronomical telescope for beginners, primary school and middle school students. It is light and easy to manipulate, and has a high magnifying power. The convenient mount enables one to easily trace a comet, and it is popular for observation of distant landscapes and objects at sea or in the mountains.



R—63

A most handy telescope for amateurs and beginners. It is patented both for mechanism and design. Its free stop style equatorial mount is equipped with a special clamp, a unique feature, which enables the user to put the instrument in a vertical position or any other position in an instant.

Model	Mounting	Optical effect								Accessories							
		Objective (Fraunhofer type, Achromat, Hard coated)						Magnifications		Eye-piece	Star finder	Sun glass	Star diagonal	Erecting prism	Sun projection screen	Barlow lens	Carrying case
		Lens aperture	Clear aperture	Focal length	Light collecting power for naked eye	Resolving power with respect to double stars	Faintest discernible star	for Astro.	for Terr.								
		mm	mm	mm	×	〃	m										
R61D	Equatorial & Alt-azimuth with slow motions on field tripod	62.5	60	1200	73	2.0	10.7	200×, 133×, 96×, 48×	same as astro.	4	6×30mm4°	1	1	1	1	—	1
605	〃	〃	〃	910	〃	〃	〃	152×,73×,45 (with Barlow lens 304×, 146×, 90×)	〃	3	〃	1	1	1	1	1	1
R63	Equatorial & wooden field tripod	〃	〃	700	〃	〃	〃	175×, 78×, 35×	〃	3	5×25mm5°	1	1	1	—	—	1

40mm, 50mm, Refractor



R—41

Most simple astronomical telescope on table use. Saturn's ring can be seen clearly.



R—42

Spotting scope with 60X~25X variabe power terrestrial eyepiece, on field tripod. provides large and bright field of view.



R—51

Smallest and effective astronomical telescope for amateur astronomers or school use with equatorial and alt-azimuth mount on field tripod.

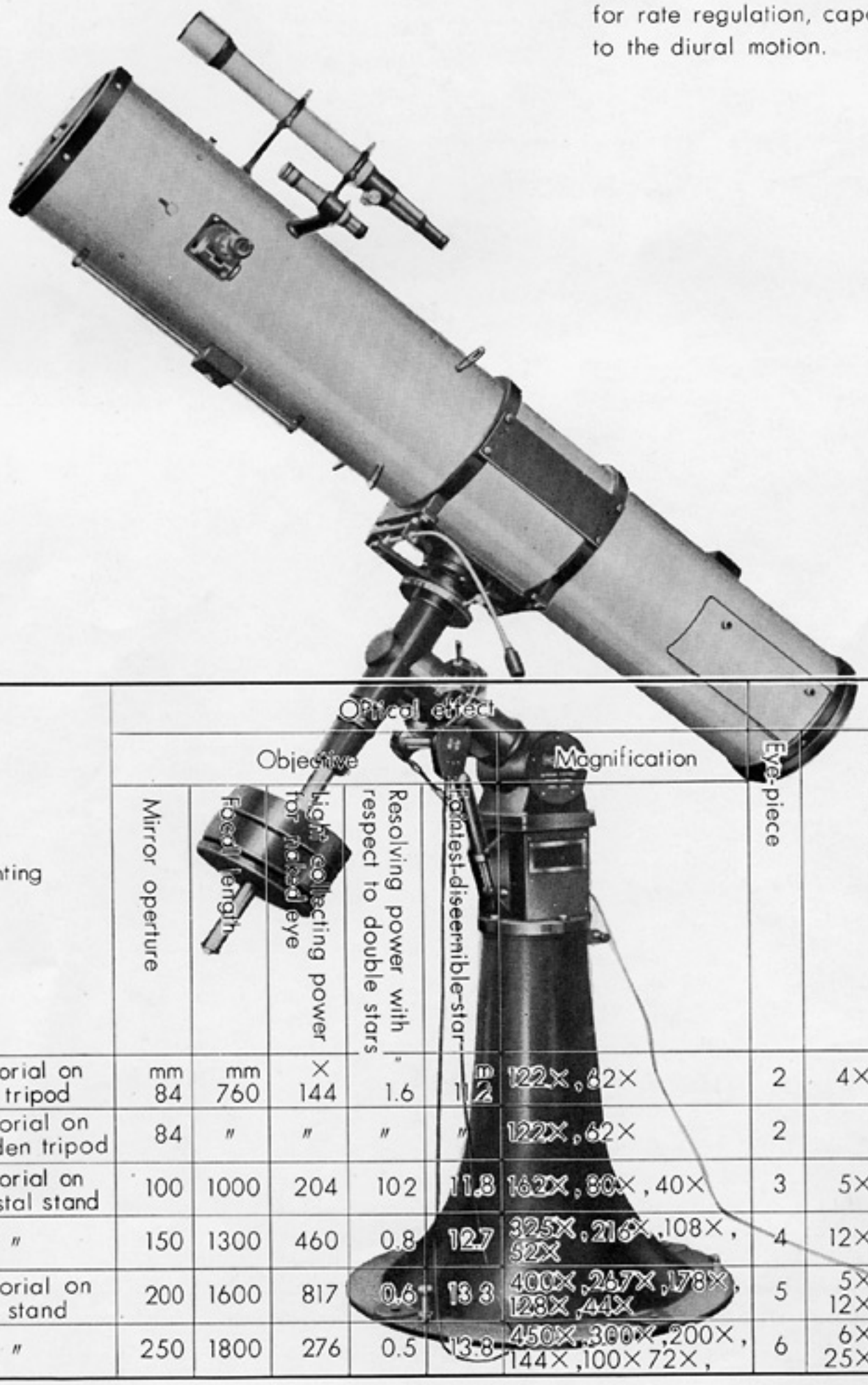
Model	Mounting	Optical effect								Accessories				
		Objective (Fraunhofer type, Achromat, Hard coated)						Magnifications		Eye-piece	Star finder	Sun glass	Star diagonal	Carrying case
		Lens aperture	Clear aperture	Focal length	Liget collecting power for naked eye	Resolving power with respect to double stars	Faintest discernible star	for Astro.	for Terr.					
R 41	Alt-azimuth on table stand	mm 42	mm 40	mm 500	× 33	3.0	9.9	56×	—	1	—	1	—	1
R 42	〃	〃	〃	〃	〃	〃	〃		60~25 ×	1	—	1	—	1
R 51	Equatorial & Alt-azimuth with slow motion on field tripod	52	50	750	51	2.4	10.3	125×, 83, 60×	—	3	4×10mm7°	1	1	1

Newtonian Reflector

10 in. Equatorial Reflector LN 10E

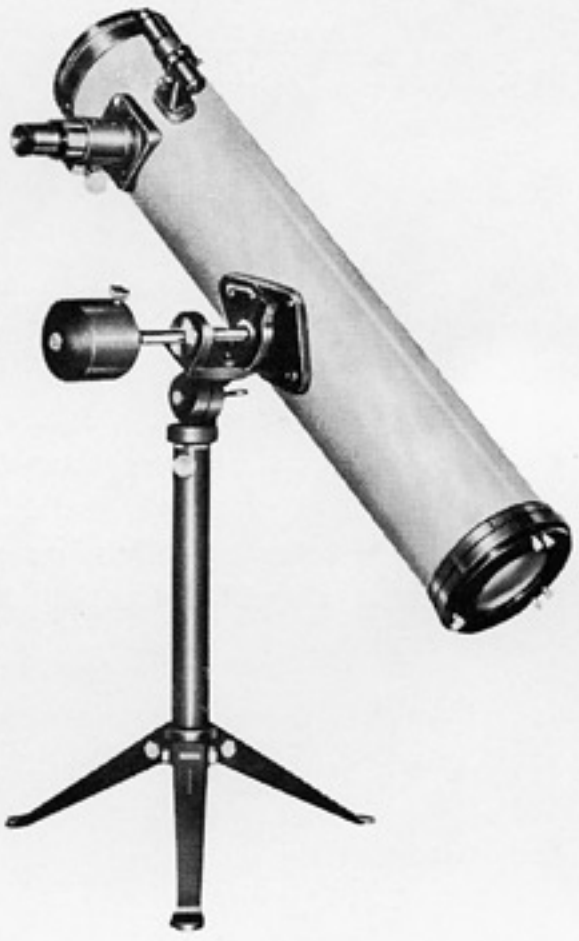
Magnificent reflector, high magnifications and bright images are obtainable. The satellites of Uranus "Oberon" and Owl nebulae (M97) in Ursa Major can be seen.

- ☆ Main mirror (Parabolic surface, Aluminized & Siliconized)
- ☆ Mounting
  Equatorial mount with hour and decl. circles and slow motion on iron pillar stand.
- ☆ Driving clock
  Electric clock with motor or gravity governors for rate regulation, capable of setting the speed to the diural motion.



Model	Mounting	Optical effect						Accessories					
		Objective					Magnification	Eye-piece	Star finder	Sun glass	Moon glass	Star diagonal prism	Off axis stop & dust cap
		Mirror operture	Focal length	Light collecting power for naked eye	Resolving power with respect to double stars	Faintest-diseernible-star							
LN 3E	Equatorial on table tripod	mm 84	mm 760	× 144	" 1.6	m 11.2	122×, 62×	2	4× 10mm7°	1	—	—	1
LN 3T	Equatorial on wooden tripod	84	〃	〃	〃	〃	122×, 62×	2	〃	1	—	—	1
LN 4E	Equatorial on Pedestal stand	100	1000	204	102	11.8	162×, 80×, 40×	3	5× 25mm5°	1	1	1	1
LN 6E	〃	150	1300	460	0.8	12.7	325×, 216×, 108×, 52×	4	12× 40mm2°	2	1	1	1
LN 8E	Equatorial on Pillar stand	200	1600	817	0.6	13.3	400×, 267×, 178×, 128×, 44×	5	5× 25mm5° 12× 40mm2°	2	1	1	1
LN10E	〃	250	1800	276	0.5	13.8	450×, 300×, 200×, 144×, 100× 72×,	6	6× 30mm4° 25× 50mm 1°	2	1	1	1

Newtonian Reflector



LN 3E

A patented type astronomical reflector with free stop style equatorial mount for beginners.



LN 3T

Compact reflector with free stop style equatorial mount and wooden field tripod for beginners.



LN 4E

A high class astronomical reflector with equatorial mount for amature astronomers and school students.



LN 6E

A higher grade reflector with driving clock for semi-professional astronomers. High magnifications and bright images are obtainable.

ACCESSORIES & PARTS

EYEPIECE

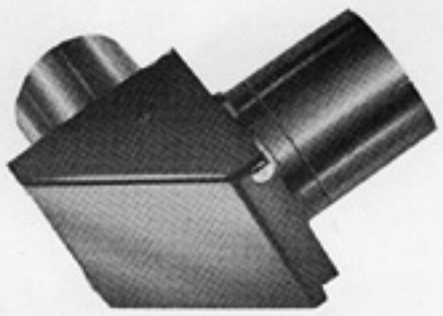


It is necessary to change the range of magnification and or field of view according to the objects. And it is suggested that you use the H or HM type of eyepieces for the Refractor, and the Orthoscopic or the Kellner for the Reflector.

Orthoscopic: This consists of a field lens of three components and a simple plano convex eye lens. It is by far the best eyepiece particulary for high magnification.

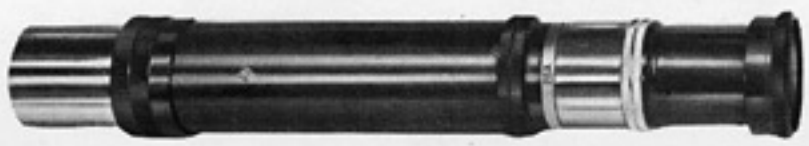
Kellner: This has a plano convex field lens and an achromatic eye lens. It is very popular for low and medium powers.

STAR DIAGONAL PRISM



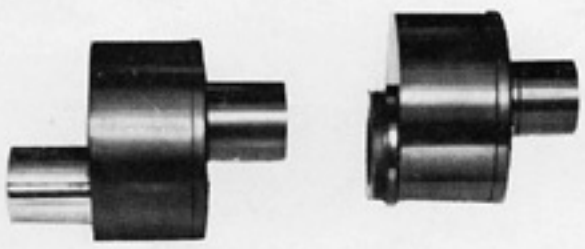
A prism eye-piece which enables you to observe celestial objects in an easy and comfortable position. The horizontal position of the object is inverted, but the vertical position is seen correctly, and, therefore, substitutes the erecting prism.

VARI-POWER TERRESTRIAL EYE-PIECE



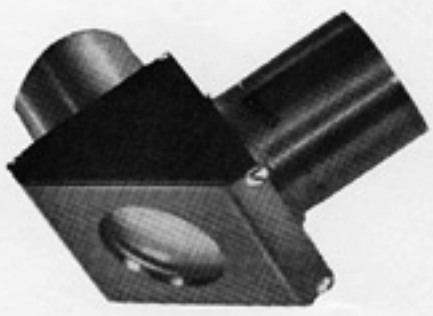
A convenient straight eye-piece which magnifies from 25 to 60 times; five magnifications at a time, according to the graduation on the eye-end.

ERECTING PRISM



With an astronomical telescope, the object is seen inverted which makes it inconvenient to see. The purpose of the erecting prism is to normalize the position of the object seen through the telescope. There are two sizes, large and small, and the use of these prism lenses provides a broader prospective than the ordinary eye-piece.

SUN PRISM



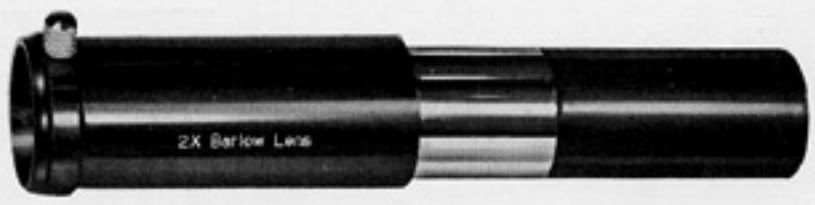
When observing the sun only through a sun glass, there is the possibility the sun glass will crack from the heat of the sun. The sun prism absorbs 95 % of the sun's heat and enables you to observe the sun for a lengthy period of time.

STAR FINDER



Astronomical tescope must be needed of the star finder telescope of which the low power and wide field. Can be fitted to the main tube and provided with adjustable graticule lined up with the optical axis of the main telescope. Small model with pillar and adjusting screws suitable of under 50mm diameter of the objective, and large model suitable for the larger diameter above 60mm of it.

BARLOW LENS



A color-corrected, capsular lens which is inserted between the main tube and the eye-piece and which optically lengthens the depth of focus and increases the magnification exactly twice or thrice that of the normal magnification of the telescope lens. It is convenient when you do not have many varieties of eye-pieces. and it can be used for photographing the sun.

When it is used individually, has the quality of of Garillei type telescope.

OBJECTIVE LENS



Fraunhofer type, Achromat, Hard-Coated Objective Lens with mount:

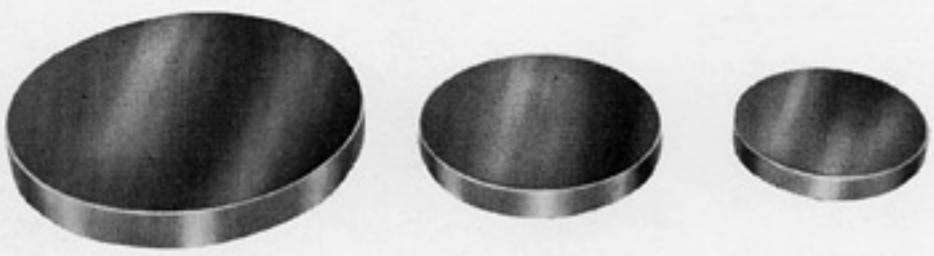
The resolving power of the objective lens exceeds the Dawes limit criterion necessary to secure a point image. The objective mount is equipped with a special device which permits "squaring on" and centering the objective lens.

DIAGONAL ELLIPTICAL MIRROR



From 20mm for 3" Reflector to 53mm for 10" Reflector

MAIN MIRROR



Parabolic surface, Aluminized & Siliconized :

Diameter	Thickness	Focal length
84mm	12mm	760mm
105mm	12mm	1000mm
155mm	20mm	1300mm
203mm	24mm	1600mm
260mm	40mm	1800mm

CAMERA ADAPTER



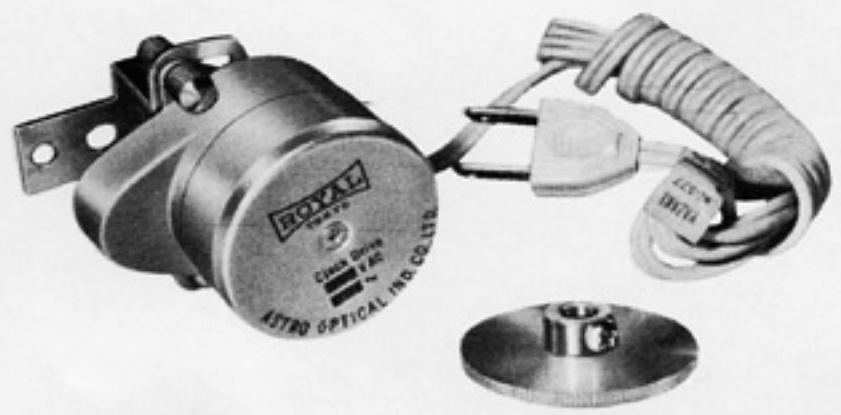
Camera adapter for 35mm single lens camera to be fitted to our telescopes.

MOUNTING CELL for REFLECTORS



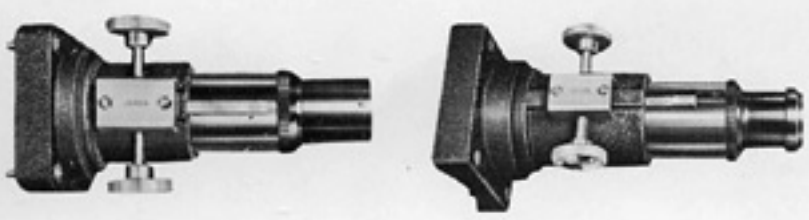
Cast aluminium cell with aligning screws and locking bolts.

ELECTRIC CLOCK DRIVE



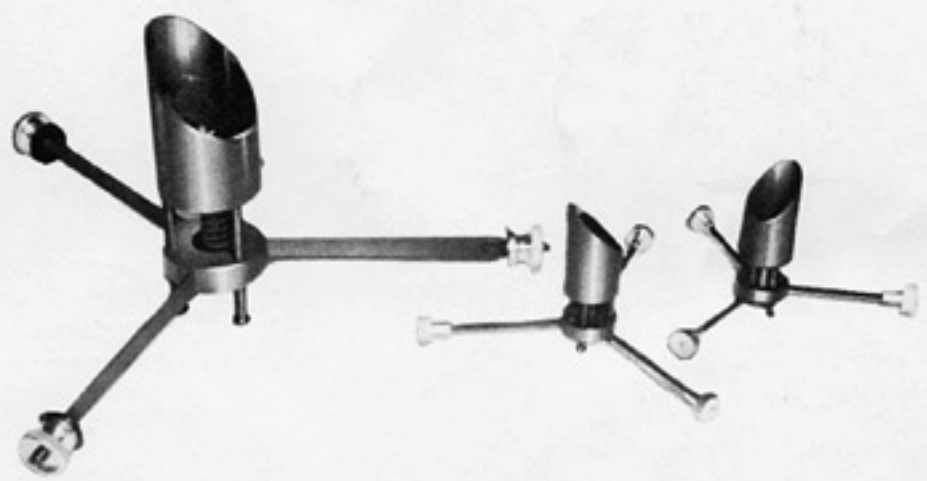
Electric Clock Drive with synchronous motor for automatically tracking stars.

RACK & PINION EYEPIECE MOUNTS



Rack & Pinion mechanism with variable tension for smooth focusing.

DIAGONAL MIRROR HOLDER



Designed for absolute rigidity, fit tube diameters of 3¼" to 10".
Made of brass, finished in dull black.