radio source position^{2,3} is marked by a cross. It is 0.30 arc s west and 7.8 arc s north of reference star D. We have measured the position of star D with respect to the positions of 23 nearby stars from the Smithsonian Astrophysical Observatory Catalogue. Its location is

$$20\text{ h }30\text{ min }37.93\text{ s} \pm 0.03\text{ s}; +40^\circ 47' 04.7'' \pm 0.3''$$

No visible object was detected at the radio position in any of our data, to the intensity limits given in Table 1. To facilitate comparison with the radio measurements, the limits are given in units of 10^{-6} f.u. In more conventional astronomical units, 10^{-6} f.u. corresponds to $V=23.9$ mag. Many of the measurements were obtained through thin clouds which precluded calibration with respect to photometric standards. Calibrations were therefore made with respect to earlier photoelectric intensity measurements of reference stars A and C of Fig. 1. These are: star A, $V=15.05$ mag, $B-V=+0.98$, $U-B=+0.43$; star C, $V=15.03$ mag, $B-V=+1.37$, $U-B=+1.70$.

When an estimate of the distance to the radio source is available, the flux limits in Table 1 will have to be corrected for the heavy, patchy absorption which is present. The direction of the radio source is the same as that of the Cyg OB2 association (=VI Cyg), which is at a distance of 1.5–2 kpc. The visual absorption for stars in the association ranges from $A_v=3$ to 10 mag^{4–6}. For smaller distances, the absorption seems to be much less. We have spectra and photometry of BD+40° 4218, which is about 3 arc min west of the radio source. With an estimated spectral type of AO III–V, these data indicate that the distance of this star is 500–600 pc, and that it is essentially unreddened.

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X-ray Observations of Cygnus X-3 by Copernicus

CYGNUS X-3 was observed by the X-ray instrument on the fourth Orbiting Astronomical Observatory, named Copernicus, for three periods following the radio enhancement. The data (Fig. 1a, b, c) were obtained from the collimated proportional counter sensitive in the range 1 to 3 Å with a field of view of 3° full width at half maximum. Incomplete coverage is caused by Earth occultations, passage through regions of high radiation, and other observations made by the satellite.

The maximum intensity observed on September 19 is approximately 1.5 times the intensity published in the Uhuru catalogue¹. Two features are apparent in the data from Copernicus: there is clear evidence of a regular drop in intensity by a factor of 2 and a preliminary analysis gives a principal period in the

Fig. 1 Intensity of Cygnus X-3 as seen by Copernicus. a, September 7; b, September 19; c, September 29.

region of 288 minutes. There are also other significant variations in intensity although not as marked as the regular drop.

Additional observations on Cygnus X-3, to refine its position, have been made by the Copernicus satellite and a refined position will be available shortly.

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More Unusual Radio Events in Cygnus X-3

DURING September 2–11, 1972, an unprecedented radio event was observed^{1,2} in the X-ray source Cyg X-3. We now report observations of additional outbursts of similar nature during September 18–25, 1972.