

Observations of Select Neglected Double Stars

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Abstract: Measurements of four neglected doubles in the USNO Northern list, set I1 were measured using a 105mm refractor and the Celestron/Baader 12.5mm Microguide eyepiece. All Observations were made at the Brookside Astronomical Observatory (BAO), Edmonton, AB Canada: 53.492°N, 113.569°W, elev. 660m.

The equipment used for these observations is a Stellarvue 105mm f/6.2 Apochromatic refractor, with a 2.5x Powermate and 12.5mm Celestron/Baader Microguide eyepiece.

The stars chosen in this report are taken from a subset of the master northern list of neglected multiple stellar systems for in the Washington Double Star (WDS) list of neglected stars published by the USNO². The stars observed were: HJ 1022, BOT 3-AC, H 624-AB, and H 624-AC.

Method

The equipment system used was calibrated using the sidereal stellar drift method on the target star alpha Aquilae (Altair). Seven (7) drift timings were performed in succession, and the mean was found to be $12.85'' \pm 0.25\%$ per scale division (SD). Position angle (PA) and separation measurements were made using the similar methods to that developed by Tanguay³ and Teague⁴.

First, the reticle was aligned by verifying that the stars which were to be measured were parallel to the inner calibrated measuring scale. Readings for the separation were read to the nearest 1/10th of a scale division, whenever possible, and confirmed three times before continuing. A mean of the three measurements was taken, before measuring the position angle. The primary was then re-centered, as necessary, such that it was in the center of the reticle's scale and field of view. Tracking of the equatorial mount was then turned off, allowing the natural sidereal drift of the target primary star until it reached the protractor scale on the reticle eyepiece. Position angles were determined by subtracting 90° from the readings on the inner scale, which has markings every 5°, and is precise enough to get angles within about ½°. Dupli-

cate PA drift measurements were taken and a third measurement and mean of all readings were determined in cases of ambiguity.

Several calibration stars were used to confirm the accuracy of the measurement system. All test measurements were with 1% of published values for separation distance and 0.5° of published position angles, before attempting the measurements made that are reported in this report.

Results of the measurements are given in Table 1.

Acknowledgments

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References

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- Tanguay, Ronald C. "Observing Double Stars for Fun and Science", Sky & Telescope, <http://skytonite.com/observing/doublestars/3304341.html>
- Teague, Thomas: "Double Star Measurement Made Easy", Sky and Telescope, July 2000, page 112-117.

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Name	J2000 RA+Dec	WDS Mags	PA (deg)	Sep (as)	Date	N	Notes
HJ 1022	00231+5146	5.8, 6.1	35.5	6.4	2006.620	2	1
BOT 3 AC	19455+3500	6.1, 8.5	24.5	38.6	2006.620	2	2
H 624 AB	23245+6217	5.2, 9.9	226.0	96.5	2006.623	1	3
H 624 AC	23245+6217	5.0, 8.7	258.0	215.2	2006.623	1	4

Table 1: Results of the double star measurements.

1. Notes:

2. 1. Neglected double, last obs. 1983; duplicate observations, spaced 1h apart.
3. 2. Neglected double, last obs. 1958; duplicate observations, spaced 1h apart.
4. 3. Not neglected, last obs. 2001; updated observation for 2006.
5. 4. Neglected(?), last obs. 1917; updated observation for 2006. H 624-CD not attempted.
6. All observations made with a SV105 f/6.2 APO Refractor, 12.5mm Celestron Microguide, 2.5x Powermate; 12.85" per scale division, on a Celestron ASGT mount. Seeing 4/5, Trans. 4/5.

The author has a Masters degree in physical chemistry and is currently working in quality control for a local GMP natural products pharmacology company, BioPak. He has been an amateur astronomy enthusiast with over 33 years of observing experience. He has designed several optical filter systems for use with amateur telescope equipment, and done some optical research and development in the recent past. He has logged over 15,000 total hours in the span of his lifetime, observing various deep sky objects, clusters, planets, and double stars.

