BRITISH ASTRONOMICAL ASSOCIATION: VARIABLE STAR SECTION

CIRCULAR No. 18 1974 APRIL

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Distribution of Circulars. During the past two years, the number of members to whom these Circulars are sent has increased from about 100 to well over 300. As mentioned in VSSC 17, we would like to produce more substantial Circulars more frequently, and, to allow us to do so without causing further strain on the production team, the following arrangements will be introduced with effect from our next issue.
Overseas members will continue to receive the Circulars as at present.
Members in the UK who wish to receive Circulars are asked to send several stamped self-addressed envelopes, of at least 8½" x 4", to the Director. Write "LAST SAE" on the top left-hand corner of one of the envelopes; this will serve as a reminder that a further batch of SAEs must be sent in.
Since the Circulars include requests for observations, and notification of changes to the Section's programme, charts and sequences, we trust that all observing members will take the necessary action.

Charge for Charts. In order to reduce the constant drain on chart stocks caused by requests from inactive members, and from those who appear to be collecting charts simply because they are free, a nominal charge has now been introduced.
For those stars for which the set of charts comprises a single sheet, the charge will be 3p, plus postage.
For those stars for which the set of charts comprises two or more sheets, the charge will be 2p per sheet, plus postage.
The enclosed list of stars under observation by the VSS in 1974 states for each star how many sheets are contained in each chart set. Part sets will not be supplied, but where self-contained binocular charts do not exist, they will be prepared, for those telescopic objects which are usefully observable in binoculars when they are bright. The absence of a number implies that, at the time of writing, no charts are available for the star concerned.
Small payments may be made in postage stamps. Observers who write to Mr. Anderson for charts without requesting specific stars will be allocated objects within the range of their equipment which are most in need of observation.

A New Binocular Group. Alan Pickup writes: "Over the past six years, for most of the time under the direction of John Isles, the Binocular Sky Society has developed an extensive programme covering over 200 variable stars (mainly semiregular, irregular and eclipsing variables) observable using binoculars. Many people have felt that the proper place for this programme was within the BAA VSS, to which many of the BSS members belong in any case. Preliminary agreement has been reached between both groups on how such a reorganisation should take place, and details of the structure and programme of the new Binocular Group resulting will be given in the next VSS Circular. Meanwhile would-be observers should write to the Coordinator of the Binocular Group, who is also the present Director of the BSS, stating experience and instruments used:

D A Pickup
38 Brockwood Avenue
Penicuik, Midlothian, Scotland
EH26 9AN "

Chart and Sequence Amendments. Observers of UW Aql, BC Cyg, BI Cyg, U Ori, RS Per and BU Per should note carefully the following amendments. Revised charts are available from Steve Anderson, and they will be supplied free of charge to members who are already working on the variables concerned.

UW Aql: The sequence has been revised as indicated below. The revised charts have been designated as 'finals':

Star	Old mag	New mag
A	7.4	7.4
B	8.1	8.0
C	8.6	8.3
D	8.8	8.6
E	9.1	9.1
F	9.3	rejected

G	9.7	9.5
H	10.0	9.9

BC & BI Cyg: Certain stars in these sequences have been revised as indicated below; the rest of the sequences remain unchanged. The additional faint comparison stars are indicated on a new 1º chart which, together with a re-drawn 3º chart, has been designated as 'final':

Sequence	Star	Old mag	New mag			
BC Cyg	A	9.5	9.4			
	D	10.8	10.7			
	E	11.4	11.2			
	F	11.7	11.4			
	G	-	11.8	2!0	Sp	BC
	H	-	12.0	1!5	Nf	BC
	K	-	12.3	2!3	p	BC
BI Cyg	C	10.3	10.1			

U Ori: The faint end of the sequence has been revised as follows:

Star	Old mag	New mag
18	-	9.36
21-72	No change	
83	-	12.3
99	12.31	rejected
107	12.67	12.8
mp	12.9	rejected
mq	13.0	rejected
110, 118 (=mx)	No change	
mt - mw	All rejected	

V529 Ori: The approximate position of this suspected recurrent nova has been indicated on the 9º and 3º field charts for U Ori, and observers of the latter are asked to check for V529 on every occasion they observe U, and to record a negative estimate. The exact position of this object is not known, and any suspicious object in the neighbourhood should be reported to the Director (or any other VSS officer) immediately, by telephone.

RS & BU Per: The following errors in preliminary chart dated 1972 Oct have been corrected, and the revised chart has been re-numbered as a 'final' chart. The sequences are unchanged.

1. Comparison star 6 should be moved 5mm to the left.
2. Comparison star D should be moved 4mm towards 11 o'clock.
3. A 6½m star should be added, 6mm below the star h Per.

U Geminorum. This well-known dwarf nova is also an eclipsing binary, whose period varies, as well as the shape of the light-curve of the eclipse. It would therefore be of considerable interest if observers with instruments in excess of 25cm were to make frequent estimates at the times of predicted minima.
The approximate GMAT of the first primary minimum in the month is listed below. To obtain times of other minima, add or subtract multiples of the period 0.1769^{d}.

1974	Apr	1.14	1975	Jan 1.12
	May	1.04		Feb 1.07
				Mar 1.02
	Sep	1.17		Apr 1.16
	Oct	1.06		
	Nov	1.02		
	Dec	1.09		

When U Gem is at minimum (14.2m), the amplitude is 0.8^{m}, but the eclipses are shallower when U Gem is brighter than 14.2m. The total duration of the eclipse is only 21 min, so estimates should be made about every 2 min for a period of about 30 min centred on the predicted time. The above predictions are derived from the Kracow Yearbook

for 1974, and the Director would like to know whether or not minima are occurring on schedule, so that, if necessary, revised predictions can be issued.
To enable observers to follow U Gem down to 15.0m, several fainter comparison stars have been added to the sequence, taken from a preliminary AAVSO chart kindly communicated by Clinton B Ford, and revised VSS charts are available from Steve Anderson.

Erratum. In the LPV predictions sent out with VSSC 17, '001838 R Cyg' should read '001838 R And'.

Eclipsing Binary Project. Any outstanding observations of eclipsing binaries for 1973 should be sent to the Director as soon as possible, as the annual report on this project is now in preparation.
An information sheet on the project, which explains among other things, how observations are reduced by the tracing-paper method and how corrections are made for light-time, is available free of charge from Steve Anderson. (Enclose a long SAE).
Members are reminded that they may obtain predictions of observable minima of the stars on this programme by sending an 8½" x 4" stamped, self-addressed envelope to J C Smith, 18 St. James' Close, Hanslope, Buckinghamshire.

1973 Observations. The Section Secretary, Doug Saw, has so far received about 24,000 observations for last year (an increase of over 100%!) and is now engaged in checking the magnitude reductions and plotting graphs of the results. He has undertaken a tremendous amount of work, and the Director is most grateful to him.
Any outstanding observations for 1973 (other than of eclipsing binaries) should be sent to the Secretary immediately, so that the plots and our annual statistical summary, which will be published in VSSC 19, can be as complete as possible.
The following notes summarise some of the principal results obtained in 1973; they will be continued in the next Circular. Observers should note carefully which stars require more attention and when.
We should all be very grateful to Doug, without whose efforts this rapid feedback to observers would not be possible.

R And: Min (14.9) in Feb, Max (7.9) in Jul, both rather fainter than usual. Needs more attention when below 14m and during the months Mar-May.
RX And: Standstills Jun 3-12 (12m) and at minimum (13m) from Dec 3 to the end of the year. Outside these standstills the star varied 10.6-13.7 with a mean period of 16^d. Needs more attention during the months Apr-Jul.
R Aql: Max (6.1) early Mar, Min (11) Aug, bright (6.1) in Dec. A hump on the second rise at 8.2m. Needs more attention in Jan.
UU Aql: Maxima around Jul 3 (short), Sep 11 (short) and Nov 16 (long), giving a period of 68^d if no maxima were missed. Underobserved.
R Ari: Max (8.5) late Jan, Min unobserved, Max (8.2) in July or Aug, Min (12.8) late Oct.
R Aur: Max (7.8) early Mar, Min (13.3) in Sep or Oct.
X Aur: Min (12.9) in Mar, Max (8.1) in May or Jun, Min (13.1) in Aug, Max (8.8) in Nov.
SS Aur: Maxima around Jan 26 (long), Mar 16 (short), May 15 (short), Sep 7 (long), Oct 31 (short), Dec 3 (short). If one outburst was missed around July, the mean period comes to 52^d. The star has apparently returned to U Gem-type behaviour, no standstills being observed and the minimum mag being around 14.5. Needs special attention between June and Aug.
R Boo: Min (12.7) early Mar, Max (7.7) Jun, Min (12.3?) early Oct?
S Boo: Min (13.3) early May, Max (8.4) in Sep or Oct.
U Boo: Min (12.6) in Mar, Max (10.6) in Jun or Jul. Needs more attention between Sep and Jan.
V Boo: Min. (9.8) early May, Max (8.0) late Sep; a standstill on the rise at 8.8m.
V Cam: Min (14.4?) in Jan?, Max (9.2) in May or June; a standstill on the rise at 13.0m. Underobserved.
X Cam: Min (12.6) in Feb, Max (8.0) in Apr, Min (13.6) in Jul, Max (9.1) early Oct, Min (12.9) early Dec. Marked variation in amplitude; the second Max was unusually faint and attention was drawn to this by the Section in an IAU Circular.
Z Cam: Standstill (11.2-12.2) until about Jun 22, then varied 10.2-13.3 with mean period 24^d.
AF Cam: One well-observed long Max at 13.7 about Nov 20, otherwise very fragmentary observations.
R Cas: Min (12.6) late Jan?, Max (5.3) in Jul.
S Cas: Max (10.0) in Nov or Dec. The star was below 14.5m until Aug and very few positive observations were made. This star urgently needs more attention by observers with apertures of 25cm or more.
T Cas: Max (7.2) in Aug, probably the brightest on record. A long standstill on the rise at 9.0m, as usual for this star.
W Cas: Max (8.9) in Mar, Min (11.6) in Oct.
HT Cas: Only 7 positive observations around 15.5m. Probably too faint for effective observation.
γ Cas: Nearly constant at 2.35.

ρ Cas: Nearly constant at 4.9.
S Cep: Max (8.6) in Jun.
T Cep: Max (6.1) late May, Min (10.4) in Nov.
o Cet: Min (9.0) in Jan or Feb, Max unobserved. At 4.6 and fading on Jul 16, Min (8.7) in Dec. Needs special attention between Mar and July when it is near the sun.
R CrB: At Max until about Dec 9, fell to 8.5 by Dec 31. The decline (which was not well observed) was at a maximum rate of 0.15 mag/day.
W Cyg: Max (5.6) in Apr, Min (7.0) in Jul or Aug, Max (5.9) in Dec. There was a standstill on the rise to the first Max and a secondary Max on the rise to the second, giving the impression of two superimposed waves of slightly different periods.
AB Dra: Varied 11.9-13.8, being brightest around Jan 30, Mar 13, Apr 4, Jun 14, Jul 20, Aug 7, Sep 5, Oct 2, Oct 18, Nov 18, Dec 19. There are a few gaps in the Curve but if no 'maxima' were missed the mean period comes to 32^d. The GCVS gives the mean period as 13^d and the minimum mag as 15.8, so it may be best to regard the star as undergoing a highly disturbed standstill.
U Mon: Min (7.4) Jan, Max (6.3) Jan/Feb, secondary Min (7.0) late Feb, secondary Max (6.4) Mar, Min (7.2?) Apr, Max (6.2?) early May. Gap until Max (5.8) Oct/Nov, secondary Min (6.9) late Nov, secondary Max (5.9) Dec. The mean magnitude rose by 0.5m during the year. Needs special attention during the difficult months Apr - Oct.
U Ori: Min (11.4) late Feb, Max (5.2?) in Jul or Aug. Needs special attention May - Jul when it is near the sun. The GCVS gives the extreme Max as 5.3m, but unless more observations come to light it will be difficult to say whether this was exceeded in 1973.
RU Peg: Maxima around Apr 6 (?), Jun 27 (Narrow), Aug 30 (Narrow), Oct 25 (Wide), Dec 31 (?); mean period comes to 67^d. Needs more attention between Jan and May.
S Per: Min (11.0) in Jun or Jul.
TZ Per: Fragmentary observations in Jan and May - Jul. Variation was confined to the range 12.5 - 13.7, the star being brightest around Mar 18, Jul 31 and Oct 19. Apparently a disturbed standstill.
R Sct: Min (6.6) in Feb or Mar, Max (5.5) in Apr, secondary Min (5.7) early May, secondary Max (5.5) early Jun, Min (7.2) in Jul, Max (5.4) early Sep, secondary Min (5.9) in Sep or Oct, secondary Max (5.5) late Oct.
SU Tau: Fell from 9.6 on Jan 1 to 10.0 on Feb 6, 14.2 on Mar 10 and 15.2 on May 1. Underobserved until Aug 6, 11.6; rose to 10.7 on Sep 8, fell to 14.9 on Oct 22, and remained faint for the rest of the year.

The Programme. In the light of the results so far received for 1973, it has been decided that two dwarf novae, AF Cam and HT Cas, should be dropped from the programme, since they are obviously too faint for effective observation by the Section. Brighter replacements are being considered.
Enclosed with this Circular is a list of the stars now included in the programme, or earmarked for addition in the near future. The information is mostly from the 1969 GCVS or its 1971 Supplement but some entries have been revised in accordance with recent VSS reports and other sources.
If the list is compared with that published in the 1973 June issue of the Journal, the extent of the changes will be appreciated. It may be helpful to members if these changes are summarised.

28 stars have been dropped, as follows:

R Ari	R Boo	R Cas	HT Cas
R Aur	S Boo	T Cas	S Cep
X Aur	AF Cam	W Cas	T Cep
U Cyg	T Her	W Lyr	R UMa
S Del	U Her	R Peg	S UMa
R Dra	R Leo	R Per	S UMi
R Gem	R Lyn	R Tri	S Vir

37 stars have been added, as follows:

DZ And	SW Cep	AC Her	DY Ori
VY Aqr	RW Cyg	SU Lac	V529 Ori
CO Aur	AZ Cyg	EG Lyr	GK Per
XX Cam	CI Cyg	EP Lyr	R Sge
TW Cam	DF Cyg	TT Oph	WZ Sge
TZ Cas	V360 Cyg	TX Oph	UY Sct
UV Cas	V441 Cyg	UZ Oph	Z Sex

EQ Cas	SS Gem	V564 Oph	BW Tau
PZ Cas	SU Gem	CT Ori	V Vul
V358 Cas			

So far, charts have been drawn up for only 10 of the ‘new’ stars, and the Director hopes members will be tolerant if there are delays in filling chart orders for the other 27 objects. Observers who have been working on the 28 dropped stars may continue to observe them if they wish, until they have taken on replacements, and we certainly want to receive any observations of these stars which are made in 1974, which will be published and analysed in the usual way. Those in possession of AAVSO or other charts for the uncharted new stars are asked to give them special attention, and state which chart was used when submitting the observations.
Although there will certainly be further minor changes to the programme, there should never again be cause for such sweeping changes as these!

The recommended apertures quoted in the enclosed list are based largely on guesswork, and the Director would appreciate suggested changes to them. An 8" aperture may seem excessive for observation of PZ Cas at minimum. The reason for this is that PZ is a double star, both components of which are suspected of variation, and the range given is that of the combined magnitude; the larger aperture is an estimate of what will be needed to make useful estimates of the magnitudes of the components individually. A 10" aperture is suggested for faint minima of RV Tau, since the GCVS range is based on photoelectric measures over rather a short period, and the minimum magnitude is probably much fainter than stated in the catalogue.

Next Circular. VSSC 19 should be published in August. Material for inclusion should reach the Director by the end of July; contributions to the Photoelectric Photometry Supplement to David Salter by mid-July, please. Don't forget to send off your SAEs

Late Addition

SU Lacertae. The following predictions for this Mira variable are based on Ian Howarth’s observations of the 1973/4 cycle, and Lowder’s observations (AAVSO Abstracts, Fall 1971, pg 13), which result in instantaneous elements of 2 442 060 + 315.E.

Star		Mean range	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
221955	SU Lac	11 - 15	-M-	---	---	--			m		-	---	--M	---

Published by the Variable Star Section and Instruments and Observing Methods Section of the British Astronomical Association.

(Probably because of the late appearance of the last Circular, no contributions have yet been received relating to photoelectric photometry in the strict sense. Several members are known to be experimenting in this field, and they are all asked to send Mr. Salter a note on the progress they have made, and any problems they have encountered, by mid-July.
This Supplement deals with the photoelectric measurement of photographic stellar images, a related topic which will also be discussed in the Supplements. Members interested in this line of work are urged to read two papers in the journal by D S Brown, who - besides much other work - has produced, with the equipment described, comparison star sequences for all the bright novae since 1963 which most visual observers consider the most acceptable of all those published. The papers are 'A Combined Microdensitometer and Plate Measuring Machine' (Vol. 72 p3) and 'Some Experiments in Photographic Photometry using Comparison Prisms' (Vol. 75 p78). - John Isles)

I should first mention that contributions should keep diagrams and circuits to an absolute minimum, please, and secondly that although I've had a bit of practice in electronics, telescope-making and lunar observation, I'm a newcomer to variable star observation and hope that you will take that into account. Anyway, the address is:

D C Salter, 16 Moor Lane, St. Budeaux, Plymouth PL5 1UA

Now to business! I was very pleased to receive the following contribution from my old friend Graham Winstanley (18 Lynnbank Road, Liverpool L18 3HF), who has been experimenting with photoelectric photometry for nearly three years. He writes:
"The method I am using is to illuminate a negative as evenly as possible over about a one centimetre circle, and then to use a short focus lens system to project the negative onto a screen. This may be replaced by a small aperture, onto which the star is aligned by a piece of glass at 45° and a lens behind the aperture, moving the negative by hand. Once aligned, the screen is removed and the light falls onto a light detector; then all you have to do is to read the micro-ammeter. Early results quickly revealed inconsistencies, however, but such results were ignored and averages of consistent results were taken. Using a Tri-X negative (an emulsion with a finer grain might be better) of the polar region taken with a 45mm lens, measurements of the BSS sequence for VZ Cam were made, and submitted to the Director (JEI) at the time. He commented that the results were of reasonable accuracy considering that no colour correction had been applied; however, to measure each star took too long and there remained the inaccuracy which I had been trying to eliminate. Down to about magnitude 3 the star image was larger than the aperture and the meter reading stayed very small. From 3 to 5 it rose nearly linearly until the meter reading was about 180 micro-amps, and then flattened out as the star image became too weak. Thus the useful region covered magnitudes 3 to 5; there was considerable deviation with a few stars, but this will be due to colour differences in the film or even poor alignment of the image.
I have now pinpointed the problem, but I have been unable to eliminate it. The surface of the photoresistor (light-dependent resistor LDR) has a sort of grid pattern and consequently is highly non-uniform in sensitivity, which makes the alignment critical. I thought that the answer was to get an out-of-focus image, which I produce with a small piece of glass rod rounded at one end and frosted at the other. Unfortunately this is no cure, and it is going to be necessary to produce a completely homogenous spot of light on the cell; I have tried optical arrangements seen in books, but without success. I would be most grateful if you or anyone else might be able to provide a solution, or perhaps suggest a cheap, easy-to-use photosensitive device which has a greater surface uniformity. I believe the technique could be a very simple one to use. The photographs may be with a direct 35mm camera for ten seconds, or using a telephoto lens with a short guided exposure. The expected accuracy is one-tenth of a magnitude, and the corrections to visual magnitude could be calibrated for any film, but the first project in Photoelectric Photometry Supplement No.1 could be carried out with no correction." (May I butt in to say that the accuracy is obviously limited by the grain size of the emulsion. While photographic timings of eclipsing binary minima would certainly be valuable, they are not what I had in mind in PEPS 1. - JEI)

Now, even though the detectors I mentioned in PEPS 1 are only sensitive over the very small area of the chip under the lens, they are very sensitive indeed if used properly, and so I sent the following information about how to use them in a practical arrangement, since they fulfill the requirement of a small, uniform, sensitive detecting area.

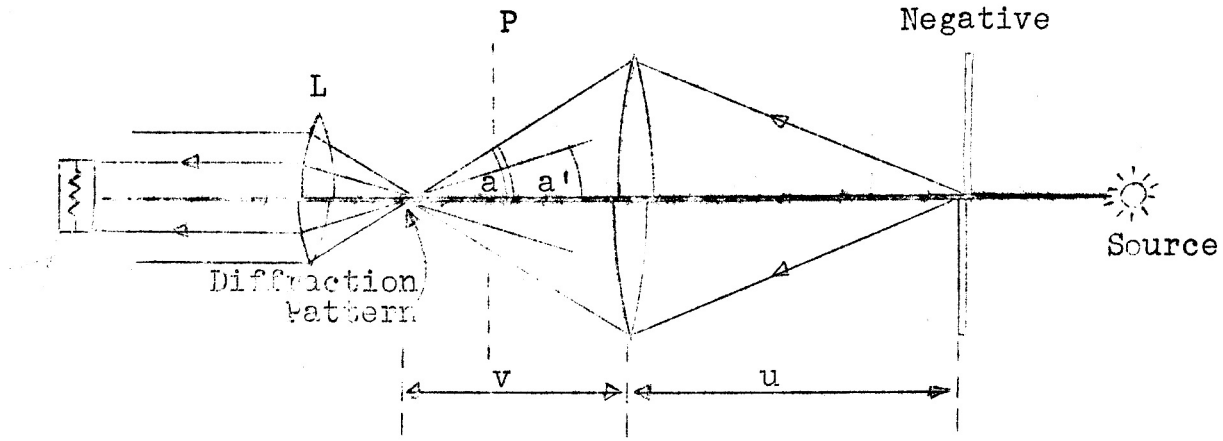
The detector is the MEL 12 silicon photo-Darlington amplifier, produced by Micro-Electronics Limited of Hong Kong, and probably available from a number of British distributors (see electronics magazines for addresses). It consists of a small silicon chip, about one mm square, on which two transistors have been formed, connected as a Darlington pair. Thus photoelectrons from the first are amplified to supply the input to the base of the second, giving a

total gain of around ten thousand. This chip is mounted under a little plastic lens about 6mm in diameter, giving a simple Cosine dependence of incident light angle to relative response. The spectral response curve is of the usual Gaussian shape, rather skewed to the longer wavelengths; it ranges from 4,000 to 11,000 Angstroms, peaking at 9,000 in the infra-red. Near sodium light, at 6,000 Angstroms, the relative response is 35% of the peak value. Biasing the base has very little advantageous effect and it is suggested that for simplicity the chip be connected as a simple LDR, and the base be ignored. For safety, I've given all figures as if a voltage of 9V has been applied across the LDR, which should be connected in series with a variable resistor of 1,000 ohms. Thus just connect up the LDR, a 1k variable resistor, a 9V battery and a MILLI-ammeter in series. When the LDR is being illuminated with the rather dim light from the star image, the variable resistor can be decreased such that the LDR takes over and allows a measurable current to pass. This should NOT exceed 35mA for a supply voltage of 9V or maximum power dissipation will be exceeded and you'll fry the chip. If the irradiance the LDR is 8mW per square cm, the device will pass 35mA if the variable resistance is set at zero. Thus, if the irradiance is 8mW per square cm, or less, the variable resistor may be removed from the completed circuit.
The actual figures are:

Irradiance H, mW per square cm:	8	5	3	2	1
Light current, milliamps;	35	21	9	4.6	2.8

(All for a supply of 9V across the LDR)

The method of detecting the changes in illumination will be left to your own experiments - it may even be possible to read the changes direct from the milliammeter, but I expect that a more sensitive meter, with resistances arranged as necessary, will be more suitable. As to the method of illuminating the LDR, using frosted glass, wastes light by scattering; a suggested method is shown below:



The lens L produces a uniform illumination (Fourier transform of the Airy disc produced by the 'hole' in the negative), and by altering u and v it is possible to alter the angle a. Thus it can be altered until it equals a', and L is only illuminated over the area which the LDR can observe, the output beam of L still being collimated. The plane P can be used for an aligning diagonal and eyepiece.

Well, that's it; more ideas and results would be most welcome. In case you receive this in time (You won't! - JEI), I'll take this opportunity of wishing you a very happy Easter.

Best wishes, David Salter

STOP PRESS: An IAU telegram announces the discovery by Burgat of a 13mpg supernova 27" E and 56" S of NGC 4414, at (1950) 12^h 24.0^m, 31^o 30', on 1974 April 20. This object is not being added to the VSS programme, but those interested in observing it may obtain a preliminary chart from I D Howarth, 67 Lichfield Road, Portsmouth P03 6DF

STARS ON THE MAIN PROGRAMME OF THE B.A.A. V.S.S. IN 1974
(excludes Binocular and Eclipsing Binary Programmes)

STAR	EXTREME RANGE	MEAN RANGE	TYPE	PERIOD	REC. APERTURE		NO. CHARTS IN SET
					Gen. use	Faint min.	
R And	6.0-14.9	6.9-14.3	M	409^{d}	8"	12"	5 (B1)
RX And	10.3-13.6	-	Z Cam	(14)	8	10	4
DZ And	10.0-(14.0	-	RCB?	-	5	12?	-
VY Aqr	8.0-16.0	-	Nr	55^{y}?	12	18	-
R Aql	5.7-12.0	6.1-11.5	M	293^{d}	3	4	4 (B1)
UU Aql	11.4-15.9	-	UG	(56)	8	18	4
VW Aql	8.5-10.0		SRc?		3	3	2
SS Aur	10.5-15.0	-	Z Cam?	(56)	6	12	4
CO Aur	7.3-8.1		RV?	40	2	2	2
U Boo	9.8-12.9	10.3-12.2	SRb	201	5	8	3
V Boo	7.0-11.3	7.6-10.4	SRa	258	2	3	3 (B-)
V Cam	8.5-16.0	9.9-15.4	M	522	8	20	4
X Cam	7.4-14.2	8.1-12.6	M	144	6	10	4 (B-)
Z Cam	10.2-14.5	-	Z Cam	(22)	10	12	3
XX Cam	7.3-9.7	-	RCB	-	2	3	-
TW Cam	9.8-10.6		RVa	86	3	3	3
S Cam	7.9-15.2	9.7-14.8	M	611	12	18	4
TZ Cas	9.0-10.5		SRc?		3	3	-
UV Cas	10.5-15.2	-	RCB	-	6	18	-
EQ Cas	11.7-13.4		RVa	58	6	8	-
PZ Cas	8.2-11.1		SRc?	900	3	8	-
V358 Cas	9.9-12.2		SRc?		4	5	-
γ Cas	1.6-3.0	-	NI	-	-	-	-
ρ Cas	4.1-6.2	-	RCB?	-	1	1	2
SW Cep	9.2-10.6		SRc?		3	3	-
o Cet	2.0-10.1	3.4-9.1	M	332	1	3	4 (B2)
R CrB	5.8-14.4	-	RCB	-	1	12	4 (B1)
S CrB	5.8-14.0	7.3-12.9	M	360	5	8	3 (B-)
T CrB	2.0-10.8	-	Nr	80^{y}?	3	3	4
W CrB	7.8-14.3	8.5-13.5	M	238^{d}	6	12	3 (B-)
R Cyg	6.5-14.2	7.5-13.9	M	427	6	12	5 (B-)
S Cyg	9.3-16.0?	10.3-16.0?	M	323	8	20	3
W Cyg	5.0-7.6		SRb	126	1	2	2
RW Cyg	8.0-9.3		SRc	550±	3	3	-
SS Cyg	8.2-12.1	-	UG	(50)	3	4	2
AZ Cyg	8.6-10.4		SRc?		3	3	-
BC Cyg	9.7-12.2		SRc?		4	5	1
BI Cyg	8.4-9.9		SRc?		3	3	1
CI Cyg	9.1-11.5		Z And	855?	4	4	-
DF Cyg	10.1-13.9		RVb	50	6	8	-
V360 Cyg	10.6-12.8		RV	70	6	8	-
V441 Cyg	8.4-10.9		SRc?		3	3	-
χ Cyg	3.3-14.2	5.2-13.4	M	407	5	12	5 (B1)
HR Del	3.5-12.7	-	Nb	-	4	5	3
AB Dra	12.0-15.8	-	Z Cam	(13)	12	18	3
U Gem	8.2-14.9	-	UG (E)	(102)	4	12	4
SS Gem	8.7-10.0		RV	89	3	3	3
SU Gem	9.9-12.2		RVb	50	4	5	2
SS Her	8.5-13.2	9.2-12.4	M	107	6	10	4
AC Her	7.0-8.4		RVa	75	2	2	-
AH Her	10.2-14.7	-	Z Cam	(20)	10	12	-
R Hya	3.0-11.0	4.5-9.5	M	388	2	3	5 (B2)
SU Lac	9.7-14.4		M	319	10	12	-
X Leo	11.4-15.2	-	UG	(17)	8	18	2

AY Lyr	12.6-17.0	-	UG	(24)	12	20	2
EG Lyr	11.1-13.1		RV	137	4	5	-
EP Lyr	10.0-11.4		RVa	83	4	4	-
U Mon	5.5-7.5		RVb	92	1	2	2
RS Oph	4.3-13.3	-	Nr		4	5	4
TT Oph	9.8-11.1		RVa	61	3	3	-
TX Oph	9.3-11.3		RVa	135	3	3	-
UZ Oph	9.6-11.9		RVa	87	4	4	-
V564 Oph	9.8-10.4		RV	71	3	3	-
U Ori	5.3-12.6	6.3-12.0	M	372	4	6	5 (B-)
CN Ori	11.5-14.8	-	Z Cam	(18)	8	12	3
CT Ori	10.3-11.6		RV	136	4	4	3
CZ Ori	12.1-15.7	-	UG	(27)	12	18	3
DY Ori	11.1-11.8		RV?	60	4	4	3
V529 Ori	6-(11		Nr?		3	?	(with U Ori)
RU Peg	9.0-13.1	-	UG	(68)	8	10	3
S Per	7.9-11.5	8.6-10.6	SRc	829	4	5	4
RS Per	9.2-10.8		SRc	152	3	3	1
TZ Per	12.3-15.6	-	Z Cam	(17)	12	18	2
UV Per	11.9-17.3	-	UG	(360)	12	40	3
BU Per	8.8-10.7		SRc	365±	3	3	(with RS Per)
GK Per	0.2-14.0	-	Na	-	6	8	-
R Sge	8.9-10.6		RVb	71	3	3	-
WZ Sge	6.0-15.0	-	Nr (E)	33^{y}?	10	12	5
R Sct	5.0-8.4		RVa	140^{d}	1	2	2
UY Sct	10.6-12.1		SRc?		4	4	-
R Ser	5.7-14.4	6.9-13.4	M	357	6	12	3 (B1)
Z Sex	8.3-9.2		RV?	57	3	3	3
T Tau	9.6-13.5	-	InT	-	4	10	3
RV Tau	9.2-11.7		RVb	79	6	10	4
SU Tau	9.5-16.0	-	RCB	-	4	20	3
BW Tau	13.7-14.8	-	Seyfert Galaxy	-	12	12	-
T UMa	6.6-13.4	7.7-12.9	M	256	6	12	3 (B-)
SU UMa	11.0-14.5	-	UG	(17)	10	12	4
SW UMa	10.8-16.0	-	UG	(459)	8	18	3
CH UMa	11.0-15.3	-	UG	(195)	10	18	2
V Vul	8.1-9.4		RVa	76	3	3	-

The recommended apertures (in inches) are not to be interpreted too rigidly. Smaller instruments can do useful work on the brighter stages, and may suffice to detect the star at minimum, especially in the hands of an experienced observer.

Where separate binocular charts are available, this is indicated in the final column. For example, the set of charts for R Hya comprises 5 sheets, but members who propose to observe this star with binoculars may instead order a 2-sheet set. A dash indicates that at the time of writing (1974 Apr) charts are not available, but it is hoped that charts will have been drawn up for all the new stars by the end of 1974.