

One Good Target

With Some Other Sights Worth Seeing
While You're in the Neighborhood

June

Some (Mostly) Easy Binocular Doubles in Draco

Like many amateur observers, I started out with a pair of binoculars – Tasco 10x50 glasses that I bought so I could see the field from my end zone seats at football games. I was amazed at how much more I could see in the sky with those binos than with my unaided eyes. I still bring binoculars along on almost all of my observing nights, and some amateurs use them as their primary (or even only) observing instrument.

The biggest problem with observing double stars using binoculars is the assumption that the binos can be hand-held. That works for some things, but double stars is not one of them. Many sources claim that you can hold 7x or even 10x binos steady enough for double star observing merely by tucking your elbows into your body or leaning them on the roof of your car, and those techniques might work for you, but my own experience doesn't bear that out. At least for me, even 7x binoculars need a firm mount – either a tripod or a parallelogram – in order to show me an image steady enough for meaningful (and comfortable) observing.

Even on a stable platform, binoculars won't be able to show the individual components of a double star if their separation is too small for your magnification, or if one of them is too faint for your aperture, or if the difference in brightness between the components is too great, or if the atmosphere is too unsteady. The Astronomical League's Binocular Double Star observing program manual estimates that in a dark sky with excellent seeing, 7x50 binoculars can reach stars down to mag 9, and split equal magnitude pairs down to 60 arcseconds' separation. All of the doubles discussed here are considerably brighter and wider than that.

Let's start with an easy but colorful optical triple composed of **Kappa [κ] + 6 Draconis**, easily found right above the bowl of The Big Dipper. Its brightest star has a blue tint, shines at mag 3.5, and sits 15½ arcminutes SSW of a mag 4.9 orange-hued secondary. There's a mag 6.6 orange star 15 arcminutes farther NE. The trio form a slightly-bent line. Their separations are wide enough that in a dark-enough sky, the individual components would be visible to many observers even without binoculars. Not far away is another triple, **Σ I 25** from the first appendix to F.G.W. Struve's double star catalog (1840). Find it by looking for the prominent mag 5 triangle formed by 7+8+9 Dra along a line leading from Kappa (κ) Dra to Zeta (ζ) Ursae Majoris, at the middle of The Big Dipper's handle. In contrast to Kappa's almost-linear profile, the stars of Σ I 25 form an isosceles triangle pointing NW, with a mag 6.5 primary perched 3 arcminutes from its mag 7.0 companion and just under 2 arcminutes from a fainter mag 8.8 component that may take some effort to spot.

Moving along The Dragon's neck, we come to another triangular triple, **OΣΣ138** from the supplement to the double star catalog of Otto Struve, son of F.G.W. Struve. It's located in the same binocular field as mag 3.3

Iota [ι] Dra. This triangle is a magnitude fainter than Σ I 25, but the difference between the mag 7.5 primary and mag 7.7 secondary stars is less, which may make them a little easier to split. They're separated by 151 arcseconds. The triangle is completed by a mag 9.3 star that sits 82 arcsec SSE of the primary and 94 arcsec NE of the secondary. The mag 9.3 star may be invisible in 50mm binoculars. All three stars are yellowish.

As we follow the curve of The Dragon around the bottom of The Little Dipper, we come to our next target, **19+20 Draconis**, located in the same field as mag 3.2 Zeta [ζ] Dra. The brighter of the two is 19 Dra, mag 4.9, which is four times as bright as 20 Dra, a very close (1.2 arcsecond) pair whose combined brightness reaches only mag 6.4. The 6 arcminute separation between 19 and 20 Dra is more than ample, but the difference in brightness may make this a more challenging pair than you expect.

Following a line from 19+20 Dra towards Vega (Alpha [α] Lyrae) will lead you through a distinctive four-star trapezoid known as *The Lozenge* that marks the head of The Dragon. With a diameter of $6\frac{1}{2}^\circ$, it will probably just fit in your binocular field. From there, scan two fields towards The Big Dipper's handle to find our next target, **17+16 Draconis**, a balanced pair of colorless stars (mag 5.4 and 5.5) separated by 90 arcseconds, which may make them somewhat challenging for 7x glasses. Scan just 3° NW from there to find **DQ Draconis**, a mag 5.8 cataclysmic variable with three wide companions: a mag 6.9 star 8 arcminutes north of the primary, a mag 8.7 star $4\frac{1}{2}$ arcminutes SW, and a dim mag 9.6 star 85 arcseconds SE. This will be a relatively challenging group due to its magnitude differences as well as the dimness of the SE and SW components.

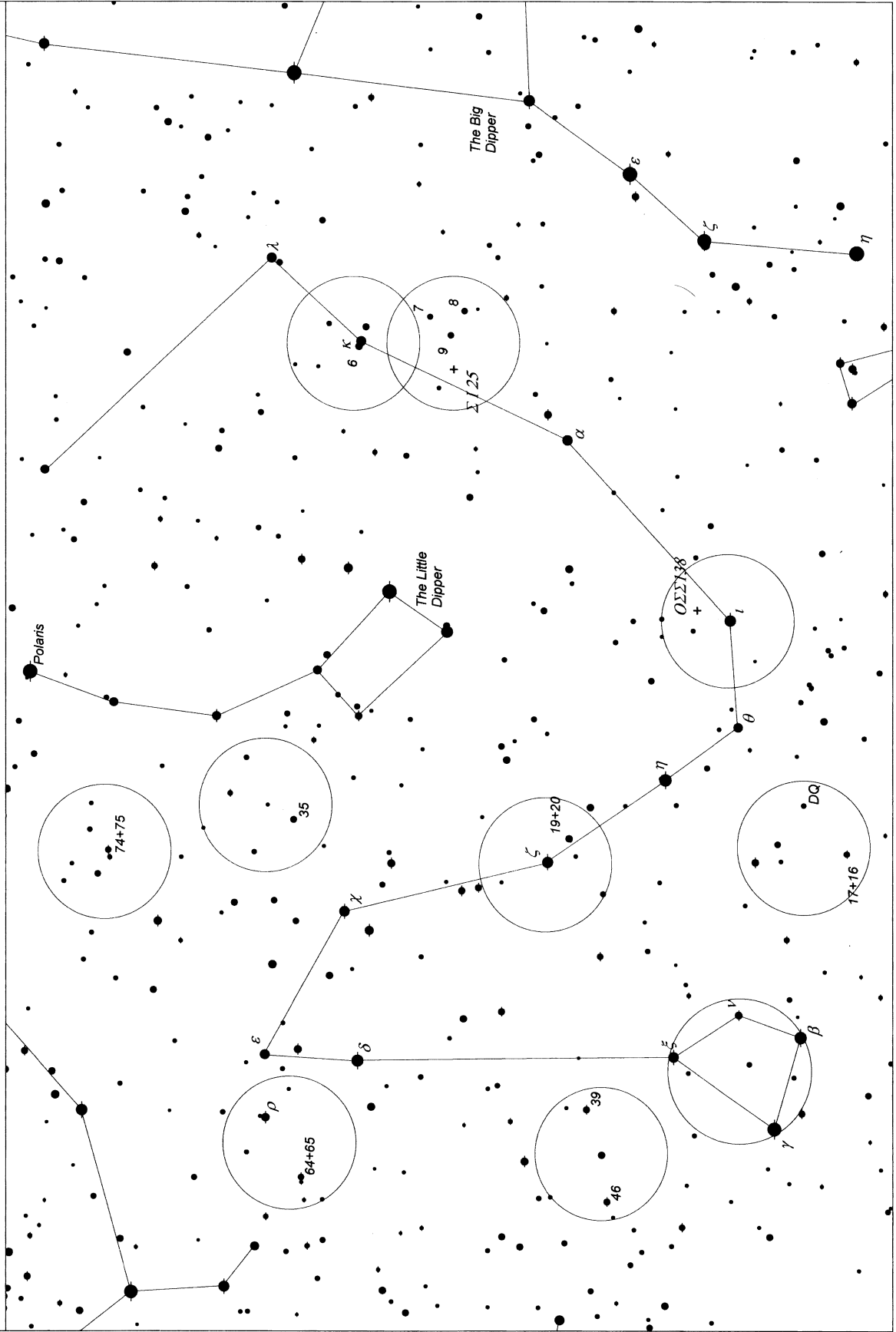
Cross the top of The Lozenge and one field farther to a line of three mag 5 stars spanning the field. The stars at the ends of the line are our next quarries. At one end is **46 Draconis**, another roughly linear triple. It's a mag 5.0 star with a mag 7.5 companion 6 arcminutes to the SE and a mag 8.1 star $5\frac{1}{2}$ arcminutes NW, creating a pleasingly balanced group. All three stars are nearly colorless. The star at the other end, **39 Draconis**, pairs a yellowish mag 5.0 primary with a mag 7.4 yellow-orange secondary 89 arcseconds away.

Farther north, find mag 3.1 Delta (δ) Dra above The Lozenge, then scan one field farther to reach mag 3.8 Epsilon (ϵ) and mag 4.5 Rho (ρ) Dra. One field directly south of Rho you'll run into our next target, **64+65 Draconis**, a mag 5.2 light red giant paired with an unrelated mag 6.4 deep yellow giant $12\frac{1}{2}$ arcminutes away. The mag 6.4 star is a true double, separated from its yellow-orange mag 8.0 companion by 100 arcseconds.

If you're at a reasonably dark site, you can use the stars of The Little Dipper to guide you to our next target, **35 Draconis**, another optical pair (meaning that the stars are not physically bound to each other and appear to be a related pair only because they lie along parallel sight lines from our perspective). Scan along the bottom of The Little Dipper's bowl from front to back, then continue one step farther along that line and you'll see a mag 5.0 star off-center in the field – that's the one we want. It forms the narrow point of an isosceles triangle with two mag 5.7 stars to its N (towards Polaris). The mag 7.5 secondary sits $5\frac{1}{4}$ arcminutes NW of the mag 5.0 star. Both of them are whitish.

Our final target is a binocular double pair, **74+75 Draconis**, located in northern Draco not far from Polaris – not quite a quarter of the way along a line from Polaris to Deneb (Alpha [α] Cygni). 75 Dra is the brighter pair, a deep yellow mag 5.5 primary $3\frac{1}{4}$ arcminutes away from a mag 6.8 yellow-orange companion. 74 Dra is 20 arcminutes S of that pair. It's a mag 6.0 light orange giant with a challenging mag 9.3 companion $3\frac{1}{2}$ arcminutes away. It's worth a pat on the back if you can spot all four components, making this a fitting spot to wrap up our binocular adventures among the stars of Draco.

This Month's Targets - 6 degree fields - N at top - stars to mag 6.5



This month's targets: binocular views

6° fields

N at top

Stars to mag 8

