

### **Choosing a binocular.**

A choice of size of binocular can seem a bit daunting, particularly for the first-time buyer. This article is not about which size is right for which type of use. I prefer to give that kind of advice, personally, to each customer, when I am able to fire a whole lot of questions at them, and then base my recommendation on the information I receive about what expectations and uses are anticipated.

Rather, I intend to offer general advice, which I hope will help people avoid buying binoculars which ultimately disappoint. Here goes!

A binocular represents a tool which is designed to enhance the joy of sight. That is what we anticipate. To be able to see more detail than the naked eye can resolve without approaching closer to the subject. If what you currently are using can't achieve that, then you probably should not have bought it.

Trying not to get too involved with technical details, I want, now to express a fundamental fact. Whatever you put before your eyes, spectacles, monocular, binocular, telescope, spotting scope or microscope, will do one of two things. It will enhance your ability to see OR be a hindrance to your eyesight. Let me explain. If the optical quality of the (properly focused and totally stabilized) lens system you put before your eyes is BETTER than your eyesight, then you can look at the subject, for as long as you wish, without inducing eye strain. However, if the optical quality is in any way inferior to your eyesight, then there will be eye strain involved. The tolerance level to this strain will vary between people. Some will be able to look through poor, dirty, or misaligned, optics for quite a long time, while others will not be able to do so for more than a few moments.

An analogy I like to relate is this. If you are driving a car with a dirty windscreen and you have the sun at your back, the dirty screen is a relatively minor distraction. Now, imagine turning into the sun. The difference is enormous and the tolerance is next to nil for most of us. You HAVE to clean the windscreen. See also my tip for cleaning lenses.

The binocular quality you need to invest in relates to these factors: the finer the detail you want to see, or, the greater the distance that you want to see it at, or, the longer time that you want to spend looking at the subject without a break, **THE HIGHER THE QUALITY OF BINOCULAR YOU NEED TO BUY.**

A common mistake when buying binoculars is to buy magnification instead of optical quality, in the mistaken belief that, somehow, if ten power is good, then twenty power must be twice as good. This is often encountered with older customers who come to me asking for "more powerful binoculars". Often, when I ask them "have you just had new spectacles?" the answer is yes. They have been told by their optometrist that they need

“stronger” spectacles and the customer makes the association that if their “stronger” spectacles can work as well as they have, then “stronger” binoculars will do the same. Well, I think that in such cases, going down to a lower magnification, better quality binocular, is likely to help them more than a higher powered model. Why?

We walk around, with eyes, essentially, of 1x magnification. Our eyes usually see us comfortably through each day without undue strain. However, if we begin to look through a magnified optical system, 8x, 10x or whatever, then I think that we are, probably, adding strain to our eyes in just the same way as we tax our muscles when we pick up, for example, a 10kg bag of potatoes. We can hold that weight close to our chest much longer than we can if we were to hold it at arms’ reach.

What is the difference? Not the weight! We simply created leverage when we extended our arms. Think, now, of our binocular, which creates a similar effect on our eyes. From 1x normal eye magnification, we now demand many times that magnified effect from our eyes through the binocular. Commonly I get older people telling me that their eyesight is not as good as it used to be. Then, does it not make sense to strain your eyes less with a lower powered binocular of quality than an even higher powered one with insufficient resolution?

Now let’s consider this other matter. Magnification power versus resolving power: they are not the same thing. Let us imagine now that we have a ten power binocular. That “ten power” can be thought of in either of two ways. First, that it will show an image ten times larger than the image, perceived by the naked eye, from the same spot. Second, that it will make the image appear to be ten times closer than the naked eye view. Both are correct. Now, it would be nice to think that our ten magnification power binocular also had ten power resolution. Sadly, that is most unlikely. What, then, is resolving power? Imagine having someone put up a poster on a sunlit wall. Walk slowly towards the poster until you can read a particular size line of type. Stop and measure the distance to the poster. Again, for the sake of simplicity we will say that you are, now, ten metres from the poster. In theory, then, we should be able to move back one hundred metres from the poster, rest the 10x binocular on a stable platform, focus it carefully for our eyes, and proceed to read the same size of type. My guess is that you will not be able to do so. To find out what RESOLVING power you have in your binocular, move your stable platform closer, and check again, closer, and check again, until you CAN read the particular line of type. Next, measure the remaining distance to the poster on the wall. If the distance is, say eighty metres then it means that your 10x binocular has a resolving power of 8x. Distance divided by magnification power: eighty (metres to target) divided by 10 (nominal magnification of the binocular) equals eight; the actual resolving power of the unit being tested.

Typically, a pair of binoculars will be described as a something by something (8 x 30, 7 x 50, 10 x 42, and, so on). Most people understand that the first figure represents the magnification of the instrument. The second figure is not so widely understood I have found. Many folk I have spoken to in the last half a century or so have thought that it represented the field of view with 40 being a wider field of view than 30 but less than the field of view of a 50 model. Not so. The second figure is more mundane. It is the diameter in millimetres of the effective diameter of the objective lens which is the large lens, furthest from the eyes. For personal advice and purchases, please contact the writer. I am happy to assist you to make a wise purchase decision. Copyright Richard Wilhelm May 22nd 2012.