

# Binocular Basics



Binoculars are available in many different sizes, magnification, and price. The most important thing to do when selecting a pair is to try them out first. Consider what is most important to you — weight, size, power, eye relief (important for eye glass wearers), close focus, waterproofing, field of view, price. Consider how the binoculars feel on your face (or glasses) and how they feel in your hands. What works for one person does not necessarily work for another. Most are waterproof and fogproof. Most have multiple coatings on all the air to glass surfaces. You can get a good pair for \$200, a great pair for \$600, and a dynamite pair for \$1,000. The best advice is to find a pair that fits your criteria and your budget.

## WHAT TO LOOK FOR

Look for good color contrast, side to side clarity, and easy focus. To check for its low light capabilities, look under a parked car, and compare the sharpness of each model. Try different pairs and put them through their paces. Using binoculars is not intuitive; it takes practice. When you put them up to your eyes, bring the two barrels or lenses together so you get one image. When trying to locate a bird or other object, try to focus with

your naked eyes on the general location and then raise the binoculars to your eyes. The chances of seeing your target are much enhanced. When describing the location

of a bird or animal to another person, look for close landmarks like rocks and snags that are easily recognized. If the bird is in a tree, use a clock face to describe its location. Try to refrain from “it’s over there” or “it’s in the tree.” Another tip is to get behind the person who is looking at the bird and train your binoculars in the same direction.

If you don’t like how your neck feels after a day of hiking or birding with a standard binocular strap, purchase a harness that takes the weight off your neck and puts it on your shoulders. The Los Gatos Birdwatcher recommends the “Bino-Strap” that has wide elastic straps.

## MAGNIFICATION X OBJECTIVE

All binoculars are rated with two numbers, the magnification and the objective (big) lens diameter. For example: a binocular rated 7x35 tells you that an object will appear to be seven times closer than with your naked eyes. Most birders agree that an 8 or 10 power is the most useful. However, when you go up in power, the field of view narrows, the light dims and shakes are magnified. The number 35 tells you that the objective lens is 35 millimeters in diameter (there are

25.4 mm to the inch.) The larger the objective lens diameter, the brighter the image will be.

## OPTIC COATINGS

Optical coatings are a microscopically thin layer, or layers, of specially formulated compounds that reduce reflections. Every time light strikes a glass surface, about 5% gets reflected. The lens systems in modern binoculars have between 10 and 16 glass surfaces which means that you would lose well over 50% of the incoming light. The light reflected from the internal lens bounces around inside the binocular creating an optical “haze” that decreases image contrast, especially noticeable when viewing in “low-light” situations. The real benefit of optical coatings does not occur until all glass surfaces in the lens systems are coated. Here are some coating definitions:

**Coated Optics** – At least one surface, usually the outer surface of the objective and sometimes the outer surface of the eyepiece, has a single layer coating. No internal glass surfaces are coated.

**Fully Coated** – All glass lens and prism surfaces have a single layer coating.

**Multi-coated** – At least one surface, usually the outer surface of the objective and sometimes the outer surface of the eyepiece, has a multiple layer coating. The internal glass surfaces usually, but not always, have single layer coatings.

**Fully Multi-coated** – All glass surfaces are coated with at least a single layer coat, and some surfaces or all surfaces, have a multiple layer coat.

## FIELD OF VIEW

Put your arms out in front of you and touch the tips of your thumb and index fingers together to make a circle. Look at a specific object across your yard through this circle. Everything you see within the circle is in your “field of view.” Now slide your

fingers together to make the circle smaller. The object you are looking at doesn't change, but the amount of reference area around the object appears less or narrows. Binoculars have the same effect. The term for how much reference area you can see is field, or angle of view. There are two units of measure for this term: number of degrees or field within feet at 1,000 yards. You can convert degrees to feet by multiplying the degrees by 52.5. For example: You want to compare two binoculars, one with a field of view of 5.5 degrees and the other with a field of view of 7.5 degrees. The first binocular's field of view is 289 ft. at 1,000 yards while the second binocular gives you a 394 ft. diameter circle at the same range, a 36% bigger circle. If you use your binoculars to scan for movement in foliage or you use them to observe birds on the wing, a wider field of view will make your task easier.

### IMAGE SHARPNESS

Image sharpness, in most binoculars, decreases as you get to the edges of the field of view. If you use a binocular with a narrow field of view, more of what you want to observe will be towards the edges and could be less sharply defined.

### BINOCULARS & EYEGLASSES

Binoculars place a focused image at a precise distance from the eyepiece lens. The distance from the eyepiece lens to this point is called the "eye relief" and is measured in millimeters. Most binocular's eye relief is 10mm to 12mm. In order to get the full benefit of the binocular's field of view, you need to place the binocular eye piece at this distance. Built in eye cups on many binoculars help maintain this distance. However, many eyeglasses or sunglasses wearers find that their glasses prevent them from placing the binoculars at the correct distance, even after they have twisted the eye cups down. This issue can be

overcome by using "long" eye relief (13mm to 20mm) binoculars. Most binoculars have twisting eye cups that allow for some adjustment. Because each person's eyes are placed differently, it is very important to actually try out a pair of binoculars to make sure they are comfortable.

### BINOCULAR DESIGN

Binoculars range in size and weight from compact (20-25mm and 9-13oz.), mid-size (32-45mm and 15-25oz.) and giant size (50-100mm and 40oz and above.). The Los Gatos Birdwatcher carries many styles in the compact and mid-size range.

**Compacts** – These are designed to be small and lightweight, something you could carry around for several hours without complaint. The small size is achieved through the use of small objective lenses, usually 25mm or less in diameter. The smaller objective lens tends to limit a compact's use to well-lit conditions.

**Mid-size** – In this class of binoculars, objective lens diameters are in the 32mm to 42mm range with magnifications of 7, 8, and 10 power.

**Giants** – These are usually used for astronomic viewing and get their name from the size of their objective lens (50mm to 100mm).

### OTHER FACTORS TO CONSIDER

**Lens Alignment** – Binoculars are precision instruments and even the most expensive ones can get knocked out of alignment during shipping. We check all incoming stock for proper alignment. It is always important for you to try out the pair you want to buy. An out-of-alignment condition may show itself by the inability to get both lenses focused or variations in image sharpness or glasses.

**Interpupillary Distance** – This is the distance between the pupils of your eyes. All binoculars have a certain range of adjustment (the central hinge)

to accommodate different people. However, the range is based on the average adult. If you are selecting a binocular for a young birder, or your eyes are very close together or very far apart, you need to try out the binoculars to make sure it fits.

**Focusing** – Always try focusing on objects at various distances. The action should be silky smooth and provide a sharp image at all ranges. Another important measurement to birders is how close can you be to the subject and still get a clear image? The close focus distance should be no more than 16 feet. Closer ranges will allow you to study your subject in great detail.

**Diopter Adjustment** – To allow for the fact that most people with uncorrected vision have one eye that is weaker than the other, a binocular has a mechanism (diopter) that allows you to adjust the focus of one eyepiece independently from the other. Usually the right hand eyepiece will be marked "+ 0 -" around the base which indicates that this eyepiece has a diopter adjustment. Set that eyepiece to "0" and cover the right objective lens with its lens cover or your hand. Observe a subject through the lens and use the central focusing wheel to get a sharp image. Without changing your distance from the subject or moving the central focusing wheel, move the lens cover or your hand to the left objective lens and observe the subject through the diopter eyepiece. If the image is not sharp, rotate the eyepiece right or left until you get a sharp image. Remove the lens cover or your hand and observe your subject with both eyes. The image should be very sharp and you should be able to observe with no eye strain. You need not change the diopter adjustment unless your eye prescription changes or someone moves the diopter control.

We hope to see you at the Los Gatos Birdwatcher where our staff will be glad to help you select your next pair of binoculars!



### LOS GATOS BIRDWATCHER

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