Binocular Myths: Debunking the Legends

by Bruce Whittington

When you are shopping around for an important purchase, it's frustrating to find that the people who have the goods don't know much about them. It's even worse to discover that, although you've been given lots of information, it is misleading, confusing, or perhaps even dead wrong.

The binocular business is no exception. There are lots of reputable and knowledgeable dealers around. But there are also dealers who know nothing about binoculars, or worse, are ill-informed and only too happy to share their "knowledge."

Once a bit of misinformation finds its way into the binocular lexicon, it is often there to stay, and it can be very difficult to separate the facts from the myths. Here are seven commonly held myths and misconceptions and some suggestions to help keep your confusion quotient to a minimum.

1. Larger objective lenses offer a wider field of view.

Large objectives have their advantages and it makes sense that they might increase field of view, but this is not the case. Field of view in binoculars is determined first by the magnification; the higher the power, the narrower the field of view. Second, the eyepiece, through which your eye views the image, may be engineered to give a wider field of view. It's a simple matter to check the manufacturer's stated field of view on a few models and you will see that a 7x35, for example, will normally have a considerably wider field of view than a 7x50. (If you are having trouble equating a field of view given in degrees with one given as a number of feet at 1,000 yards, there is a simple formula: One degree is about equal to 52.5 feet at 1,000 yards.) Eyeglass wearers will find the field of view quite different than what is stated, except in the case of long eye relief binoculars. The most positive test is to look through the binoculars and see what you can see from left to right.

2. Rubber armoring makes binoculars waterproof.

Many of today's binoculars feature a nice rubber coating. This will quite effectively prevent moisture from getting through it, but it does not waterproof the binoculars. Water can seep in where lenses are seated, and sometimes at body joints (or joints in the rubber armoring). The most vulnerable spot on a binocular is the ocular tube, which slides in and out as the binocular is focused. It is possible to put O-ring seals on these tubes, but it is a difficult system to waterproof effectively. Some binoculars are focused by moving the objective lenses, but the same

principles apply. The most reliably waterproofed binoculars will have a focusing mechanism that is completely inside the binocular body. Truly waterproof binoculars are also filled with nitrogen, which has no latent water vapor to condense on internal optics or foster growth of mold or fungus.

3. Rubber eyecups make binoculars suitable for eyeglass wearers.

This is only half a myth. Rubber eyecups, which can be folded down to allow bespectacled eyes to get closer to the binoculars, will improve the performance of that binocular for eyeglass wearers. They are certainly an improvement over the old-style hard plastic eyecups. But eyeglass wearers will do much better with binoculars that feature long eye relief. Simply put, this is the distance from the eyepiece where the image is focused, and typically eyeglass wearers will need from 15 to 20 mm of eye relief (sometimes more). A good clue is that long eye relief binoculars usually have quite deep rubber eyecups, which keep noneyeglass wearers back where they belong. Since every eyeglass wearer has a unique facial structure and eyeglass designs vary widely, it is important to compare binoculars for comfort and performance.

4. Multiple coatings on lenses produce brighter images.

We're getting close to the truth here, but there is still some room for confusion. Coatings are applied to lenses to improve light transmittance. The theory is that if an optimum-thickness coating is applied, 100 percent light transmittance will be achieved. The problem is that there is no single compound that fills the bill. Lower-priced binoculars use magnesium fluoride, which is quite good. Better are combinations of two or three, and sometimes seven or more, different compounds, which come very close to achieving the magical thickness. There are many moderately priced binoculars that feature the enhanced performance of multicoated lenses. The best performance, however, comes with the increasingly sophisticated lens coating processes found, you guessed it, in the increasingly expensive models. They may not look much different, but you can see the difference when you put them to your eyes.

5. Relative brightness is important.

In order to quantify in some way the brightness of their binoculars, some manufacturers use exotic-sounding formulas to sell their products. The size of the beam of light that is delivered to your eye by a binocular can be calculated quite simply: It is the diameter of the objective lens divided by the magnification. In order to make the differences between models seem more significant, some companies use relative brightness, which is simply the square of the exit pupil. A 7x35, then, with a 5 mm exit pupil, has a relative brightness of 25, whereas a 7x42, with an exit pupil of 6 mm, has a relative brightness of 36. All you really need to know is that relative brightness is relatively meaningless.

Another measure that is sometimes used is twilight factor. It is calculated by multiplying the magnification by the objective lens diameter, and taking the square root of the result. This is really just an attempt to quantify how resolution in low light can be improved with higher power.

The simplest and most meaningful measure of brightness is the exit pupil. Beyond that, look for better optics and lens coatings to maximize the transmission of that precious light.

6. Roof prism binoculars are better than Porro prism binoculars.

This is the condensed version of four other myths: Roofs are smaller/lighter/sharper/brighter than Porros. There is a lot of mystique around roof prism binoculars, but only one thing is sure: They cost a lot more to make than Porros. The best are very good, but let's make some comparisons.

In terms of size, the early roofs were slimmer and lighter than contemporary Porros. But compare today's Zeiss 8x30 (one of the smaller roof prism models in that format) with the venerable Nikon 8x30E Porro. The shape is different, yes. One is shorter and wider (Porro), the other longer and narrower (roof). But both would fit within a similar-sized box. And the Nikon weighs in at 60 grams less than the Zeiss. The Zeiss is waterproof, but the Nikon costs less than half as much.

Nikon's new 10x42 SE Porro, arguably the sharpest binocular on the market, weighs less than any of its roof prism competitors (Zeiss is close), with Nikon's excellent l0x42 roof coming in at a hefty 270 grams heavier.

Roof prism glasses are thought to be brighter. But the odds are stacked against them from the start. Because most roof prism designs reflect the light five times internally (compared with four in a Porro), an additional lens must be used to reerect the image. More glass, more room for light loss. Roof prisms also require phase correction coatings on the roof face of the prisms to correct an inherent aberration. It's what gave the earlier roofs a somewhat "soft" image.

The best roof prisms have overcome the drawbacks of the design, but the result is that they are extremely expensive. Compare the performance of a $200 roof with a $200 Porro and you'll quickly see where the best bang for your buck is.

Quality roof prism binoculars are generally waterproof, an important consideration. They also produce an apparently larger image. Some people simply prefer the narrower body shape. But don't get on the roof prism bandwagon until you've compared them for yourself.

7. There is a perfect binocular.

The myth is that somewhere out there lurks the perfect binocular. The truth is that there are many perfect binoculars. What is perfect for me, however, may be too heavy for you, not bright enough for another person, and have the focus wheel in the wrong place for the third.

The sooner we learn to ignore all the myths, the sooner we'll be able to make better use of the test equipment we're provided with: our senses. Use your eyes, your fingers, your hands. Find out why you like your present binocular, or why you covet someone else's. And somewhere down the road, when the perfect binocular finds its way into your hands you'll know it.

Bruce Whittington lives and birds in Saanichton, British Columbia, Canada.