

# Technical Bulletin M0008

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## Choosing The Right Binocular



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### Choosing The Right Binocular

When looking to purchase binoculars, you'll find a wide range of features and pricing on models that virtually look alike.

While binoculars are all similar in their function, the differences in the features, which are primarily optical, are what drives the price and, more importantly, the performance. Just as in fine quality cameras, the better the lens, the better the image. And this difference is noticeable and often considerable.

#### Physical Size

Binoculars come in many sizes, but are typically classified as "Compact" and "Full Size".

Full size binoculars are a little bulkier and heavier, but do provide a steadier image and wider field of view. Wide front lenses (objective) allow more light to enter for a brighter image and better viewing in low-light conditions.

Compact models are very popular for their size, and are great for travel. Some are small enough to fit in a pocket, so if carrying a heavy load into the field, they don't add much. However, because the objectives are significantly smaller than a full size model, Compacts are best suited for daylight use.

#### Binocular-Speak

Some of the terminology associated with purchasing binoculars. It's really not as difficult as it looks!

#### Magnification

Magnification is expressed by numbers such as "7 x 35". The first number is the magnification power, meaning that any object viewed will appear 7 times closer than viewing with the naked eye.

However, it's noteworthy to mention that magnification greater than 10 tend to be extremely sensitive to even the slightest movement, so steady viewing can be much more difficult.

#### Objective

In the same 7 x 35 example, the 35 represents the diameter in millimeters of the objective lens (the ones on the front). Again, larger lenses mean more light and brighter images.

#### Field of View

The width of the area that can be viewed at a distance of 1,000 yards.

#### Angle of View

The greater the angle of view, the easier it will be to discern subjects at a distance, such as wildlife. In this instance, bigger is better!

#### Exit Pupil

Measured in millimeters, this term refers to the diameter of the light that exits each eyepiece and reaches the pupil of your eyes. In addition, a larger exit pupil also helps compensate for movement or shaking.

The exit pupil is determined by dividing the objective diameter by the magnification, so a 7 x 35 model has an exit pupil of 5mm ( $35 \div 7$ ). Because your pupil's vary in size from an average of 2.5mm in bright sunlight to 7mm in low light, an optimum exit pupil should be at least 4mm or greater.

#### Relative Brightness

This is the amount of light that is transmitted through the optics to your eyes. The higher the relative brightness, the brighter the image. A high relative brightness number will perform better in low light conditions. The type of prism, quality of the optics, lens coatings and other factors all affect relative brightness.

#### How to Adjust Focus

While looking at a subject, close your right eye and use the center control to focus. Then, close your left eye and fine-tune the focus by rotating the right eyepiece (diopter). From this point on, the center control will quickly sharpen the focus.

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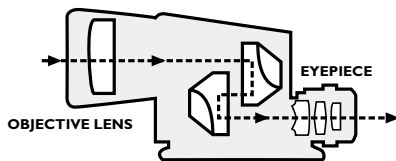
## Choosing The Right Binocular

### Eye Relief

This term relates to how far away your eyes can be from the eyepiece and still view a full image. Eyeglass wearers will need 11mm or more of eye relief and should roll down the eyepiece collars before viewing.

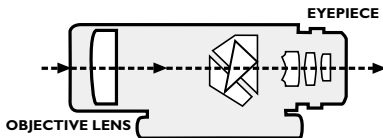
However, binoculars can sometimes fully correct for near- or farsightedness, so some eyeglass wearers may remove their glasses. Those with astigmatism may need to wear their glasses in order to maintain a sharp image.

### Understanding Prisms



#### Porro Prism

The most popular prism system, porro prisms have the eyepieces offset from the objective lenses giving a zigzag profile to the binoculars.



#### Roof Prism

The prisms in roof prism binoculars are in a straight-line design, allowing for a more compact design and lighter weight construction. This system requires the binoculars be manufactured to exact specifications, sometimes making them more expensive than porro prism binoculars.

### Binocular Features

With so many models and technologies colliding in new ways every day (like camera binoculars), there are a number of features and combinations to seek out. Some of the more common to consider are:

#### Zoom

Just like a camera lens, some models will zoom in to a small feature, or zoom out to a wide field of view.

#### Armor

Applies to the binocular housing. Some are rubberized for extra shock resistance and a secure grip, while others may feature high-impact polycarbonate materials.

#### Weatherproofing

Most models feature some level of weather resistance. "Water resistant" models will perform well in light rain, but will leak if they fall overboard. "Waterproof" models are completely sealed.

Some models also feature nitrogen-filled interiors or other proprietary methods to eliminate fogging or to prevent dust collection inside.

#### Lens Coatings

Most binoculars have lens and prism coatings to enhance lens performance, reduce glare and improve image contrast and quality. Generally, the more coatings the optics have, the better the quality.

### Selecting The Right Model

One binocular might not be suitable for every viewing condition, but there are some basic recommendations for those who prefer an at-a-glance approach.

Application	Recommendations
Outdoor/Nature	7x35, 7x50, 8x40. Any wide angle or wide angle zoom model.
Hunting	7x50, 7x35, 8x30, 8x40, 10x50, folding roof prism compacts or any rubber armored model. Camo or black versions are preferred.
Birding	7x26, 8x36, 8x40, 7x35, 10x40, 10x50. Binoculars with extended eye relief and close near focusing are preferred.
Boating	7x50, 10x50. Any waterproof or rubber armored models are preferred.
Low Light	7x50, 10x50.
Hiking/Gen'l.	7x35, 10x50, 8x40, compacts or any wide angle model.
Stadium Sports	7x35 wide angle, 7x35, 8x40. Any zoom or side angle model.
Outdoor Concerts	7x35, 7x50, 8x40. Any compact, zoom or wide angle model.
Theatre/Indoor Sports	Any theatre glass, compact model or general sports glass.