British Astronomical Association

VARIABLE STAR SECTION CIRCULAR

No 90, December 1996

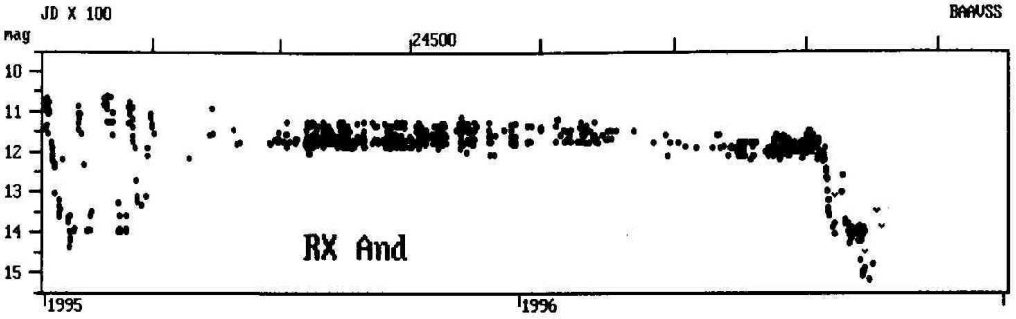
Contents

ISSN 0267-9272

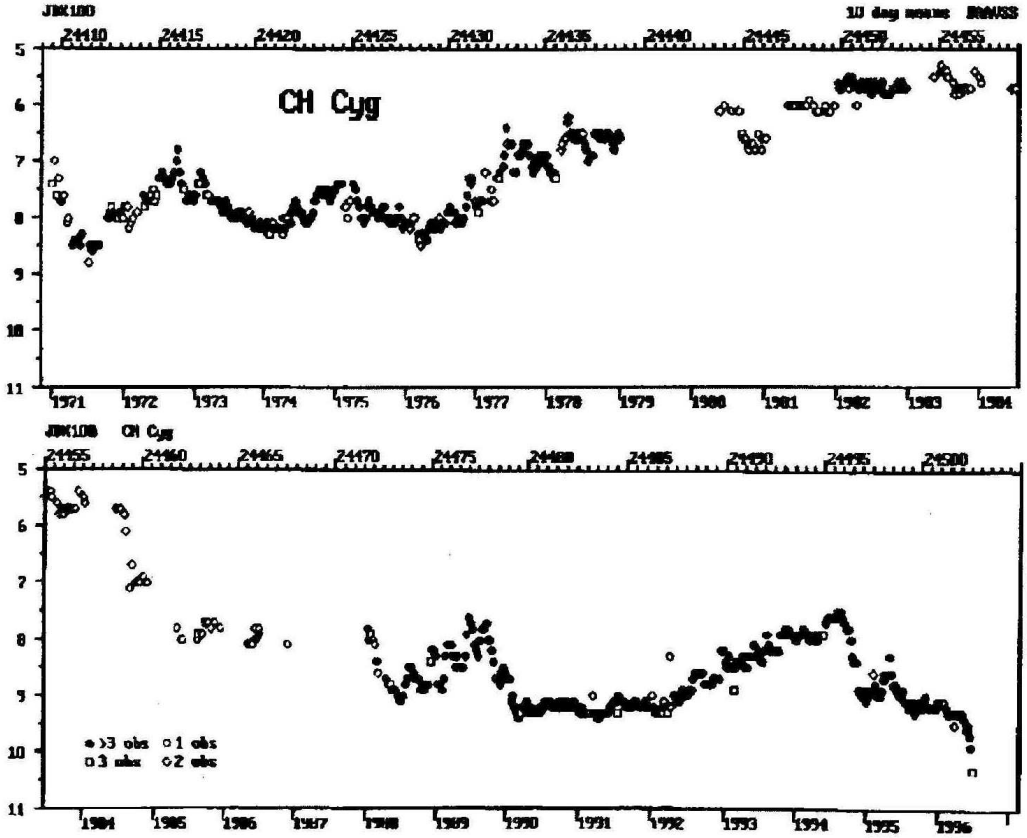
Office: Burlington House, Piccadilly, London, W1V 9AG

A SELECTION OF LIGHT CURVES

DAVE MCADAM



RX And 1995 to 1996. 785 observations by;-
S W Albrighton, K G Andersson, R J Bouma, S M Brincat, L K Brundle, M Gainsford, D Gill, M Gill, B H Granslo, J Greaves, K Holland, R A H Paterson, G Poyner, G Salmon, P Schmeer, J Toone, M Westlund, W J Worraker.



CH Cyg; 8756 observations, 110 named observers

SECTION MEETING
GARY POYNER

The Director would like to thank everyone who attended the section meeting at Northampton on October 5th, and in particular the seven speakers who made it such a successful and interesting day. An account of the meeting begins in this circular, and will be continued in future issues.

SUPERNOVA 1996bo IN NGC 673
GARY POYNER

Mark Armstrong (Rolvenden, Kent) has been named as co-discover of SN 1996bo in N673 on IAUC 6497. Mark imaged the galaxy on Oct 23rd at 02.17 UT, and detected a suspect object of about mag 15 and about 10" E of the nucleus, using a 0.26-m reflector + CCD. An independent discovery by Weidong Li, Qiran Qiao, Yulei Qiu, and Jingyao Hu, Beijing Astronomical Observatory (BAO), as part of the BAO Supernova Survey on CCD images taken on Oct. 18 was also announced on IAUC 6497.
This could well constitute the FIRST supernova discovery from the UK! Our congratulations go out to Mark from everyone in the VSS.

SAO 28567
GARY POYNER

Dave Storey (Carterton, Oxon) has written with regard to possible magnitude variations in the SAO star 28567, which he noticed whilst observing Comet Tabur. He comments that SAO 28567 is brighter than shown in Uranometria; on the morning of Oct 17th he estimated it roughly to be magnitude 6.5, and on the evening of the 17th at 7.1. Checks through various catalogues reveals nothing which suggests that SAO 28567 is suspected of variability. The position for SAO 28567 is as follows...

		Magnitude			
RA (2000.0)	Dec	SAO	PPM	GSC	HD
12h 55m 39s	+54.57.40	7.9	7.6	7.15+/-0.4	7.9

Any observations of this star would be welcomed.

NOTE TO AUTHORS
Would all authors of articles for the circular please note that selected articles from these circulars are published on the BAAVSS WWW pages;

http://www.telf-ast.demon.co.uk

Authors inform the editor if you **DO NOT** want your article to appear on the internet.
Please also note that the **deadline** for articles for VSSC 91 will be 1st February, 1997.

ERRATA
Please note that in the article entitled "Appulses of 24 Themis with SY Cancri, commencing 6th November 1996 and 13th January 1997" (VSSC 89) star 'D' is incorrectly marked on the chart given. True 'D' is the next brightest star immediately to its right. The author of the article apologises for any inconvenience that may have been caused by this.

RECURRENT OBJECTS PROGRAMME NEWS

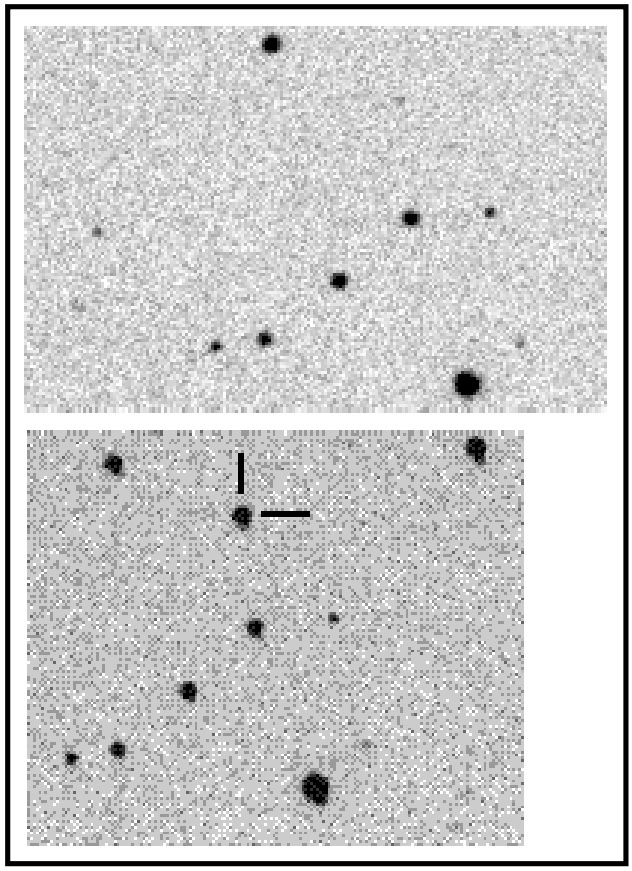
GARY POYNER

DO Dra (YY Dra)

The first recorded outburst of this UG star since September 1990 (9.1 mag, Schmeer) was detected by the Director on October 16th at magnitude 12.7. Confirmation was obtained by Tonny Vanmunster (CBA, Belgium) shortly afterwards, and independent confirmations were received from W. Worraker & M. Gill.

DO Dra peaked at magnitude 10.7 on October 18th, and by the 22nd had faded to 14.8 mag - the whole outburst lasting around 6 days. This agrees well with historical outbursts, which have all proved to be of short duration.

Photometry by CBA observer Tonny Vanmunster has revealed large amplitude (>0.2) variations, which it is claimed are periodic. This is the first outburst where accurate photometry has been obtained, and the results are eagerly awaited.



The two CCD images show the field of DO Dra at minimum and in outburst. Images by Vanmunster on 1996 Jly 24.0715 UT, and Oct. 18.8993 UT using 25cm f6.3 SCT & ST-7 unfiltered CCD.

Two Recurrent Objects have been observed visually for the first time recently.

V1454 Cyg was observed in outburst on Oct 7th by Eric Broens, Director Belgian VVS, at magnitude 13.6, and confirmed by Vanmunster shortly afterwards by CCD. A visual observation by the Director on Oct 15th at magnitude 15.2 puts the outburst lasting at least 8 days, possibly indicating a supermaximum. This was the first recorded outburst since September 1968.Unfortunately this star is poorly monitored by observers aroundthe world, and very few observations were recorded during this outburst.

AW Sge was observed in outburst by the German observer Jochen Pietz on September 17th at mag. 15.0, and confirmed by T. Kato (Japan) by CCD on Sep 18. Unfortunately AW Sge did not get brighter than magnitude 15.0, and very few observations were reported.

These three outbursts underline the importance of the Recurrent Objects Programme in that without it, these stars would receive hardly any attention at all. More observers to this project would increase the number of outburst detections, and improve our understanding of these enigmatic objects.

Chart News

JOHN TOONE

The following new charts are now available from the Chart Secretary. In the case of RX And and CH Cyg the new charts have been prompted by the unprecedented recent faint behaviour of these two stars.

001.03 RX And
Formally 001.02, the sequence has been extended at the faint end to include new comparison stars P, R and S. Following the 15 month standstill lasting from May 1995 to August 1996, RX And has been very faint at around 15th magnitude or fainter and several observers using small telescopes (including myself) have mistakenly estimated the 14.3 star (now comparison P) instead of RX. Active observers of RX And should have received copies of the new charts already, in an attempt to monitor this unusual behaviour as accurately as possible. New observers to RX And should contact the chart secretary for the updated chart and sequence. See the inside cover of this circular for a light curve.

089.02 CH Cyg
This chart was formally 089.01, and as in the case of RX And the sequence has been extended at the faint end to include new comparison stars P, R, S and T. CH Cyg has been fainter than magnitude 10 since June 1996, and has never been recorded as faint as this previously. See the inside cover of this circular for a light curve.

217.01 Z and RY UMa
Formally MDT1984Apr12, a labelled sequence with letters for Z and numbers for RY has been introduced which reduces the overall number of comparison stars.

218.01 U LMi
A new chart adapted from the AAVSO(c) 1942 and (d) 1939 charts which introduces a lettered sequence.

BINOCULAR PRIORITY STARS IN 1995

M TAYLOR

The priority list of brighter (binocular) variables as noted in VSS Circulars 70 and 72 is based on; the variable's observability, its usefulness from a Pro-Am viewpoint, and the need for refining data from the General Catalogue such as periods, amplitude or sub-type. An original aim of publishing the priority list was to encourage observers to follow these stars once every 10 days, or 5 days for more rapid types.

An abbreviated summary according to a preliminary investigation as to the visual changes of these stars during 1995 is given below together with 'raw' light curves. Listed is: variable's name, extreme magnitude range by individual observers, main characteristic of variability and the Catalogue (GCVS, 1985) information in brackets. For small amplitude stars (with the exception of Y Tauri) the star's mean magnitude and standard deviation is noted. Well defined maxima and minima are noted where appropriate as well as unusual variability. A month (or months) in brackets shows the star was not estimated in that time, other than when the variable was near conjunction with the Sun. A comment as to a serious lack of observations or other anomalies which observers may care to follow-up is appended in the hope that the listed variables are targetted. The light curves are not final information as only selected estimates have been used in the single estimate plots against a generally crude time scale. A larger dot size simply refers to two or more coincident magnitude estimates. The work of all observers of these stars is very much appreciated , and acknowledged in the preparation of this summary.

One variable on the list, RW Hya at RA 13h 31.5m Dec -25° 7' a ZAND type, 8.0 to 9.0 was not observed adequately in 1995 and is thus not listed.

AQ And 8.1 - 9.1, Sep, Oct magnitude 8.5, main variations 8.5 to 8.9. (SR, 8.0 - 8.9, 346d)

EG And 7.1 - 7.7, mean magnitude. 7.5 s.d.0.1. (ZAND, 7.1 - 7.8V) Near M31

V Aql 6.8 - 7.8, 7.4 s.d. 0.2, Oct 7.2, (Dec). (SRB, 6.4 - 8.4V, 353d)

UU Aur 5.2 - 6.1, slow variations, mag 5.5 (Jun). Sep to Dec 5.7. (SRB, 5.1 - 6.8, 234d)

AB Aur 6.7 - 7.2, 6.94 s.d. 0.13 (May) (INA, 6.9 - 8.4V, B9)

V Boo 8.0 - 9.3, Maximum Aug 8.0, (Jun, July). (SRA 7-12V, 258d, M6).

RW Boo 7.3 - 8.5, 8.1 s.d. 0.3, fainter at beginning of year, Jun/ July 7.8. (SRB, 6.4 - 7.9, 209d, M5)

RX Boo 7.6 - 8.3, 8.09 s.d. 0.13. (SRB, 6.9 - 9.1, 160d, M6-M8)

U Cam 7.4 - 8.7, brightening from start of year at mag. 8.7 to max. Mar 8.1, main variations 8.1 to 8.5, (Jun). (SRB, 7.7 - 8.7, P?).

ST Cam 6.6 - 7.6, Mar, Aug 7.1, main variations 7.1 - 7.6 (May).(SRB, 6 - 8, 300d?)

XX Cam 7.3 - 7.8, 7.5 s.d. 0.1 all year, (Jun). (RCB?, 7.3 - 9.7)

X Cnc 6.3 - 7.1, Mar, Oct 6.5 main variations 6.5 to 6.9. (SRB, 5.6 to 7.5, 195d).

RS Cnc 5.7 to 6.8, monthly mean magnitude range 6.0 to 6.5, Mar and Dec 6.0, May 6.5. (SRC, 5.1 - 7.0, 120d? M6)

V CVn 6.9 - 8.6, mean variation 7.2 to 8.0, pre-max. 'step' mag 7.5 (SRA, 6.5 - 8.6V, 192d, M4-M6).

WZ Cas 7.0 - 7.9, few estimates, mean mag. 7.25 s.d. 0.22. (SRB, 6.9 - 8.5, 186d).

V465 Cas 6.0 - 7.6, Mar 6.8, May 6.7, Sep 6.7, large scatter between individual observers. (SRB, 6.2 - 7.2, 60d, M5)

γ Cas 1.9 - 2.4, 2.21 s.d. 0.10. (GCAS, 1.6 - 3.0V)

ρ Cas 3.8 - 5.1, main variations 4.4 to5.0. Much scatter between individual observers. Brighter in last half year. (SRD, 4.1 to 6.2V, 320d?, F8 - K0)

W Cep 8.0 - 8.8, 8.40 s.d. 0.16. (SRC, 7.0 - 9.2, K0 - M2

AR Cep 7.3 - 8.4, fading at start of year to Feb minimum, slow, small amlitude variations July/Aug/Sep, SR changes in range 7.6 to 8.0. (SRB, 7.0 - 7.9p, M4)

μ Cep Monthly mean magnitude range 3.9 to 4.3, Jan 3.9, Nov 4.3, Dec 4.2. (SRC, 3.4 - 5.1V, 730d, M2)

O Ceti Rapid rise from Jan mag 9.0 to mid-march 5.0, possibly high max. (?), fading from July mag 6.3 to Dec 9.2 (M, 2.0 - 10.1V, 332d, M5 - M9).

R CrB 5.9 - 14.0, light curve shows daily magnitudes from Aug 01 to Oct 12 covering the start of the fade, Oct 30, 12.5, Nov 04, 12.2, Dec 24, 14.0

W Cyg 5.7 - 7.2, see light curve. (SRB, 5.0 - 7.6, 131d, M4 - M6)

AF Cyg 6.7 - 7.8, see light curve, there is considerable scatter in estimates. (SRB, 6.4 - 8.4, 92d, M5 - M7).

CH Cyg 8.4 - 9.6, main variations 8.7 to 9.3, mid-Apr 8.7, then from May to Dec 9.0 to 9.3. (ZAND + SR, 5.6 - 9.5V, M7+Be)

U Del 6.5-7.4, 6.98 s.d. 0.15. (SRB, 5.6-7.5, 110d?, M5).

EU Del 5.8-6.8, 6.36 s.d. 0.29, Sep 6.7. (SRB, 5.8-6.9V, 60d, M6)

RY Dra 6.8-8.0, slow variations 7.0 to 7.5. (SRB? 6-8, 200d?)

TX Dra 7.1-8.3, semi-regular variations 7.2 to 7.8. (SRB, 6.8-8.3, 78d?, M4-M5)

AH Dra 7.7-8.3, 8.00 s.d. 0.23, few observations. (SRB, 7.1-7.9, 158d, M7)

NQ Gem 8.2-8.6, 8.43 s.d. 0.09, few observations. (SR+ZAND, 7.4-8.0V, 70d?)

X Her 6.3-7.3, monthly mean magnitudes 6.5 to 7.1, max. Jun 6.5. (SRB, 6.3-7.4, 95d, M6)

SX Her 8.0-8.9, slow variations 8.0 to 8.5, magnitude 8.3 at start of year, Mar 8.0, Dec 8.5. (SRD, 8.0-9.2, 103d, G3-KO)

UW Her 7.7-8.7, main variations 8.25 s.d. 0.28. (SRB, 7.8-8.7, 104d)

AC Her 7.0-8.4, mean variation; max. 7.3/7.5, minI 8.2/8.3, minII 7.8/8.1. (RVA, 6.8-9.0V, 75d, F2-K4).

IQ Her 6.9-7.8, few estimates. 7.49 s.d. 0.21. (SRB, 7.0-7.5, 75d, M4)

OP Her 5.4-6.9, slow variations 6.3 to 6.8 with brightening in July/Aug to 5.4 (extreme magnitude) independently confirmed by three observers. (SRB, 5.9-6.7V, 120d, M5).

R Hya 5.5-7.2, maximum approx. Mar17, mag 5.5. (M 3.5-10.9V, 389d, M6-M9)

RX Lep 6.0-6.3, 6.20s.d. 0.07. (SRB, 5.0-7.4V, 60d, M6)

SS Lep 4.5-5.2, 4.81 s.d. 0.20. (ZAND, 4.8-5.1V, A0+M1)

Y Lyn 6.8-8.5, Jan 6.9 to Mar 7.9 minimum (Jun, July), Aug 7.6 to Dec 8.2 (SRC, 6.9-8.0, 110d, M6)

SV Lyn 7.0-7.8, 7.40 s.d. 0.21. (SRB, 6.6-7.5, 70d?, M5)

U Mon 5.7-7.4, mean variations 5.9 at maximum, minI 6.5/6.6, minII 7.1/7.2. (RVB, 5.9-7.8, 91d, F8-K0)

X Oph 6.6-8.6, Jan 7.1 to minimum mid July at mag 8.5 and Nov 7.7 (M 5.9-9.2V, 328d, M5-M9)

BQ Ori 7.3-8.7, monthly mean magnitudes 7.6 to 8.5, max, Apr 7.6, Nov 8.5. (SR, 6.9-8.9, 110d, M5-M8)

AG Peg 8.2-9.1, 8.50 s.d. 0.19 (NC, 6.0-9.4V, WN6+M3)

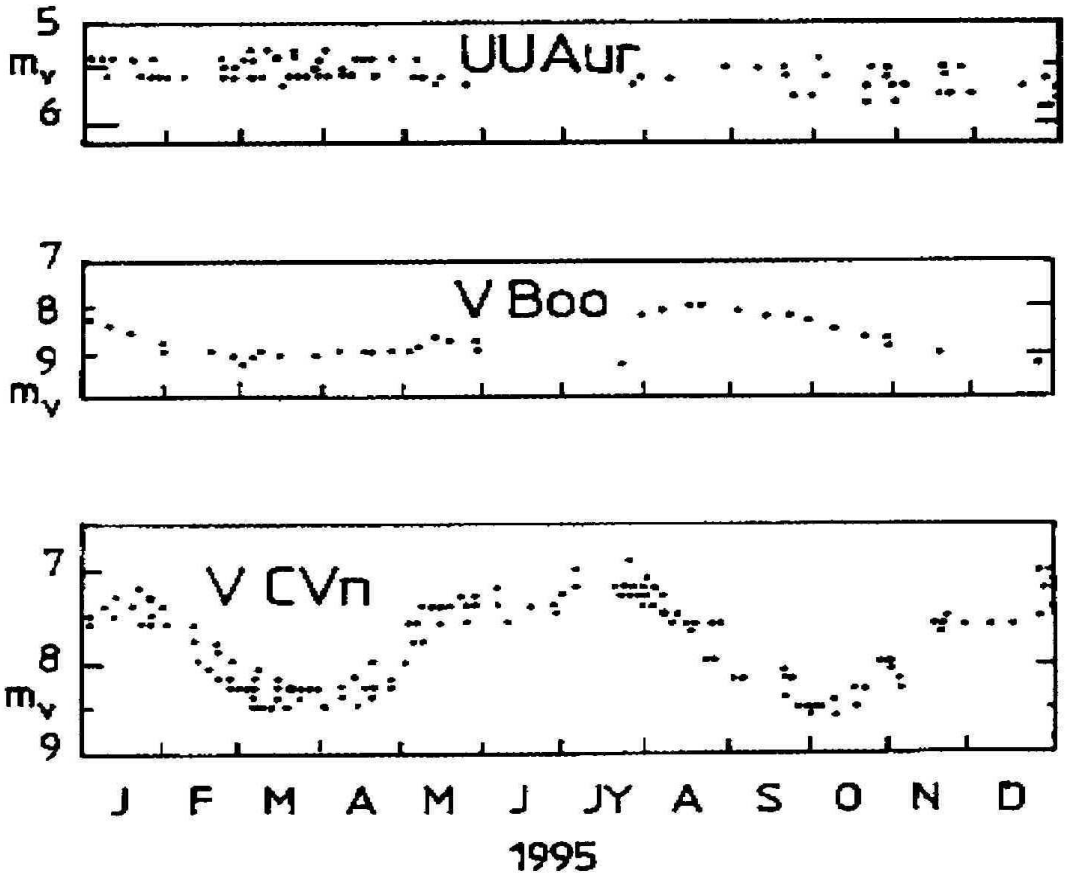
GO Peg 7.1-8.5, slow variations 7.84 s.d. 0.26. (LB, 7.1-7.8, M4)

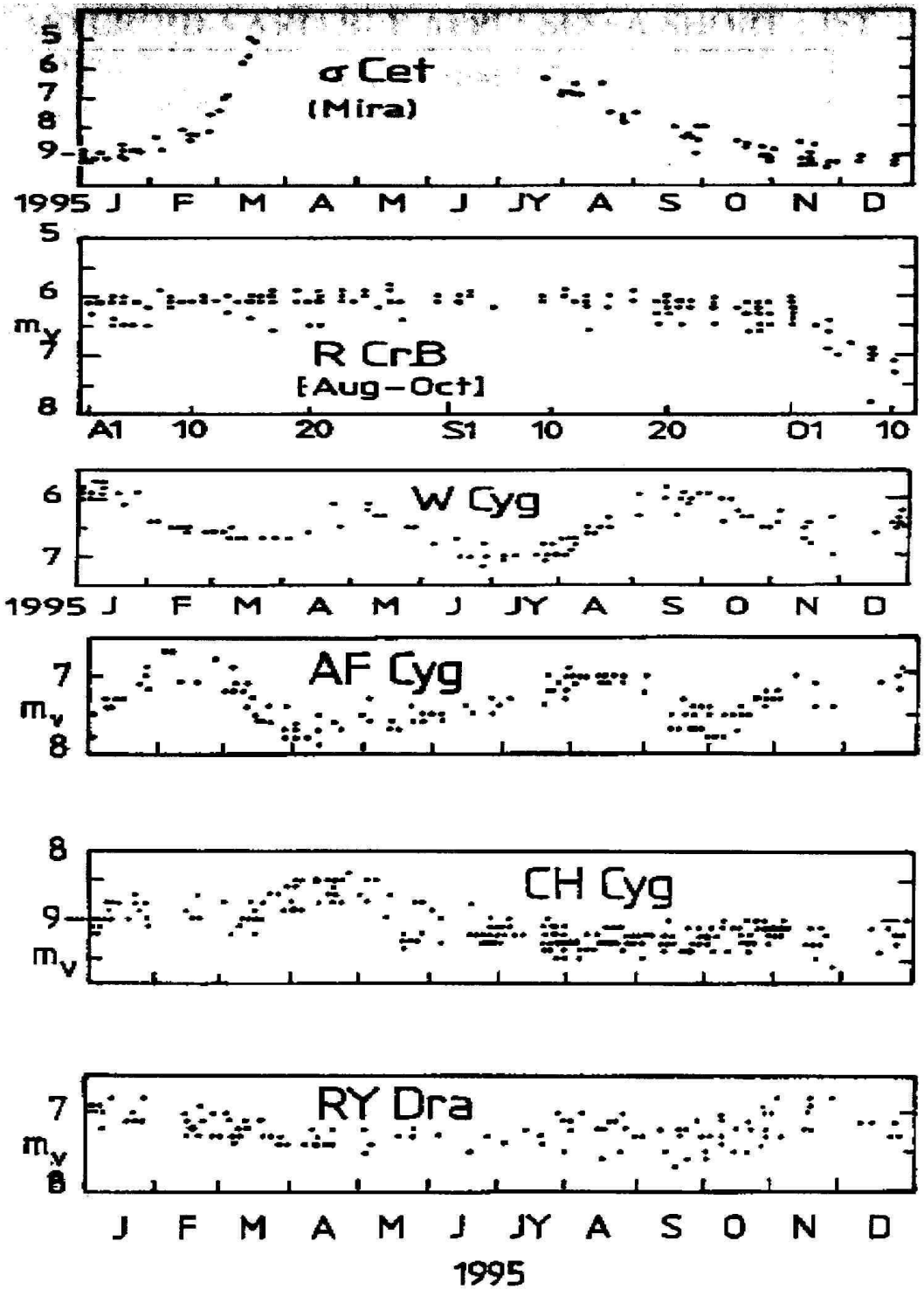
X Per 6.0-6.6, 6.25 s.d. 0.13. (GCAS+XP, 6.0-7.0V, 09)

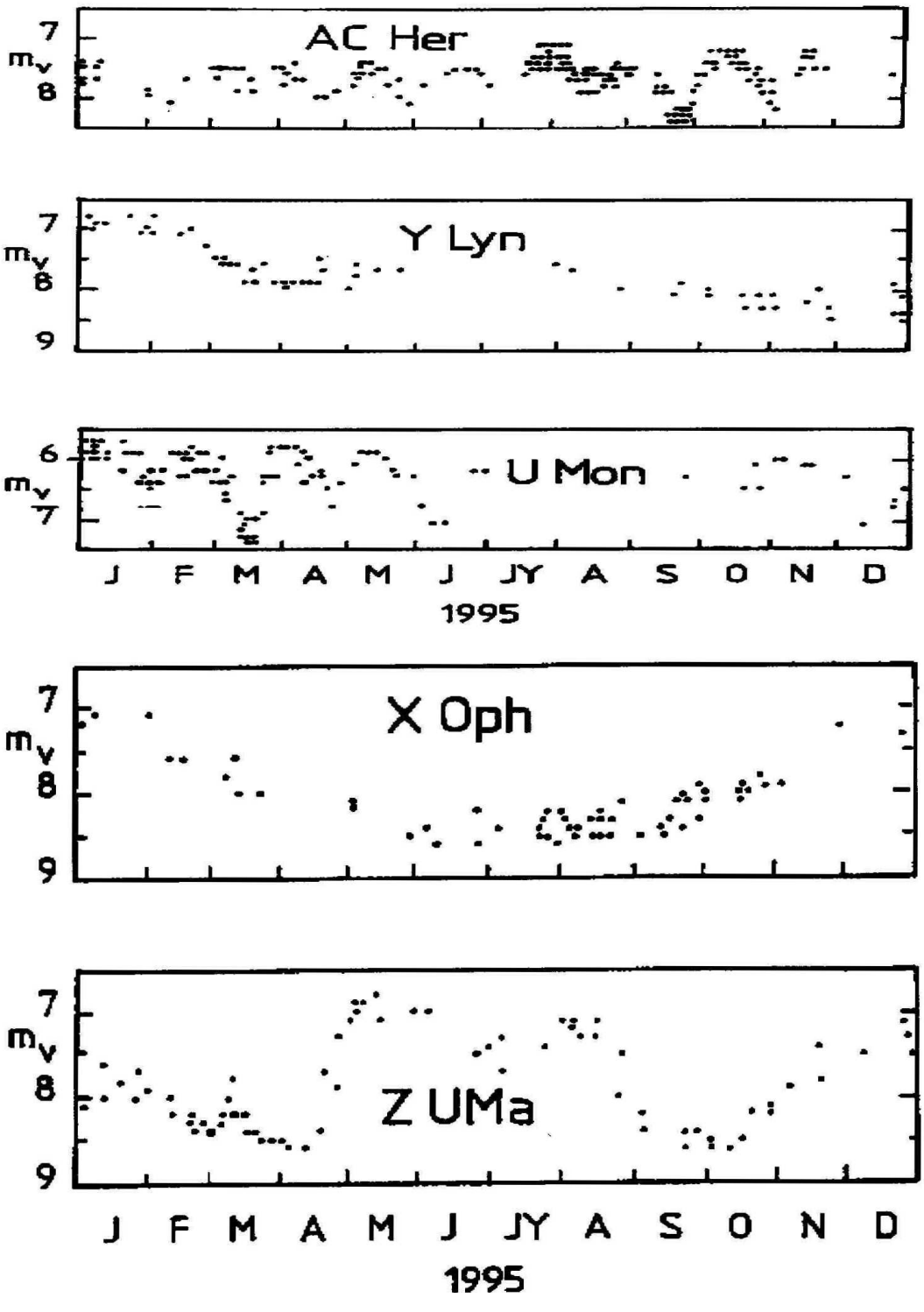
R Sct 5.1-8.5, see VSSC 88 for light curve. (RVA, 4.2-8.6, 146d)

Y Tau	6.9-8.2, 7.53 s.d. 0.35. (SRB, 6.5-9.2V, 242d)
W Tri	7.7-8.8, 8.10 s.d. 0.25, Oct 7.8 max. (SRC 7.5-8.8, 108d)
Z Uma	6.5-8.6, lightcurve shows 'spike' about Mar10 at mag 7.8 (SRB 6.2-9.4V, 196d, M5)
ST Uma	6.6 to 7.3, mean magnitude 7.04 s.d. 0.17. (SRB, 6.0 - 7.6V, 110d?, M4 - M5).
VY Uma	5.9 - 6.9, 6.40 s.d. 0.20. (LB, 5.9 - 7.0V).
V Umi	7.8 - 8.6, Apr 8.4, maximum Oct 8.0. (SRB, 7.2 - 9.1, 72d)
SS Vir	8.4 - 9.4 observed from March to May, minimum end of April at mag 9.1. (SRA, 6.0 - 9.6, 364d)
SW Vir	6.5 - 8.1, Feb 7.9 brightening to 7.1, few estimates. (SRB, 6.4 - 7.9V, 150d?, M7)

The majority of these stars, with notable exceptions when at minimum, are observable in 50mm binoculars and small (60mm) telescopes; some like γ Cas, μ Cep need the naked-eye. All charts for these are available from John Toone, the chart secretary, for a charge of 10p (or 30p for R Cr B and R Hya) and a large sae.




σ Cet
(Mira)
5
6
7
8
9
1995 J F M A M J JY A S O N D
R CrB
[Aug–Oct]
m_v
A1 10 20 S1 10 20 O1 10
W Cyg
AF Cyg
CH Cyg
RY Dra
J F M A M J JY A S O N D
1995


AC Her
Y Lyn
U Mon
X Oph
Z UMa
m_v
7
8
9
6
J F M A M J JY A S O N D
1995

ASTEROID-VARIABLE APPULSES: A SHORT LIST TO 2000

J GREAVES

The following is a list of well placed appulses resulting from a processing run between 74 asteroids that are numbered less than 1000 with known *maximum* amplitude variations of at least 0.4 magnitudes that also better magnitude 14 at the time of appulse, and, 58 variables from the BAAVSS Telescopic Programme selected in consultation with the Section's Director. A subset of the full BAAVSS programme was chosen to keep processing time down, such that the exercise could be completed **before** the upper time limit was upon us (31/12/2000)! The paths of the brighter asteroids are well documented in popular magazines and elsewhere (*qv* 2 Pallas in Boötes; BAAVSS circular 88). Further, there didn't seem to be much point in referring to an appulse between an 8th magnitude variable and a 13th magnitude asteroid or vice versa, for one thing the variable's sequence would most likely contain no suitable comparison stars.

The humble list below is based upon an ongoing project to predict all meaningful appulses between the short list of 58 variables and all known asteroids numbered between 1 and 1000 undertaken by myself at the request of the Director. Charts for the event involving 24 Themis and SY Cancri appear in circular 89. It is hoped that some visual observers will find interesting the challenge of following any light variations that these objects may display. CCD photometrists should note that these asteroids all have a B-V index within the range of 0.7 to 0.9 and are therefore reddish objects, thus reliable photometry can not be assured without the correct use of a V filter upon a CCD camera of assured spectral response within the V continuum range, as well as a reliable photoelectric V magnitude for at least one suitable comparison star within the field. It is the author's opinion that the accuracy of unfiltered CCD measures, such as those given for dwarf and classical novæ during outburst that have been appearing in the amateur literature of late, owes as much to the fortuity of the objects under investigation possessing a B-V index of around 0.0 than to any inherent consistency in the methods and/or systems used.

TABLE COLUMN HEADINGS

Date:	Start = first date (DD/MM) that the asteroid lies within 1° of the variable normalised to 0h UT Mid = date (DD/MM) of closest approach normalised to 0h UT End = last date (DD/MM) that the asteroid lies within 1° of the variable normalised to 0h UT
Asteroid:	Number and name of the asteroid in question
Mag:	Asteroid's magnitude at closest approach (ie at *Mid* date above)
Amp:	Maximum amplitude of asteroid's magnitude. This is a *maximum* value and depends on the objects orientation and/or albedo effects in the line of sight to the observer at the time of observation. The full amplitude range is given in the notes when known
Per:	The asteroid's orbital period to one decimal hour
Dist:	Estimate of asteroid-variable distance, in arc minutes, at closest approach (ie at *Mid* date above)

Start	Date Mid	End	Asteroid	Mag	Amp	Per	Dist	Variable	Type	Range	M	N
1997												
27/08	03/09	07/09	107 Camilla	12.7	0.52	4.8	22'	VY AQR	UGSU	8.4- 17.2p	N	
1998												
08/01	12/01	16/01	66 Maja	12.3	0.4		5'	IR GEM	UGSU	10.7-[14.5	F 1	
03/02	08/02	13/02	182 Elsa	11.9	0.7	80	4'	U GEM	UGSS	8.2- 14.9	F 2	
22/03	28/03	02/04	182 Elsa	13.3	0.7	80	16'	U GEM	UGSS	8.2- 14.9	N 3	
1999												
07/01	10/01	14/01	984 Gretia	12.8	0.65	5.8	12'	AW GEM	UGSS	12.9-[17.5p	1	4
21/01	26/01	01/02	333 Badenia	14.2	0.4	10'		IR GEM	UGSU	10.7-[14.5	L	
06/04	08/04	10/04	15 Eunomia	10.3	0.56	6.1	27'	RV TAU	RVb	8.8- 11.0	L	5
2000												
06/05	08/05	10/05	337 Devosa	13.4	0.75	4.6	9'	IR GEM	UGSU	10.7-[14.5	N	
06/08	10/08	14/08	30 Urania	11.5	0.45	13.7	2'	TT ARI	NLVY	10.2- 14.5p	L	
06/12	08/12	10/12	433 Eros	14.5	1.50	5.3	7'	VY AQR	UGSU	8.7- 17.2p	F 6	

TABLE COLUMN HEADINGS CONTINUED

Variable:	The variable's identification in the standard notation. See BAAVSS list for charts
Type:	The variable's type, for reference, as quoted in the BAAVSS Telescopic Programme
Range:	The variable's magnitude range, as quoted in the BAAVSS Telescopic Programme
M:	Lunar phase at closest approach (ie at *Mid* date above), to the nearest Quarter N = New 1 = First Quarter F = Full L = Last Quarter
N:	Notes. Comments upon individual events follow the main body of the table

NOTES

1 The nearly full moon lies a mere 10° South on closest approach

2 Though a nearly full moon lies at the other end of Gemini on the evening of the 7th, the fact that the asteroid lies only 2' South Preceding to UGEM at 19h UT makes it a worthwhile target.

3 182 Elsa's second appulse with U Gem occurs near New Moon. Although the separation is greater and the magnitude fainter, this in some ways makes up for the previous month's appulse (note 2).

4 The asteroid's amplitude range is from 0.4 to 0.65 of a magnitude.

5 15 Eunomia goes on to lie within 43' of the UGSS star HW Tau on 16/04/99 (near full moon).

6 The amplitude ranges from 0.05 to 1.50 magnitudes. Included for its interest as being the target of investigation by NASA's NEAR spacecraft in 1999 (hopefully).

COMMENTS ON THE VSS OBSERVERS' QUESTIONNAIRE

ROGER PICKARD

Members may have wondered whatever happened to the Questionnaire that was sent out with Circular No. 73 in November 1992.
Initially, members were asked to return them to me and I gave a brief report in Circular No. 78 before passing them to the Director at that time. Unfortunately, a change of circumstances brought about a number of changes to the post of Director since the original conception, which resulted in no further action being taken. However, the present Director has seen fit to return them to me for a more "in depth" report. So, with that little piece of background history, here goes.

The Questionnaire was intended to find out the resources of the Section, i.e. how much observing members did, of what objects and with what type of instrumentation. It also asked if members had a computer, whether they were interested in photoelectric photometry and whether they would be interested in keying in data for the Sections records. Altogether (49) Questionnaires were returned from as far afield as the US and Australia!

However, there were some surprising omissions, but I won't name them here to save any

embarrassment!! Just let me add that the first reply was from Mike Gainsford, and should it be of any interest, our present Director was number 5.

Not all members are active observers of course, but of those that are, they generally spend on average around 60 nights per year observing; roughly once a week, although this was not necessarily always on variable star work.

Nearly everybody has access to a pair of binoculars (7x50 being the most popular), whilst over 70% also had a telescope. The telescopes were mostly 220mm reflectors and above although there were a number of smaller OGs. There is also quite a lot of experience in the section with many members reporting that they had been observing for well over 20 years, whilst the least experienced had not yet completed their first year.
Most observers with telescopes observed all types of variable, whilst those with only binoculars tended to observe only Miras and semi-regulars (not surprising really!).

Question 9 was not very specific in asking members what they observed? Some members replied with the types of variable most frequently observed whilst others described other types of observing apart from variable stars.

The number of members with a computer in 1993 was nearly 60%, although this is probably far higher now. These ranged from a Spectrum to a modern Notebook style and even a Mainframe! Many of those owning or having access to a computer were prepared to help out with keying in the Section's database. In addition, several members also said they would be prepared to help if a computer could be made available to them.

A number of members were interested in PEP, although sadly this number probably hasn't increased. Of the 8 members who had or had access to a photometer in 1993 only one has gone on to produce results. (However, one other member is now making PEP observations, but he was not a Section member in 1993 or did not feature in the survey).

The Questionnaire did not specifically ask about interest in CCDs, but this was already an area of interest in 1993, and has obviously increased dramatically since. Ten members reported interest in this area of activity.

Finally, there was a question asking for other comments and these included:-

How about the Section having an annual meeting and the occasional meeting in the North? This has at least been partially addressed in recent years. (Particularly as one of those who raised this point was the current Director!). However, the possibility of having a meeting in the north is still entirely dependent on finding somebody from that area to help organise it. Are there any offers - you have plenty of time as the next one wouldn't need to be held until 1997 or early 1998?!

How about a letters page in the Circular?
Letters are printed from time to time, as appropriate.

Could we have articles for beginners please?
A good point, we tend to forget that not everyone is an "expert" observer!

How about organising a training programme, under the guidance of a training officer?

This is more difficult, especially given the British weather! How would it operate? Is such a programme really required?

Should we be looking at ways to make visual observations more accurate?
Brilliant idea. How do we do it?

And the final question from our overworked Secretary:
Is anybody interested in paperwork or generally helping out the Section?

A number of members expressed the desire to be free of light pollution, either by better local lighting or by moving to a more remote location (or both!).

It was also gratifying that some members very kindly said how helpful the Section's Officers were. Thank you, on their behalf - both past and present.

Answers to any or all of these questions to the Director, please!

VSS MEETING - PART 1

TRISTRAM BRELSTAFF

For its 1996 meeting on October 5th, the VSS were the guests of the Astronomical Section of the Northamptonshire Natural History Society (NNHS). The meeting was opened by Bob Marriot who welcomed the VSS on behalf of the NNHS and then gave way to Gary Poyner, the Director of the VSS. Gary announced that Dave McAdam had almost reached the million mark in the entry of observations into the VSS Computer Archive. He then introduced **Guy Hurst** who was to speak on **Novae and Supernovae**.

Guy said that his talk would be mainly about searching for novae, with a little bit on supernovae. He summarised the work of George Alcock, the main inspiration for the UK Nova/Supernova Patrol. George had found 5 novae so far but Guy stressed that that was only after thousands of hours of searching. Even at the age of 85, George had still clocked up 300 hours so far this year.

The UK Nova/Supernova Patrol has the following aims:

1) To discover novaeand supernovae (for the latter you really need at least a 6-inch telescope)
2) To check out other people's discoveries
3) To carry out follow-up magnitude estimates and astrometry (to 0.1 arcsec accuracy)
4) To monitor stars known to show recurrent outbusts at long intervals
5) To compile lists of stars omitted from atlases (these can give rise to false alerts)
6) To chart selected regions of the sky and the areas around galaxies to make it easier to find novae and supernovae
7) To liaise with the IAU Commission on Supernovae, the Central Bureau for Astronomical Telegrams, and professional astronomers interested in novae and supernovae
8) To publish details of discoveries as soon as possible (mainly by e-mail now)
9) To publish preliminary light-curves and more detailed analyses in The Astronomer, the Journal of the BAA, and other places.

The Patrol was founded in 1976 after several pre-discovery images of novae were found post-discovery on 35mm photographs. The first success for the Patrol was John Hosty's remarkable discovery of Nova Sge 1977. This was followed by Robbie McNaught's discoveries of Nova Cen 1980 and Nova Sgr 1987. Then came Dave McAdam's "Nova" And 1988 which actually turned out to be a WZ Sge type dwarf nova. The first comparable success for the Supernova Patrol came only recently with Pesci's discovery of SN1995al.

Guy outlined the various features of nova light-curves and then went on to describe three particular novae in more detail. Nova Her 1991 was found by George Alcock and confirmed by Denis Buczynski, who photographed it in very strong morning twilight. It faded very rapidly from its maximum of mag 5 and probably no more than 200 magnitude estimates were made of it world-wide.

Nova Sge 1977 (= HS Sge) was found by John Hosty at about mag 7.4 when it was at an altitude of only 10 degrees. Guy has recently re-reduced all available estimates of it using photoelectric magnitudes for the comparison stars and is hoping to publish the results in the Journal of the BAA. This will apparently be the first published light-curve of this nova. It shows a very rapid fade from maximum down to mag 11.5, and then a slower decline.

V705 Cas (= Nova Cas 1993) showed a DQ Her type light-curve: a long drawn-out maximum with superimposed rapid fluctuations, followed by a steep fade into a deep broad minimum, and then a partial recovery to a secondary maximum before the final decline set in. Guy pointed out that in recent observations of the final decline there were large discrepancies between CCD and visual observations and also between visual observers from different countries! The latter were probably due to differences between the comparison stars used. He also pointed out a small dip of about 0.5 mag that preceeded the big minimum. There is a suggestion that there was a similar dip in the light-curve of DQ Her and Guy said that some professional astronomers had shown interest in this feature.

Guy finally said a few words about the types of supernova. He showed a light-curve for SN 1995al and pointed out that on the decline visual observations were consistently about 0.5 mags brighter than photoelectric V-measures.

In the subsequent discussion, Mark Kidger said that the discrepancies in the light-curves were most probably colour effects. Unfiltered CCD photometry is not really much use and even with filters it needed careful calibration. Concerning stars missing from atlases, he added that the Guide Star Catalogue was "hopeless" and had "loads of missing stars". In his work on Tenerife he had known several professional astronomers who had become convinced that they had discovered something, only to find that it was just an omission from the GSC. Guy added that there tends to be lots of such omissions near galaxies - maybe nebulosity upset the algorithms used in the compilation of the GSC?
Gary Poyner said that it was important to keep V705 Cas under observation as long as possible.

This summary of the talks given at the variable star meeting will be continued in the next circular.

Photoelectric Minima of Eclipsing Binaries, 1995

TRISTRAM BRELSTAFF

The numbers of photoelectric observations of eclipsing binaries received from various observers in 1995 are listed in Table 1.

Table 1. Observer Totals

Observer	No Obsns	No Timings	Notes
J Ells APT (EJ)	811	5	1
J Saxton (XT)	83	4	2
K West (WEK)	101	3	
Total	995	12	

Notes:

1. The code EJ indicates timings made with the Jack Ells Automatic Photoelectric Telescope operated by M Gough.
2. The observations by J Saxton are from 1993-94.

The timings derived from these observations are listed in Table 2. A colon (':') following a timing indicates that it is uncertain either because the observations show large scatter or else because the rising or fading limb was poorly covered. The O-C values are relative to the linear elements given in the 4th Edition of the GCVS.

Table 2. Timings of Minimum

Star	Epoch	JD Hel	O-C (d)	No	Observer
WW Aur	6778.5	2450061.3812	-0.0009	27	WEK(pe)
BF Aur	5931	2450018.4538	0.0068	117	EJ(pe)
IU Aur	6248	2449766.5042:	-0.0002:	40	EJ(pe)
RZ Cas	5041	2449225.5595	0.0131	18	XT(pe)
VW Cep	21015.5	2450006.3668	0.0332	82	EJ(pe)
VW Cep	21037	2450012.3424:	0.0251:	37	EJ(pe)
AI Dra	4868	2449127.4662	0.0097	20	XT(pe)
AM Leo	18852.5	2449389.5785	-0.0060	17	XT(pe)
AM Leo	18863.5	2449393.6026	-0.0057	20	XT(pe)
AM Leo	19973	2449799.4561	-0.0044	94	EJ(pe)
U Oph	3266.5	2449895.4427:	0.0050:	13	WEK(pe)
Beta Per	1516	2449988.3686	0.0218	33	WEK(pe)

Recent Papers on Variable Stars

TRISTRAM BRELSTAFF

Extremely Rapid Bursts of TeV Photons from the Active Galaxy Markarian 421
(Gaidos et al., Nature, 383, 319-320, 1996)
Report the detection of two gamma-ray flares from this BL Lac object. The second lasted only 30 mins. This implies the source must be very small - maybe only 10 light hours across.

The Peak Brightness of SN 1937C in IC 4182 and the Hubble Constant: Comments on Pierce and Jacoby (Schaeffer, Astron. J., 111, 1668-1674, 1996) - Points out that the analysis of Pierce and Jacoby (Astron. J., 110, 2885, 1995) contains systematic errors due to the colour correction for the difference between light and dark adapted vision. They also only used 13% of the data available. Schaeffer re-analyses all the data, finds at max V=8.75 and B=8.71. He then derives a Hubble Constant of 57.4±4 km/s/Mpc.

The Orbital Period of BK Lyncis PG 0917+342 (Ringwald et al., MNRAS ,278, 125-131, 1996)
Long-term light-curves from the Harvard Plate Collection and from the Indiana Automatic CCD Photometry Telescope ('Roboscope') show no dwarf nova outburst. Spectroscopy gives an orbital period of 107.97 mins. It is not clear whether this should be regarded as the first nova-like variable found below the period gap or a WZ Sge star with very rare outbursts.

The Story of FG Sagittae (Tipper, in 'Hydrogen Deficient Stars', Astron. Soc. Pacific, Conf. Ser. 96, 329-340, 1996)
Reviews the photometric and spectroscopic history of this unique star.

First Image of the Surface of a Star with the Hubble Space Telescope
(Gilliland & Dupree, Astrophys. J., 463, L29-L32, 1996)
Use the HST Faint Object Camera to image Alpha Ori at two wavelengths in the ultraviolet. Stellar disk covers about 10 resolution elements and has diameter of 125 milliarcsecs (this is about 2.2 times the diameter in in the visual). Both images show a bright spot in the SW quadrant. (This agrees with results obtained by a team from Cardiff University and Imperial College who used the William Herschel Telescope - see Observatory, 116, 214-215, 1996)

Bipolar Flow in Slowly Expanding Circumstellar Envelope around X Herculis
(Kahane & Jura, Astron. Astrophys., 310, 952-960, 1996)
Millimeter wave observations of carbon monoxide are interpreted as being from 3 separate components of the stellar wind: a very slow spherical outflow and two high-velocity flows directed in opposite directions. The reason for this structure is not clear.

RV Tauri Stars I: A Long-term Photometric Survey (Pollard et al., MNRAS, 279, 949-977, 1996)
Analyse BVRI photometry on 11 stars covering 2 to 3.5 years. Results are consistent with alternating deep and shallow minima being due to 2:1 resonance between fundamental and 1st overtone mode pulsations.

A Re-examination of the Suspected Early-type Flare Star BD+31°1048 (BS 1938) in Aurigae - A Skeleton from the Cupboard (Andrews, Irish Astron. J., 23, 189-193, 1996)
Andrews first suspected this star of flares 30 years ago. This paper discusses old and new photometry and spectroscopy and urges a search in the infra-red for a cool companion.

NSV 5598 is not a Rapid Variable Star (Boninsegna, GEOS Circular EB24, 1-3, 1996)
17 photoelectric measures on 6 nights show no detectable variation.

IBVS's 4349 - 4367

GARY POYNER

4349 Photometric Variability of the Lambda Bootis star HD 30422. (Kuschnig et al, 1996)
4350 Discovery of the new RR Lyrae star GSC 2576_466. (Gladders & Robb, 1996)
4351 Nonvariability among Lambda Bootis stars III: CTIO (1995) and McDonald (1995) data. (Paunzen et al, 1996)
4352 HBV 479: A new variable star in Hercules. (Kohoutek, 1996)
4353 DDC Photometry of CN Tau, V427 Tau, V926 Cyg and GS Lyr. (Wetterer et al, 1996)
4354 Identification of Dahlmark Variables. (Williams, 1996)
4355 Photometry of alpha Orionis (October 1994 to April 1996). (Krisciunas & Luedeke, 1996)
4356 NSV 09136, an RR Lyrae type star in Ophiuchus. (Sanchez, 1996)
4357 Great optical outburst of AO535+26=V725 Tauri. (Dorokhov & Dorokova, 1996)
4358 U,B,V light curves and period behaviour for the Solar type eclipsing binary, V417 Aql. (Pauley et al, 1996)
4359 1991 B,V,Rc, Ic light curves of the southern very short period eclipsing binary V676 Centauri. (Gray et al, 1996)
4360 Nine new variables in the eta Herculis field. (Antipin, 1996)
4361 New supernova 1983 on Moscow Plates. (Antipin, 1996)
4362 Eccentric eclipsing binary stars as test of general relativity: The case of V541 Cygni. (Guinan et al, 1996)
4363 New apsidal motion determination of the eccentric eclipsing binary V1143 Cygni. (Burns et al, 1996)
4364 NSV 07968 is an overcontact eclipsing binary star. (Gomez-Forrellad & Garcia-Melendo, 1996)
4365 The new overcontact eclipsing binary star NSV 07457. (Nomen-Torres & Garcia-Melando, 1996)
4366 CCD Photometry of eight suspected cataclysmic variables. (Haefner et al, 1996)
4367 New observations of four galactic Cepheids. (Dupuy & Bloomer Jr, 1996)

ECLIPSING BINARY PREDICTIONS

TRISTRAM BRELSTAFF

The following predictions are calculated for an observer at 53 degrees north, 1.5 degrees west but should be usable for observers throughout the British Isles. The times of mid-eclipse appear in parentheses with the start and end times of visibility on either side. The times are hours GMAT, that is UT-12h. D' and 'L' are used to indicate where daylight and low altitude, respectively prevent part of the eclipse from being visible. Charts for all of the stars included in these predictions (17 in all - see below for a list) are available from the Eclipsing Binary Secretary at 10p each (please enclose a large SAE)

Star	Range (mags)	Period (days)	Eclipse (hours)	Star	Range (mags)	Period (days)	Eclipse (hours)
RZ Cas	6.18 - 7.72V	1.19524892	4.9	U Cep	6.75 - 9.24V	2.49307	9.0
SS Cet	9.4 - 13.0v	2.973967	9.3	SW Cyg	9.24 - 11.83V	4.573011	13
Z Dra	10.8 - 14.1p	1.3574257	4.8	TW Dra	7.3 - 8.9v	2.806842	11
S Equ	8.0 - 10.08V	3.4361291	11	RW Gem	9.53 - 11.76V	2.8654972	10
V640 Ori	11.2 - 13.5p	2.0207326	5.3	Z Per	9.7 - 12.4p	3.0562868	10
ST Per	9.52 - 11.40V	2.6483358	8.3	Y Psc	9.44 - 12.23V	3.765723	9.0
U Sge	6.45 - 9.28V	3.3806129	14	RW Tau	7.98 - 11.59V	2.768780	9.3
X Tri	8.88 - 11.27V	0.9715306	4.2	TX UMa	7.06 - 8.80V	3.063305	8.8
Z Vul	7.25 - 8.90V	2.45492679	11				

1997 Jan 1 Wed
U Cep D05(04)09
ST Per 07(11)15
V640 Ori 10(12)15L
RW Gem 11(16)18L
RZ Cas 14(17)19D
TX UMa 15(20)19D

1997 Jan 2 Thu
Z Dra D05(04)06
SS Cet D05(08)12
SW Cyg D05(10)12L
Z Per 07(12)17
Y Psc 10(14)10L
TW Dra 12(17)19D
SW Cyg L14(10)17
RZ Cas 19(21)19D

1997 Jan 3 Fri
RW Tau D05(01)06
Z Vul D05(05)08L
Z Dra 10(13)15
V640 Ori 10(13)15L
U Cep 11(16)19D

1997 Jan 4 Sat
ST Per D05(02)06
U Sge D05(04)07L
RW Gem 08(13)18L
TX UMa 17(21)19D
Z Dra 19(21)19D

1997 Jan 5 Sun
RZ Cas D05(07)09
SS Cet D05(07)12
TW Dra 07(12)17
Z Per 08(13)17L
V640 Ori 11(13)15L
RW Tau 15(20)16L
Z Vul L17(15)19D

1997 Jan 6 Mon
S Equ D05(04)07L
U Cep D05(04)09
Z Dra D05(06)08
Y Psc D05(09)10L
RZ Cas 09(11)14
ST Per 14(18)17L
X Tri 14(17)14L
SW Cyg 18(24)19D

1997 Jan 7 Tue
SW Cyg D05(00)06
RW Gem D05(10)15
V640 Ori 11(14)15L
Z Dra 12(14)17
X Tri 13(16)14L
RZ Cas 14(16)18
U Sge L17(13)19
TX UMa 18(23)19D

1997 Jan 8 Wed
Z Vul D05(02)07L
SS Cet D05(07)11
TW Dra D05(08)13
RW Tau 09(14)16L
Z Per 10(14)17L
U Cep 11(16)19D
X Tri 13(15)14L
RZ Cas 18(21)19D

1997 Jan 9 Thu
ST Per 05(09)13
V640 Ori 12(14)14L
X Tri 12(14)14L

1997 Jan 10 Fri
Y Psc D05(03)07
RW Gem D05(06)11
Z Dra D05(07)10
X Tri 11(14)14L
Z Vul L17(13)19
U Sge L17(22)19D

1997 Jan 11 Sat
TW Dra D05(03)08
U Cep D05(04)09
SS Cet D05(06)11
RZ Cas D05(06)08
RW Tau D05(09)13
SW Cyg 08(14)12L
X Tri 11(13)14L
Z Per 11(16)17L
V640 Ori 12(15)14L
SW Cyg L14(14)19D
Z Dra 14(16)18

1997 Jan 12 Sun
RZ Cas 08(11)13
X Tri 10(12)14L

1997 Jan 13 Mon
Z Vul D05(00)05
S Equ D05(01)06
RW Gem D05(03)08
X Tri 09(12)14L
U Cep 11(16)19D
V640 Ori 13(15)14L
RZ Cas 13(15)18
TW Dra 17(22)19D

1997 Jan 14 Tue
TX UMa D05(02)07
RW Tau D05(03)08
SS Cet D05(05)10
U Sge D05(07)06L
Z Dra 07(09)12
X Tri 09(11)14
ST Per 12(16)16L
Z Per 12(17)17L
RZ Cas 18(20)19D

1997 Jan 15 Wed
Z Vul 06(11)07L
X Tri 08(10)13
V640 Ori 13(16)14L
Z Dra 15(18)19D
Z Vul L16(11)16

1997 Jan 16 Thu
U Cep D05(03)08

SW Cyg D05(04)10
S Equ 06(11)06L
X Tri 07(10)12
TW Dra 13(18)19D

1997 Jan 17 Fri

TX UMa D05(03)08
SS Cet D05(05)09
RZ Cas D05(05)08
ST Per D05(08)12
X Tri 07(09)11
Z Per 14(18)16L
V640 Ori 14(16)14L
U Sge L17(16)19D
Z Vul 17(22)19D

1997 Jan 18 Sat

X Tri 06(08)11
RZ Cas 08(10)13
Z Dra 08(11)13
U Cep 10(15)19D
RW Gem 16(21)17L

1997 Jan 19 Sun

X Tri D05(08)10
TW Dra 08(13)18
RW Tau 11(16)15L
RZ Cas 12(15)17
Z Dra 17(19)19D

1997 Jan 20 Mon

SS Cet D05(04)09
TX UMa D05(05)10
X Tri D05(07)09
Z Vul D05(09)06L
SW Cyg L13(17)19D
Z Per 15(20)16L
RZ Cas 17(20)19D

1997 Jan 21 Tue

U Sge D05(01)06L
U Cep D05(03)08
Z Dra D05(04)06
X Tri D05(06)09
Y Psc 06(10)09L
RW Gem 12(17)17L

1997 Jan 22 Wed

X Tri D05(06)08
TW Dra D05(09)14
RW Tau 06(10)15
Z Dra 10(13)15
ST Per 11(15)16L
Z Vul L16(20)19D

1997 Jan 23 Thu

SS Cet D05(03)08
RZ Cas D05(05)07
X Tri D05(05)07
TX UMa D05(06)11
S Equ D05(08)06L
U Cep 10(15)19D

1997 Jan 24 Fri

X Tri D06(04)07
U Sge D06(11)06L
RZ Cas 07(10)12
RW Gem 09(14)17L
U Sge L16(11)16

1997 Jan 25 Sat

X Tri D06(04)06
TW Dra D06(04)09
Y Psc D06(05)09L
RW Tau D06(05)10
Z Dra D06(06)08
ST Per D06(07)11
Z Vul D06(07)06L
SW Cyg D06(07)11L
RZ Cas 12(14)17
SW Cyg L13(07)13

1997 Jan 26 Sun

U Cep D06(03)08
SS Cet D06(03)07
TX UMa D06(08)13
Z Dra 12(14)17
RZ Cas 17(19)19D

1997 Jan 27 Mon

RW Gem 06(11)16
Z Vul L16(18)19D
U Sge L16(20)19D
TW Dra 18(23)19D

1997 Jan 28 Tue

U Cep 10(15)19D

1997 Jan 29 Wed

SS Cet D06(02)07
RZ Cas D06(04)07
Z Dra D06(08)10
TX UMa D06(10)14
SW Cyg 15(21)19D

1997 Jan 30 Thu

Z Vul D06(05)06L
RW Gem D06(08)13
RZ Cas 07(09)11
ST Per 10(14)15L
RW Tau 13(18)15L
TW Dra 14(19)19D
Z Dra 14(16)18

1997 Jan 31 Fri

U Cep D06(02)07
RZ Cas 11(14)16

1997 Feb 1 Sat

SS Cet D06(02)06
TX UMa 06(11)16
Z Vul L15(16)19D
RZ Cas 16(18)19D

1997 Feb 2 Sun

Z Per D06(01)06
RW Gem D06(05)10
ST Per D06(05)09
Z Dra 07(09)12
RW Tau 07(12)15L
TW Dra 09(14)19D
U Cep 09(14)19D

1997 Feb 3 Mon

SW Cyg D06(11)10L
SW Cyg L12(11)17
Z Dra 15(18)18D
U Sge L16(14)18D

1997 Feb 4 Tue

RZ Cas D06(04)06
TX UMa 08(13)17

1997 Feb 5 Wed

RW Gem D06(01)06
U Cep D06(02)07
Z Per D06(03)07
RW Tau D06(07)11
TW Dra D06(09)14
RZ Cas 06(08)11
Y Psc 07(12)08L

1997 Feb 6 Thu

Z Dra 09(11)13
RZ Cas 11(13)16
Z Vul L15(13)18D
U Sge 17(23)18D

1997 Feb 7 Fri

ST Per 08(12)15L
U Cep 09(14)18D
TX UMa 09(14)18D
RZ Cas 15(18)18D
Z Dra 17(20)18D

1997 Feb 8 Sat

SW Cyg D06(00)07
Z Per D06(04)09
TW Dra D06(05)10

1997 Feb 9 Sun

Z Dra D06(04)07
Y Psc D06(06)08L

1997 Feb 10 Mon

U Cep D06(02)07
ST Per D06(04)08
Z Dra 10(13)15
TX UMa 11(16)18D
RW Gem 14(19)15L

1997 Feb 11 Tue

Z Per D06(05)10
RZ Cas D06(08)10
Z Vul L15(11)17

1997 Feb 12 Wed

SW Cyg 08(14)10L
U Cep 09(14)18D
RZ Cas 10(13)15
SW Cyg L11(14)18D
S Equ L18(23)18D

1997 Feb 13 Thu

Z Dra D06(06)08
RW Tau 09(14)14L
RW Gem 10(16)15L
X Tri 11(14)12L
TX UMa 12(17)18D
TW Dra 14(19)18D
RZ Cas 15(17)18D
U Sge L15(17)18D
Z Vul 17(22)18D

1997 Feb 14 Fri

Z Per D06(07)11
X Tri 11(13)12L
Z Dra 12(14)17

1997 Feb 15 Sat

U Cep D06(01)06
ST Per 07(11)14L
X Tri 10(13)12L

1997 Feb 16 Sun

RW Tau D06(08)13
RW Gem 07(12)15L
X Tri 09(12)12L
TW Dra 10(15)18D
TX UMa 14(19)18D
Z Vul L14(09)14

1997 Feb 17 Mon

SW Cyg D06(04)09L
RZ Cas D06(07)10
Z Dra D06(08)10
Z Per D06(08)13
U Cep 08(13)18
X Tri 09(11)11L

1997 Feb 18 Tue

ST Per D06(03)07
X Tri 08(10)11L
RZ Cas 10(12)14
Z Dra 14(16)18D
Z Vul 15(20)18D

1997 Feb 19 Wed

RW Tau D06(03)08
RW Gem D06(09)14
TW Dra D06(10)15
X Tri 07(10)11L

RZ Cas 14(17)18D
TX UMa 15(20)18D
S Equ L17(20)18D

1997 Feb 20 Thu

Z Per D06(09)14L
X Tri 07(09)11L
U Sge L14(12)17

1997 Feb 21 Fri

X Tri D06(08)11
Z Dra 07(09)12
SW Cyg 12(18)18D

1997 Feb 22 Sat

TW Dra D06(06)11
RW Gem D06(06)11
X Tri D06(08)10
U Cep 08(13)18
Z Dra 16(18)18D
TX UMa 17(22)18D

1997 Feb 23 Sun

RZ Cas D06(07)09
X Tri D06(07)10
ST Per D06(10)14L
Z Per D06(11)14L
Z Vul L14(18)18D
U Sge 15(21)18D

1997 Feb 24 Mon

X Tri D06(06)09
Y Psc D06(08)07L
RZ Cas 09(11)14
RW Tau 11(16)13L

1997 Feb 25 Tue

RW Gem D06(03)08
X Tri D06(06)08
Z Dra 09(11)13
RZ Cas 14(16)18D

1997 Feb 26 Wed

X Tri D06(05)07
SW Cyg D06(07)09L
Z Per 07(12)14L
SW Cyg L11(07)14
S Equ L17(17)18D
Z Dra 17(20)18D

1997 Feb 27 Thu

X Tri D06(04)07
RW Tau D06(10)13L
U Cep 08(13)17
TW Dra 15(20)18D

1997 Feb 28 Fri

Z Dra D07(04)07
ST Per 13(17)13L
Z Vul L13(16)18D

1997 Mar 1 Sat

RZ Cas D07(06)09
Z Per 09(13)14L
Z Dra 10(13)15

1997 Mar 2 Sun

RW Tau D07(05)09
RZ Cas 08(11)13
TW Dra 11(16)18D
U Sge L14(15)18D
SW Cyg 15(21)18D

1997 Mar 3 Mon

ST Per D07(09)13
RZ Cas 13(16)18D

1997 Mar 4 Tue

TX UMa D07(02)07
Z Dra D07(06)08
U Cep 07(12)17
Z Per 10(15)13L

1997 Mar 5 Wed

TW Dra D07(11)16
RW Gem 12(17)14L
Z Dra 12(15)17
Z Vul L13(13)18D
S Equ L17(14)18D

1997 Mar 7 Fri

TX UMa D07(04)08
V640 Ori D07(04)07
RZ Cas D07(06)08
SW Cyg D07(11)08L
SW Cyg L10(11)17
Z Per 11(16)13L

1997 Mar 8 Sat

TW Dra D07(06)11
Z Dra D07(08)10
RZ Cas 08(10)13
RW Gem 09(14)14L
ST Per 12(16)13L

1997 Mar 9 Sun

V640 Ori D07(05)08
U Cep 07(12)17
RZ Cas 13(15)17D
U Sge L13(09)15
Z Dra 14(16)17D

1997 Mar 10 Mon

TX UMa D07(05)10
RW Tau 07(12)12L
Z Per 13(17)13L
Z Vul L13(11)17
RZ Cas 17(20)17D

1997 Mar 11 Tue

V640 Ori D07(05)08
ST Per D07(07)11
RW Gem D07(11)14L

1997 Mar 12 Wed

Z Dra 07(09)12
U Sge L13(18)17D
Z Vul 17(22)17D

1997 Mar 13 Thur

RZ Cas D07(05)07
V640 Ori D07(06)08
RW Tau D07(06)11
TX UMa D07(07)11
Z Dra 16(18)17D
TW Dra 16(21)17D

1997 Mar 14 Fri

RW Gem D07(07)12
U Cep D07(12)16
RZ Cas 07(10)12

1997 Mar 15 Sat

V640 Ori D07(06)09
RZ Cas 12(14)17
Z Vul L12(09)14
S Equ L16(21)17D

1997 Mar 16 Sun

TX UMa D07(08)13
Z Dra 09(11)14
SW Cyg L09(14)17D
ST Per 10(14)12L
TW Dra 11(16)17D
RZ Cas 17(19)17D

1997 Mar 17 Mon

RW Gem D07(04)09
V640 Ori D07(07)10
Z Vul 15(20)17D

1997 Mar 19 Wed

ST Per D07(06)10
V640 Ori D07(07)10L
TX UMa D07(10)15
U Cep D07(11)16
TW Dra D07(12)17
U Sge L13(13)17D

1997 Mar 20 Thu

RZ Cas D07(09)12
Z Dra 11(13)15
Z Vul L12(07)12

1997 Mar 21 Fri

V640 Ori D07(08)10L
SW Cyg L09(04)10
RW Tau 09(14)11L
RZ Cas 11(14)16

1997 Mar 22 Sat

TW Dra D07(07)12
TX UMa D07(11)16
Z Vul 13(18)17D
S Equ L15(18)17D
RZ Cas 16(19)17D
U Sge 16(22)17D

1997 Mar 23 Sun

Z Dra D07(06)08
V640 Ori D07(08)10L
X Tri 09(11)09L

1997 Mar 24 Mon

RW Tau D07(08)11L
U Cep D07(11)16
X Tri 08(11)09L
ST Per 09(13)12L
Z Dra 12(15)17D

1997 Mar 25 Tue

TW Dra D07(03)08
V640 Ori D07(09)10L
X Tri 07(10)09L
TX UMa 08(13)17D
SW Cyg 12(18)17D

1997 Mar 26 Wed

RZ Cas D07(09)11
X Tri D07(09)09L
U Sge L12(07)13

1997 Mar 27 Thu

RW Tau D07(03)07
ST Per D07(05)09
Z Dra D07(08)10
X Tri D07(08)09L
V640 Ori D07(09)09L
RZ Cas 11(13)16
Z Vul L12(16)17D

1997 Mar 28 Fri

X Tri D07(08)09L
TX UMa 10(14)17D
RW Gem 10(15)12L
Z Dra 14(16)17D
RZ Cas 16(18)17D

1997 Mar 29 Sat

X Tri D07(07)09L
V640 Ori D07(10)09L
U Cep D07(11)15
U Sge L12(16)17D
S Equ L15(15)17D

1997 Mar 30 Sun

X Tri D07(06)09L
SW Cyg L08(08)14
TW Dra 12(17)16D

1997 Mar 31 Mon

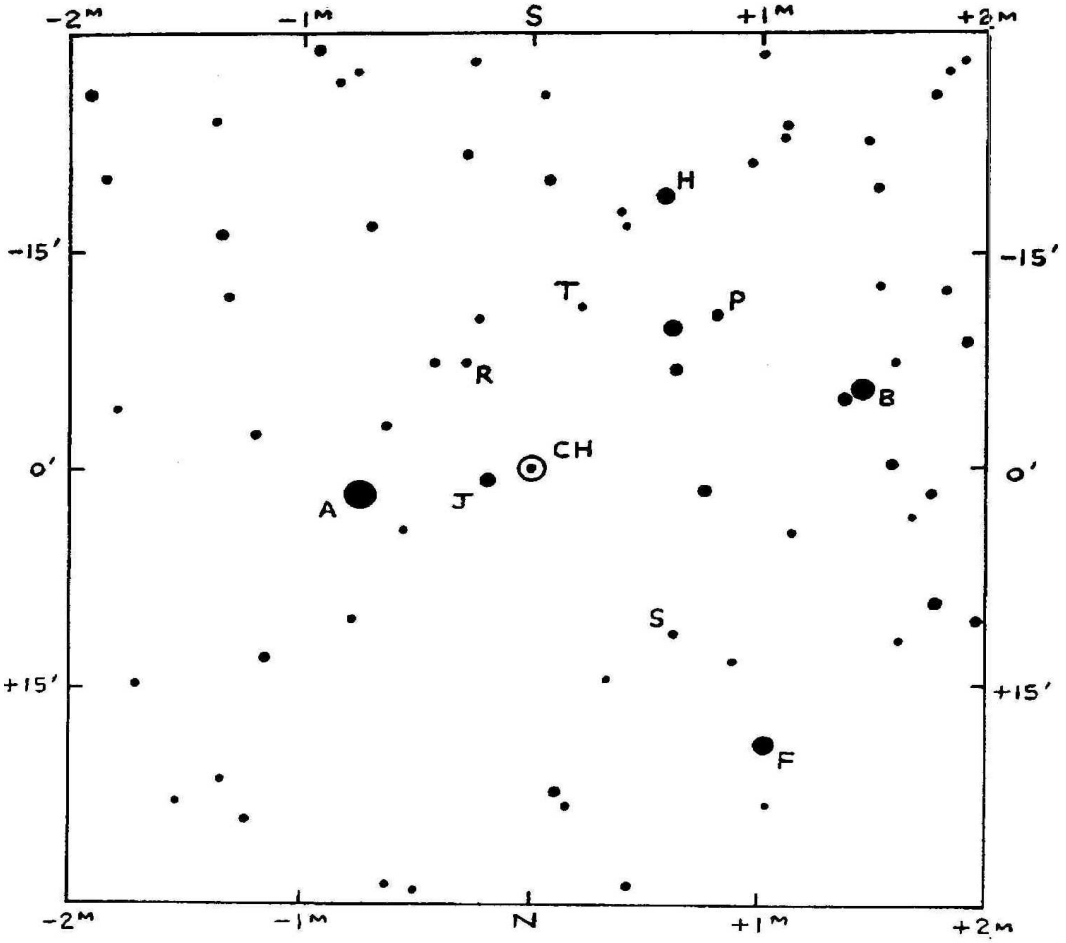
X Tri D07(06)08
Z Dra D07(10)12
RW Gem D07(12)12L
V640 Ori 08(10)09L
TX UMa 11(16)16D

NEW CHART FOR CH CYGNI

JOHN TOONE

089·02 1° FIELD INVERTED

CH CYGNI 19ᴴ 24ᴹ 33ˢ +50° 14·5′ (2000)



SEQUENCE: A,B,F,H
AAVSO CIRCULAR 24.
J,P,R,S,T B.SKIFF.
CHART: STELLARUM.

A	6·5	P	10·1
B	7·4	R	10·8
F	8·5	S	11·0
H	9·2	T	11·7
J	9·4		

BAA VSS
EPOCH: 2000
DRAWN: JT 11-8-96
APPROVED: G. POYNER

SECTION OFFICERS

Director Gary Poyner
67 Ellerton Road, Kingstanding, Birmingham, B44 0QJ.
Tel: 0121 6053716 Internet:gp@star.sr.bham.ac.uk
Section Secretary Melvyn D. Taylor
17 Cross Lane, Wakefield, West Yorks., WF2. 8DA. Tel: 01924 374651
Chart Secretary John Toone
Hillside View, 17 Ashdale Road, Cressage, Shrewsbury, SY5 6DT. Tel 01952 510794
Computer Secretary Dave McAdam
33 Wrekin View, Madeley, Telford, Shropshire, TF7 5HZ.
Tel 01952 432048 Internet dave@telf-ast.demon.co.uk
Nova/Supernova Secretary Guy M Hurst
16 Westminster Close, Basingstoke, Hants, RG22 4PP .
Tel & Fax 01256-471074 Internet Guy@tahq.demon.co.uk
Pro-am Liaison Committee Secretary & Photoelectric Photometry Advisor
Roger D Pickard, 28 Appletons, Hadlow, Kent TN11 0DT
Tel 01732-850663 Internet rdp@star.ukc.ac.uk
Eclipsing Binary Secretary Tristram Brelstaff,
3 Malvern Court, Addington Road, Reading, Berks, RG1 5PL Tel 01734-268981
Circulars Editor and CCD Advisor Karen Holland
136 Northampton Lane North, Moulton, Northampton, NN3 7QW
Tel 01604 671373 Internet kho@star.le.ac.uk
Recurrent Objects Co-ordinator - as Director

TELEPHONE ALERT NUMBERS

Nova and Supernova discoveries
First telephone the Nova/Supernova Secretary. If only answering machine response, leave a message and then try the following: Denis Buczynski 01524-68530, Glyn Marsh 01772-690502, or Martin Mobberley 01245-475297 (weekdays) 01284-828431 (weekends).
Variable Star Alerts
Telephone Gary Poyner (see above for number)

Charges for Section Publications

The following charges are made for the Circulars. These cover one year (4 issues). Make cheques out to the BAA. Send to the Circulars editor.

	UK	Europe	Rest of World
BAA Members	£3.00	£4.00	£6.50
Non-Members	£5.00	£6.00	£8.50

The charges for other publications are as follows. Make cheques out to the BAA and please enclose a large SAE with your order.

	Order From	Charge
Telescopic Charts	Chart Secretary	30p
Binocular Charts	Chart Secretary	10p
Eclipsing Binary Charts	Eclipsing Binary Secretary	10p
Observation Report Forms	Section Secretary	Free
Inroduction to the VSS	Section Secretary	40p
Making Visual Observations	Section Secretary	40p
Chart Catalogue	Section Secretary	60p
Sample Charts for NE and Binoculars	Section Secretary	40p
Sample Charts for Smaller Telescopes	Section Secretary	40p
Sample Charts for Larger Telescopes	Section Secretary	40p