

# So What Makes Binoculars “Good?”

## Binocular Seminar Notes Blue Ridge Bird Seed Company

***Binoculars let you peek – closely - at the natural world in a way that makes you appreciate our planet and who we share it with. Binoculars put “WOW” in your life!***

### How Do Binoculars Work?

- Light is gathered by the objective lens (the big end)
- Prisms correct the image so it's right-side up and right-to-left
- The image is magnified by the eyepieces into your eyes.

### Binocular Types

- Porro Prism: Traditional zigzag design – objective lenses wider than eyepieces
- Roof Prism: Newer design – objectives and eyepieces in a straight line

### What Are All Those Numbers?

For Example: 8x42 / 336 Feet @ 1000 Yards / 16 mm Eye Relief / 5 Ft Close Focus

- 8x the magnification (how many time larger the object will appear)
  - o *More is better – up to a point.*
- 42 the diameter of the objective lens in millimeters (mm)
  - o *Bigger is brighter.....and heavier.*
- 336 the width of the view, in feet, measured at 1000 yards
  - o *Wider is usually better; field of view narrows as magnification increases.*
- 16 the furthest distance (mm) behind the eyepieces at which you see the full view
  - o *Especially important for eyeglass wearers.*
- 5 Ft Minimum distance to which a pair of Binocs can be focused
  - o *Less than 10 feet promotes butterfly and flower watching*

### What Else Do I Need To Know To Understand What I'm Buying?

- **The quality of glass** used in lenses and prisms varies tremendously
  - o BK-7 (boro-silicate) is lower quality, used in cheaper binocs.
  - o BAK-4 (barium-crown) is denser; used in better binocs.
  - o High-end Binocs contain proprietary glass (trade secrets)
  - o **Coatings** reduce internal reflection of light and increase brightness enormously. (Uncoated glass loses 5% of the light passing thru it to reflection.)
  - o Magnesium Fluoride coatings cut reflection *at each air-to-glass surface* from 4-5% to 0.5%; typical Binocs have 10 to 16 surfaces.
  - o *Coated* - at least one side of one lens is coated with one layer.
  - o *Fully-coated* - all sides of all lenses and prisms are coated with one layer.
  - o *Fully multi-coated* - all sides are coated with more than one layer.

## Where's The Value?

Binoculars should be viewed as an investment. Better binoculars will last many years, and will give good service every year of their life. (I still use my 1977 Bushnell Binocs as backups and my 1973 Bushnell Spacemaster spotting scope as my primary scope.)

Quality binoculars are lighter, brighter, clearer, easier to focus and hold steady, and will withstand temperature changes, humidity and rain without problems. Good binoculars are much less likely to be knocked out of alignment if they are dropped.

Equally important – you will enjoy your hobby more with decent optics, whether it's birding, general wildlife viewing, hunting, boating, spectator sports or the theater.

- Birders are moving rapidly toward the compact roof-prism design, and manufacturers are concentrating design improvements on roof-prism models.
- As a result, tremendous quality & price improvements have been made in the past five years.
- Desirable Features for birders
  - o Roof-prism design
  - o Rubber-clad
  - o Fully multi-coated lenses & prisms
  - o Waterproof & nitrogen purged
  - o Eye relief of 15 mm or more
  - o Close focus under 8 feet
  - o Twist-up eyecups

Match your investment to your hobby, your interest level and your budget.

You can buy minis, compacts, full-sized binoculars, even monoculars. Note: a set of mini's or a monocular is very handy to keep in your car. I use mine to read cross-street signs when I'm navigating in unfamiliar territory.

You can spend as little as \$45 (Bushnell Falcon) or as much as \$1800 (Swarovski EL). You pretty much get what you pay for, but the features and value have improved dramatically in recent years. \$150 – 500 buys a lot of binocular these days, especially in the Audubon and Vortex lines.