

# CARSON®

## Full Size Binoculars



Congratulations on selecting your new Carson Binocular! In order to achieve optimum performance, please follow instructions for proper use and care.

### BASIC BINOCULAR TERMINOLOGY:

**Binoculars** are commonly identified using 2 sets of numbers. The most common size is 8x21mm. The “8” is the magnification and the “21” is the diameter of the objective lens in millimeters.

**Magnification:** Typically, binoculars range from 5x to 12x power. A 5x binocular means that the image you see through the binocular is 5 times larger than it would be when viewed with the naked eye. There are larger power binoculars available, and most higher power binoculars are usually the variable type, also known as zoom binoculars. A 20-80x zoom binocular, for instance, has a magnification range from 20 to 80 power.

**Objective Lens:** The objective lens (front lens) diameter is listed in millimeters. The larger the lens, the more light can enter the binocular and the brighter the image will be. However, binoculars with smaller lenses are more compact and portable.

**Field-of-View:** (Also known as FOV) is the total width of the viewing area through your binoculars from left to right. It is often measured in feet at 1,000 yards. For instance, if you see “358 ft @ 1000 yards”, that means an object that is 358’ wide and a thousand yards away will take up the entire viewing area of the binocular image you see. Sometimes this measurement is listed in degrees and is referred to as Angle of View, i.e. 8° . To convert to feet, multiply the number of degrees by 52.5 and you will get the FOV. Example: If Angle of View is 8°, Field of View is  $8 \times 52.5 = 420' @ 1,000 \text{ yds}$ .

### EYE ADJUSTMENTS: HOW TO ADJUST FOR DISTANCE BETWEEN THE EYES

The distance between the eyes, interpupillary distance, varies from person to person. To achieve perfect alignment of lens to eye:

1. Hold binoculars in normal viewing position.
2. Rotate barrels closer or farther apart until you see a single circular field.



Single Circular Field

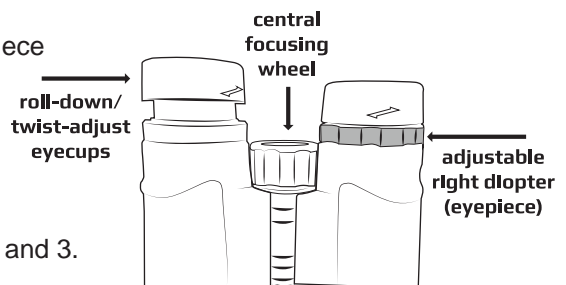


### INDIVIDUALLY ESTABLISHING LEFT/RIGHT EYE FOCUS:

Most binoculars have a center focus wheel and an independent right diopter eyepiece to account for small differences in the strength of each eye. Please follow the steps below to focus properly:

1. Eyecups should be fully extended if you don't wear glasses. If you wear glasses, twist/roll down eyecups to bring your eyes closer to the binocular lens.
2. With right eye closed, rotate the central focusing wheel until the image in the left eyepiece is sharp.
3. With left eye closed, rotate the adjustable right diopter eyepiece until the image is sharp.
4. Image should now be focused to your individual eye strength and will retain setting for future use.

Note: If you still cannot focus, rotate adjustable right diopter to reset by lining up symbols (triangle, line, circle, etc.) on diopter eyepiece and barrel. Then repeat Focusing Steps 2 and 3.



## FOCUSING YOUR BINOCULARS:

While viewing an image, adjust the center focus wheel for distance.

**Please note that certain binoculars have different focusing systems.** Some may only contain a center focus wheel which will focus both eyepieces simultaneously. Some may employ a central focus wheel with a rotating left eyepiece. Others will not have a center focus wheel and you must turn each eyepiece independently to focus. Never try and force an eyepiece if it was not designed to turn. This may seriously damage your binocular.

## ROLL-DOWN EYECUPS:

Your binoculars may be fitted with rubber eyecups designed to exclude extraneous light. If you wear eyeglasses, you may be able to roll-down the eyecups. Some binoculars are outfitted with twisting eyecups which raise and lower the eyecups. For eyeglass wearers, lowering or rolling down the eyecups will bring your eyes closer to the binocular lenses, thus providing an improved field of view. Please note that not all binoculars are equipped with roll-down or twisting eyecups.

## TYPES OF BINOCULARS:

**Standard binoculars** traditionally offer magnification in one set power only and they use a wheel or knob used to engage the focus mechanism.

**Fixed focus binoculars** cannot be adjusted and are usually fixed at an average distance. They are normally used for concerts, opera, or any situation in which variable focusing on objects is not required.

**Zoom binoculars** are equipped with a zoom function to allow you to take a closer look at the object you are viewing. In order to operate a zoom binocular, you must first focus on a distant object. To zoom in, simply adjust the zoom lever or switch to the desired magnification setting. Please note that you may need to adjust the center focus wheel slightly when changing the power setting. Zoom systems vary by model.



**Waterproof binoculars** and **fog-proof binoculars** should be nitrogen purged and O-ring sealed in order for their internal lenses to be truly resistant to fogging and/or water damage.

## STYLE OF BINOCULARS: PORRO OR ROOF PRISM DESIGN

Binoculars come in two distinct styles in which the design is dependent upon the type of prism system used. The image that passes through a binocular is upside down (a function of the lens) and needs to be corrected. The prism is the optical glass inside a binocular whose purpose is to invert the image.

**Roof Prism Systems:** The prisms overlap closely allowing the objective (front) lens to line up directly with the eyepieces. The result is a slim, streamlined shape in which the lenses and prisms that magnify and correct the image are in a straight line.



**Porro Prism Systems:** The objective lens is offset from the eyepiece. Light is redirected through the binocular internally. The result is a shorter, stockier shaped binocular. In general, porro prism binoculars offers a wider field of view. Most zoom binoculars use the porro prism system.

## USE OF A TRIPOD ADAPTER:

Many binoculars can be mounted to a tripod using a standard binocular tripod adapter. Your binocular may contain a thread that can accept a tripod adapter. To expose this thread, look for a tripod socket cover (typically located between the objective lens barrel of your binocular). Twist this cover counterclockwise to remove it. Then attach the threaded portion of the adapter to your binocular, twisting in a clockwise direction until tight. You may then attach the bottom of the adapter to your tripod. Note: not all binoculars contain a tripod adapter.



## CLEANING AND CARE:

Cleaning must be done safely and carefully to avoid scratching the lenses and permanently damaging your binoculars. Safe cleaning can be accomplished by following the procedure below:

1. Blow away any dust or debris on the lens (or use a soft lens brush).
2. To remove dirt, grease, or fingerprints, clean with a microfiber cloth, rubbing in a circular motion. Use of a coarse cloth may scratch the lens surface and eventually cause permanent damage.
3. For a more thorough cleaning, photographic type lens cleaning fluid may be used. Always apply the fluid to the cleaning cloth, never directly to the lens. Do not use any abrasives, chemical cleaners, or solvents.
4. Never attempt to clean your binoculars internally or try to take them apart. This may cause the internal optical components of your binoculars to become misaligned resulting in a double image when looking through them.
5. Keep the lens cover (not included with some models) on the lenses when binoculars are not in use.
6. Non-waterproof models should not be exposed to excessive moisture.

**Caution: Do not view the sun with this binocular. Viewing the sun can cause permanent eye damage.**

**Customer Service:** If you experience any difficulties, please contact us and we will be happy to help you.



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