

***BINOCULARS, ASTRONOMICAL AND TERRESTRIAL TELESCOPES
CHRONOMETER WATCHES ETC.***



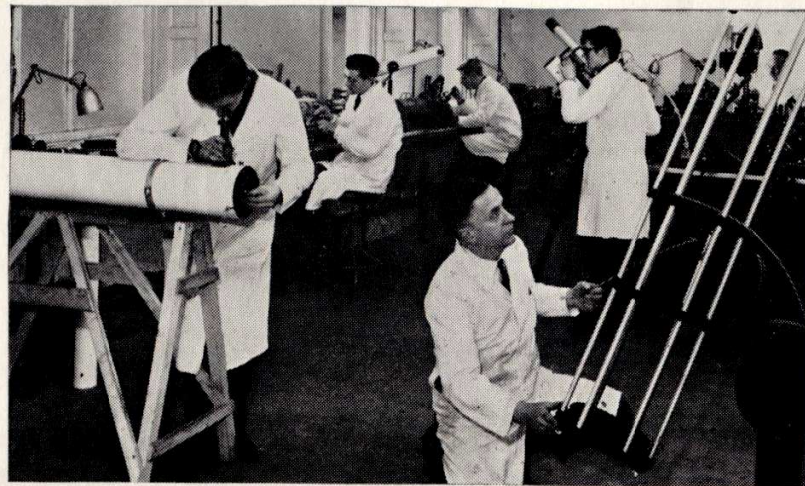
ESTABLISHED 1907

CHARLES

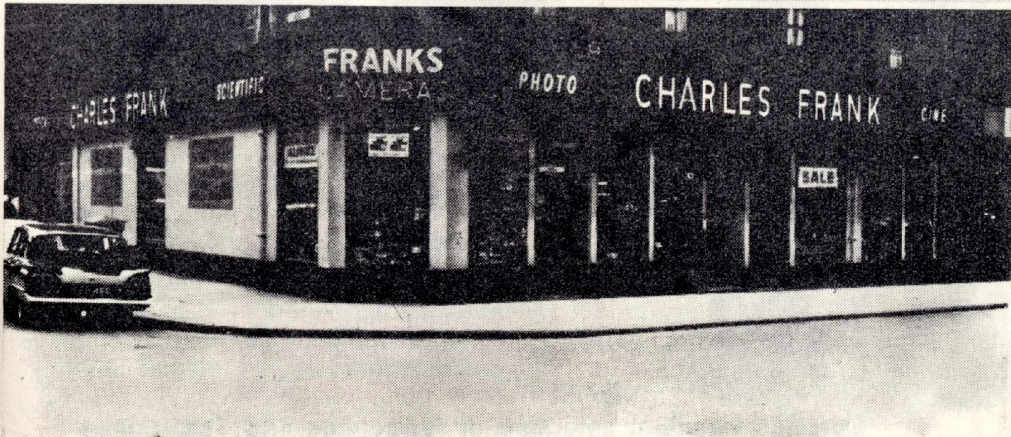
FRANK

GLASGOW

Shown below are sections of our modern, well equipped workshops.



**CHARLES
FRANK**
GLASGOW



CHARLES FRANK LTD.

For over half a century we have specialised in fine quality binoculars, telescopes, and all types of optical and scientific equipment. Our instruments are used by thousands of Merchant Navy officers of the principal shipping lines throughout the world. We supply the Crown Agents, Ministry of Aviation, The Admiralty, Home and Foreign Governments, Trinity House, Port of London Authorities, and it has also been our pleasure to serve tens of thousands of Birdwatchers, Yachtsmen, Sportsmen, etc., who have relied on our experience and integrity to provide the right type of instrument at a fair price.

In addition to the items shown in this catalogue we also carry comprehensive stocks of the following goods, and we welcome your enquiries.

Surveying, Plane Tabling and Mathematical instruments. Navigational and Rally instruments and equipment. Still and Cine cameras, projectors, and all photographic apparatus. Military Sights, Rangefinders, Aircraft Cameras, Lenses, etc. Chronometer Watches, Stop Watches, Microscopes, Micro Balances, etc., etc.

Guarantee

Our instrument shop is staffed by highly skilled technicians and every instrument we sell is thoroughly examined before being offered for sale. Should any item prove to be unsuitable, we will either exchange it or refund full purchase price. Approval facilities can generally be arranged.



ADMIRALTY RELEASE

7 x 50

**CANADIAN NAVAL
BINOCULARS**

Complete with rubberised
or Hide Case

Assembled in Canada by arrangement with world famous Bausch & Lomb and recognised to be one of the world's finest binoculars. The advanced Optical system and precision optics produce an extraordinary high light transmission and maximum performance is obtained under the dullest conditions. Another feature is the wide field combined with a great stereoscopic or 3D effect. The

weatherproof construction enables this binocular to be used under the most adverse conditions and the fixed focus characteristics ensure that once focused, the binoculars can be used for all distances without need to re-focus. Wt. is 2 $\frac{3}{4}$ lbs.; Ht. 7 $\frac{1}{2}$ in. and a perfect balance is maintained. This is indeed one of the world's great Binoculars and without doubt one of the finest binocular offers we have ever made.

**Free Comparison test—Even if only for interest's sake
try them out against your present binoculars**

5 YEARS FREE MAINTENANCE GUARANTEE

Current value approx. £60. **£24.0.0**

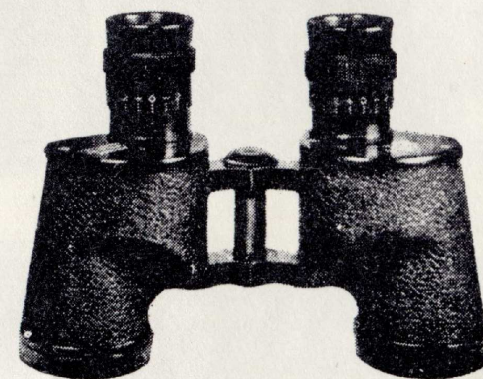
Binocular Specialists for over Half a Century.

**6 x 30
CANADIAN NAVAL
BINOCULARS**

An eyepiece focusing binocular of high quality. The wide field of 148 yds. at 1000 yds. is combined with excellent definition. In good used condition. Five Year Guarantee.

£10.15.0

NEW HIDE CASE 25/-



Europe's greatest selection of Binoculars and Telescopes

M.O.S. Binoculars

EX-ADMIRALTY

BARR & STROUD 7 x 42 BINOCULAR

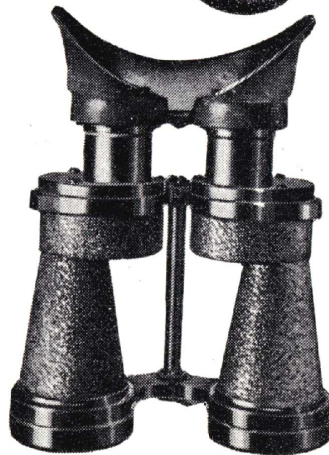
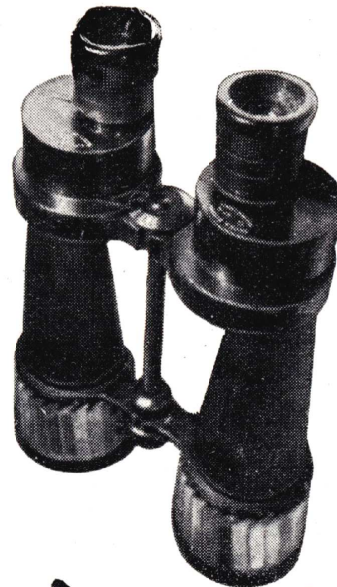
We have been successful in purchasing from the Admiralty a quantity of the famous 7 x 42 (Model C.F.25) BARR & STROUD Eyepiece Focus Binoculars. This is a Binocular of average magnification and ideal for all general purposes. Due to its original optical design, it is particularly suitable for use in conditions of poor visibility. Field of view is extremely wide being 381 feet at 1000 yards. Height is 8". Nett weight 32 zos. These fine Binoculars are fitted with the Barr & Stroud patented collapsible ray shades and internal filters. Another special feature is the rubber eye shield which ensures the exclusion of stray light when making observations. The general condition of these Binoculars is extremely good and many of them appear to be new and unused. The original hide case provided with it is of the highest quality. Current cost of a Binocular of this type would be in the region of £56. We offer them from **£16 10 0** to **£21** according to condition.

The clumsier and rather older 7 x 50 models are available at **£10** to **£15**, case extra.

5 x 40 NIGHT GLASS

Ex A.M. Fixed Focus 5 x 40 Prismatic Night Glass. Extra wide field.

£12.10.0



7 x 50 ROSS

Manufactured by Ross of London and N.L.I. to military specification, these Eyepiece Focus Binoculars have a high light transmission and wide field of view of approx. 125 yards at 1000 yards. Height 8½". Weight 40 ozs. With leather case.



£16.10.0 to £21.0.0

EX US NAVY BU-SHIPS MK III BINOCULARS by SPENCER-BUFFALO

This extra wide field, day and night 7 x 50 BU-Ship Binocular was made to stringent Naval Specification. It is much more compact than the usual 7 x 50 Binocular being only 6¾" in height. A tremendous stereoscopic effect is obtained by virtue of widely spaced object glasses. Nett weight 2½ lbs. In excellent condition. Complete with case. **£22**

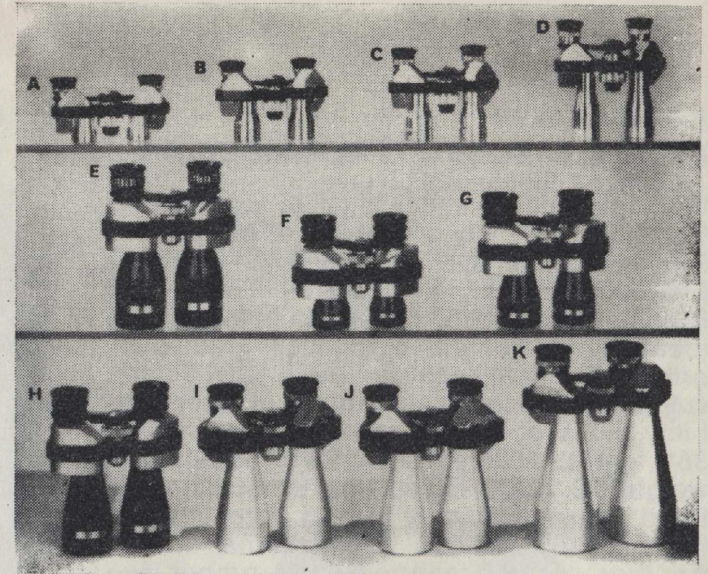


The New Range of "NIPOLE" MINIATURE PRISMATIC BINOCULARS

Available for the first time in the U.K., the performance of these miniature binoculars has to be seen to be believed. The satin finish, all-metal body, and fine workmanship that has gone into their production results in a binocular which is a positive joy to handle and use.

The smaller models can be carried in pocket or handbag and the larger ones are still very much lighter and more compact than conventional instruments. Focussing is quickly achieved by adjustment of centre wheel with provision to compensate for any inequality in the user's eyes.

For many years a really lightweight and compact glass has been sought by the birdwatcher, mountaineer and holiday-maker. These "Nipole" binoculars are indeed the answer. Incidentally they are also most elegant in appearance and it would be difficult to think of a more useful and acceptable gift.



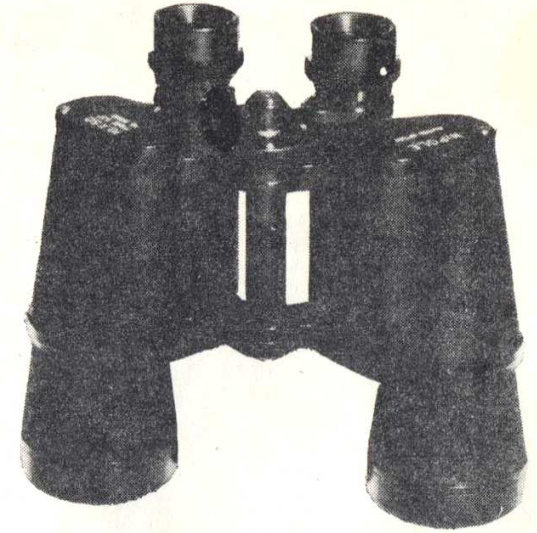
Model	Magnification	Obj. Glass Dia.	Field of View	Width	Height	Weight	Price
A	6	15 mm.	7.3°	3 $\frac{3}{4}$ "	2"	6 $\frac{1}{4}$ ozs.	£8.15.0
B	7	18 mm.	6.3°	3 $\frac{3}{4}$ "	2 $\frac{1}{2}$ "	7 $\frac{3}{4}$ ozs.	£9.10.0
C	8	20 mm.	5.3°	3 $\frac{3}{4}$ "	2 $\frac{3}{4}$ "	7 ozs.	£10.10.0
D	10	20 mm.	4.3°	3 $\frac{3}{4}$ "	3 $\frac{1}{2}$ "	8 $\frac{1}{2}$ ozs.	£10.19.6
E	7	30 mm.	7°	4 $\frac{1}{2}$ "	5"	17 $\frac{1}{4}$ ozs.	£12.19.6
F	7	23 mm.	Wide Angle 9.5°	4 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	13 ozs.	£13.19.6
G	8	25 mm.	Wide Angle 8.5°	4 $\frac{1}{2}$ "	4"	14 $\frac{3}{4}$ ozs.	£14.10.0
H	10	30 mm.	Wide Angle 6.5°	4 $\frac{1}{2}$ "	5"	16 ozs.	£14.19.6
I	10	40 mm.	Wide Angle 7.1°	5"	5"	18 $\frac{3}{4}$ ozs.	£15.15.0
J	12	40 mm.	6°	5"	5"	18 $\frac{3}{4}$ ozs.	£16.16.0
K	12	50 mm.	6°	5 $\frac{1}{2}$ "	6"	21 $\frac{3}{4}$ ozs.	£17.17.0



THE NIPOLE RANGE OF PRISMATIC BINOCULARS

The Nipole Binocular is manufactured in Japan to our own specification, and we are the sole distributors in the United Kingdom. In every respect this is indeed a first-class Binocular, and performance is equal to many others costing two or three times as much. The optics are fully coated and definition is unusually crisp and free from distortion right to the edges of the field. Chromatic aberration (colour fringes) has also been reduced to a minimum. It will be found that whilst cheaper and poorer quality Binoculars will often give an excellent image in the central region of the field, the quality of the image round the edges may leave much to be desired and pleasurable viewing can often be spoiled by distortion or colour fringes. The mechanical properties of a Binocular is also of considerable importance for it is essential that the instrument should be able to withstand a fair degree of rough usage without the alignment being affected. The Charles Frank Nipole Binocular passes all tests for optical and mechanical perfection, and it is with the utmost confidence that we guarantee each pair for a period of 7 years against any defect arising from imperfect workmanship or materials.

"Proof of the Pudding" free home test. You are cordially invited to prove for yourself the excellence of this Binocular by testing it free for fourteen days at your own home. There are no strings attached to this offer, and you will not be involved in any obligation whatsoever.



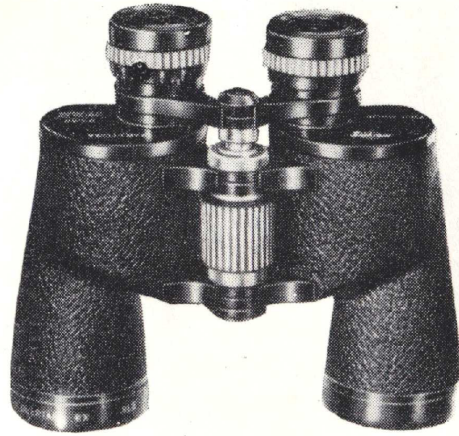
MB



Magnific'n	Dia. of Obj. Glass	Focus	Height	Nett Weight	Complete with Pigskin Case and Straps	
					Cash Price	Credit Terms
8×	30 mm.	Centre wheel	4½ in.	18 ozs.	£10.19.6	£2 Deposit followed by 8 Monthly Payments of £1.4.6 Total £11.16.0
10×	50 mm.	Centre wheel	7 in.	36 ozs.	£15.10.0	£2.10 Deposit followed by 8 Monthly Payments of £1.15.0 Total £16.10.0

Swift Binoculars

An excellent range of Binoculars manufactured in Japan under the rigorous inspection of Swift (U.S.A.) resident personnel. These Binoculars carry a lifetime guarantee against defective materials or workmanship.

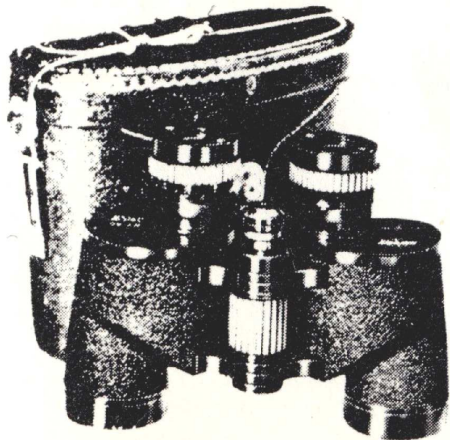


SARATOGA 8 × 40

This binocular gives you power equal to the "Apollo", plus brightness equal to the lower power binoculars, plus a good field of view. If you particularly want the extra power for deer-stalking, horse-racing or touring, this is the binocular for you.

7 × 35 TRITON

The most popular general purpose binocular. Low in cost but high in performance. A bright image, a good wide field of view and light weight make this an ideal binocular for the tourist, hunter or mariner. Excellent for outdoor sports too.



APOLLO 8 × 30

Excellent for target spotting on the rifle or pistol range, open field hunting, and marine use.

SPECIFICATION

Cat.	Model BCF (Centre focusing)		Field of View (Ft.)	Relative Light	Weight (oz.)	Size Closed	Retail Price
							Including case and P.T.
6040	Triton	7 × 35	376	37.5	23	5.2 in.	£18. 0. 0
6060	Skipper	7 × 50	376	76.4	38.8	6.8 in.	£21.10. 0
6180	Apollo	8 × 30	393	21.1	23.7	4.7 in.	£16.18. 6
6205	Saratoga	8 × 40	393	37.5	22.8	5.7 in.	£19.19. 0
6340	Newport	10 × 50	367	37.5	36	6.8 in.	£25. 0. 0
6215	Zoom	7-12 × 40	355 at × 7	54 at × 7	42.4	6.8 in.	£30.10. 0

MB

Approval Facilities Available.



A Specialist Binocular for bird watchers

The Swift Audubon 8.5 x 44



Designed to the suggested specification of an internationally known group of Ornithologists—this is one of the finest Nature-Study Binoculars available. Extra power is matched by extra brilliance to reveal details at dawn or dusk, or when an object is in deep shadow. The fantastically wide field is ideal for the tracking of birds in flight or as they hop from perch to perch. Extra-close focusing challenges the skilled stalker who can close right up to 12 ft. and watch feeding activities as if they were 18 inches away.

EXCLUSIVE FEATURES

Retractable eye-cups for spectacle users.

Tripod Adaptor built into the base of the centre spindle to fit any standard Ball and Socket or Pan and Tilt Camera Tripod.

Easy positive focusing by cylindrical control.

All air-to-glass surfaces "Ve-coated"—a specially formulated extra-hard lens coating, straw-coloured, which accentuates the blue in the spectrum, producing an exceptionally white image.

Finest quality leather case, vee-slotted to facilitate removal of binoculars.

Exceptionally short focus to 12 ft. for close-up work.

Model BWCF (Centre focusing)	Field of View (ft.)	Relative Light	Weight (oz.)	Height Closed	Including Case
"Audubon" 8.5 x 44 wide angle	445	44	38.4	6.25"	£36. 0.0

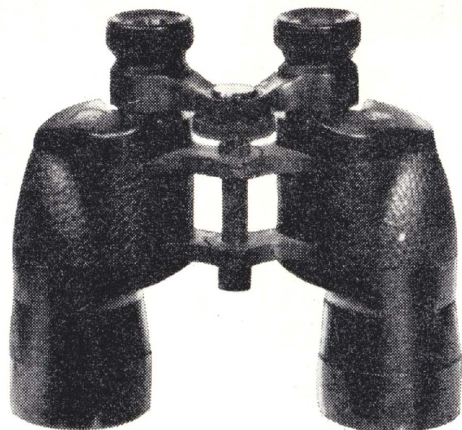
New Ross Binoculars

Ross of London have always been associated with top quality optical instruments and the

9 x 35 ROSS SOLAROSS

is probably the best "buy" in the Solaross range. It is beautifully balanced and stream-lined and weighs only 26 ozs. Height 6½ in. Ideal for birdwatching, racing, holidays, and, in fact, for all general purposes. Supplied complete with English made leather case.

£20.9.9



OTHER BINOCULARS FROM THE ROSS RANGE



Solaross	8 x 40	£19. 0.10
Solaross	9 x 35	£20. 9. 9
Solaross	12 x 40	£26. 0. 4
Solaross	16 x 60	£32. 8. 8
Spectacle Solaross	8 x 35	£28.10. 4
Steptron	8 x 30	£40.19. 9
Stepruva	9 x 35	£43. 4. 9

Spectaross	8 x 40	£47. 5. 8
Steplux	7 x 50	£55. 2. 4
Tropical	7 x 40	£55.10.10
Stepsun	12 x 50	£59. 6. 5
Specnorm	9 x 50	£59. 1. 5

The Spectacle Solaross, Spectaross and Specnorm are made specially for spectacle wearers.

Full technical data of all binoculars in the Ross and Wray range will be sent free on request together with the Ross Booklet—How to Use and Choose Binoculars.



New Wray Binoculars

Wray established their name over a century ago with the production of top grade astronomical telescopes. From these precision instruments it was a natural step to prismatic binoculars.

11 x 60 WRAY—Coated, Centre Focus, with Eye Adjustment

Although of relatively high power it can be used for long periods without strain. The large 60 mm. Object Glasses ensure high light transmission enabling the binocular to be successfully used in the dullest weather. Of the larger binoculars manufactured in Europe the Wray 11 x 60 is one of the best 'buys'. Height 8 in. Weights 2½ lbs.

Complete in solid hide case with straps.

£38.17.1

WRAY 9 x 40—Coated, Centre Focusing

Height 6½ in. Weight 24 ozs. Including Skiver Leather Case.

£22.3.5

8 x 40 WRAYSTAR (Extra Wide Field)

Height 6¼ in. Weight 28 ozs.

With Hide Case

£30.14.6

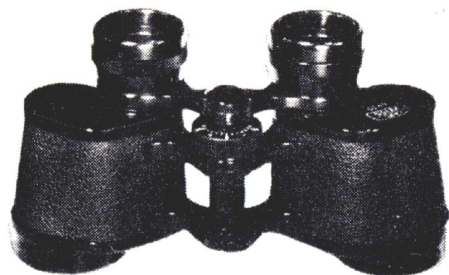
WRAY 8 x 30

Height 4½ in. Weight 19 ozs. With solid Hide Case.

£18.13.9

NEW ZEISS BINOCULARS

Zeiss binoculars are still being produced in the original Zeiss factory in the Eastern Zone of Germany. These instruments bear the well known Zeiss trade mark—Zeiss Jena. It is interesting to note that after the war an independent Zeiss factory was set up in the Western Zone and here also is produced a fine range of binoculars of extremely high quality. These instruments bear the name Zeiss and they are rather more compact than the Zeiss East Zone models. Illustrated brochure on East and West models can be provided on request.



8 x 30 ZEISS CENTRE FOCUSING

The most famous of all Zeiss glasses is without doubt the Zeiss Deltrintem. This precision centre focusing instrument produced in the original Zeiss factory has long been looked on as a standard of excellence. Complete with a superb hide case.

£43. 4.10

The 8 x 30 model produced in the West Zone.

£75 14.0

8 x 30B (for spectacle wearers).
West Zone.

£78.2.0



10 x 50 ZEISS CENTRE FOCUSING

Produced in the original East German works. A high efficiency glass ideally suitable where quality is more important than cost. With hide case.

£76. 8. 9



West Zone model
£125.11.0

The 8 x 30B "DIALYT"

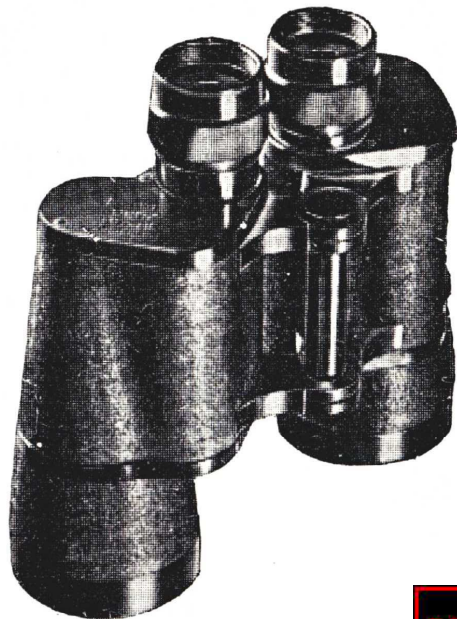
from Zeiss (West Zone) is worthy of note. It is compact and of unconventional design. Weight is 23 ozs. Height 5.3 in. It is waterproof but its chief claim to fame is that the spectacle wearer gets the full benefit of its tremendously wide field of view of 130 yards at 1,000 yards. It is excellent value at, complete with case

£59.15.0

**Approval
Facilities
Available.**

Other Selected ZEISS MODELS

MAKE	SPECIFICATION	HT.	WT.	PRICE
ZEISS West Zone	15 x 60 Centre Focus	7"	44½ ozs.	£142. 6.0
ZEISS East Zone	15 x 50 Centre Focus	7"	38 ozs.	£83. 1.9
ZEISS East Zone	7 x 50 Eyepiece Focus	7"	36 ozs.	£69.16.9



Inexpensive Japanese, Hong Kong and German Binoculars

The Binoculars listed on this page are all good in their class. The German Excelsior 8 x 30 are extremely light and compact and are of excellent quality. The Japanese Binoculars have been carefully selected from the large array available today. We have also included the Regent and Skybolt Binoculars which are made in Hong Kong (generally described as Empire made). Whilst they are not as good as the better German and Japanese instruments, they do nevertheless represent excellent value.

GERMAN

Genira (incl. Case)	
8×30	£12.12.0
Meopta	
12×60	£36. 0.0
Steinheil	
8×40	£40. 5.0
Noctovist	
8×30 wide angle	£17. 5.6
Excelsior	
8×30. A very compact Binocular weighing only 15 oz. in camera type case—wonderful value.	
	£11.19.6

JAPANESE

Pearl (incl. Case)	
8×30 wide angle	£15. 6.0
10×50	£18.18.0
Milo de Luxe	
12×50	£20. 0.0
Komiya—Newbold	
16×50	£20. 5.0
Yashica	
8×40	£17.17.0
Canon	
7×35	£32.11.0

HONG KONG

Skybolt or Regent (incl. Case)	
7×50	£10. 4.6
8×30	£8. 3.6
8×40	£9. 5.3
10×50	£10.10.6
12×65	£21.14.0
16×50	£15. 4.6
8×30 (special) ...	£5.19.6
Case £1 extra	



The premier award for ingenuity, and the most talked-about Binocular of the year is the first ever **POWER ZOOM** Binocular. This is powered by a small flashlight battery. Zooming from low to high power and back again to low is an uncanny sensation. For the man who wishes to be in the forefront with something different, this Binocular would prove to be an attractive proposition. With case

£67.10.0

New Russian & German Binoculars

Everyone knows that Germany produces high quality Binoculars but not so many people realise the tremendous strides that Russia has made in Binocular production over the past few years. Generally speaking these Binoculars lack the stream-lining of their German or Japanese counterparts but this is more than compensated by their engineering precision and optical excellence. Considering the high quality of Russian Binoculars it is somewhat surprising that the quality of the carrying cases is so poor but if reminded we will supply in lieu of the Russian case and without extra charge a solid hide case of English make.

RUSSIAN

The most popular of the Russian Binoculars is the 7 x 50 Eyepiece focusing model. It is fully coated and is built to stand up to most rigorous use. Performance is exceptionally good, and angular field of view is wide at 6° 40'. The height of the Binocular is 8 in., and at 38 ozs. in weight it is not unduly heavy. Filters are provided for use in strong sunshine and haze. Price complete with case and straps

£15.15.0

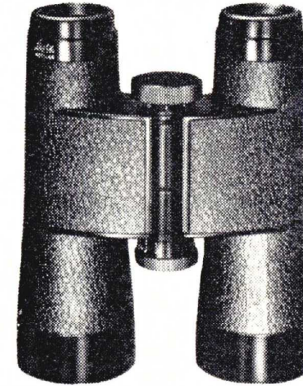


The centre focusing model, which is not so robustly made as the eyepiece focusing model, is available at £16.16.0. Included in the Russian range is an excellent 8 x 30 Binocular as illustrated. Weight is 21 ozs. Height 4½ in., and focusing is by individual eyepieces. Filters provided. Price, with case and straps

£12.10.0

All Binoculars are fully guaranteed. Arrangements can generally be made to submit instruments on approval. Your own binoculars can be accepted in part exchange.

GERMAN



Amongst the notable newcomers in the Binocular field is the Leitz Trinovid range. Amazingly compact, they are revolutionary in design and performance. The 10 x 40 is the most popular model in the range and actually weighs only 19 ozs. and is just 5½" long.

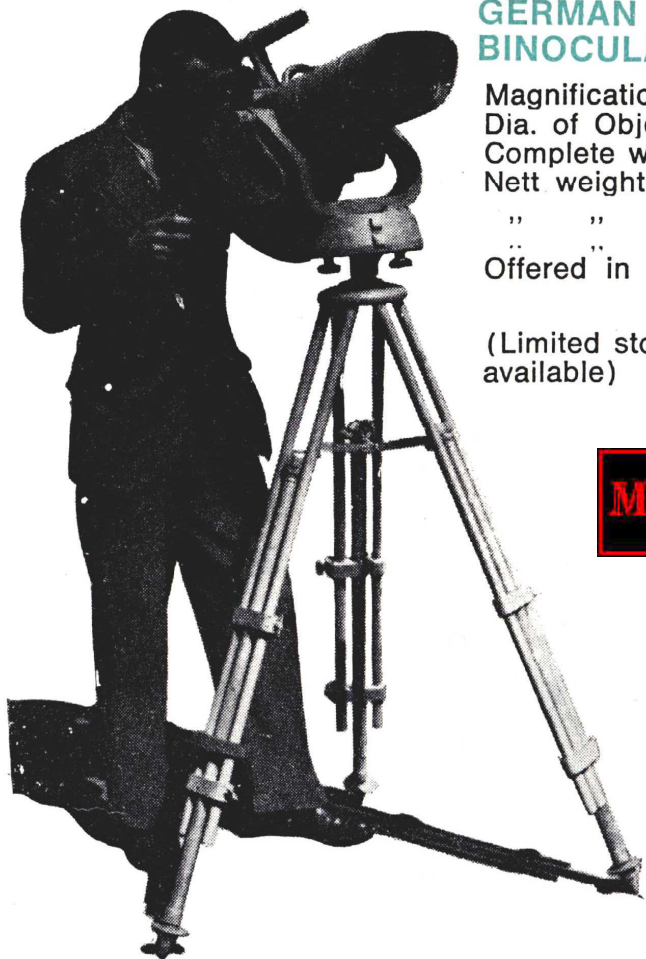
This model offers the highest practical magnification for hand held observations and provides the highest twilight factor for dim-light use. In the more expensive range it would be difficult to think of a better "buy". With soft leather case.

Also available the 6 x 24 at
£64.3.10
and the 8 x 32 at **£78.19.6**

£86.17.1

An excellent low priced quality Binocular is the "EXCELSIOR" 8 x 30. Its weight is only a matter of 15 ozs. and it is a very popular glass where lightness is an important factor. Focusing is by centre wheel with right eye adjustment, and the optics are coated. The case is of solid leather and is of the compact camera case pattern. Price, complete

£11.19.6



GERMAN RECONNAISSANCE BINOCULARS

Magnification 25×.
 Dia. of Object Glass—105 mm.
 Complete with original Mount and Tripod.
 Nett weight Binoculars—34 lbs.
 " " Mount—22 lbs.
 " " Tripod—38 lbs.
 Offered in sound condition at

£198.0.0

(Limited stocks—enquire first whether still available)



TRIPOD MOUNTED ROSS HEAVYWEIGHT BINOCULARS

Designated as ROSS BINOCULAR GUN-SIGHT with internal filters—this remarkable instrument is of extremely robust construction and performance is exceptionally good even in dull lighting conditions. Individual lever focussing incorporated in Eyepieces. Magnification 10×.
 Object Glass diameter 70 mm.
 Length 14 in. Weight 22 lbs.
 For added comfort in viewing a rubber eyeshield is provided. Supplied complete with full-length tripod. Brand new condition. Probable cost over £200. Offered complete at



Tripod Mounted Ross Heavyweight Binocular

£35.0.0

The world's largest Binocular was built by Ross of London for the Admiralty for use in the Fortress of Malta.

Magnification—20×.
 Diameter of Object Glass—150 mm.
 Cost is reputed to be over £3,000. Offered at

£375.0.0

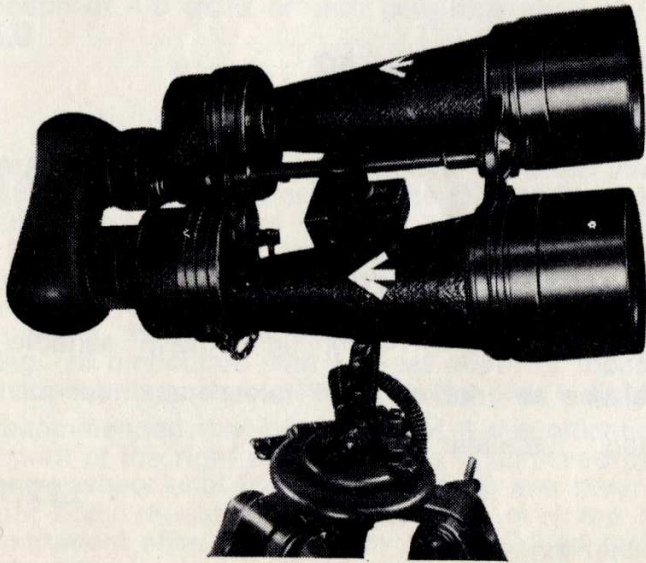
German Reconnaissance Binocular



ROSS OF LONDON EX-ADMIRALTY BATTLESHIP BRIDGE BINOCULARS

The Admiralty commissioned ROSS OF LONDON to produce a binocular which would have good penetrating and resolving power even under the dullest of lighting conditions. The resultant 10 x 70 binocular proved to be one of the finest tripod supported instruments ever to be produced. The instrument is fitted with internal filters which can be used to advantage in strong sunshine or in haze. This large binocular is 15 in. in length and weighs 10 lbs. but it is extremely well balanced and while it is intended to be tripod supported it can nevertheless be hand held. Current value is estimated to be in the region of £200. The binocular is in excellent condition and is offered at the attractive price of **£45.0.0.**

A few of the 10 x 80 models are available at **£65.**
Tripod and Mount **£10** extra for either model.



LONG RANGE BINOCULARS

ROSS OF LONDON Ex-Govt. 7 x 50 RECONNAISSANCE

An instrument of great precision and remarkable performance even under the dullest conditions. This is a heavy, robustly built Binocular weighing 16 lbs. It can be left out in the open without fear of damage. The fitted filters are helpful in haze and in bright sunshine. Estimated present cost £200. Offered in new condition at

£15.0.0

A Tripod and Mount can be supplied for about £5 extra.

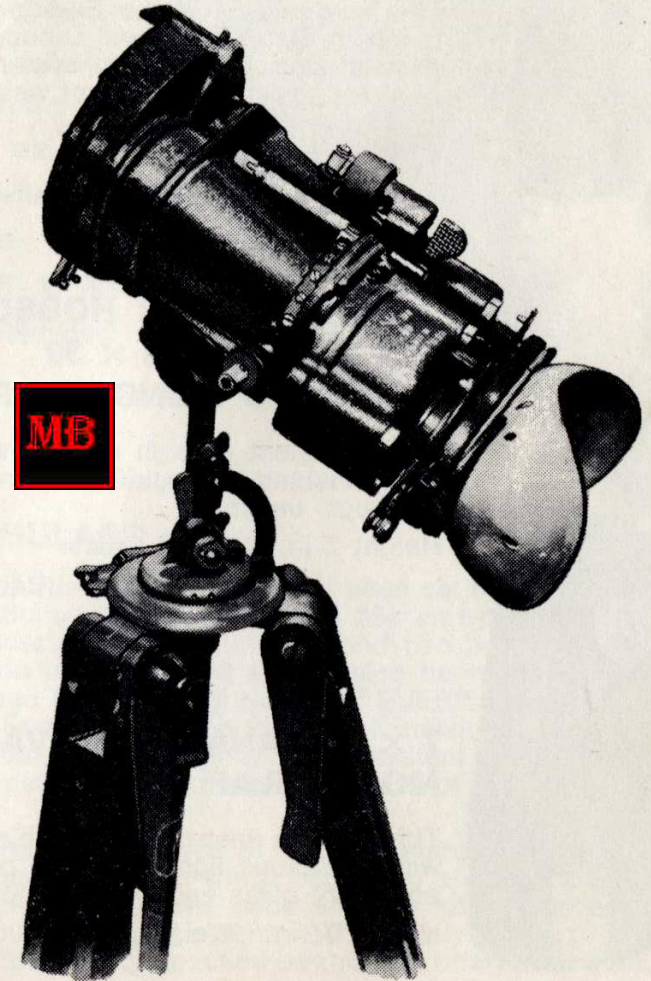
3½ x Fixed Focus Model with Object Glass of 25 mm. dia. offered complete with 3½ ft. wooden Tripod at **£12.10.0.** Carriage extra.

LINDERMAN 12 x 80 BINOCULARS

Civilian pattern fully coated Binocular of high light transmission. Weight 6 lbs. Near new condition.

Price
£35.0.0

Extras: Tripod and Mount
£7 10/-. Hide Case **£5.0.0**





EX-GOVT. MONOCULARS

Ex-Govt. BAUSCH & LOMB & CANADIAN NAVAL 6 × 30 PRISMATIC MONOCULAR

This is one half of the Ex-Admiralty 6 x 30 Bausch & Lomb or Canadian Naval Binoculars shown on page 2. Its well designed optical system and precision lenses produce excellent clarity of vision.

Height 4¾ in. Weight 9 ozs.



£6.10.0

Ex-Govt. TAYLOR HOBSON and KERSHAW 6 × 30 PRISMATIC MONOCULAR

An instrument of high quality, which will withstand a considerable amount of rough usage.

Height 5 in. Weight 9 ozs.

£4.18.6



7 × 50 CANADIAN NAVAL PRISMATIC MONOCULAR

This superb instrument combines good magnification with enormous light-gathering power. A wonderful day and night glass and we can thoroughly recommend it.

Height 7¼ in. Weight 22 ozs.

£11.15.0

These Monoculars are in fact binoculars which have been halved. The Monocular has many points in its favour such as portability and the fact that it is virtually impossible for it to go out of adjustment. Contrary to popular belief field of view of a Monocular is exactly the same as a binocular.

BARR & STROUD MONOCULARS

A choice is available between the 7 x 50 and the more compact 7 x 42 model. These instruments are of the highest quality and are fitted with three internal filters. Offered at—

£9.15.0

ROSS OF LONDON 7 × 50

A good quality Monocular.

£8.15.0

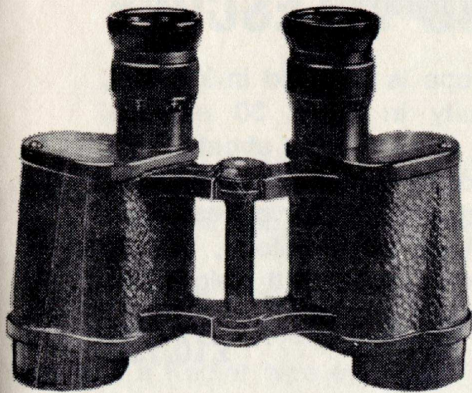
ROSS 10 × 70 MONOCULAR

A precision instrument of high, light grasp suitable for astronomical use as "richest field" telescope or for all long range viewing. Excellent condition.

£22.10.0

Tripod optional extra at 50/-.

**MINISTRY OF AVIATION
DISPOSALS
6 x 30, PRISMATICS**



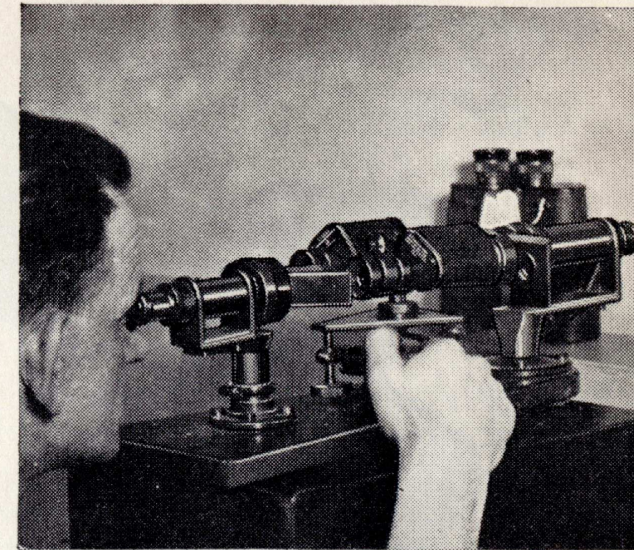
Produced by famous British Optical firms such as Kershaw, etc., these fine precision instruments are completely weather-proof and will stand up to a considerable degree of rough usage. They are recognised to rank amongst the best of the British General Service binoculars and definition is crisp right to the edges of the field. Accurate focusing is by each eyepiece and once focused it is seldom necessary to reset the focus. This is a binocular we can thoroughly recommend for the seafarer, shepherd, bird-watcher and for general holiday use. Weight is 28 ozs., height 5 in. **We show our**

confidence in this glass by guaranteeing it UNCONDITIONALLY for 5 years. Current cost of a binocular of this quality would be in the region of £25. It should be noted that these binoculars have been completely overhauled in our own workshops. Can be supplied with web pouch at 4/6 extra or with new hide case at 32/6.
£8.15.0

We are fully equipped to repair and overhaul binoculars of all types. Spares are carried for most makes and we attend to minor repairs on the spot. A complete overhaul can usually be undertaken within 5 days and the cost is seldom over **£5.0.0**. Free estimates supplied on request. Illustration shows a 6 x 30 binocular being collimated in our workshop.



BINOCULAR REPAIR SERVICE



HINTS ON THE SELECTION OF BINOCULARS

The term 6 x 30 applied to a binocular indicates that the binocular is of 6 magnification so that the subject viewed is seen six times its normal size. The '30' refers to the diameter of the Object Glass in millimetres. Binoculars with magnifications of between 4x and 25x can be obtained, but for general purposes, powers of 6x to 10x are best. These medium powered binoculars are most comfortable in use, and can be held quite steady; other things being equal, they are much brighter and sharper than the very high magnification binoculars. It should also be remembered that the greater the magnification the smaller the field of view. It is interesting to note that the Armed Services and Navies of EVERY country in the world chose 6 x 30 for the general purpose binocular and 7 x 50 for the day and night binocular. Focusing can be either (a) individual eyepiece or (b) centre wheel. With individual eyepiece, each eyepiece can be adjusted with great accuracy, but this is a slightly slower system than by centre wheel focusing. In binoculars with a great depth of focus such as the Services 6 x 30 and 7 x 50 patterns, the relative slowness of eyepiece focusing is not a disadvantage, for once set to the user's sight there is little need to re-focus.

It is recommended that binoculars of 8 magnification and over should be centre focusing and with this type of focusing there is always a separate adjustment of the right eye. Focusing is achieved by covering up the right object glass with the hand, and whilst observing a distant object turning the centre wheel until the image is sharp and clear. The left object glass should now be covered with the hand and the adjustable eyepiece on the right body should be adjusted. Both eyes are now 'balanced', and further focusing should be by the centre wheel only.

Our instrument shop is staffed by highly skilled technicians and every instrument we sell is thoroughly checked before it is offered for sale. Should any item prove to be unsuitable, we will either exchange it or refund full purchase price.



THE CHARLES FRANK

C.P. 80 4" REFLECTING TELESCOPE

This fine 4 in. diameter reflecting telescope is supplied in kit form, but can be assembled without difficulty in about 30 minutes. Although inexpensive there is no plastic or cardboard about it. The tube, mount and table stand are all of metal, finished in a pleasing shade of grey hammer enamel. The quality of the optical components is first-class, and wonderful views of the Moon, Planets and Stars can be obtained. Length of tube 30 in. Nett weight 7 lb. Price, complete with eyepiece giving power of $31\times$

£10.15.0

For pleasurable viewing we recommend moderate powers such as $31\times$ eyepiece supplied with the instrument, but if required we can provide at extra cost eyepieces giving greater power—e.g. the $78\times$ eyepiece at 55/-. Also available is a mounted Barlow Lens which when used in conjunction with an eyepiece, will approximately double its power. This Barlow costs 35/-. Theoretically, the Barlow used in conjunction with the $78\times$ Eyepiece will produce a linear magnification of about $156\times$, which is equal to an area magnification of $24,336\times$. Although this may sound very attractive, it will be found in practice that the down-to-earth lower powers are much more useful.

FRANK'S BOOK OF THE TELESCOPE

FRANK'S BOOK OF THE TELESCOPE is an illustrated 132 page volume for the amateur astronomer and for those who are thinking of building their own NEWTONIAN reflector. There are chapters on Astronomical Photography, Eyepieces, War Surplus instruments, etc. 8/6.

THE CHARLES FRANK JUNIOR ASTRONOMICAL TELESCOPE

This is an instrument of the refracting type. It has a single lens Object Glass of 47 mm. external diameter and a Kepler type eye lens. It is, in fact, a similar type of telescope to that used in the past by famous astronomers such as Galileo, Kepler and Cassini. Magnification is approximately $30\times$ linear (equal to area magnification of $900\times$).

This is an ideal 'first' instrument and under favourable observing conditions the craters and mountains can be viewed and the rings of Saturn can just be discerned. Length of telescope with draw extended in using position 42 in.

Supplied with each telescope is a complimentary copy of 'Frank's Book of the Telescope'—a 132 pp. illustrated guide to instruments for the amateur astronomer, together with our newest publication—'The Stars Above Us' by Sir Harold Spencer Jones, an exciting and beautifully written book by the former Astronomer Royal.

The telescope is supplied complete with table tripod, all packed in colourful presentation box.



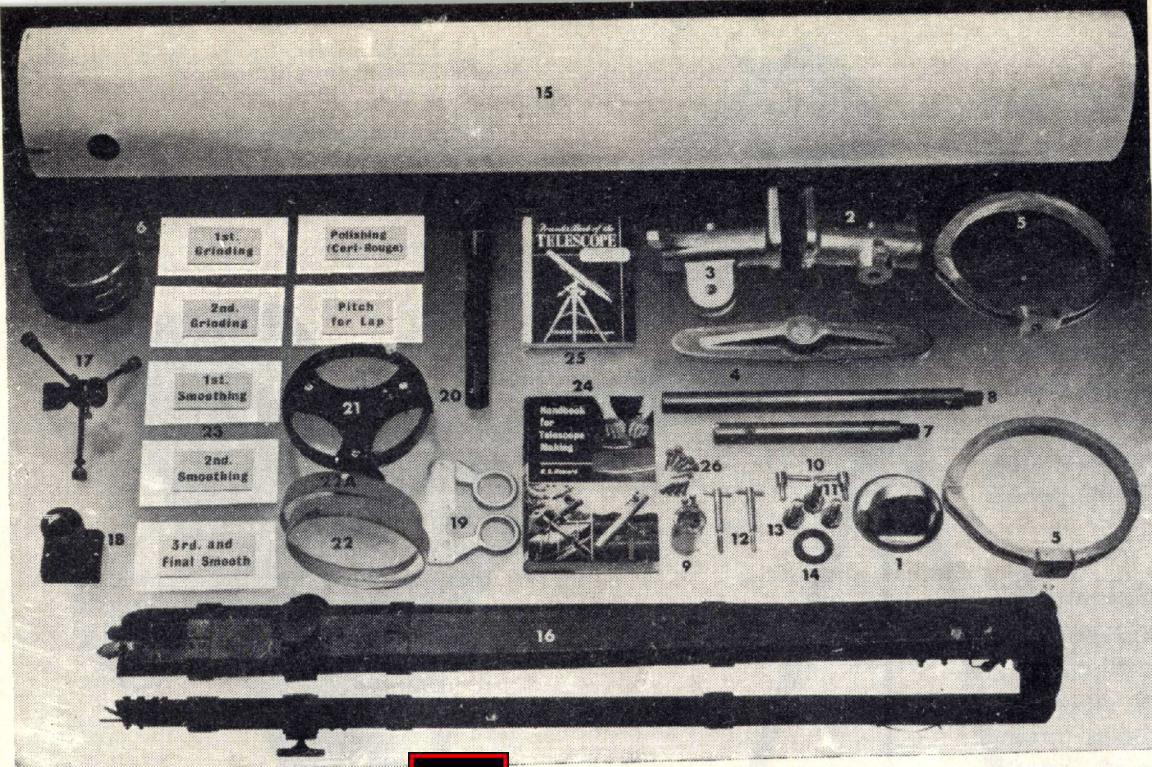
Inclusive Cost

£4.4.0

Post Free

INVERTED IMAGE

It should be noted that as in all Astronomical telescopes, the image is upside down.



THE CHARLES FRANK CONSTRUCTION KIT for a 6 in. Newtonian Reflecting Telescope

The assembly of this kit will present no difficulty to anyone of modest mechanical ability who has access to a drilling machine.

The kit as detailed is supplied carriage free at **£37.10.0** or to those of our customers who do not wish to grind their own mirror we can supply the kit complete with finished mirror and flat at the inclusive price of £46.0.0.

Eyepieces (not included in kit) available to suit customers' requirements. See Eyepiece List.

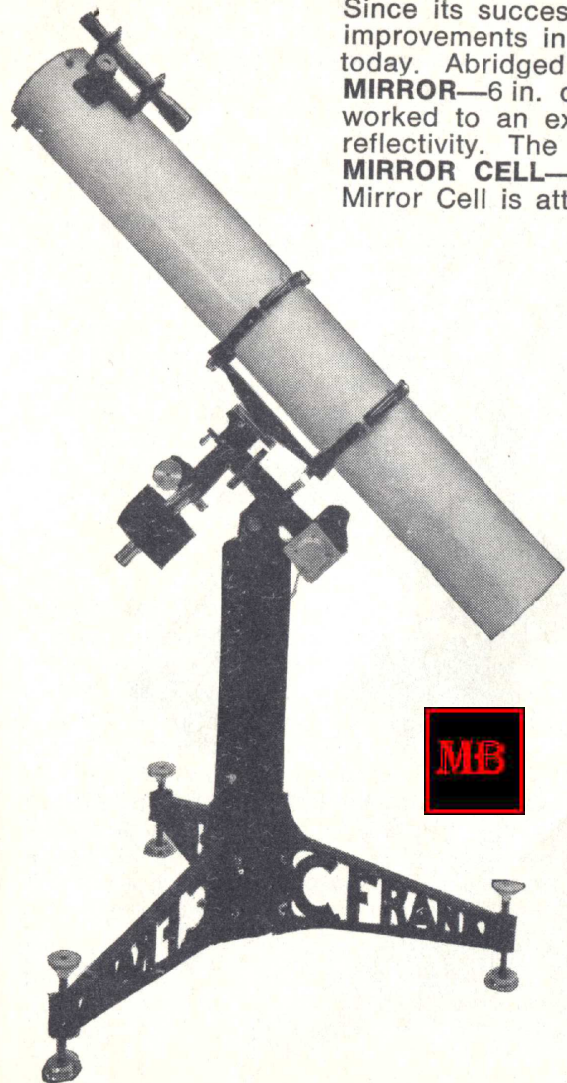
AN IDEAL EDUCATIONAL PROJECT FOR
SCHOOLS AND COLLEGES

PARTS LIST

MB

Part No.	Description	No. Off	Part No.	Description	No. Off	Part No.	Description	No. Off
1.	Base	1	16.	Heavy Duty Tripod	1	24.	Howard's Handbook for Telescope Making, a Profusely Illustrated Volume giving step by step Instructions on the Simple Hand Grinding, Polishing, and Testing of the Mirror	1
2.	Polar Axis Housing	1	17.	Spider Complete with Optical Flat Mirror	1	25.	Frank's Book of the Telescope	1
3.	Declination Axis Housing	1	18.	Focussing Mount (for Eyepiece)	1	26.	Knurled Head 4 BA Screws for Finder Bracket	6
4.	Saddle Bar	1	19.	Star Finder Mounting Bracket (3 Castings)	1	27.	The following Screws:—	
5.	Tube Clamps	2	20.	Star Finder. No. 42	1	2 BA × ¼ in. C'Sunk Head	4	
6.	Balance Weights	3	21.	Mirror Cell and Bracket	1	2 BA × ¼ in. Cheese Head	2	
7.	Polar Axis Shaft	1	22.	6 in. Pyrex Glass Bank for the Making of Main Mirror	1	2 BA × ¼ in. Round Head	2	
8.	Declination Axis Shaft	1	22.(a)	Glass Tool for Working Main Mirror	1	4 BA × ¼ in. C'Sunk Head	3	
9.	Spacing & Retaining Collars	5	23.	Set of Grinding and Polishing Agents, also Pitch to Hold Mirror and Tool	1			
10.	Axis Clamping L Bolts	2						
11.	Tube Clamp Securing Bolts	2						
12.	Tube Clamp T Bolts	2						
13.	Polar Axis Securing Bolt	1						
14.	¼ in. Washers	3						
15.	48 in. x 7 in. Diam. Alloy Tube	1						

THE CHARLES FRANK 6 in. REFLECTING TELESCOPE Equatorially Mounted



Since its successful introduction in 1963 the 6 in. Reflecting Telescope has undergone several minor changes and improvements in its design, the present model representing one of the finest instruments in its price range available today. Abridged specification as follows:—

MIRROR—6 in. diameter, 48 in. focal length, with resultant aperture of F8. It is of pyrex low expansion glass and worked to an extremely accurate Parabolic figure. The aluminised surface has an exceptionally high degree of reflectivity. The companion flat is made to a correspondingly high standard.

MIRROR CELL—The mirror cell mounting bracket is fitted inside the tube and secured with three screws. The Mirror Cell is attached to the bracket with a 3 point suspension, and is instantly adjustable for alignment.

TELESCOPE TUBE—This is in either 16 gauge seamless aluminium or fibre glass construction depending upon the availability of materials. White gloss outside and matt black inside.

EYEPIECE FOCUSING MOUNT—Helical Spiral Focussing Mount accepting Standard R.A.S. threaded eyepieces. (Also 24.5 mm. Swift eyepieces by means of an adaptor available as an extra).

STAR FINDER BRACKET—This is now mounted to form one unit with the eyepiece focussing mount. Three point suspension for rapid and easy adjustment.

STAR FINDER— $3\frac{1}{2}\times$ fully achromatic 10 element with 31 mm. eyepiece. Long eye relief for comfortable use.

EYEPIECE—With the £98 pillar mounted telescope, two eyepieces of approximately $1\frac{1}{2}$ in. and $\frac{1}{2}$ in. focal length are supplied giving $32\times$ and $84\times$. A fully achromatic Barlow Lens is also supplied giving $72\times$ and $190\times$ respectively when used with the $1\frac{1}{2}$ in. and $\frac{1}{2}$ in. lenses.

EQUATORIAL MOUNT—This is fully described elsewhere in this catalogue, and the mount fitted to the De Luxe £98 model has graduated setting circles and geared slow motion drives to both axis.

PILLAR STAND—Extremely rigid single pillar stand with 3 specially designed supporting feet with levelling adjustments.

GEARED SLOW MOTION DRIVES—Hand operated slow motion worm and pinion drives with 96-1 ratio, and operating through an adjustable slipping clutch are fitted to both Polar and Declination axis.

SETTING CIRCLES—The Polar Axis (or right ascension) circle is engraved in hours 0-24 and sub divided into 20 minute and 4 minute divisions. The Declination circle is divided into degrees and engraved into 4 sections 0-90-0-90-0.

SPIDER MOUNT—A 3-arm Spider is fitted for mounting the optical flat diagonal mirror, and fine 3-point adjustment provided for easy and accurate alignment.

FINISH—Mount and Stand in black crackle and chrome. Tube—gloss white with matt black interior.

PRICE—De Luxe Model Telescope complete on Pillar Stand, with Setting Circles and Slow Motion Drives, 2 Eyepieces and Achromatic Barlow Lens. **£98.0.0**

Synchronous motor drives for the above are priced under accessories, but if a motor drive is ordered with the telescope then the price of one slow motion drive (£4.17.6) should be deducted before adding the price of the motor.

ECONOMY MODEL—With one eyepiece and with unpainted and unchromed mount. Geared drives and setting circles which can be purchased as extras not supplied. Rigid tripod supplied in lieu of pillar stand. **£59.10.0** Carriage U.K. £2.0.0

THE NEW CHARLES FRANK

8½" REFLECTOR TELESCOPE

Designed and built in our Glasgow workshops this telescope possesses several unique features which we think will make it of particular interest to school or college as well as the serious amateur.

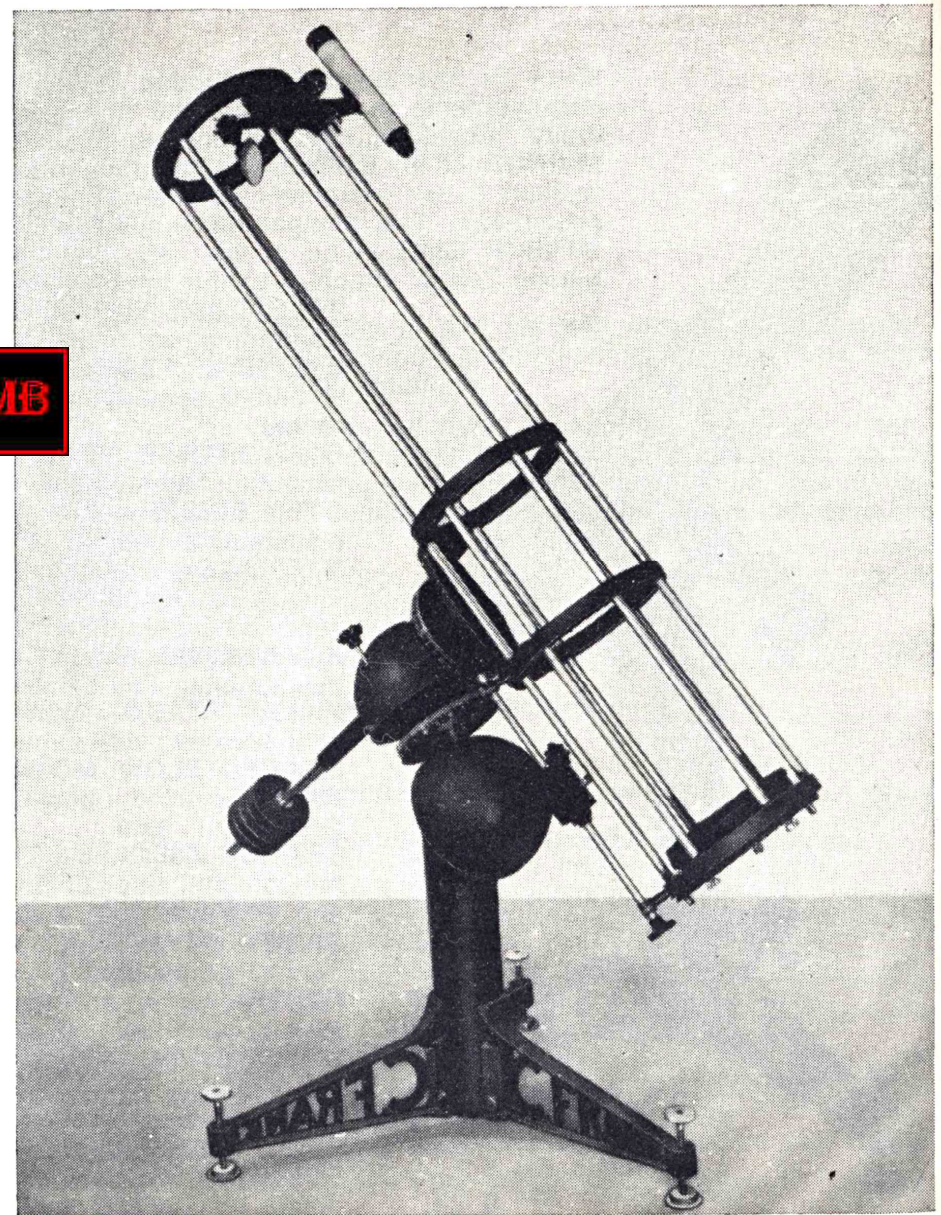
SPECIFICATION:

Mirror—8½ in. diameter parabolized Mirror, in Pyrex Low Expansion Glass worked to an extremely accurate figure. A choice of two focal lengths is offered, 51 in. giving a focal ratio of F6, and 64 in. giving a focal ratio of just under F8.

Mirror Cell and Mounting Bracket—Fully ventilated mirror cell on 3-point precision suspension, permitting rapid and accurate alignment. The mounting bracket is attached to the tube by 3 thumb nuts, and rests on 3 accurately machined surfaces. The outstanding feature of this mount is that both mirror cell and mount can be removed from the telescope for storage or protection and instantly replaced without altering the accurate alignment.

Telescope Tube—This is of the open frame skeleton tube pattern, consisting of six $\frac{3}{4}$ in. diameter high tensile alloy tubes spaced equidistant around four circular alloy formers. Outside diameter of tube is 12 in. with an overall length of 5 ft. 1 in. for the 64 in. focal length Mirror and 4 ft. 1 in. for the 51 in. focal length Mirror. It attaches to the mount by two bolts and is therefore easily removed and replaced for transportation, storage, etc.

20



Special Mount for Elliptical Flat, Focussing Eyepiece Mount, and Star Finder Bracket—A special casting is fitted to two of the $\frac{3}{4}$ in. tubes which make up the framework at the eyepiece end. This casting is a sliding fit on these tubes and can be moved up or down as required before fixing with four clamping screws. To this one casting is mounted the Single Arm Spider mount carrying the Elliptical Flat, the Focussing Eyepiece Mount and the Star Finder. The great advantage of this method is that the Elliptical Flat together with the eyepiece and mount can be moved nearer to the main mirror, without disturbing the alignment. This then brings the focal point outside the eyepiece mount and enables focal plane photography to be carried out. This system uses neither eyepiece nor camera lens. One of the problems of the standard reflecting telescope is the limited focussing range, which is sometimes insufficient to accommodate both long and extra short focus eyepieces. The long extending draw tube as used in refractors cannot be used as it would protrude into the main tube of the telescope when pushed in. The system used in our $8\frac{1}{2}$ in. Telescope eliminates this problem. The Elliptical flat itself is fully adjustable for precise alignment.

Equatorial Mount—This is an entirely new design of heavy duty mount, with $1\frac{1}{2}$ in. diameter steel axles revolving in roller bearings. It has built-in geared slow motion hand drives to both Polar and Declination axis, using a 7 in. diameter phosphor bronze worm wheel with a drive ratio of 214 to 1. One outstanding feature of this design is that all bearings and gears are totally enclosed to protect them from dirt and damage. Since the German Equatorial Mount was first designed many years ago it has been common practice to leave all geared drives totally exposed, and the damaged gears we have so often seen on second-hand telescopes convinced us of a definite need for adequate protection for this vital component. We have done this in such a way as to present a pleasing modern design combining looks and efficiency. To enable the slow motions to be operated whilst viewing, no matter what position the tube is in, we have provided flexible drive connectors. A Synchronous Motor Drive to the Polar axis is available as an extra.

Pillar Stand—A special version of the Charles Frank Pillar Stand is used with the above mount and the mount is permanently set for the latitude of the British Isles, variation between North and South being taken care of by the adjustments in the feet. Telescopes for use in latitudes other than the British Isles must be ordered specially and we then fit the mount to the stand at the required angle.

Star Finder—The standard Star Finder supplied is the $3\frac{1}{2}$ X achromatic as fitted to the 6 in. Telescope. If preferred an elbow Telescope Finder can be supplied in lieu at a small extra cost.

Eyepieces—The focussing Mount accepts standard R.A.S. thread eyepieces and the telescope is normally supplied with the two eyepieces and a Barlow Lens plus an adaptor to accept the push-fit "Swift" eyepieces.

Setting Circles—One of the great failings of many high-class telescopes is the provision of small, finely engraved circles, which require a good light plus a powerful magnifying glass to read them. The circumstances under which circles are normally used demand a large diameter with plain easily read figures and divisions, which is what we have provided. Dials are 8 in. dia. anodised black, with white heavily engraved figures $\frac{1}{4}$ in. high, and divisions which can be plainly seen without recourse to magnifiers.

The Telescope weighs approximately $1\frac{1}{2}$ cwts. and with the tube in its highest position measures 6 ft. 4 in. high for the 64 focal length and 5 ft. 8 in. for the 51 focal length.



Price £198.0.0

(Part Carriage in U.K. £2)

THE CHARLES FRANK MK. III 4 in. REFLECTOR TELESCOPE

Equatorially Mounted. In 1963 we introduced the Mk. II 4 in. Telescope, the main improvement then being the new heavy duty equatorial mount, having facilities for the addition of slow motion, geared drives and setting circles. This was an immediate success and during the past three years we have made further modifications and improvements to both mount and telescope. The instrument is manufactured at our Glasgow workshops to the highest standards. Abridged specification as follows:—

MIRROR—Precision ground and polished to the finest quality with highly reflective aluminised coating. Diameter 4 in., focal length 32 in., with resultant aperture F8.

MIRROR CELL—Fully Floating 3-point suspension type, featuring quick and positive adjustment for alignment of mirror.

SPIDER MOUNT—An entirely new design of 2-arm Spider mount, comprising an alloy ring which fits over the end of the telescope tube, the optical flat with its 3-point adjustment being carried on two tapering arms recessed into the tube.

TELESCOPE TUBE—In 16 gauge Seamless Aluminium, stove enamelled white outside and matt black inside.

EYEPIECE MOUNT—Helical Spiral focussing, accepting standard R.A.S. threaded eyepieces (an adaptor is available to enable our Swift range of 24.5 mm. push fit eyepieces to be used).

STAR FINDER BRACKET—This is now mounted to form one unit with the eyepiece focussing mount. Three-point suspension for rapid and easy alignment.

STAR FINDER— $3\frac{1}{2}\times$ fully achromatic, 10 element, of finest optical construction with .31 mm. diameter eyepiece having long eye relief for comfortable use.

EYEPIECE—Supplied with the telescope is an eyepiece of approximately $\frac{3}{4}$ in. giving a magnification of $44\times$. Eyepieces of 1 in. or $\frac{1}{2}$ in. focus giving either $32\times$ or $64\times$ can be supplied in lieu if requested without additional charge.

EQUATORIAL MOUNT—This is a precision die cast mount. (The same mount is used for both 4 in. and 6 in. Telescopes).

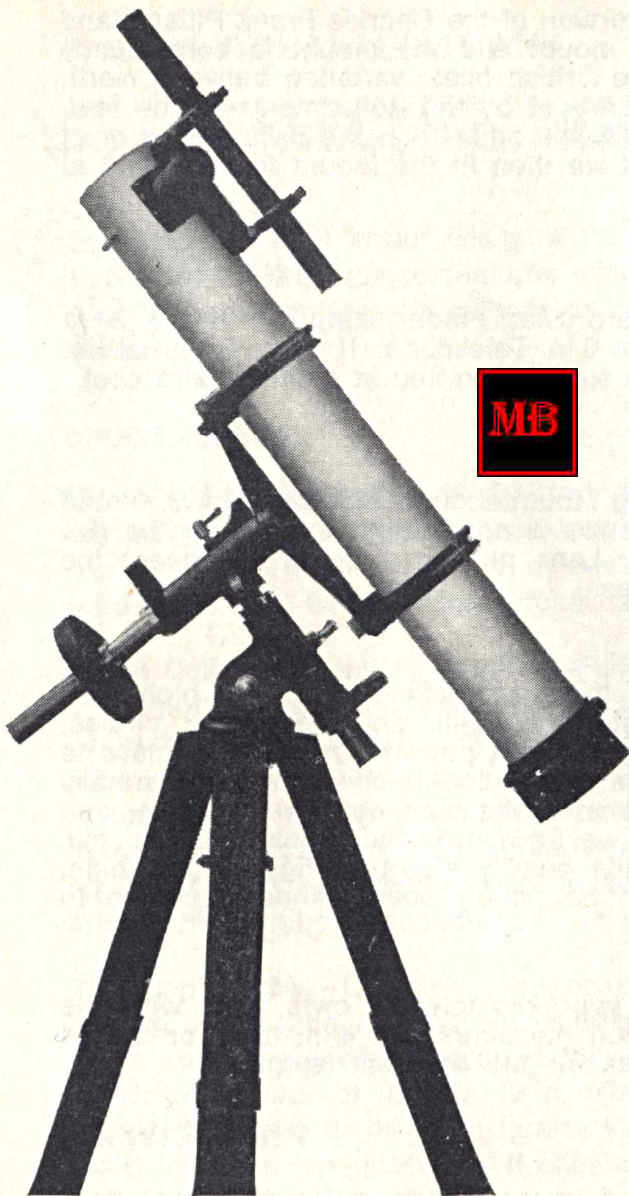
TRIPOD—Extremely rigid, in non-rusting alloy.

GENERAL FINISH—Tripod, Mount, Mirror Cell, Finder Bracket and Eyepiece Mount in fine black crackle instrument finish, with small metal parts bright chrome plated. Tube in white Stove Enamel.

Price £39.10.0

(Part Carriage in U.K. 10/-)

The instrument can also be supplied with only the tube painted, all other parts unpainted and unchromed **£32.10.0 (Carriage 10/-)**



The Charles Frank 'SATURN'

4 inch Astronomical Telescope

We are proud to introduce this new Telescope which we consider to be the finest in its price range available today. It possesses features only expected in much more expensive instruments.



ABRIDGED SPECIFICATION:

Mirror:

f/8 Aluminised optical mirror of 95 mm. clear aperture.
Basic magnification: 31× linear.

Tube:

30 in. long alloy tube finished in white enamel, and fitted with open sights.

Mount:

Sturdy column mount supported on widely spaced Table Tripod. Smooth acting motions in altitude and azimuth.

Pillar Height: 19½ in.

Total Weight: 6½ lbs.

Price **£15.15.0**

78× Eyepiece optional extra—55/-.

Negative Barlow Lens which can be used in conjunction with any eyepiece and which has the effect of increasing power by approximately 100%. Price 35/-.



THE CHARLES FRANK

3" REFRACTING TELESCOPE

Equatorially Mounted



24

By combining the finest quality optics from the famous American controlled Swift factories of Japan with our own Charles Frank Equatorial Mount and Stand, we are able to offer an instrument which is generally regarded as being the finest 3 in. Refractor available today.

Abridged specification:—

OBJECT GLASS—79 mm. diameter, clear aperture 77 mm. This fully coated object glass is of air spaced design and magnificent quality. Focal length is 1,000 mm. (39.4 in.). The resolving power at infinity (Dawes Limit) 1.51. The equatorial mount used for this instrument is the same as supplied with the Charles Frank de-luxe 6 in. Reflector and full description is given elsewhere in this catalogue.

MODEL A.3—Consists of 3 in. Swift Telescope with one eyepiece but without Star Finder. It is supplied complete with the Charles Frank Equatorial Mount and heavy duty alloy extending Tripod (3 ft. to 4 ft. 11 in.).

£55.0.0

MODEL B.3—This is the same as A.3, but with the addition of a high grade fully achromatic focussing star finder with 40 mm. object glass and magnification of 10×.

£61.0.0

MODEL C.3—Is a more comprehensive instrument consisting of 3 in. Swift Telescope, Star Finder, 3 Eyepieces, Charles Frank Equatorial Mount and Tripod, fawn Crackle Stove Enamel and Chrome finish, fitted with geared hand slow motion drives to both axis, and setting circles.

£85.0.0

MODEL D.3—As for Model C.3, but with Charles Frank Pillar Stand in lieu of Tripod (as illustrated).

£100.0.0

TERRESTRIAL MODEL—Incorporates the same high quality optics as the Astro models, but is fitted with a prism erecting system giving an upright image for all long range land viewing as well as being suitable for Astro observations. Supplied with heavy duty Altazimuth mount and metal tripod. With basic 50× eyepiece and auxiliary 10× sighting Telescope.

£57.10.0

Full details of Swift Eyepieces and other accessories can be found on page 28.

Unusual purchase of CIVILIAN PATTERN WATCHES from H.M. Government

This represents one of the most important watch purchases since the war and we are proud to offer them for public sale at prices well below their true value. Included amongst these superb timepieces are many well known and respected makes but others have branded names better known on the Continent than in the U.K. All of them have lever escapements and are fully jewelled, and most are incablock shockproof, etc. We will gladly submit a selected watch on free approval, confident in the knowledge that this is one of the best watch offers we have ever made. For the most part the watches appear to be new and unused and each one carries our twelve month written guarantee. We have grouped the watches into two lots as follows:

LOT A.....Price £5. 5. 0

LOT B.....Price £7. 7. 0

Please state your preference as follows: small, medium or large watch; stainless steel or gold plated; sweep seconds hand or small seconds hand; automatic; with date, etc.

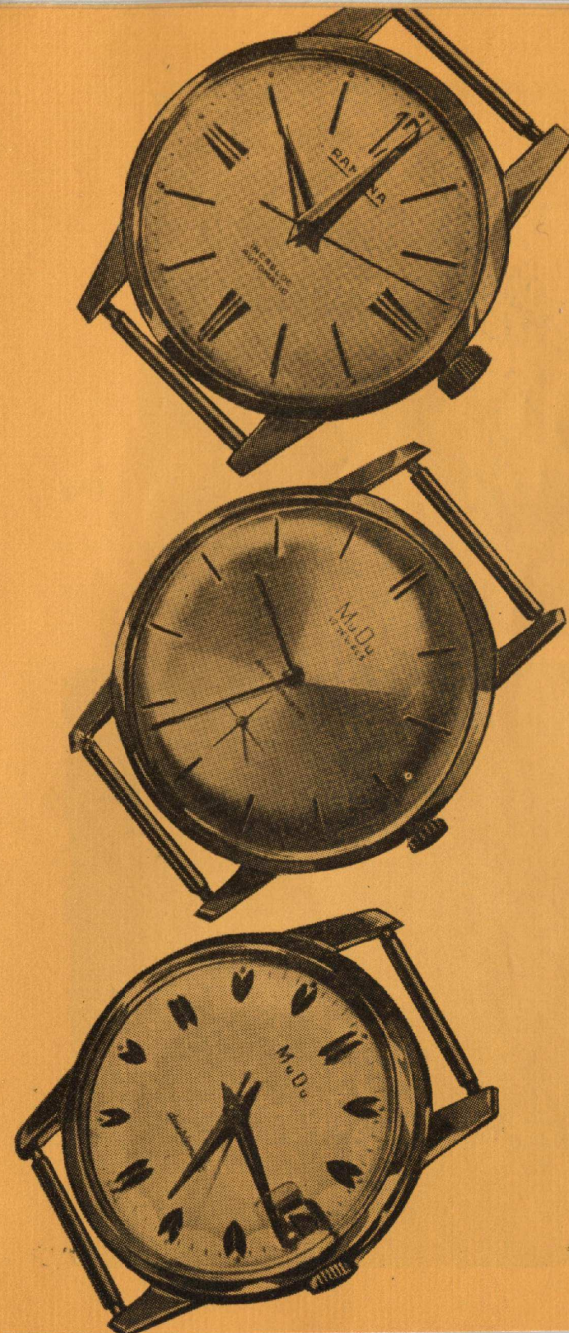
Three of these fine watches are illustrated on the right.

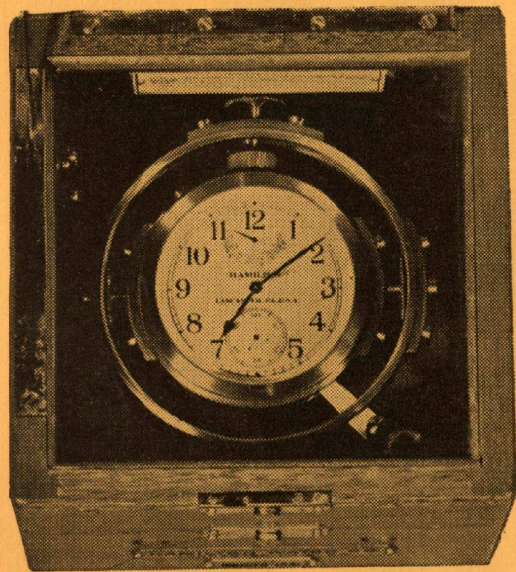
NOTE.—The automatic and date watches are mostly in the 7 gn. Lot.



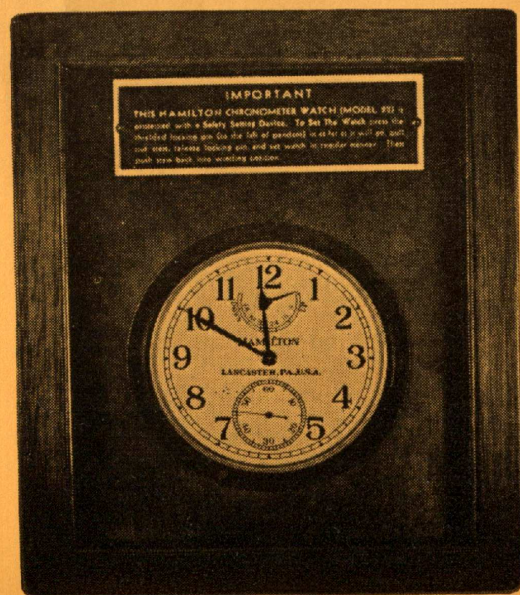
EX SERVICES WRIST WATCHES—Choice of black or white dial

Fully jewelled lever escapement watches by best Swiss makers. This is probably the smallest and neatest of the Service Watches with an overall dia. of only $1\frac{1}{8}$ ". The dial is white with luminous hands and points. The case is chromium with stainless steel screw back. Unrepeatable value at 4 Gns.





(A)



(B)

CHRONOMETER & DECK WATCHES

Originally held by the Chronometer Department of Greenwich Observatory.

HAMILTON GIMBAL MOUNTED CHRONOMETER WATCH

(A)

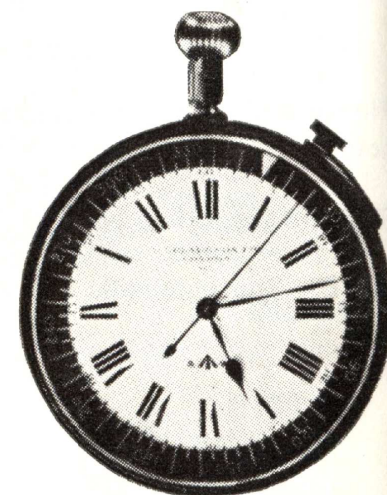
Designed to stringent Naval specification, they are especially suitable as navigational instruments for merchant shipping and yachtsmen. 25 ligne (size)—stem wound—safety setting—21 jewel movement—lever type escapement—54 hour mainspring—up and down dial adjusted in 6 positions and in temperatures. In brass bowl, gimballed mounted, housed in standard mahogany box with lock. Size of box 6" x 6" x 6". Price **£52.10. 0**

Subject to availability, we can also offer the 8-day WALTHAM Model at **£52.10. 0**.



NAVIGATIONAL WATCH (Swiss and marketed by Golay)

Lever escapement, 18 jewels, brass and steel compensated balance. White enamelled dial, large sweep centre seconds hand. External rotatable navigation ring, graduated in degrees of a circle. Stainless steel case—no bow. Dia. 55 mm. New and unused **£8. 8. 0**



HAMILTON TWO-DAY CHRONOMETER DECK WATCH

(B)

This is the Hamilton two-day Chronometer Watch (described above) but in lined deck watch box and not gimballed. It is a truly magnificent instrument capable of a rating equal to that of a standard chronometer. In mint condition and worthy as a collector's piece **£37.10. 0**



WRIST WATCHES from the Royal Observatory and Ministry of Aviation

OMEGA WRIST WATCHES

MODEL A

Over the years many fine watches have been produced in the world famous Omega factories in Switzerland, but few have surpassed this truly magnificent timepiece. With its screw-back stainless steel case it is classed by Ministry of Aviation as being waterproof (i.e. not a diver's watch but will withstand worst weather conditions, etc.). Moreover the watch is built to stand up to an unusually high degree of rough usage. It is a large man-size watch of overall diameter $1\frac{3}{8}$ "', with a clear white dial and large sweep seconds hand.

The flawless movement of these watches bespeaks technical perfection and results in a watch capable of adjustment to closest possible limits of accuracy. This watch is without doubt one of the finest we have ever handled and we invite you to share our enthusiasm by testing it free for 14 days. We do not think you will be disappointed. The cash price is **£15.0.0** or £5 deposit and 8 monthly instalments of £1.7.6 (total credit price £16.0.0).

MODEL B

Those of our customers who prefer a smaller, slimmer watch but who still insist on superlative quality will be interested in the OMEGA and LONGINES watches which were formerly held by the Chronometer Department of the Royal Observatory. These watches have a clear white dial of 30 mm., non-luminous hands and figuring and incorporate large sweep seconds hand. The movement is fully jewelled lever type. The case is of polished aluminium with stainless steel back. Cash price **£12.18. 6** or £5 deposit and 8 monthly payments of £1.2.6 (total credit price £14.0.0).

- When required we are able to re-case any of the above watches in a gold plated case of excellent quality at an additional cost of **£2.10.0**

Also, if desired, these watches can be fitted with black dial at no extra charge.

MINISTRY OF AVIATION NAVIGATIONAL WRIST WATCHES

Similar in general specification to the large water resistant Screwback Omega Watches listed elsewhere, these fine timepieces have black dials with luminous points and hands, and incorporate small seconds dial. They can be divided into two groups as follows:

Group A

VERTEX, BUREN, RECORD, TIMOR, etc.

Cash Price: **£8.15. 0** or
9 monthly payments
of £1. 1. 8 each.

Group B

ETERNA, JAEGER LE COULTRE, LEMANIA, etc.

Cash Price: **£9.18. 6** or
9 monthly payments
of £1. 4. 3 each.

EX. GOVERNMENT STOP WATCHES

1/10th Second STOP WATCH

(Illus. A)

High quality Smiths Stop Watch with 7 jewel lever movement. Reading to 1/10th second and recording to 15 minutes. Start stop and return to zero, all controlled by centre button. Offered at approximately half price **£3.10. 0**
 Precision SWISS 1/10th of similar pattern **£4. 5. 0**



1/5th Second ELGIN STOP WATCH

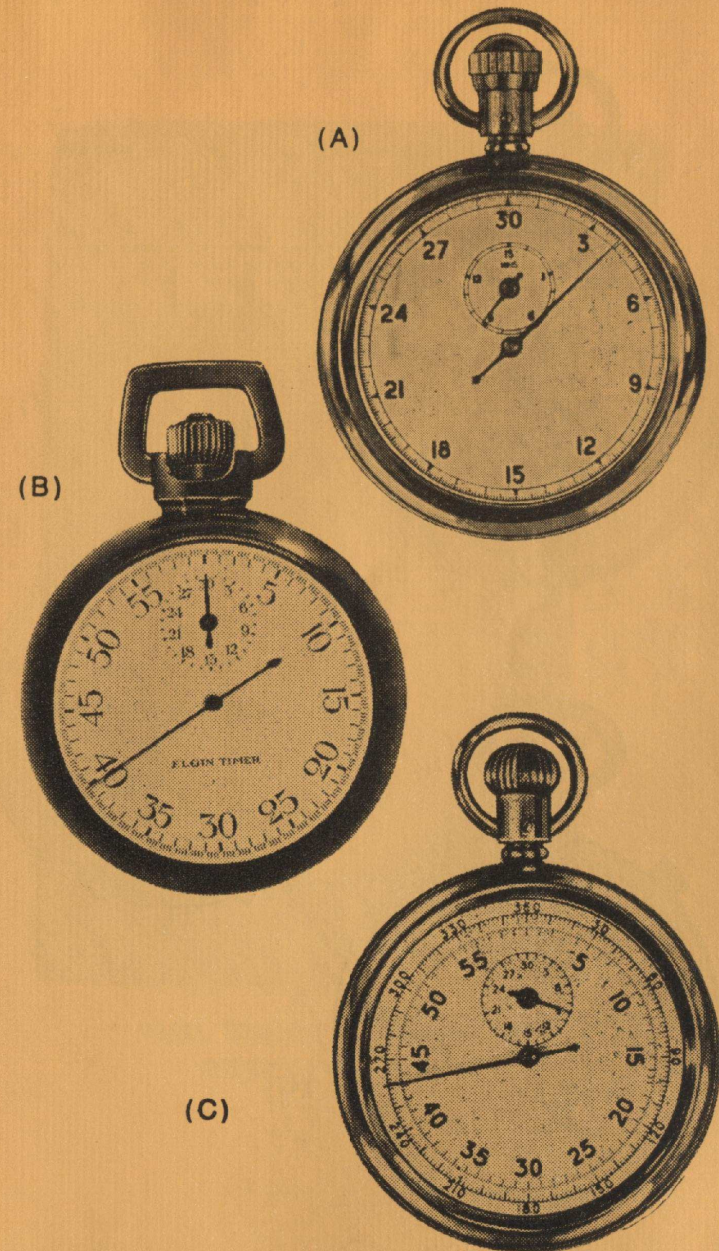
(B)

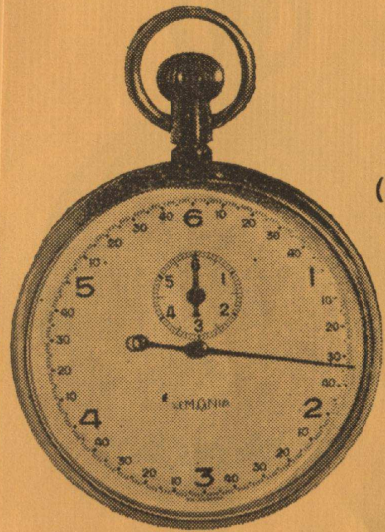
Jewelled lever movement reading to 1/5th second and recording to 30 minutes. Start, stop and return to zero all controlled by centre button. A stop watch of superb quality. Current value approx. £12. 0. 0 **£4.10. 0**

1/5th Second STOP WATCH

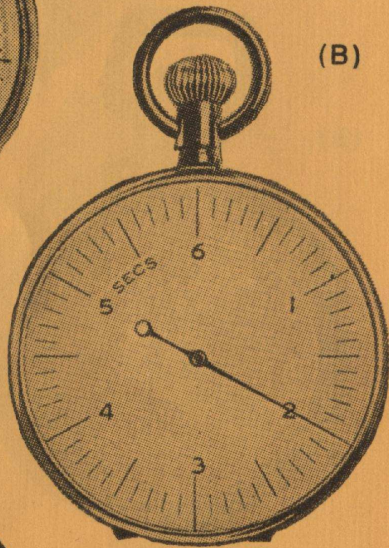
(C)

Made to exacting Government requirements by Smith, these watches read to 1/5th second and record to 30 minutes. They have jewelled lever movements and start, stop and return to zero by centre button. Cost approx. £6.10. 0 Offered at **65/-**
 Precision SWISS 1/5th of similar pattern **75/-**

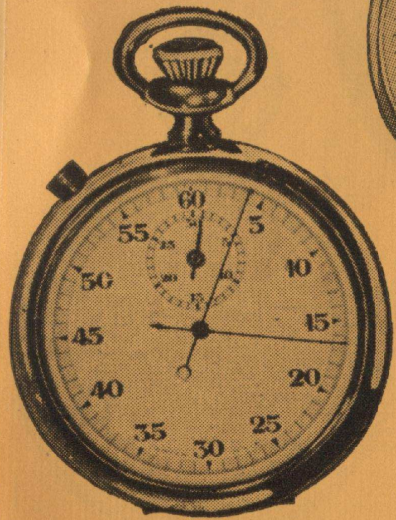




(A)



(B)



(C)



PRECISION SWISS 1/50th Second STOP WATCH

(A)

All controls by centre button. The world famous firm of Lemania of Switzerland made these fine jewelled watches to stringent Admiralty specification. Adapted to read to 1/50th second or judged to 1/100th second by interpolation. The extra large 2" dial ensures instantaneous and error-free reading. If an accuracy of 1/10th is considered sufficient, then the slightest glance is all that is necessary for exact reading **£6.15. 0**

WALTHAM and LEMANIA (Swiss)

(B)

Extremely high grade, 2" dial Stop Watches with start, stop and return to zero through winding button. The following three types are available:—

- (a) 60 second dial reading to 1/5th second.
- (b) 6 second dial reading to 1/10th second.
- (c) 6 second dial reading to 1/50th second.

It should be noted that these watches do NOT have a minute recorder and would therefore have limited application. Offered at **45/-**.

These watches are also available in their original form with the six second dial graduated from 0-5,000 yards. Although a special purpose watch it nevertheless has many applications in industry, laboratories, etc. Offered at the extremely low price of **25/-**

SPLIT ACTION STOP WATCH

(C)

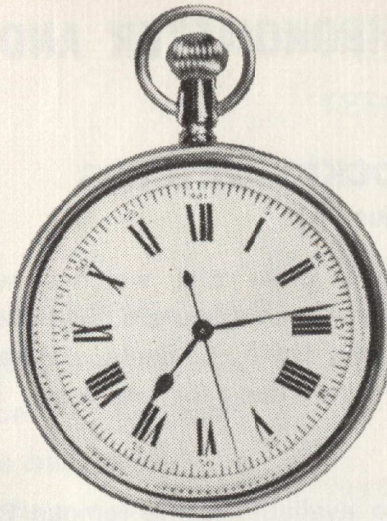
1/5th second recording to 30 minutes. One hand controlled from winding button, the other from the side plunger **£7.15. 0**

LIMITED STOCKS—Please enquire first whether still available.

NAVIGATIONAL DECK WATCH
by Mathey Tissot

Of superb quality, this large watch is 55 mm. in diameter. It has an 18 jewel movement with brass and steel compensated balance. The white enamelled dial is divided in half seconds with large sweep seconds hand. The stainless steel case has screw back and front.

New condition £8.10. 0
Used condition £7.10. 0

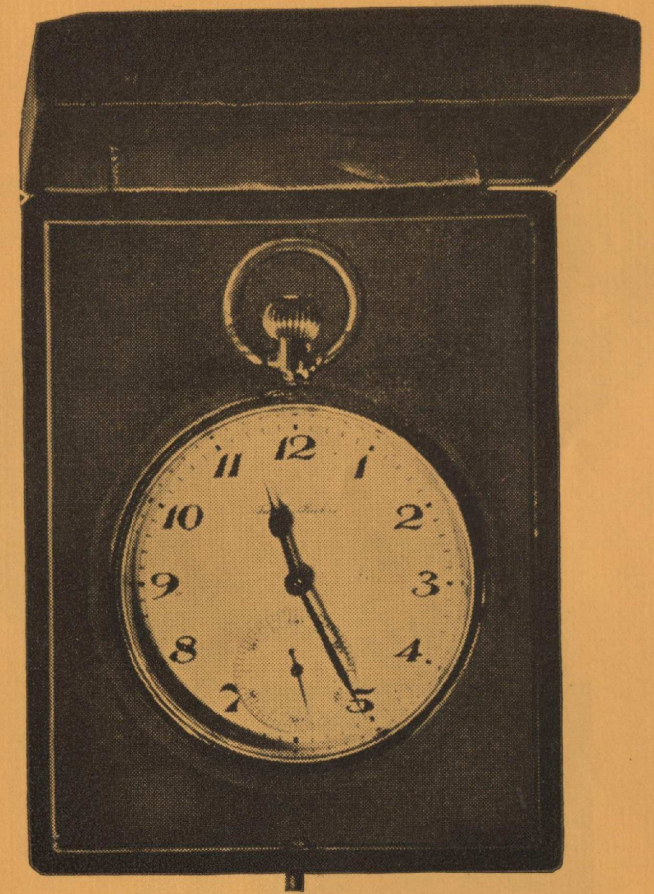


PAUL BUHRE 24 LIGNE DECK WATCHES

We have sold very few of these as deck watches but a surprisingly large number have been purchased as presentation watches. They lend themselves particularly well to this purpose for, apart from the precision 19 jewel lever movement, their appearance with highly polished chrome case of 2¼" dia. can be described as functionally beautiful. In attractive lined presentation case at 16 Gns

WALTHAM POCKET CHRONOMETER WATCH

16 ligne, 21 jewel, with two calibrations. A 12 hour main dial with an inner calibration continuing up to 24 hours sweep seconds hand £15. 0. 0



**PAUL BUHRE 24 LIGNE
DECK WATCH**

CHRONOMETER AND POCKET WATCHES

POCKET WATCHES

(Illus. A)

These white dial watches were made to Government specification by Switzerland's leading manufacturers. All the watches have fully jewelled lever escapements and makes include Doxa, Lemania, Jaeger le Coultre, etc. They are all in excellent condition and are guaranteed for one year. Offered at a fraction of cost **£3.10. 0**

Also available is the famous Black Dial

WALTHAM POCKET WATCH

(Illus. B)



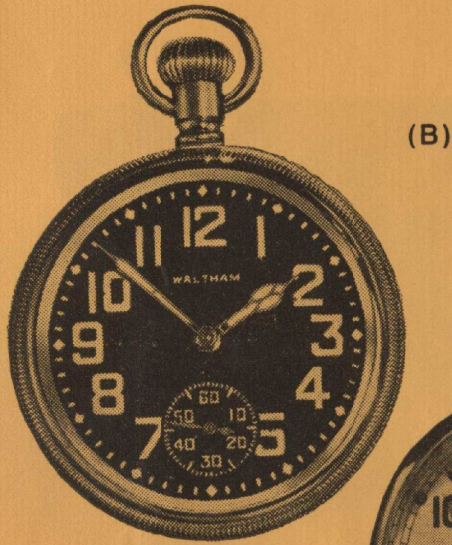
15 Jewelled Lever escapement **£3.10. 0**

NARDIN LE LOCTE CHRONOMETER DECK WATCH (C)

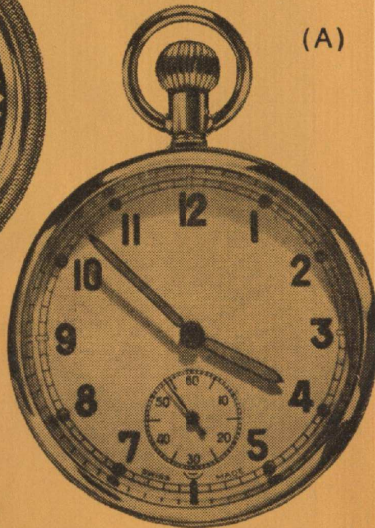
This standard 18 jewel lever escapement watch is fitted with Guillaume balance and has clear white enamel dial. The watch case is of silver with screw back. In screw top brass container housed in mahogany deck watch box. Good used condition. Cost over £100 **£25. 0. 0**

EARLY ENGLISH DETENT ESCAPEMENT CHRONOMETERS

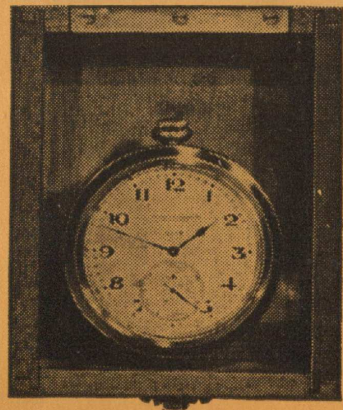
These collectors' pieces formed part of the collection held by the Royal Observatory and are being offered at prices ranging from **60 Gns.** Details on request. Also available are a few early watches, repeaters, etc.



(B)



(A)



(C)

Stereoscopic Binocular Telescope

This remarkable prismatic Binocular Telescope was made by world famous Ross of London to M.O.S. specification. It is different from ordinary Binoculars and Telescopes in that due to the object glasses being spaced 27 in. apart, a tremendous stereoscopic or third dimensional effect is achieved. This feature makes this instrument invaluable where the determination of relative positions is important, as in Yacht Racing, etc. The instrument is substantially made of brass and weight—less tripod and mount—is 19 lbs. Length is 29 in. (unlike ordinary telescopes this instrument is used parallel too and not at right angles to line of sight). The binocular eyepieces for the use of both eyes are of the revolving turret type and the available powers are 10× and 20×. Effective aperture of O.G.'s 45 mm. The special mounting bracket which we have adapted for use with this instrument allows for all vertical and horizontal movements and the rigid metal tripod permits comfortable viewing. Original cost probably in excess of £250.0.0. Offered complete at

£45.0.0

Illustration on request.

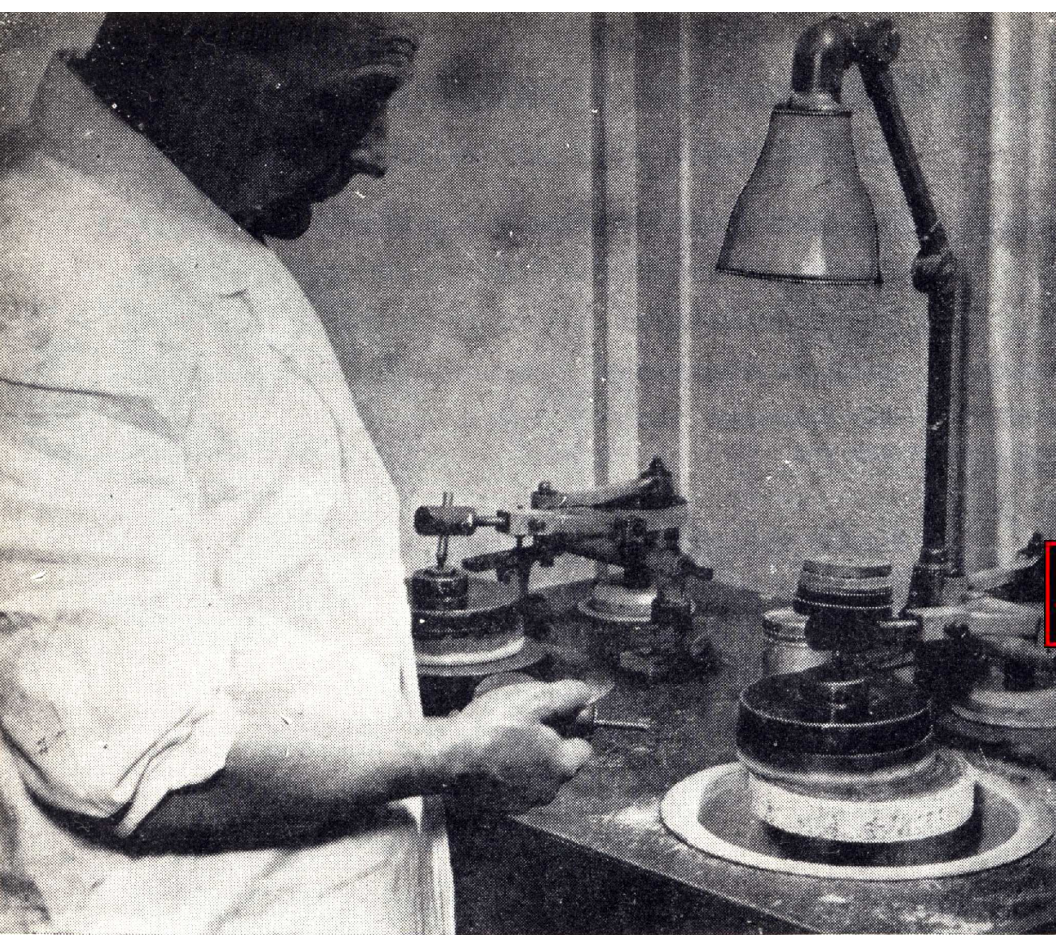
THE SWIFT 3 in. REFRACTOR FOR TERRESTRIAL AND ASTRONOMICAL USE

This erect image telescope is of extremely high quality mounted on the Charles Frank Altazimuth Mount and Tripod. Ideal for all long-range land views and also useful as astronomical telescope. Supplied complete with Starfinder and 80× Eyepiece.

£57.10.0

Further details of optical system and accessories on pages 30 to 31.





The illustration shows a stage in the production of one of our 6 inch mirrors.

Selected Items for the Amateur Astronomer

TELESCOPE MIRRORS (aluminised)

4 in. spherical hand finished, thickness $\frac{3}{4}$ in., "A" quality, Focal length 32 in. Price **£5.0.0.**

"B" quality mirror of $\frac{1}{2}$ in. thickness can be supplied at **£2.10.0.**

6 in. Paraboloidal pyrex low expansion glass, Aperture F8 48 in. focal length. "A" quality **£15.0.0**

8½ in. Paraboloidal pyrex low expansion glass "A" quality **£30.0.0**

MB

FLATS

Elliptical aluminised flats for 6 in. reflector. Minor axis $1\frac{1}{4}$ in. **30/-**

Secondary mirror for 4 in. reflector (rectangular). **15/-.**

Quotation on request for other sizes of diagonals.

Blanks for telescope mirrors (moulded and therefore do not require edging).

4 in. plate glass 18 mm. thick **15/-** each. Postage 2/6 per pr.

6 in. pyrex 27 mm. thick **33/-** each. Postage 2/6 per pr.

8½ in. pyrex 40 mm. thick **45/-** each. Postage 4/6 per pr.

To grind a mirror it is necessary to use another blank as a tool. One of low quality would suffice but at present we only have first quality blanks which, although perfectly suitable, are somewhat expensive for this purpose.

TELESCOPE TUBING

We can supply best quality seamless drawn aluminium tubing in 16 SWG enamelled white externally and matt black internally. 4 in. dia., 31 in. length. Inclusive packing and carriage U.K. **49/6**

7 in. diameter, 52 in. length, inclusive carriage, crate returnable **£8.15.0**

GRINDING AGENTS

Complete kit for the making of a mirror. The kit consists of 5 grades of Carborundum, i.e. Grade Nos. 120, 125, 175, 225 and 240. plus cerirouge for final polishing and pitch for holding the mirror and the tool. **25/-.** Postage 2/6

ACCESSORIES

For use with the Charles Frank Range of 3 in., 4 in., 6 in. and 8½ in. REFRACTING and REFLECTING TELESCOPES

EYEPIECES

The following eyepieces are of finest optical construction and quality. (All fitted with standard R.A.S. thread)

Huyghenian

Focal lengths 1 in., ¾ in., ⅝ in., ½ in. and ⅜ in. each **£3.10. 0**
 Focal lengths ⅓ in. and ¼ in. each **£3.17. 0**
 Extra high powers 1/5 in. and 1/6 in. ... each **£4.12. 6**
 Tinted suncaps for above each **£0.10. 0**

Orthoscopic—1 in. and ½ in. focus each **£7.15. 0**

Ramsden

Focal lengths 1 in., ¾ in. and ½ in. each **£2.15. 0**
 Focal lengths ⅓ in. and ¼ in. each **£3.10. 0**

Special Comet (Kellner)

Approx. 1½ in. focal length with achromatic eye lens and large field lens of 1⅞ in. dia. These lenses have high light transmission and are ideal for Clusters, Comets, Nebulae and other faint objects. Each **£4.13. 6**



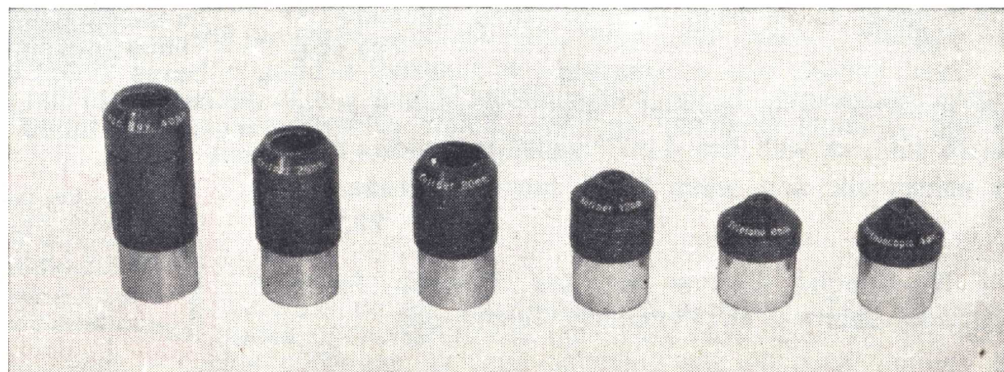
“Swift” Range of Eyepieces: These high grade eyepieces are supplied for use with the “Swift” 3 Refractor Telescope, and have a push fit diameter of 24.5 mm. Due to their optical construction, they are ideally suited for use with reflecting telescopes. To enable them to be used with the standard R.A.S. thread fitting we have made a special adaptor. This screws into the R.A.S. thread on the focussing mount and converts it to 24.5 mm. push fit. The full range of 6 “Swift” lenses may be used with the one adaptor, price of which is **18/6**

(Note: No adaptor is necessary to use these eyepieces with the “Swift” 3 in. Refractor which has a 24.5 mm. push fit mount).

TA-1	40 mm. Achromatic Huyghenian	£3.4.6	12 mm. Kellner	£3. 4.6
TA-2	26 mm. Kellner	£3.4.6	6 mm. Triplane	£3.13.0
TA-3	20 mm. Kellner	£3.4.6	4 mm. Orthoscopic	£4.15.0

TA-10 & 11—Moon and Sun Filters to fit the above eyepieces each **11/6**

(NOTE: For direct viewing of the Sun, a Sun Filter must be used in conjunction with a special Sun diagonal. Direct viewing of the Sun without the protection of these two items used together could cause permanent blindness due to the intensity of the focussed rays of the Sun).





TYPE I—As used on the Charles Frank Equatorial Mount. Precision divided in solid alloy. Diameter $3\frac{3}{4}$ in. x $\frac{1}{2}$ in. thick with 1 in. diameter bore. Divisions engraved on edge. Hour or right ascension circle 0 - 24 hours, sub-divided into 20 minute and 4 minute divisions. Declination circle, engraved in degrees in four sections 0 - 90 - 0 - 90 - 0. Supplied complete with locking screws and pointers.

Price per pair £5.18.6

TYPE II—These are larger circles as used in our $8\frac{1}{2}$ in. Reflecting Telescopes, size 8 in. diameter x 1 in. thick with $2\frac{7}{8}$ in. diameter centre hole. Engraving as per Type I.

Price per pair £9.18.6

Geared Slow Motion Hand Drives. These precision drives are designed specifically for use on the Charles Frank Equatorial Mount. They consist of a steel worm in an alloy mount with phosphor bronze bearings and a special anti-backlash device which positively removes any end play of the worm. This worm meshes with a phosphor bronze worm wheel of $3\frac{1}{4}$ in. diameter and 1 in. bore and having 96 teeth giving an overall ratio of 96 to 1. The drive is transmitted to the shaft of the telescope through nylon pads. The pressure applied by these pads can be varied to give a 'slipping clutch' so that the telescope can be quickly aligned by hand before recourse to the slow motion drive.

Price, each £5.5.0

Special Heavy Duty pattern Geared Slow Motion Drives (as fitted to the Charles Frank $8\frac{1}{2}$ in. Reflector Telescope). These drives are designed specifically for the above Telescope, but home constructors could no doubt adapt them to their particular requirements. The steel worm is in an alloy mount with adjustable anti-backlash device, and meshes with a phosphor bronze worm wheel of 7 in. diameter having 214 teeth with an overall ratio of 214 to 1. This worm wheel is mounted on a steel boss 3 in. long x 3 in. diameter turned down to $2.1/16$ in. diameter for $1\frac{3}{4}$ in. of its length, and having a $1\frac{1}{2}$ in. diameter hole through the centre for mounting on the $1\frac{1}{2}$ in. diameter steel axes of polar and declination axes. Four adjustable nylon clutch pads are incorporated in each drive.

Price, each £15.0.0

Flexible Drive for remote operation of the Geared Hand Drives. This consists of special flexible shafting with Plastic Hand Wheel at one end and a coupling at the other for attaching to the shaft of the slow motion hand drive. (The original hand wheel on this drive must first be removed) enabling them to be operated whilst viewing. Two types are available:—

Type I for use with our standard slow motion drives fitted to the Charles Frank Equatorial Mount. 18 in. long.

Price, each £1.15.0

Type II for use with the heavy duty geared drive as fitted to the $8\frac{1}{2}$ in. Telescope. Length 26 in.

Price, each £2.0.0

Both types are finished Bright Chrome Plate.

Synchronous Motor Drive to Polar Axis and slipping clutch to allow independent movement of telescope.

£16.10.0

Dual Drive (Motor or Hand)

£20. 0.0

BARLOW LENSES

This a negative or minus lens and is a convenient way of increasing magnification. It is used in conjunction with an eyepiece and gives us an increase of anything from 50% to 125%, depending on the negative focal length of the Barlow and its distance from the eyepiece. It is always fitted between the eyepiece and the objective or mirror. We can offer three models, as follows:—

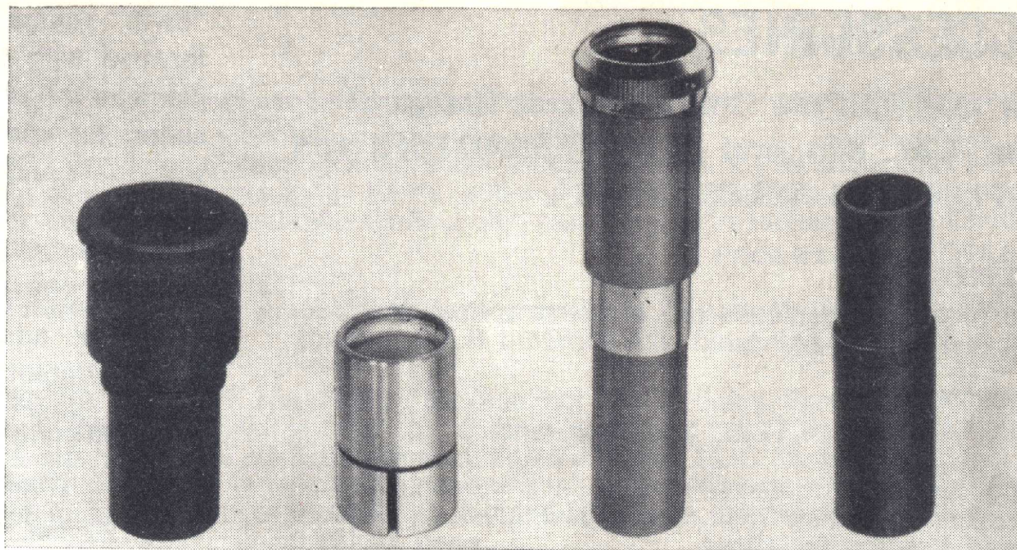
TYPE I—Fully achromatic colour corrected Barlow of 2 in. Negative focal length. In anodized alloy mount it screws into any R.A.S. threaded focussing mount and the eyepiece to be used screws into the Barlow mount. Gives 125% increase in power **£3.15.0**

TYPE II—This is a non-achromatic Barlow of approx. $3\frac{1}{2}$ in. negative focal length in a push-fit mount. This slides into our helical focussing mount and magnification can be varied by moving the Barlow in relation to the eyepiece. Gives from 50% to 100% increase
£1.12.6

TYPE III—This is a special "Swift" Barlow and is suitable for use with the 3 in. "Swift" refractor. It is fully achromatic and gives 100% power increase.
£3.10.0

TYPE IV—Special Barlow for the Charles Frank CP80 and Saturn 4 in. Reflecting Telescopes.

35/-



Type I

Type II

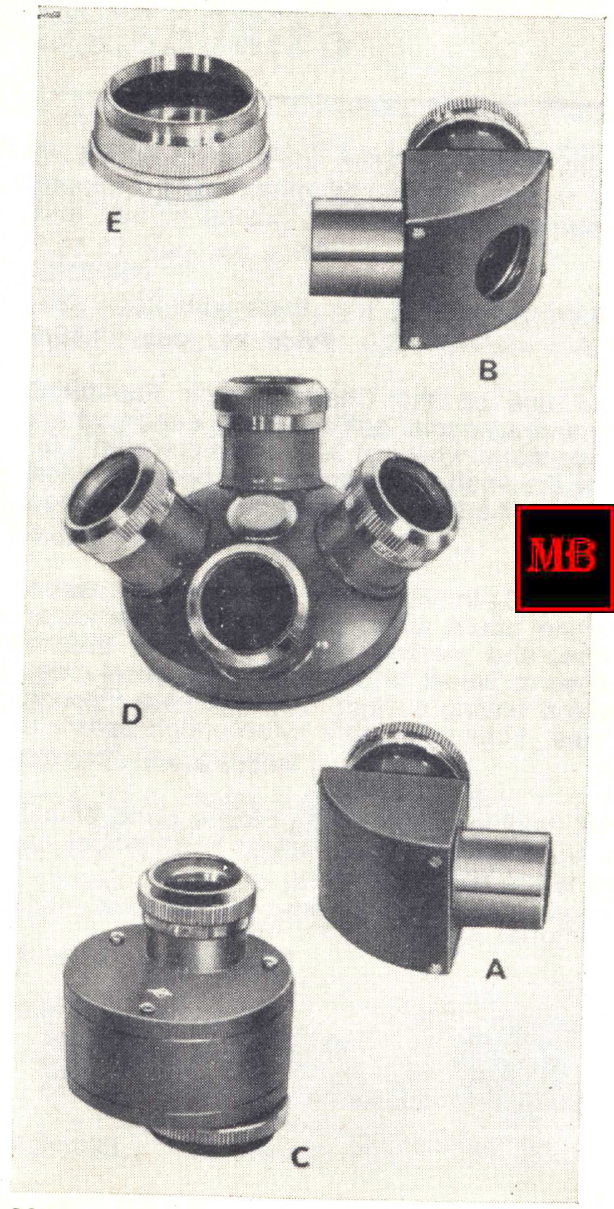
Type III

Type IV

FOCUSSING MOUNT

A well made mount with multi-start helical focussing giving a $2\frac{1}{2}$ in. range of movement and accepting standard R.A.S. threaded eyepieces or Barlows type I & II. These mounts are available with radiused bases to suit 4 in. and 7 in. diameter tubes, also with flat bases to suit refractors and square tubed reflectors. **Price £2.19.6**





ACCESSORIES for use with the 3 in. "SWIFT" REFRACTOR TELESCOPE

TA-8 Star Diagonal Prism. This enables overhead objects to be viewed from a comfortable and more natural position.

TA-18 Sun Diagonal Prism. Similar in external appearance to the Star Diagonal, it employs a special wedge shaped prism known as a "Herschell Wedge" to divert a very large percentage of the Sun's light and heat rays away from the eyepiece. To be used with a Sun Filter on the eyepiece. Filters can sometimes be omitted when Sun is low

TA-9 Prismatic Terrestrial Erector Prism. This corrects the normally inverted image of a purely astronomical refractor and gives a right-way-up, right-way-round image for general terrestrial viewing. The full range of eyepieces can still be used with this.

Price £4.2.6

TA-14 Quadruple Eyepiece Revolving Turret. Enables rapid interchanging of any four selected eyepieces when viewing.

Price £6.10.0

TA-16 Camera Adaptor. For attaching Reflex cameras with Pentax, Practika, Edixa thread to the "Swift" Telescope. For focal plane photography

£1.17.6

For eyepiece projection photography it is necessary to have a TA-16 adaptor modified to accept eyepieces as well as the camera. The price of this modification is 30/-.

To enable various degrees of magnification to be obtained, a set of Pentax, Edixa, Practika thread camera extension tubes is desirable. They can be supplied per set of three at **£2.0.0.**

Sun Projection Screen. Projects an image of the Sun on to a white metal screen attached to the telescope. Must be used in conjunction with a star diagonal Prism.

£4.15.0

Camera Adaptors for use with the Charles Frank 4 in., 6 in. and 8½ in. Telescopes.

Almost any 35 mm. or 2¼ in. square single lens reflex camera can be fitted to these telescopes by means of an adaptor. It is assumed that the eyepiece projection method will be used with the 4 in. and 6 in. telescope because focal plane photography is not possible with these two instruments without moving the mirror further up the tube to bring the focal plane outside the eyepiece focussing mount. With the 8½ in. Telescope it is possible to slide the focussing mount and the elliptical flat as one unit nearer to the mirror. This has the effect of bringing the focal plane outside the eyepiece mount. It can then be returned to its original position for general viewing without upsetting the optical alignment.

All our adaptors are made to accept the "Swift" push-fit eyepiece, so that those persons who purchase a camera adaptor and who do not already have a "Swift" pattern eyepiece will need to purchase one with the adaptor (unless they only intend to do focal plane photography with the 8½ in.). Any such eyepiece purchased can be removed from the camera adaptor and used in conjunction with an R.A.S. thread adaptor for general viewing. The best eyepiece for eyepiece projection photography is either the 26 mm. or 20 mm. focal length. Price of adaptors depends upon the type of camera. For Pentax, Edixa, Practika cameras, price is **£1.7.6**, plus cost of eyepiece and any extension tubes, if required. For bayonet fitting cameras the price is higher.

STAR FINDERS (without mounting bracket)

Model No. 22—Fully achromatic. Length 1 in. Diameter 1 in. Cross hair graticule. Has no magnification, its main function being to bring the cross wire on to the same focal plane as the image of the object being viewed. Ex-Government. 25/-

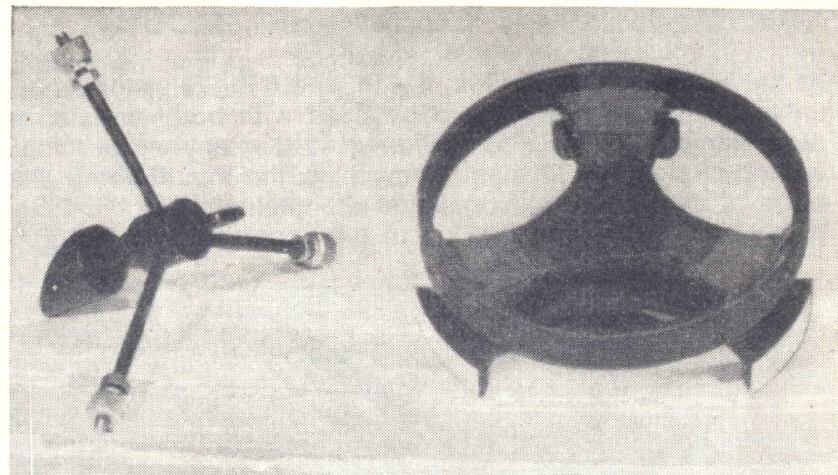


Model No. 42—This is a high grade fully achromatic star finder and no less than 10 optical elements are used in its construction. Length 11 in., diameter 1 in. with 31 mm diameter eyepiece; cross wire graticule. Ex-Government. £2.15.0



STAR FINDER BRACKET

Two types of mounting brackets are available. **Type I**, suitable for fitting direct on to any telescope tube and secured with two 2BA nuts and bolts. 3 point suspension. **Type II**, similar to Type 1 but with special base for mounting direct on to our helical focussing mount. Price of either £2.0.0



A

B

THE CHARLES FRANK MIRROR CELL AND ADJUSTABLE MOUNT FOR 6 in. MIRROR

This improved mount and cell has fully floating adjustable 3-point suspension, and the design is such that air is allowed to circulate freely around the mirror, thereby avoiding uneven expansion or contraction. Finished in matt black.

Illus. B

£3.17.6

SPIDER FOR 6 in. REFLECTOR (Illus. A)

This Charles Frank Mount for the elliptical flat has been specially designed to give full range of adjustment to the flat. Adjustment is precise and straightforward. Finish in matt black.

£2.15.0

As the arms in this spider are interchangeable it can be supplied with longer arms to suit telescope tubes of 10 in. or 12 in. diameter for an extra 10/-.

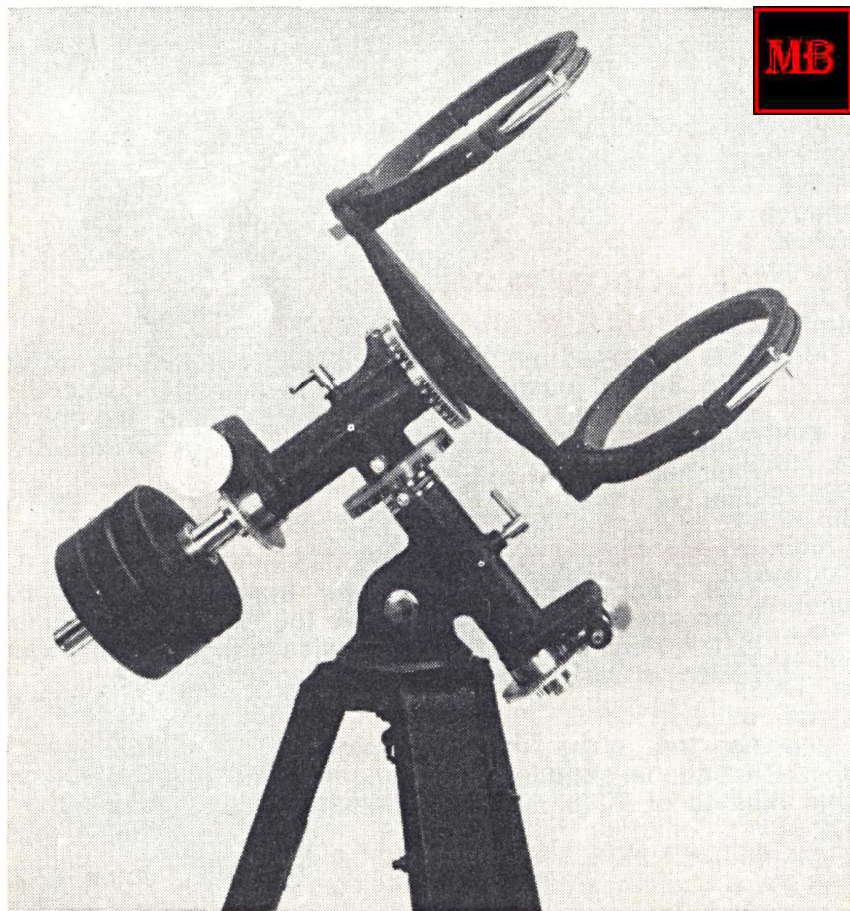
SPIDER FOR THE 4 in. REFLECTOR

Price £2.7.6



The Charles Frank EQUATORIAL MOUNT

At the same time as the Mk. II 4 in. and 6 in. Telescopes were put on the market in 1963, it was decided to design a special heavy duty universal mount which could be used with both models, as well as with refracting telescopes, by means of a range of interchangeable tube clamps. It was also designed so that anyone purchasing a mount could at any later date purchase slow motion drives and/or setting circles and fit them themselves, the mount being already machined and holes drilled and tapped to accept them. The major parts of this mount are precision die castings and the Polar and Declination axes are 1 in. diameter steel shafts. It is suitable for reflectors up to 6 in. aperture and Refractors up to 3½ in. or 4 in.



Price of Mount complete with one pair of tube clamps (for 7 in., 4 in., 3½ in., 3 in. and 2½ in. tubes) (state size required) and one balance weight, finished in Black Crackle and Chrome £17.10.0
 Ditto but unpainted and unchromed £14. 0.0
 Extra balance weights black crackle finish £1. 0.0
 Unpainted 15/-

Those who wish to construct their own telescope mount and have access to a drilling machine and a 3½ in. lathe, may purchase a set of unmachined casting and all parts for the above amount for
 Per Set £8.10.0

For those not having access to a lathe, we can drill and ream both axes for £1 extra.

All screws and clamping bolts are provided and the two steel axis bars are threaded ¼ in. Whitworth.

A Heavy-Duty Rigid Alloy Tripod for the above Mount can be supplied in green finish. £4.15.0
 In black crackle stove enamel £5.15.0

This Tripod extends from 3 ft. to 4 ft. 11 in. and can be locked in any position between these sizes.

PILLAR STAND as supplied with De Luxe 6 in. Telescope £22.0.0
 (Mount extra)

Geared Drives, Motors and Setting Circles for this mount are listed separately under accessories.

Where the above mount is to be used for 6 in. Telescopes, or fitted with synchronous motor drive, we recommend the fitting of a ball bearing thrus race on the Polar axis shaft before sliding the shaft into the Polar axis casting. This removes any friction between the two opposing faces.
 Price each 18/6

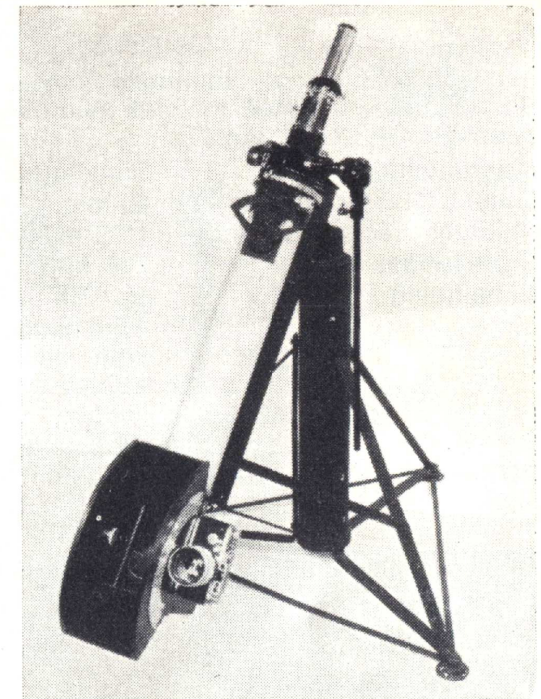
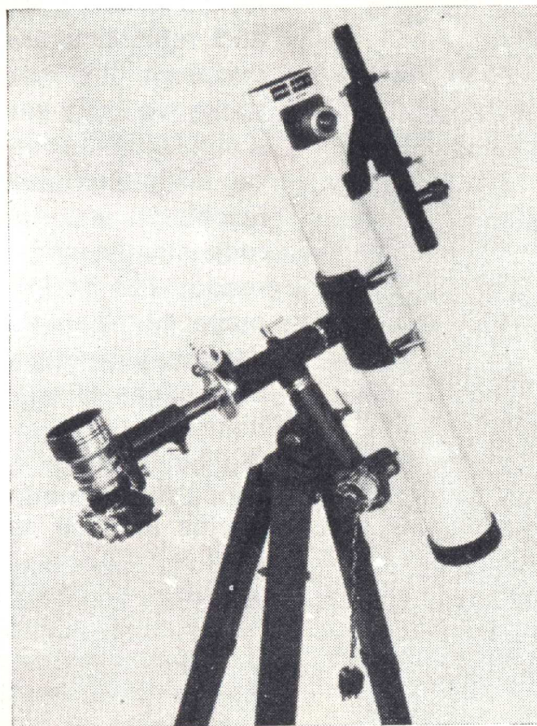
SPRINGFIELD TELESCOPE

These telescopes are not a standard production and are only built to special order. The Springfield was originated by Russel W. Porter and it utilises a special mount with hollow declination axis through which the image forming rays are reflected into a fixed position eyepiece. The great advantage of this kind of construction is that all observations are made from a fixed and comfortably seated position enabling prolonged and accurate observations to be made. Apart from this special feature it is basically a reflecting telescope of the Newtonian type. We would be pleased to quote on request.



CHARLES FRANK ASTROGRAPH

This instrument is designed for wide field photographic recording of star fields, nebulae, etc. It is basically a 4 in. Reflecting Telescope in which the main telescope is used for guiding. The addition of hand slow motion gearing to the declination axis and a synchronous motor drive at sidereal rate to the polar axis enables long exposures to be given. Almost any type of camera from miniature to 5 x 4 can be attached to the bracket provided. Price of the complete instrument, excluding camera, is in the region of £55.0.0 but full details can be provided on request.



POLAR TELESCOPE

These Polar Telescopes manufactured by Charles Frank are increasing in popularity and the attraction of this instrument is that observations can be carried out in the comfort of an enclosed and heated observing hut. These Polar Telescopes are of the refracting type and we are at present producing two models as follows:—

With 3 in. Object Glass ... £95.0.0
With 3½ in. Object Glass ... £135.0.0
Full details on request.

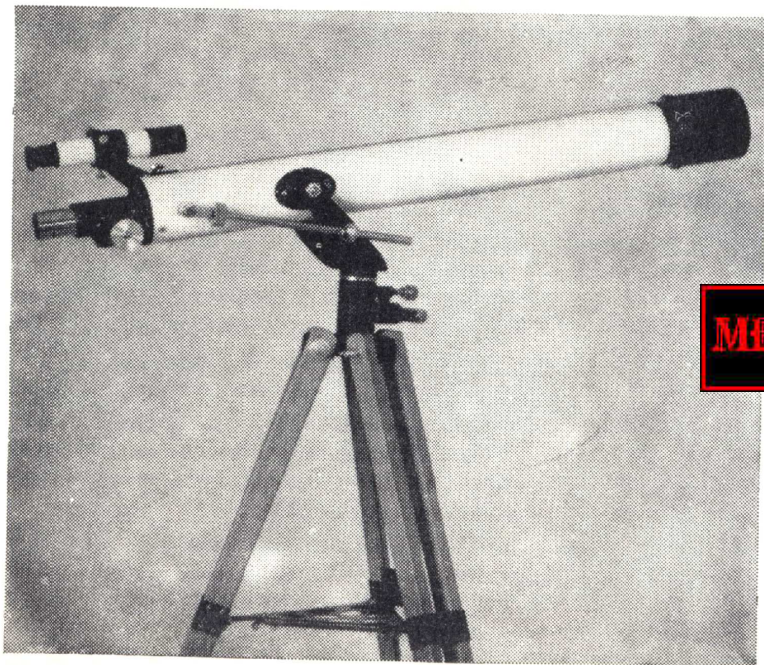
ASTRONOMICAL REFRACTOR

In the lower priced Japanese Astronomical refractors we would be inclined to think that this can be included amongst the 'best buys'.

Magnification	56x, 112x, 117x, 234x
Object Glass diameter	60 mm.
Faintest discernable star	10.9 magnitude.
Tube length	680 mm.
Tube finish	smooth white
Mount	Altazimuth Mount with vertical and horizontal fine adjustment.

H.6 mm. ocular; 12.5 mm. ocular; 5 x 24 viewfinder, 2x Barlow Lens, star diagonal prism, sun lens, 1.5x erecting eyepiece; with full length telescopic tripod.

29 gns.

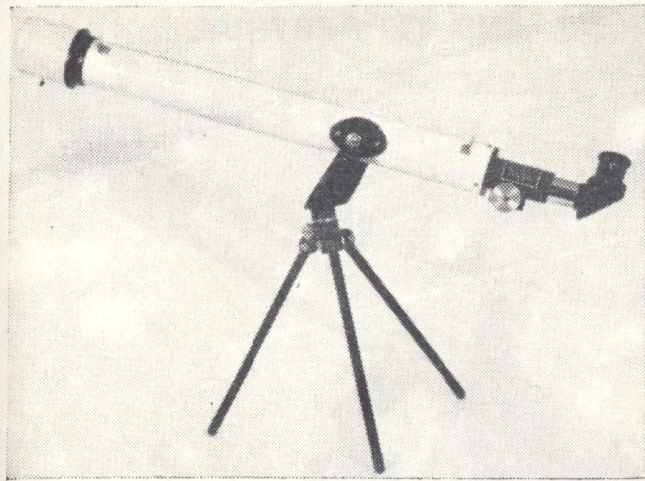


ARE JAPANESE ASTRONOMICAL TELESCOPES WORTH BUYING?

This is a question which crops up daily, but we are always apprehensive of giving a simple 'yes or no' answer. In the past few years, the Japanese optical industry has made tremendous strides, and they are now capable of making lenses which are every bit as good as the best of the German lenses. The quality of top Japanese Binoculars, for instance, is superb, and these Binoculars represent amazing value. Their small Telescopes, too, are unbeatable, and a Japanese telescope costing today £2 is equal in quality and performance to a telescope which would have cost about £6 a few years ago. Nevertheless, the buyer of Japanese Telescopes should not be lulled into thinking that all instruments from Japan are good, for we have found that the larger Japanese equatorially mounted reflectors and refractors are far from satisfactory. Whilst their optics are usually excellent, the mount and tripod is generally of flimsy construction and those we have seen are quite incapable of supporting the telescope with a sufficient degree of steadiness. The importance of rigid mounting cannot be over-emphasised, and we make no apology for saying that the Equatorial and Altazimuth Mounts which we manufacture in Glasgow are rock steady; and we are vain enough to say that a better mount is not made. The design of these mounts is such that they can be fitted to any make of telescope, and those of our customers who already have a Japanese Telescope with flimsy mount and tripod may wish to avail themselves of our Mount and Tripod, which can be supplied as separate items.

We have shown elsewhere in this catalogue the Japanese SWIFT Telescope fitted to our own Mount and Tripod. This combines the best of both worlds and the resultant instrument stands comparison with the world's best.

The Japanese Refractors shown on the following pages are of simple design and reasonably stable. They have been carefully selected and represent excellent value. We are not offering for sale any Japanese Reflecting Telescopes for those we have seen are of poor design and quality and do not in our opinion represent good value.

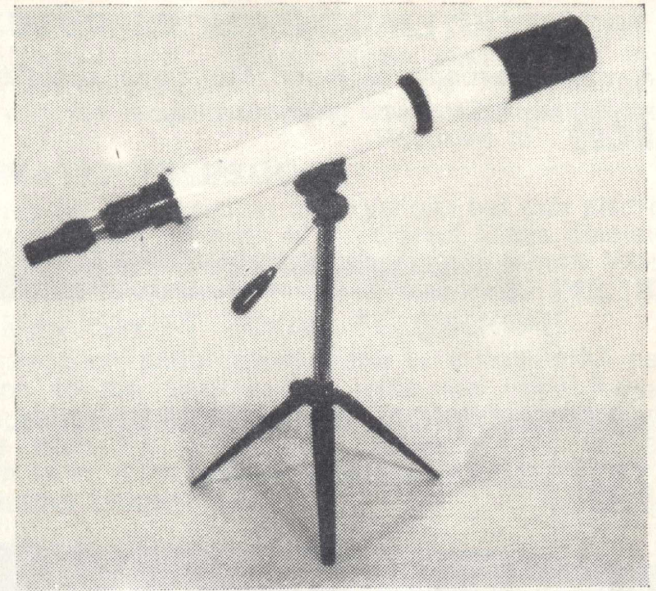


PRISMATIC ASTRONOMICAL REFRACTOR

Object Glass diameter 50 mm.
Magnification 50 \times . This
telescope is intended for
astronomical observations and
is unsuitable for land use.
Complete with diagonal prism
and sun filter.

£12.12.0

MB



VARIABLE POWER TELESCOPE

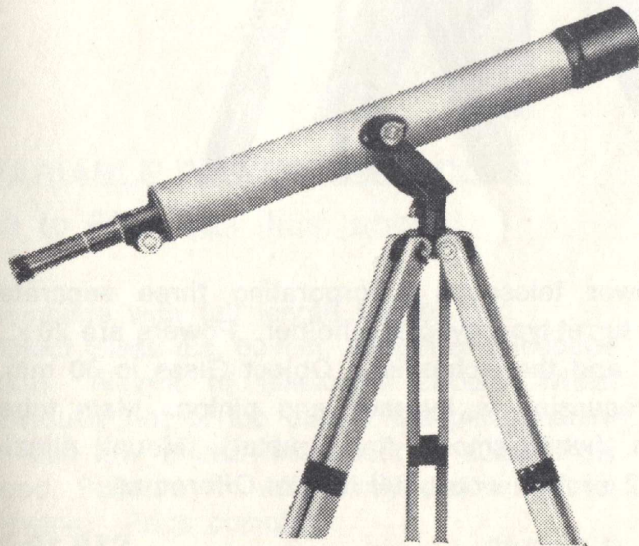
Astronomical and terrestrial
pancratic eyepiece with
powers of from 40 \times to 60 \times .
Object Glass dia. 60 mm.
Length of tube 28 mm. with
full length tripod.

£13.19.6

Mk. II ZOOM TELESCOPE with Table Tripod

A superior quality instrument which can be
zoomed from 15 \times to 60 \times . High light trans-
mission is obtained with the 60 mm. diameter.
Object Glass. Length 23 in. An excellent
telescope for either astronomical or terrestrial
observation (illus. above).

£24.3.0



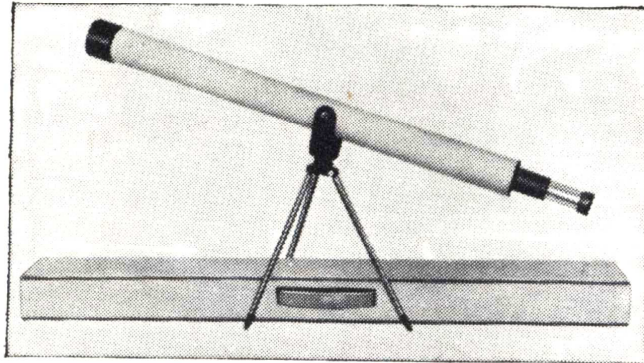
THE SCOUTER GENERAL PURPOSE TELESCOPE

A new telescope of much the same specification as the Army Signalling telescope. Without case:

£8.15.0



ASTRONOMICAL AND TERRESTRIAL TELESCOPE (MOD. 5/01)



A moderately priced telescope suitable for Astronomy and land viewing. Power is 30× and Object Glass diameter is 40 mm. Supplied complete with detachable table tripod in gift box.

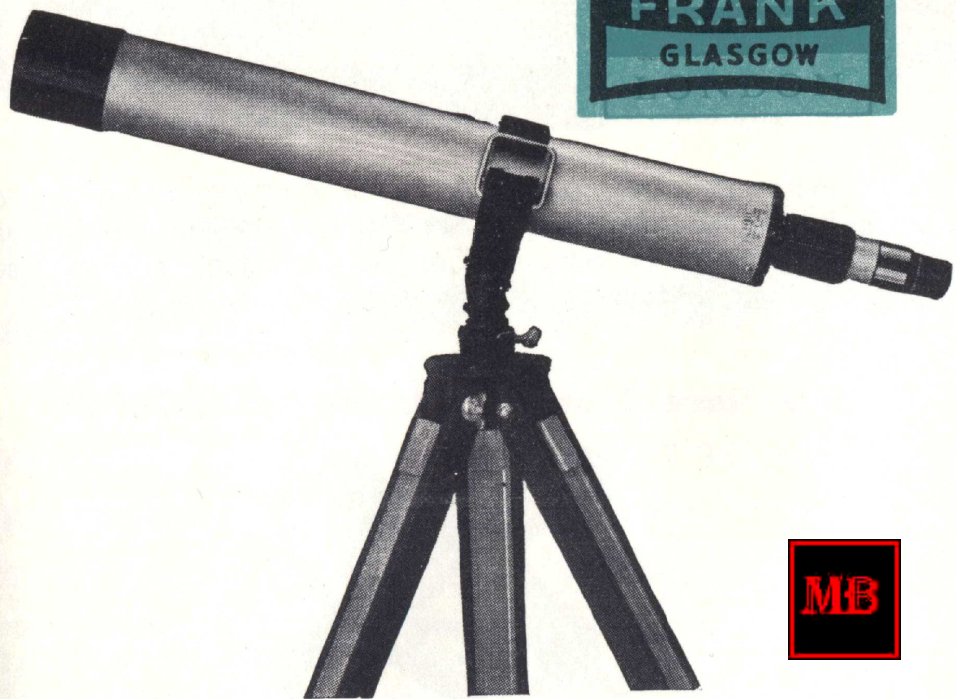
£4.12.6

ASTRONOMICAL AND TERRESTRIAL REFRACTING TELESCOPE



A variable power telescope incorporating three separate eyepieces in a turret-type eyepiece holder. Powers are 20×, 40× and 60× and the Achromatic Object Glass is 60 mm. in diameter. Focussing is by rack and pinion. Main tube length 750 mm. (white smooth finish metal). Mount, Altazimuth. Tripod, 2 section wood, full length. Offered at

£19.19.0



VARIABLE POWER TELESCOPE

40 to 60x (as illus. above)

Complete with full length tripod. Object Glass dia. 60 mm. Length of telescope 23 in. Weight of telescope 27 ozs. Whilst obviously not of top quality the performance of this low priced instrument is surprisingly good. Suitable for Astronomy and terrestrial viewing. Price complete

£15.15.0



LAND AND ASTRONOMICAL TELESCOPE

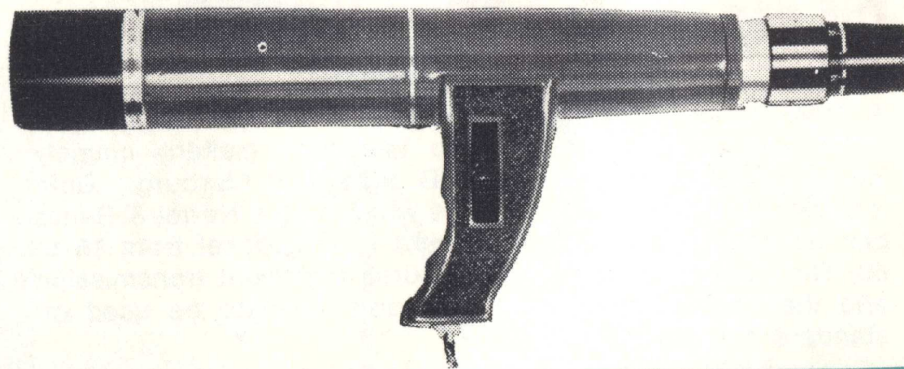
Magnification 40x. Object Glass diameter 60 mm. Metal tube finished white. Length 28 in. Supplied complete with full length extending wood tripod in gift box. Reduced to **£9.19.6**

PRISMATIC TELESCOPE

Primarily for astronomical observations but can also be used terrestrially. Power 40x. Object Glass diameter 60 mm. Length of body 20 in. Altazimuth Mount. Wood extending Tripod. Reduced to **£13.19.6**

The New SWIFT ZOOM TELESCOPE

This precision pistol zoom-scope is a wonderful new addition to the Swift range. With the "one finger" focussing wheel power can be zoomed smoothly and swiftly from 6x to 18x. Lightweight at 16 ozs. Length 14 in. First-rate value at only (Illustrated below). **£8.8.0**



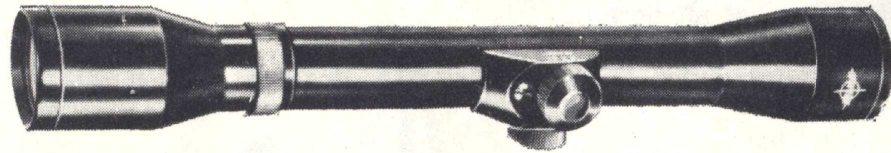
THE CHARLES FRANK ASTRONOMICAL REFRACTING TELESCOPE

A new Telescope made in our Glasgow factory which should prove of especial interest to educational authorities and to the young enthusiast. The Telescope is well made and is 42 in. in length, with an object glass of 47 mm. external diameter. Linear power is 30x, and image is inverted. A tripod is not provided with this telescope, but the instrument can be rested on the window sill or suitable ledge. Price complete **£1.5.6**

TELESCOPIC RIFLE SIGHTS

BY SWIFT

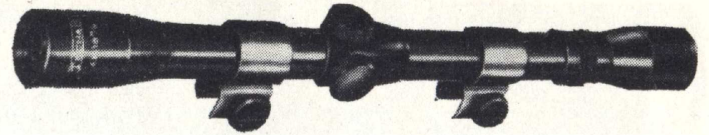
TRADE SUPPLIED



830 SWIFT RIFLESCOPE 4 x 31

A beautifully built instrument, carefully designed for maximum performance without unnecessary frills . . . Fully tested to withstand hard use. For most shooting purposes, this scope's 4x magnification provides the ideal power. 3 in. eye relief ensures comfortable aiming. 31 mm. objective provides brilliance equal to night binoculars. Fine windage adjustment changes angle of aim 15 seconds of arc per click (equal to $\frac{1}{4}$ in. at 100 yds.) and total range of adjustment is 18 minutes of arc (equal to 18 in. at 100 yds.) each side of dead centre. Duralumin tube is strong, rigid and light (total scope weight 10.5 oz.). Overall length 12 in. Complete with leather lens caps. Gift boxed.

£9.19.6



TECNAR RIFLESCOPE By Swift

Model 846—4 x 18

A well-made scope, carefully designed for good performance at low price. Ideal for small-game hunting and target practice. Thumb-screw type, clamp-on mounts fit virtually any popular rifle or air gun. Standard, rifle-blue exterior finish protects against corrosion. Magnification 4x—Objective aperture 18 mm.—Field at 100 yds. 20.95 ft. (4°)—Eye relief 3 in.—Exit Pupil 4.5 mm.—Relative brightness 20—Cross-hair graticule—Weight 7.05 oz.—Length $11\frac{1}{8}$ in. Tube diameters: Main $\frac{3}{4}$ in., Objective 1 in., Eyepiece $1\frac{1}{16}$ in.

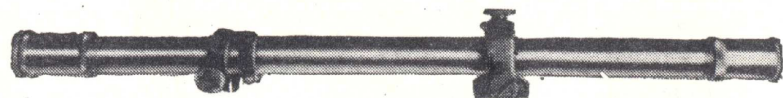
£4.8.0

MB



Binocular Specialist for over half a century.
Europe's greatest selection of Binoculars and Telescopes.

EX-GOVT. RIFLE SIGHTS and SIGHTING TELESCOPES



U.S.A. WINCHESTER RIFLE SIGHTS

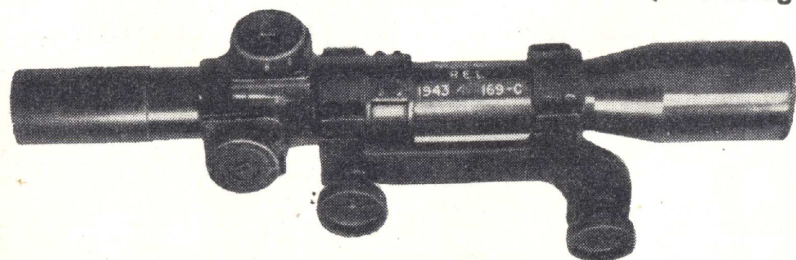
This is the famous .22 featherweight Winchester, weighing only 9½ ozs. Length 14 in. Four adjustments—Focusing, Parallax, Windage, Elevation. (The windage and elevation adjustments are incorporated in the fitted mounts). Graticule—Crosshair. Magnification 2½x With barrel blocks.

£3.15.0

SIGHTING TELESCOPE No. 22

A precision Sight constructed of brass. Length 13 in. Outside dia. 1 in. Weight 18 ozs. Graticule: Crosshair and pointed post with Right and Left correction on Crosshair. Fully achromatic optical system giving high light transmission and no magnification.

25/- Postage 1/6

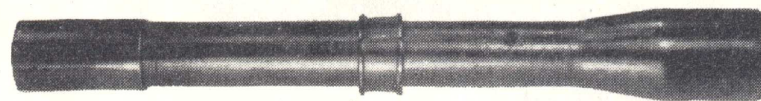


RIFLE SIGHT No. 32

Out of stock at time of going to print—when available price approximately £5.15.0.

NEW SIGHTS

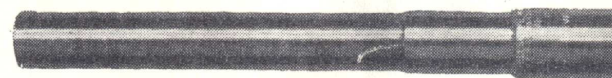
Elsewhere in this catalogue is shown the new range of Swift sights. They are fine instruments and we can thoroughly recommend them.



RIFLE SIGHT No. 42

Weather-proof Sight for all calibres from .22 to .303. Good luminosity is combined with remarkable definition. Specification: Magnification 3½x. Eye relief 3 in. Diameter of body tube 1 in. Nett weight 17 ozs. Overall length 11 in. Diameter of eye lens 31 mm. Diameter of object glass 17 mm. Crosshair graticule or with crosshair and pointed post. Complete with Parker Hale mounts and blocks.

85/-

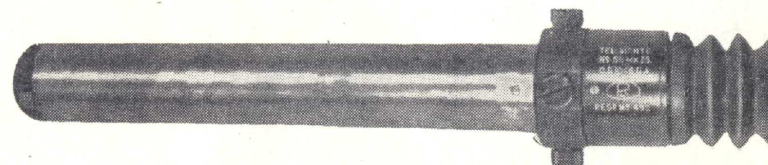


M45 TELESCOPE SIGHTS

Specification: Magnification 2x. Approx. diameter of body tube 7/8 in. Diameter of O.G. 5/8 in. Overall length 8¾ in. Weight 10 ozs. Eye relief 3 in. Graticule: short vertical and horizontal graduations. With Parker Hale mounts and blocks.

57/6

Specially fitted crossline graticule 15/- extra



SIGHTING TANK TELESCOPES

The optical system consists of five achromats, all of the highest quality. For the experimenter and for certain industrial applications, this is an excellent instrument. Average Specification: Magnification 2½x. Dia. of O.G. 1½ in. Dia. of Eyepiece lens 1½ in. Graticule Crosslines. Eye relief approx. 2 in. Weight 6½ lbs. Length 16 in.

35/- Post and Packing 2/6



CHARLES FRANK PRISMATIC SPOTTING TELESCOPE

Designed with the marksman in mind this high quality prismatic telescope is comparable to the world's finest. Magnification is 22 \times and object glass is 50 mm. Extremely smooth focusing is achieved by precision multi-start thread on the micrometer eyepiece. Ideal not only for the marksman, but also for the bird watcher, astronomer and for those who seek a fine instrument for long range viewing. The instrument is 14 in. in length and weighs 3 lbs.

An Ex-Govt. table tripod is provided, but the instrument can be speedily detached from the tripod and hand held. Price complete.

£19.10.0

Approval facilities available; compare this telescope with your own!



EX ADMIRALTY 7 x 50 TELESCOPE

This superb instrument has been adapted in our own workshops and is ideally suited for long range viewing, Lunar, planetary and Satellite observations.

It is of heavy construction—nett weight being 13 lbs. The Binocular face-piece covering both eyes makes viewing a positive pleasure, and the fitted filters ensure best performance in the haze, sunshine, etc.

This is one of the finest instruments made for service needs and in its present Tripod mounted form it is a most valuable instrument for observations of all kinds.

£10.15.0

Part Carriage 5/-

BOOKS ON ASTRONOMY AND AIDS FOR STAR STUDY

Books to the value of £2 and over post free

MB

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Terry Maloney

Beginning with the simplest phenomena that we can observe with our eye alone the author leads us into increasingly involved concepts. His clear explanations, vivid illustrations and the book's unusual photographs makes even the most hard-to-grasp wonders intelligible. illus. 17/6d

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James Muirden

No specialised knowledge is assumed on the part of the reader and the author shows how versatile an ordinary pair of binoculars can be in viewing comets and meteors and the slow drifting of the planets; to say nothing of the inexhaustible reaches of the stellar heavens into which binoculars can make surprising inroads. illus. 25/-

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Absorbingly interesting and informative for those who wish to venture into this exciting field of amateur activity. illus. 25/-

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An exciting biography of one of astronomy's greatest figures. illus. 12/6d

BOOKS ON ASTRONOMY AND AIDS FOR STAR STUDY

FRANKS BOOK OF THE TELESCOPE

One of our own publications which we can recommend to all those interested in astronomy. It contains chapters on Reflectors, Refractors and on specialised instruments, Catadioptric systems, etc. To quote from Sky and Telescope "The amount of information contained in this small volume of 132 pages is truly amazing". Well illus. **8/6d**

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A book which we can thoroughly recommend to the telescope maker. Step by step instruction is given on the simple hand grinding, polishing and testing of a mirror. profusely illus. **45/-**

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Amateur Telescope Making—Book 1 provides an immense amount of information for the home builder. illus. **£2.2.6d**

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advanced

Covers somewhat similar ground to the preceding work but deals with amateur made instruments of somewhat greater refinement. illus. **£2.17.6d**

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Book III

The articles in this work go into deeper theoretical territory than either of the two previous works of the series, considerable information is provided concerning objectives and camera lens computation, diffraction theory, binocular collimation, Schmidt telescope construction, and the quartz-polaroid monochromator. Not a work for the beginner. illus. **£2.17.6d**

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Originally drawn by Elger. Notes on notable features by Dr. Wilkins. **5/-**

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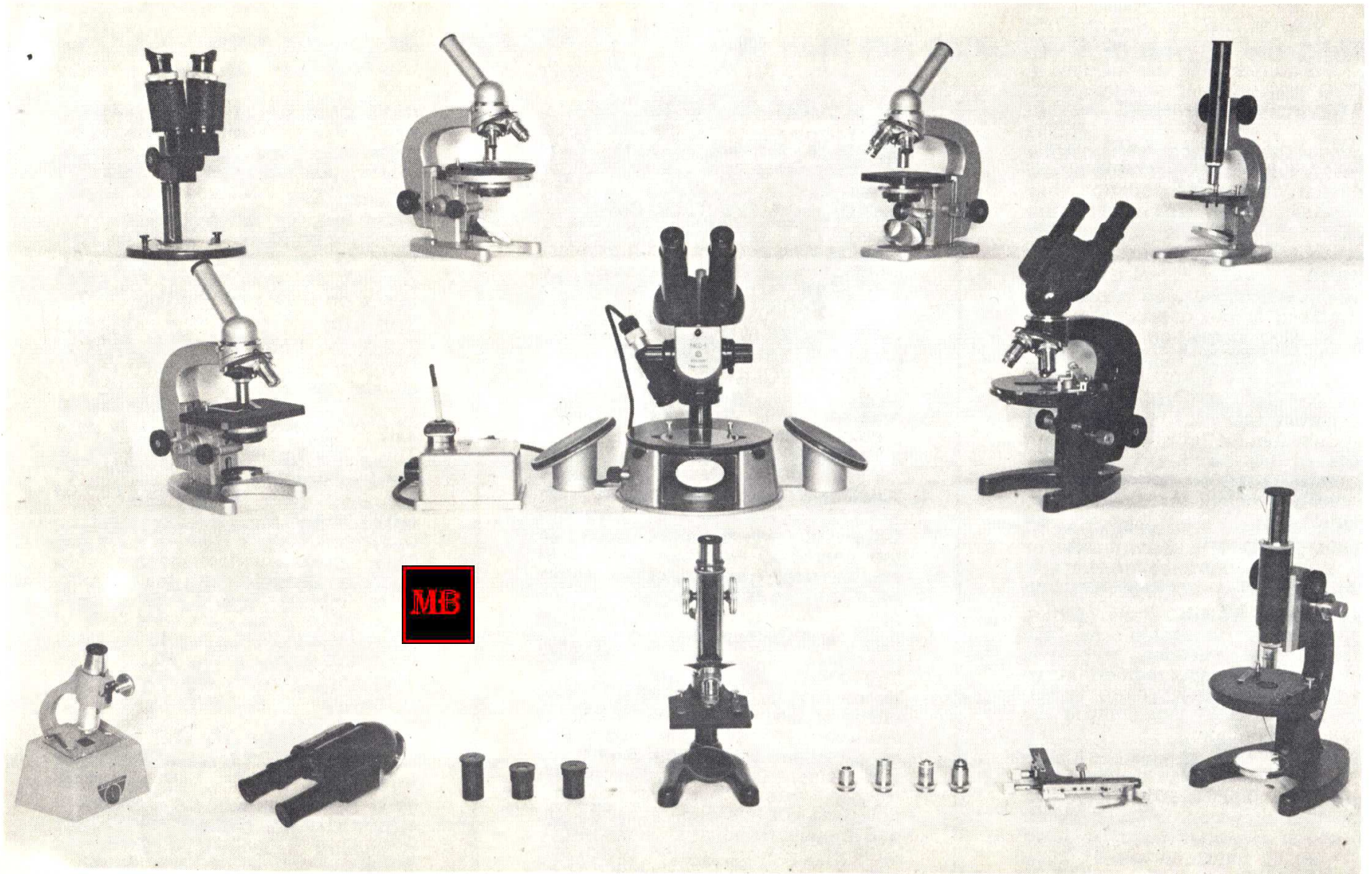
This quite understandably has become recognised as the astronomers bible. Packed with useful information it also contains lists of 500 interesting objects and no fewer than 9000 stars clusters and nebulae. We can thoroughly recommend this publication to the serious observer. **21/-**

AN EASY GUIDE TO THE CONSTELLATIONS

Gall Inglis
With a Star Atlas. **3/6d**

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Peck
A popular guide to a knowledge of the stars. illus. **4/-**



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MICROSCOPES :

This leaflet presents a very brief summary of technical data on a small section of the range of instruments we handle. Of the new Microscopes available on the British market today, we would be inclined to recommend the range of Russian Instruments as representing best value. They are good both optically and mechanically and the purchaser has the satisfaction of knowing that ample spares are available and, thanks to our expertly staffed and well equipped workshops, we are able to attend to repairs and adjustments without delay. Arrangements can be made to submit any of the following Russian Instruments on approval and, if required, our technical representative will be pleased to call on you.

SHM-1 Student Microscope. (Illus.A). Approved by Nuffield Foundation, this is a robust monocular instrument using standard objectives and eyepieces, and providing a range of magnifications from X56 to X300. The focussing mechanism is by rack and pinion and the microscope has a die-cast foot and limb which is inclinable. The circular stage is non-corrosive. Sub-stage aperture control with click stops is provided. Finish is hammer grey and black. The microscope is supplied complete with X8 and X20 objectives, X7, X10 and X15 eyepieces, all in strong wooden case with additional accessories..... £16:16: -

MBU-4 Biological Microscope. (Illus.B). Approved by Nuffield Foundation. A well made instrument using standard R.M.S. objectives and eyepieces providing a range of magnifications from X56 to X300. The coarse focussing mechanism is by rack and pinion and side fine adjustment is graduated in .002 mm. divisions. The instrument is inclinable and the circular stage is non-corrosive. The sub-stage is provided with three interchangeable diaphragms which can be selected in accordance with the objective used. Finish black and chrome. Complete with X8 and X20 objectives, X7, X10 and X15 eyepieces. In fitted wooden case with lock and key £23:17: 6

BM-51-2 Stereoscopic Binocular Microscope. (Illus.C). An instrument with application in School, Laboratory and Industry. It has also proved to be of inestimable value for the prolonged inspection of coins, stamps, handwriting etc. The instrument has a wide field of view and long working distance. Focussing is by rack and pinion, magnification X8.75. Price complete in fitted box £25:15: -

MBR-1E Biological or Laboratory Microscope. (Illus.D). An extremely well made general purpose full-size monocular microscope, incorporating deeply curved limb which allows the use of extra large culture plates. Fine adjustment is graduated in .002 mm. divisions. The stage is rectangular (5" x 3 1/2") and can accommodate the CT-12 mechanical stage which can be provided, if required, as an extra. The microscope is fitted with a quadruple nosepiece, rack and pinion focussing sub-stage, with Abbe condenser, iris diaphragm and filter holder. The standard R.M.S. objectives and eyepieces supplied provide a magnification range from X56 to X600. Supplied complete with X8, X20 and X40 objectives; X7, X10 and X15 eyepieces; in fitted wooden case with lock and key..... £39:19: 6

MBR-1 Biological or Laboratory Microscope. (Illus.E). Probably the most popular microscope in the Russian range, this versatile instrument is being used in leading hospitals and universities throughout the world. Both coarse and fine mechanisms activate the limb whilst the circular stage remains stationary. This stage is of the centring rotating type and lends itself particularly well for photomicrography. Standard R.M.S. objectives and eyepieces provide a magnification range of from X56 to X1350. The fine focussing is scaled to divisions of 0.002 mm. Supplied with three eyepieces and three standard objectives equivalent to 2/3", 1/6" and 1/12" oil immersion. The eyepiece tube is inclined and may be rotated about its axis and clamped in any desired position. The sub-stage is rack and pinion focussing with Abbe condenser (aperture 1.2). The instrument is supplied complete in fitted wooden case £49:10: -

MBD-1 Portable Microscope. (Illus.F). A well made instrument designed for maximum portability. It is of similar design and specification to the MBR-1 and MBR-1E and also incorporates the deeply curved limb. The stage is 3 1/2" square and sub-stage focusses by rack and pinion. Abbe condenser (aperture 1.2) condenser top lens is removable for use with objectives having initial magnification of X8 or less. Eyepiece tube inclinable and can be rotated and clamped in any position. Quadruple nosepiece with four objectives including water immersion and oil immersion. Two Huyghenian Eyepieces and one compensating eyepiece providing a range of magnifications and X63 to X1350. Complete in fitted carrying case 10.3/8" x 8.3/4" x 4.1/2". Total weight when packed in case 11 lbs..... £54:10: -

MICROSCOPES:

MBS-1 Stereoscopic Microscope. (Illus. G) A modern Stereoscopic Microscope giving a brilliant erect image in either transmitted or reflected light. The revolving indexed drum on the main body of the microscope has magnification factors of X 0.6, X1, X2, X4 and X7. Pairs of X6, X8 and X12.5 eyepieces are included in the outfit and the microscope has a range of total magnifications from X3.6 to X87.5. The circular base is fitted with an adjustable mirror and matt reflector for use with transmitted light, the lighting unit being screwed into the rear of the base. The stage aperture holds either a clear glass plate or a metal disc and provision is made for fitting the attachable mechanical stage CT-12 should this be required. The binocular head is reversible and the body unit is adjustable for height on the vertical column. Focussing is by rack and pinion. The instrument is complete with pairs of X6, X8 and X12.5 eyepieces, and single X8 micrometer eyepiece with combined scale and crossline graticule, five objectives. The working distance remains constant at 64 mm. Supplied in cabinet with accessories - lighting unit with transformer and rheostat, two spare bulbs, arm rests..... £125: -: -

MBS-2 Optically identical to Model MBS-1. The microscope body is mounted on a universal stand that has a rack and pinion movement on the horizontal arm. Height of the vertical column is 15 $\frac{3}{4}$ ". Supplied with full range of accessories. Price complete.. £134: -: -

MPS-1 Stereoscopic Polarising Microscope. (Illus. H). Provides an erect, three dimensional image. Observation by transmitted or incident light or by transmitted or incident polarised light. Magnification range X3.6 to X87.5, working distance 64 mm. Circular, rotating, divided stage and additional rotating stage mounted to an angle of 11°. Price complete in fitted case..... £165: -: -
Full technical data of this instrument can be provided on request.

MIM-7 Metallographic Microscope. designed for the visual examination and photomicrography of the microstructure of metals by bright and dark field illumination and by bright field polarised light. For visual observation, the range of magnification is from X60 to X1440 and for photomicrography from X70 to X1350. Supplied with range of optics and accessories. Price complete £425: -: -

MIN-10 Polarising Microscope . Orthoscopic/conoscopic instrument designed for the observation of transparent specimens in transmitted polarised light. Magnification range from X17.5 to X900. Fully rotating stage graduated to 360°. Extensive optical outfit includes Planachromat and Achromatic objectives, Micrometer and Compensating eyepieces and a full range of accessories. Price complete... £120: -: -

ACCESSORIES & OPTIONAL EXTRAS: The following is a selection from our extensive stocks of accessories for Russian Microscopes:-

AY-12 Binocular Attachment. For adapting to MB range. One of the eyepiece tubes is provided with a dioptric adjustment of $\frac{+}{-}$ 5 diopters. Supplied with matched X7 and X10 eyepieces. Packed in case. Initial magnification X1.5 Magnification of Huyghenian eyepieces X7 and X10 Range of interocular adjustment from 55mm to 75mm..... £37:10: -

CT-12 Mechanical Stage. A simple and convenient device to effect the movement of a specimen on a microscope stage, both vertically and horizontally, and to measure the co-ordinates of objects being investigated. The CT-12 has scales and verniers reading to 0.1 mm with movements of 30 mm. in the vertical and 80 mm. in the horizontal directions..... £11:10: -

01-10 Light & Dark Field Condenser. Suitable for use with the Biological Microscope MBR-1 and gives bright and dark field illumination with transmitted light. The 01-10 may be used for routine investigations of specimens as well as for the preparation of living organisms in humid chambers. When using dark field illumination the numerical aperture of the condenser, 0.7 should be greater than that of the objective. The numerical aperture of the light field condenser is 0.6 . Supplied in individual polished wood case £10:10: -

01-13 Dark Field Oil Immersion Condenser. The Dark Field Condenser N.A.1.2 may be used with both dry and oil immersion objectives. In the latter case the aperture must be reduced. A funnel stop is included for use with the X90 oil immersion objective N.A.1.25. The condenser is supplied in a centring substage mount. The 01-13 is supplied packed in a polished wood case £8:17: 6





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