The British Astronomical Association

VARIABLE STAR SECTION

CIRCULAR 57

LIGHT CURVES

MARCH 1984

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Editorial

We hope that with this issue we will make up some of the leeway in publication for which we apologize (once again) to members. Although we expect to publish a further installment in our occasional series 'Atlases for Variable Star Observers', no other material for the next issue is to hand. Contributions from members will be very welcome.

Epsilon Aurigae

John Isles would be pleased if observers would submit estimates of ε Aur as soon as possible, as he is preparing a report on the recent eclipse for presentation at a BAA meeting in the autumn. (Other objects on the Section's programme will also probably be discussed at the same time.)

T Coronae Borealis

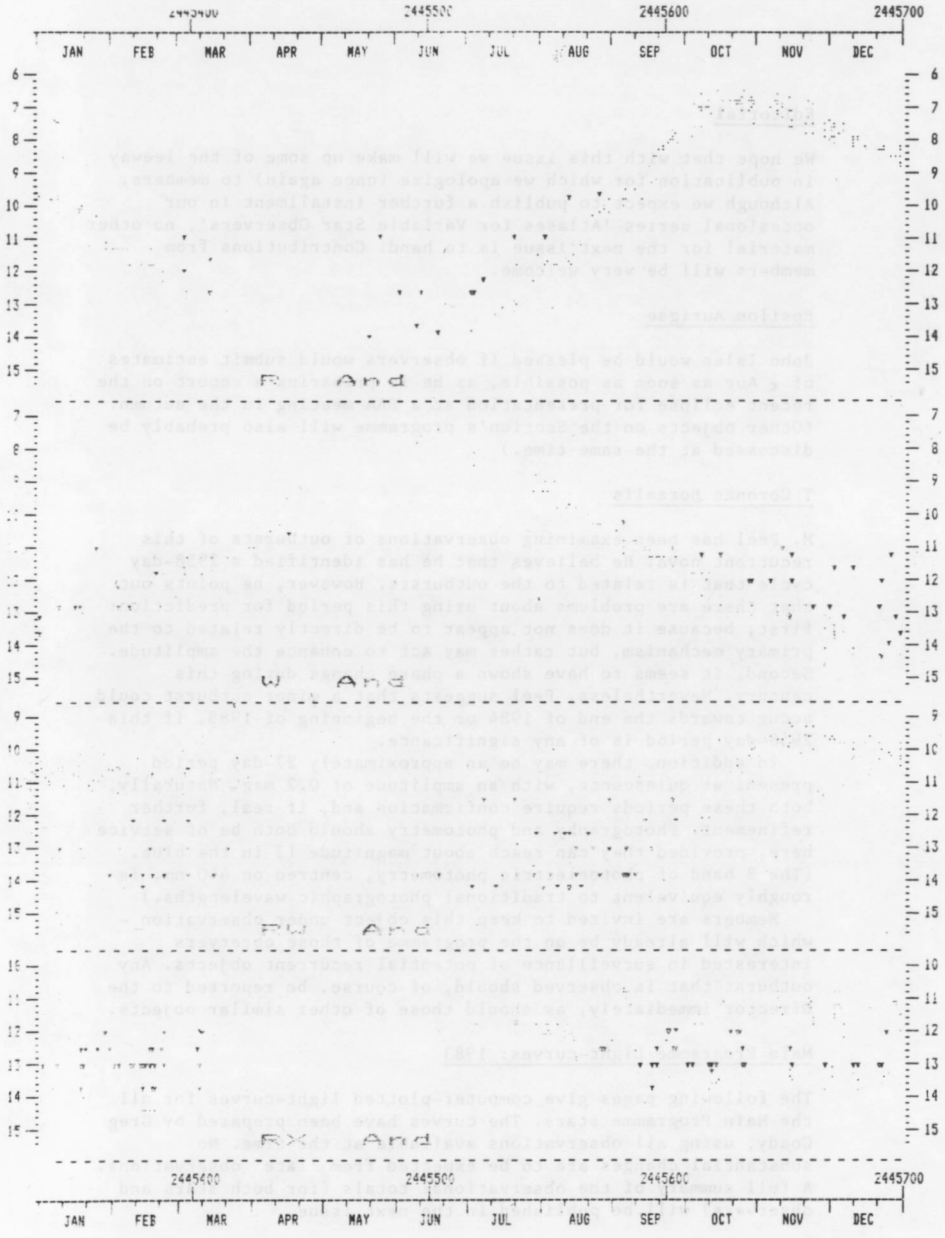
M. Peel has been examining observations of outbursts of this recurrent nova. He believes that he has identified a 2958-day cycle that is related to the outbursts. However, he points out that there are problems about using this period for prediction: first, because it does not appear to be directly related to the primary mechanism, but rather may act to enhance the amplitude. Second, it seems to have shown a phase change during this century. Nevertheless, Peel suggests that a minor outburst could occur towards the end of 1984 or the beginning of 1985, if this 2958-day period is of any significance.

In addition, there may be an approximately 27-day period present at quiescence, with an amplitude of 0.2 mag. Naturally, both these periods require confirmation and, if real, further refinement. Photography and photometry should both be of service here, provided they can reach about magnitude 12 in the blue. (The B band of photoelectric photometry, centred on 440 nm, is roughly equivalent to traditional photographic wavelengths.)

Members are invited to keep this object under observation - which will already be on the programme of those observers interested in surveillance of potential recurrent objects. Any outburst that is observed should, of course, be reported to the Director immediately, as should those of other similar objects.

Main Programme Light-curves: 1983

The following pages give computer-plotted light-curves for all the Main Programme stars. The curves have been prepared by Greg Coady, using all observations available at the time. No substantial changes are to be expected from 'late' observations. A full summary of the observational totals (for both stars and observers) will be published in the next issue.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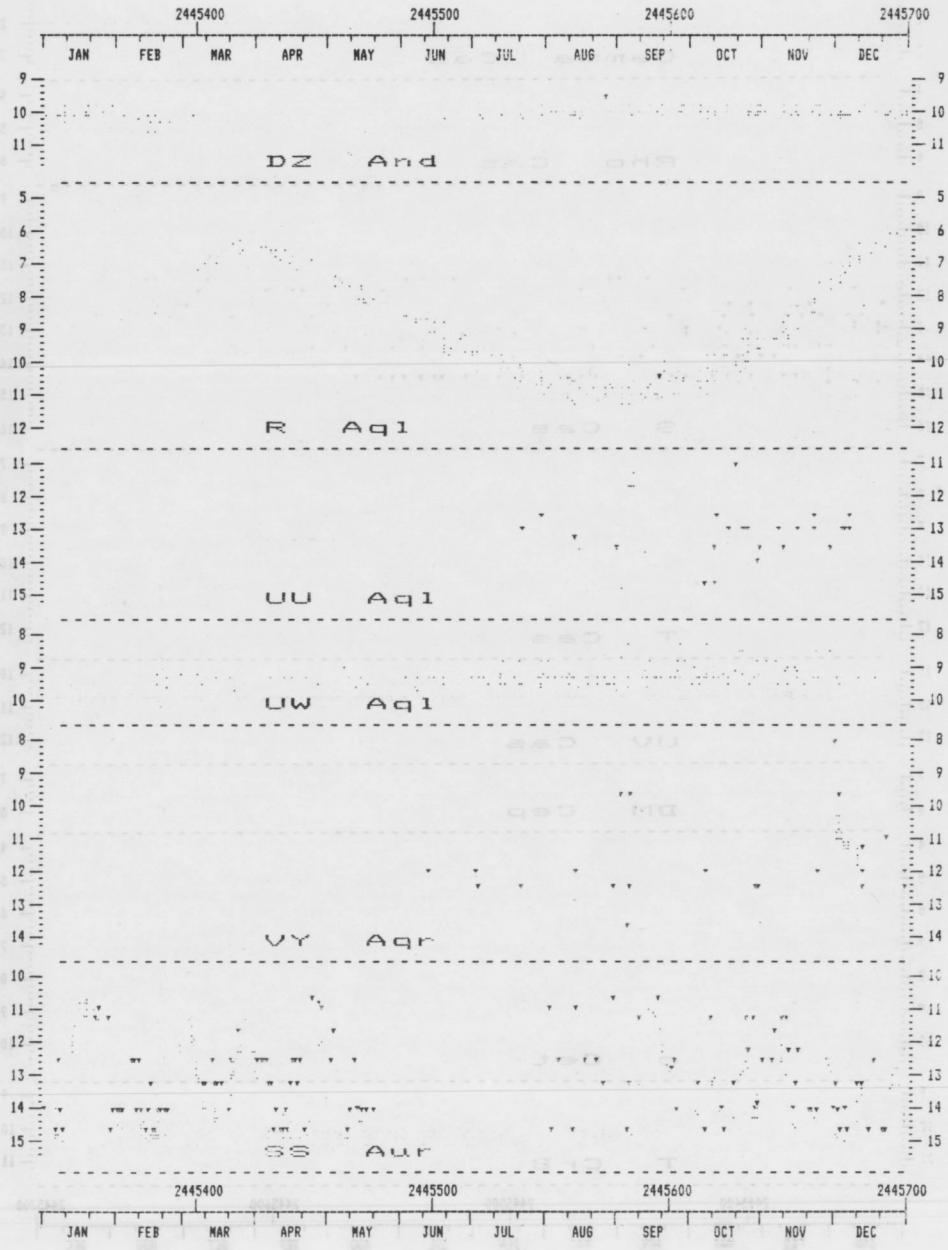
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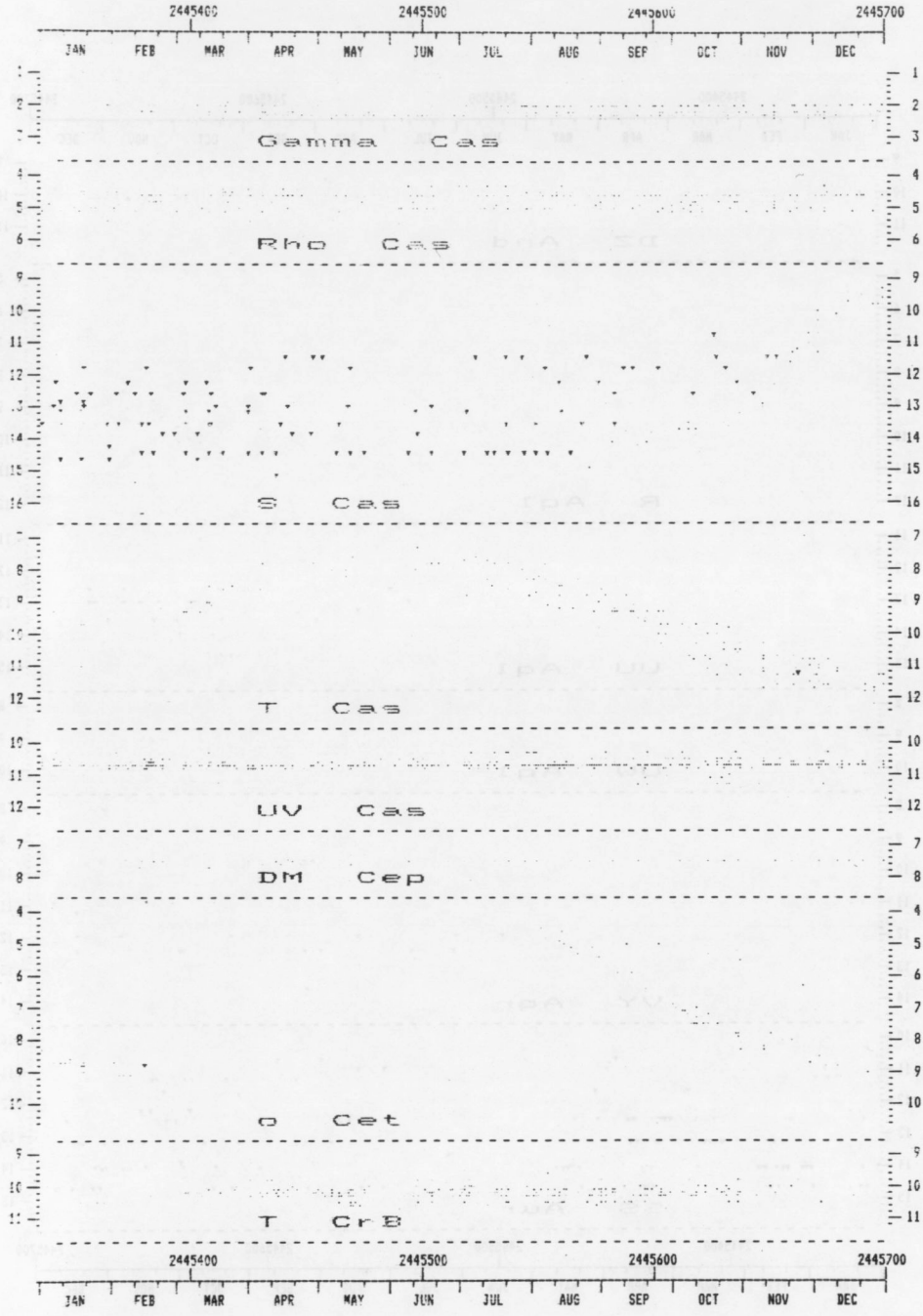
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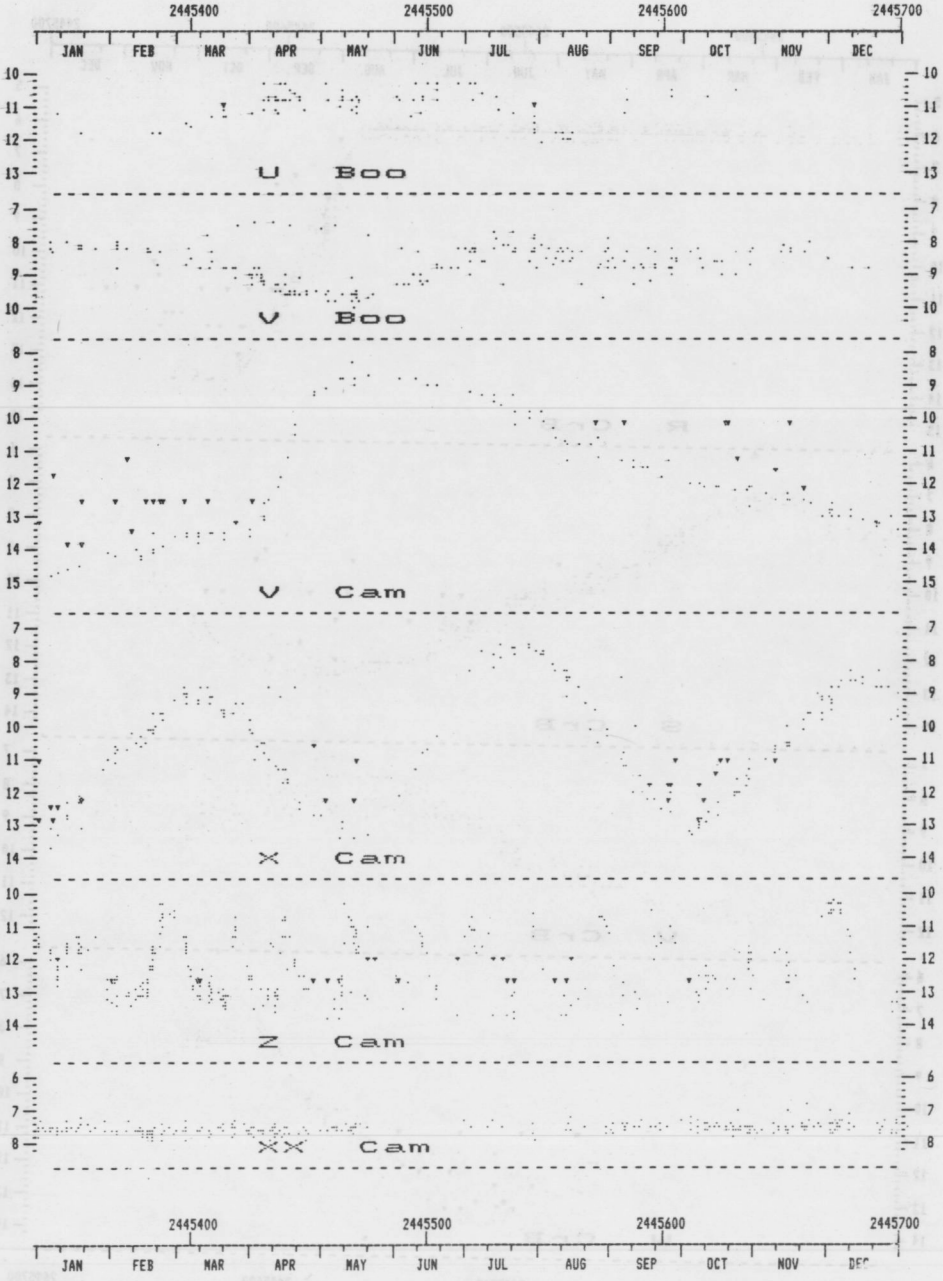
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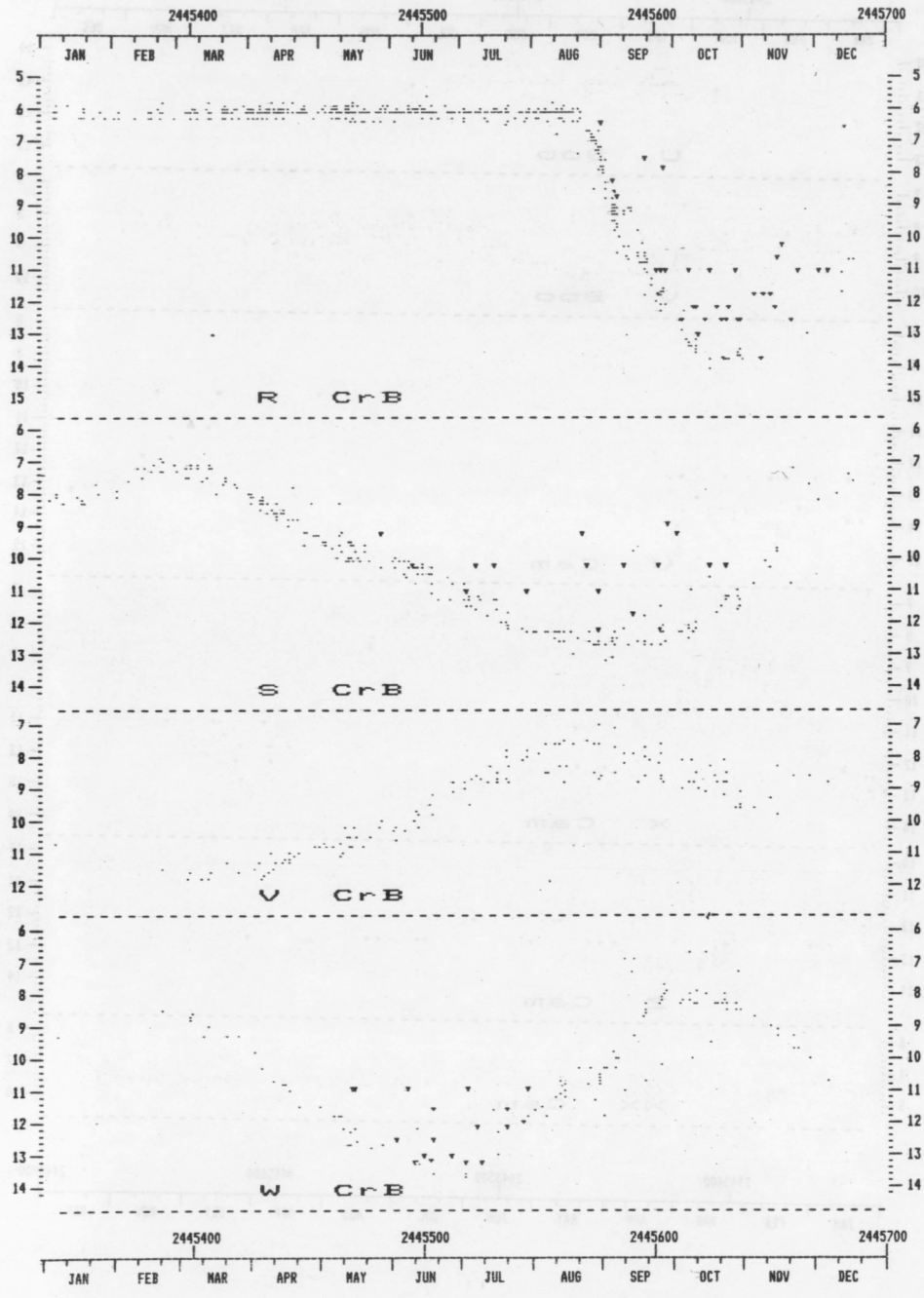
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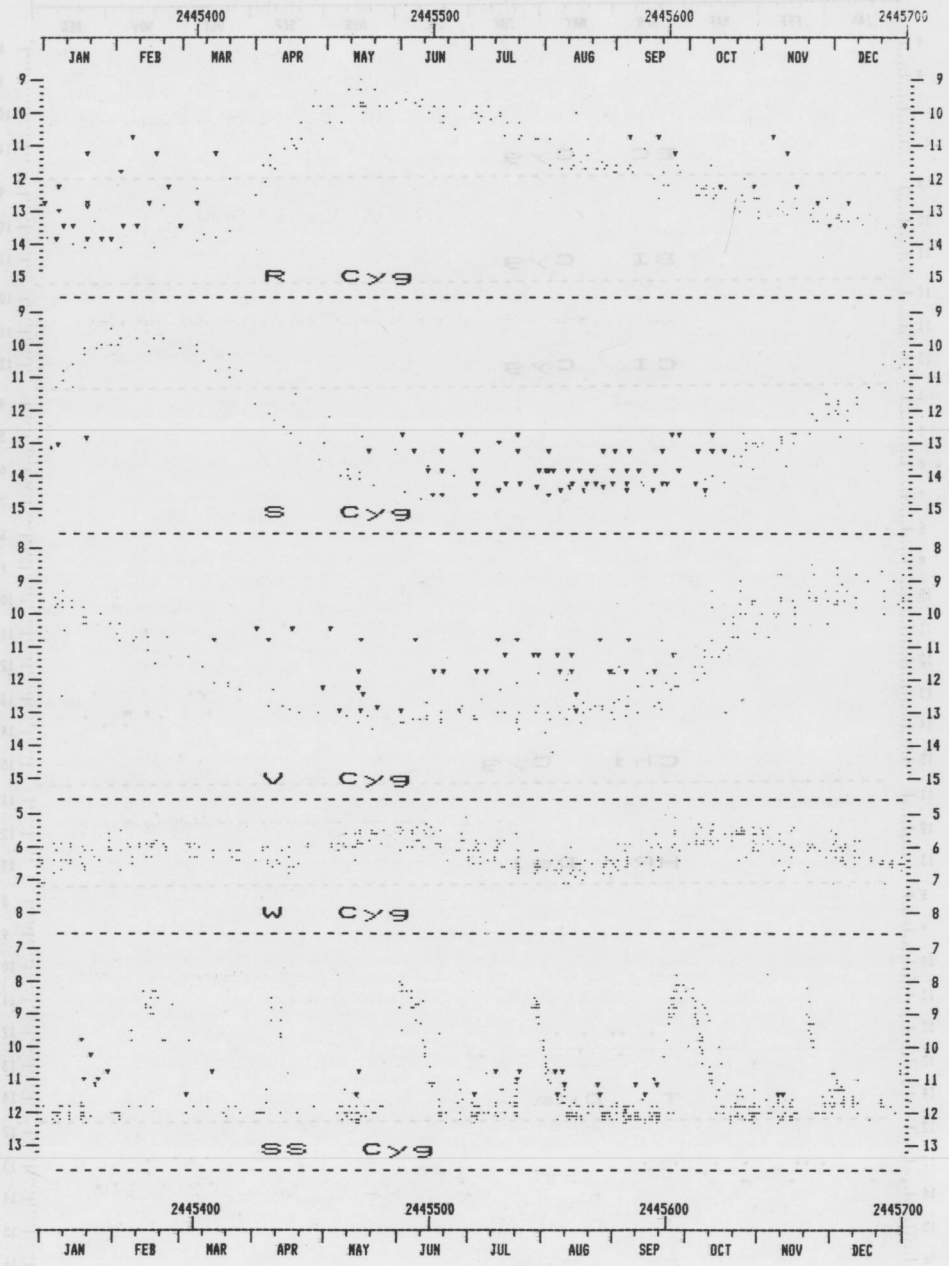
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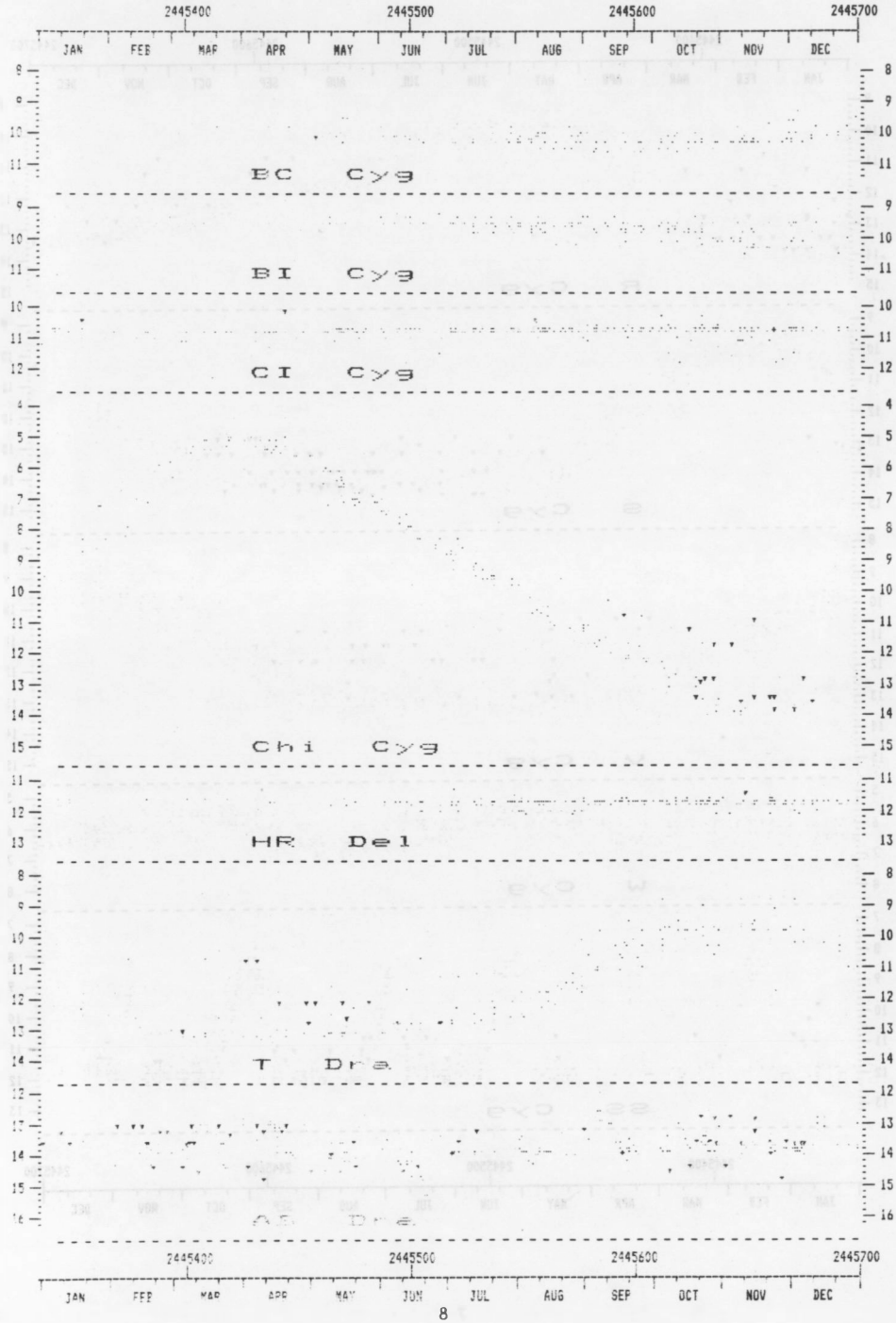
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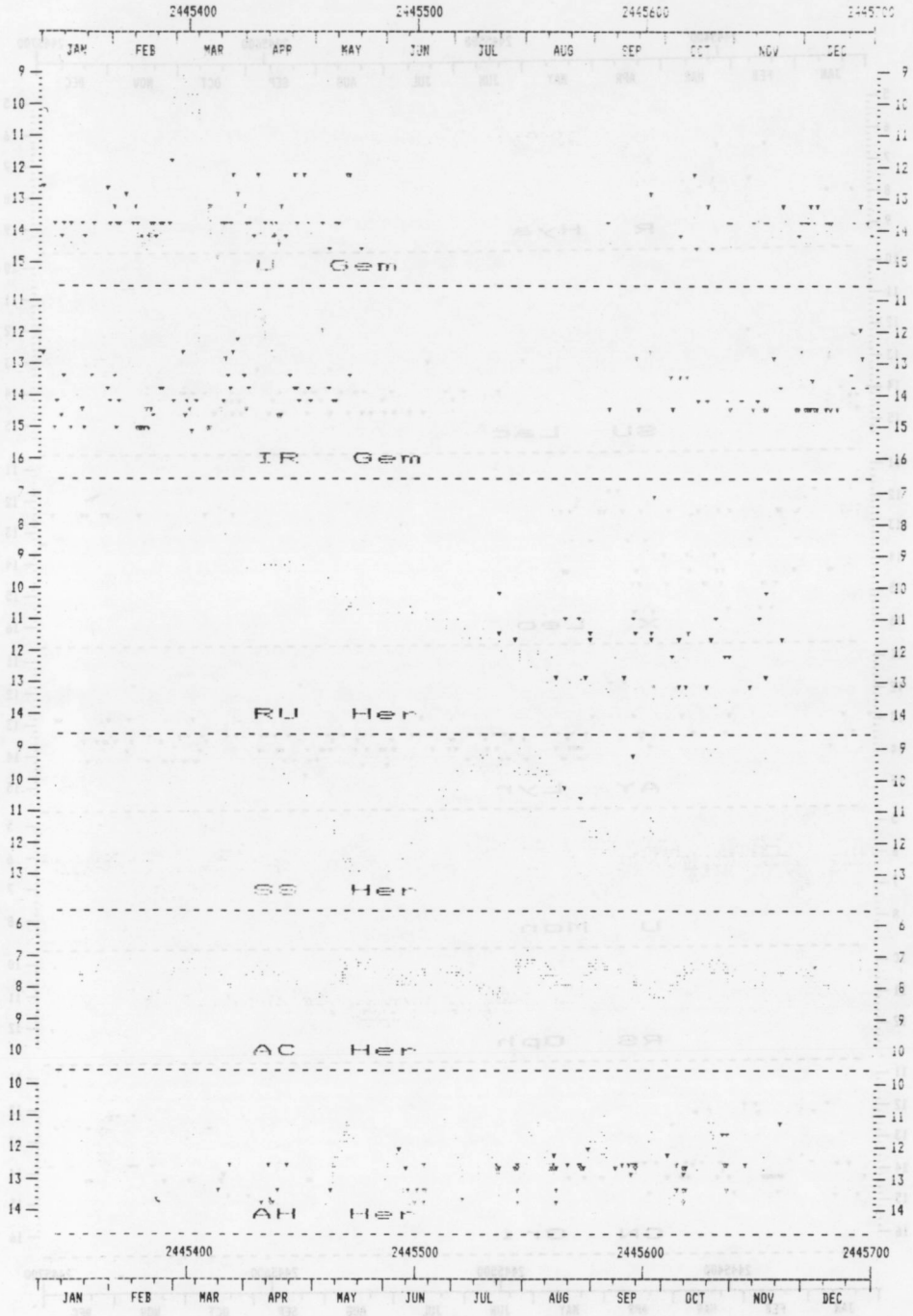
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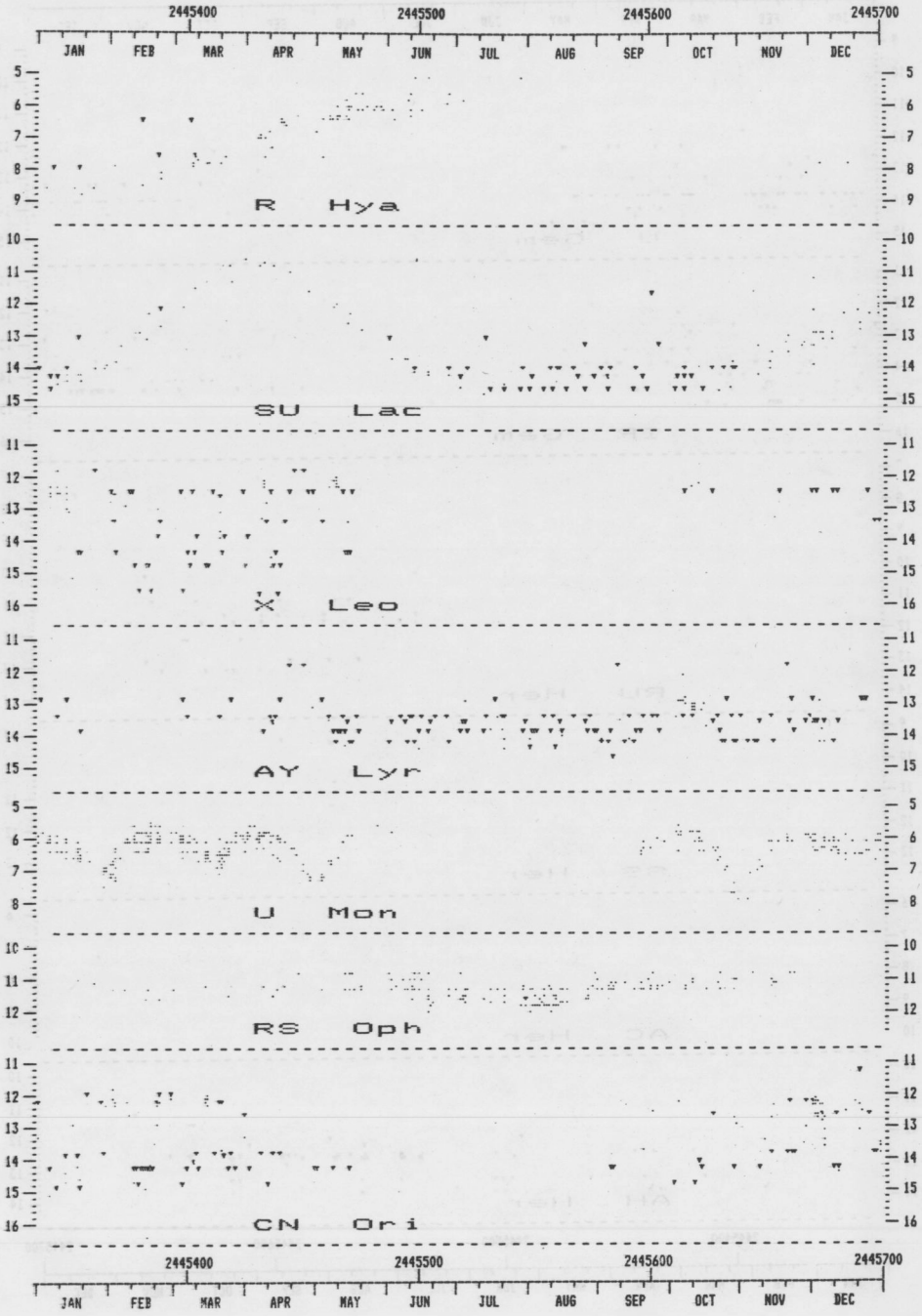
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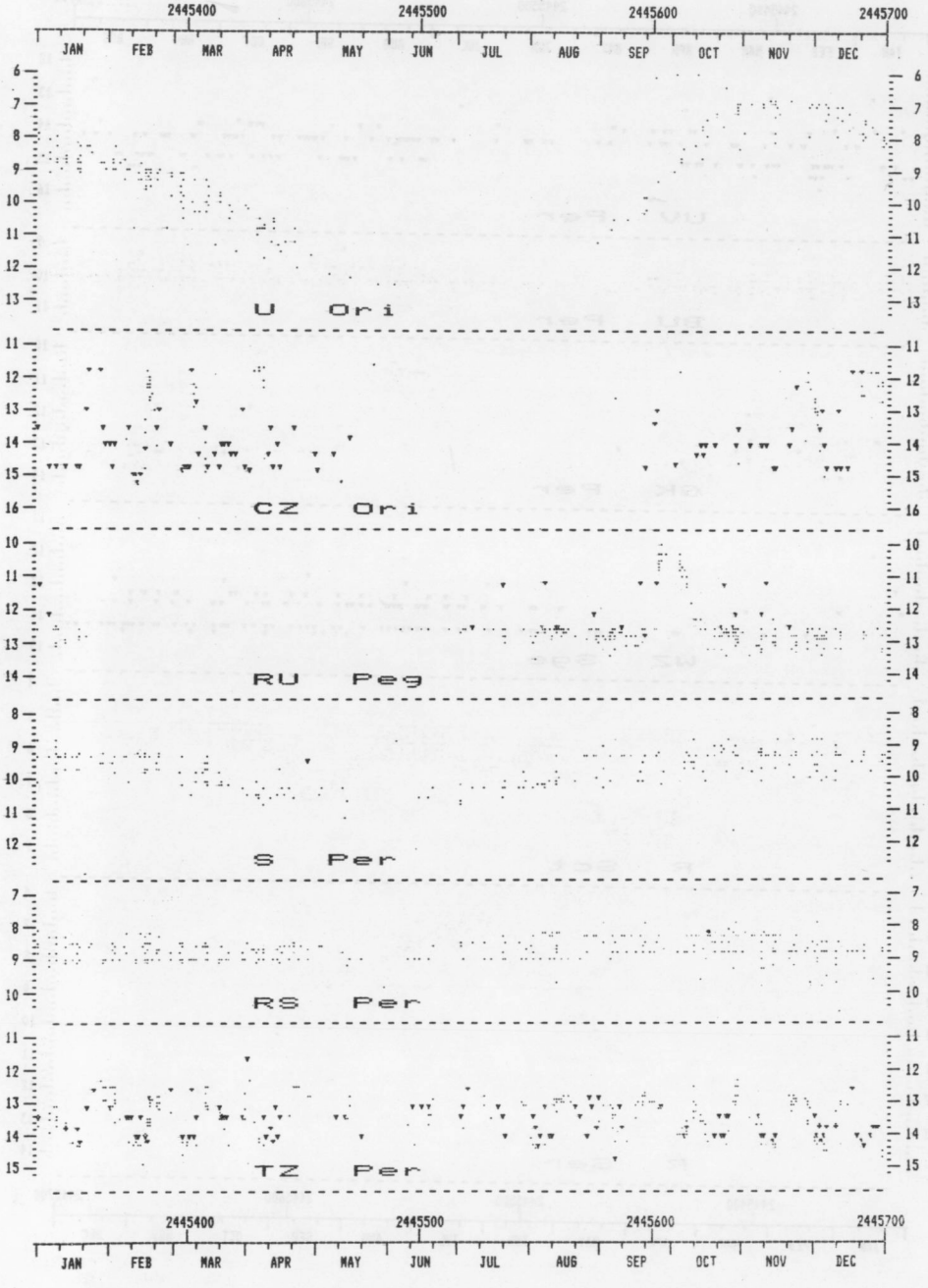
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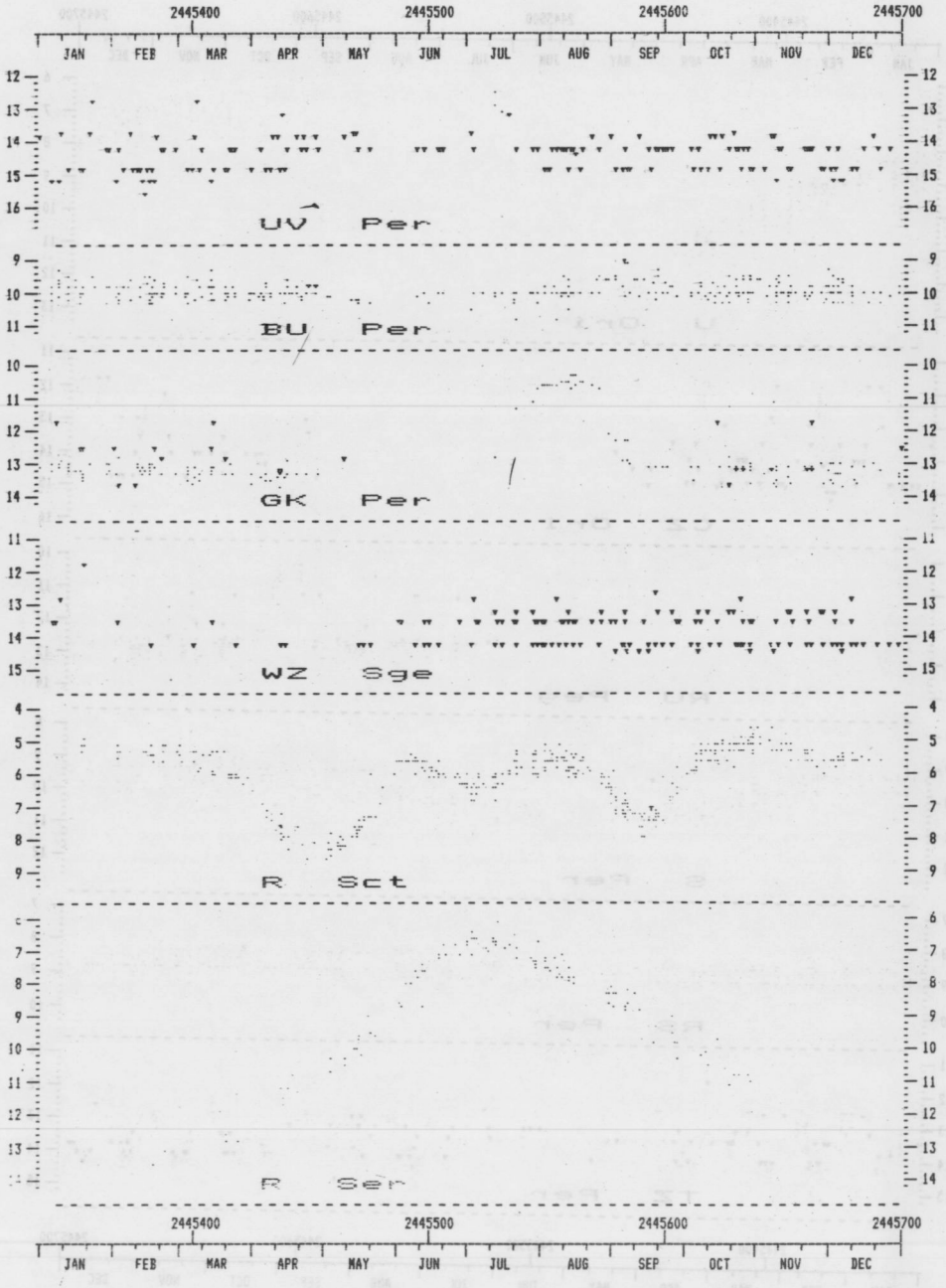
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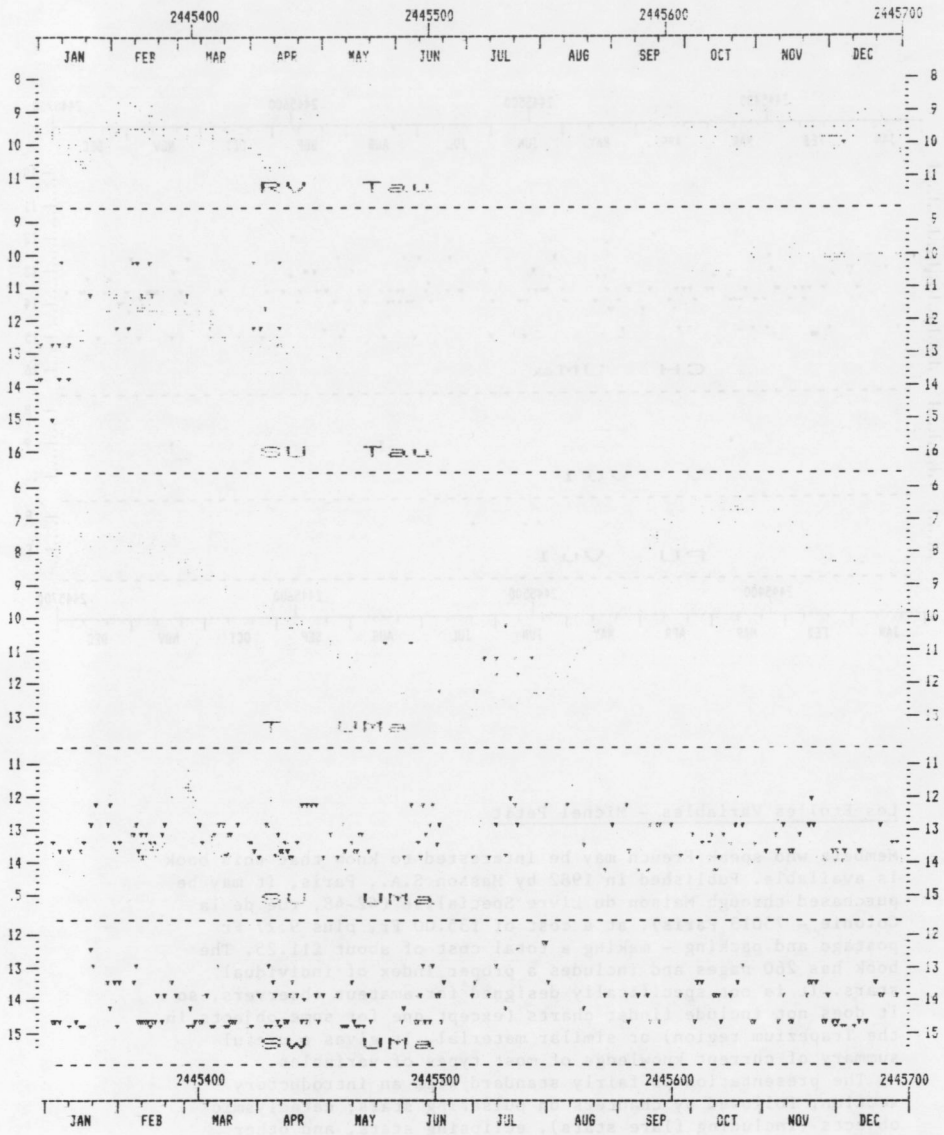
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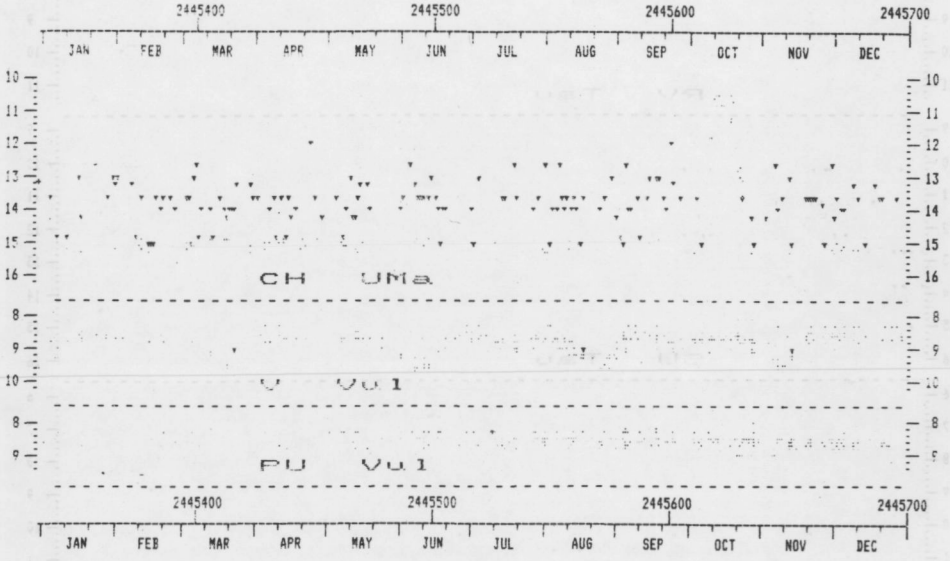

Les Etoiles Variables - Michel Petit

Members who speak French may be interested to know that this book is available. Published in 1982 by Masson S.A., Paris, it may be purchased through Maison du Livre Specialisé (42-48, rue de la Colonie - 75013 Paris), at a cost of 135.00 Fr, plus 9.27 Fr postage and packing - making a total cost of about £11.25. The book has 260 pages and includes a proper index of individual stars. It is not specifically designed for amateur observers, so it does not include finder charts (except one for some objects in the Trapezium region) or similar material. It gives a useful summary of current knowledge of most types of variables.

The presentation is fairly standard with an introductory section, followed by chapters on pulsating stars, cataclysmic objects (including flare stars), eclipsing stars, and other variable objects (young stars, pulsars, peculiar objects like SS 433, and extragalactic variable objects). There are 50-odd interesting and useful tables of objects, a few photographs and 122 line figures. Unfortunately, some of the latter are not particularly well executed, although their purpose is usually achieved. Many of the light-curves have been added to the observational plots with an apparently rather shaky hand, so that a number of eruptive objects appear to go backwards in time! However, this should not mislead most of our readers, although it

might be confusing to some beginners. (It should be noted that the book itself – like so many nowadays – has been prepared from typescript, so that the printing is legible, but rather imperfect in places.)

Notes from other publications:

Information Bulletin on Variable Stars

FO And

IBVS 2483 (1984 Feb. 29) – L. Meinunger suggests that this object may well be a member of the SU UMa sub-group of dwarf novae. It is unfortunately faint being about 17.5 and 18.0 m_{pg} at minimum, but the supermaxima reach 13.8 m_{pg}. Cycle lengths are between 15 and 23 days. A close-field chart is given in this reference. Further details are scheduled to appear in a future issue of MVS.

CO Aur

IBVS 2456 (1984 Jan. 2) – B. Fuhrmann and R.H. Schult confirm the double-mode character of the variations observed in this object. They inspected about 880 plates taken between 1928 and 1983 at Sonneberg. Fournier analysis established the combined period as 1.78301 days.

ε Aur

IBVS 2496 (1984 March 23) – T. Oki et al., using UBV photometry found an anomalous brightening at about the time of third contact. Lasting about 40 days, its peak approximately coincided with third contact. Visible at all three wavelengths, it was most conspicuous in U, where it amounted to about 0.15 mag. The colour variation in the star is known to be small but this anomalous brightening is particularly noticeable in the U-B plot. The cause of this brightening is quite unknown, and other observational data will be required to find a satisfactory explanation.

VW Cep

IBVS 2457 (1984 Jan. 4) – P. Rovithis and H. Rovithis-Livaniou, report photoelectric observations and find good agreement with the O – C diagram prepared by Van't Veer (1973) and Karimic (1983) based on Kwee's (1966) ephemeris.

R Coronae Borealis

IBVS 2510 (1984 Apr 27) – N.M. Ashok et al. report infrared photometry (J, H, K, L) of this object. During minima the decrease in brightness is less in infrared than in visual, but in the L band (3.4 μm) there are variations unrelated to the visual

declines. Strecker earlier (1975) found variations on a time scale of about 1000 days, but from the few observations reported here it appears that the fluctuations are not periodic.

CI Cyg

IBVS 2485 (1984 March) - T.A. Belyakina et al. report observations of the 1982 eclipse of this star observed in UBVRI. Before eclipse the magnitude rose, reaching about 10.6 (V) on 244 5155. The eclipse began about 244 5190 declining 1.2 in U, 0.9 in B, 0.4 in V and 0.1 in R by 244 5225, I remaining constant. After phase 0.0 (about 244 52250) there was a further decline of 0.2 in B, 0.4 in V, 0.3 in R and 0.2 in I, U remaining constant. The rise then set in and eclipse ended about 244 5300. The duration of eclipse was comparable to that observed in 1980. The second decline is thought to be caused by variations occurring in the cool component, which is probably an irregular red giant.

HR Del (Nova Del 1967)

IBVS 2367 (1983 Jly 11) - H.-M. Steinach and L. Kohoutek, report 1981 and 1982 observations, finding periodic variations as had been previously noted in 1977-1980. Observations for 1982 July 27/28 and 28/29 were combined and searched for periods. Three possible periods were found, with the best fit being 0.21231 day - apparently close to periods ranging from 0.2159 - 0.2201 day found in earlier data. The brightness of the nova appears to be still declining very slightly, the differential magnitude between one comparison and the nova increasing by about 0.06 mag between 1981 and 1982.

AG Peg

IBVS 2495 (1984 March 22) - R. Luthardt has examined visual observations of this symbiotic star by the AFOEV in an attempt to determine which of the two published periods (827 days and 733 days) is most likely to be correct. The former (derived by Meinunger from Sonneberg Sky Patrol plates) also appeared to fit the radial velocity data - i.e the orbital period. The shorter period was established from AAVSO visual data by Slovak. This most recent study found two additional minima and the analysis showed that the best fit was obtained by the use of Meinunger's elements:

$$\text{Min} = 242\ 8250 + 827\ E_1$$

until epoch 16. A period-change appears to have occurred about JD 244 3000, and epochs after 17 generally agree with:

$$\text{Min} = 244\ 2370 + 760\ E_2.$$

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VARIABLE STAR SECTION

CIRCULAR 57

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ZX + interface for Storm