

TRAIL CAMERAS FAQ

WHY ARE MY NIGHT TIME IMAGES OVER/UNDER EXPOSED?

Over/under exposed night time images can be an issue if the camera isn't set up correctly. On applicable models, the Night Vision (NV) Shutter and LED Control settings can be adjusted to address the brightness of a night time image. The NV shutter address how quickly the shutter opens/closes, and the LED control dictates how many of the camera's IR LED's fire for a night time image.

MY BATTERY LIFE IS SHORTER THAN EXPECTED.

Battery life will vary with operating temperature and the number of images taken over time. Typically, a camera will be able to capture several thousand images before the batteries die. Battery type can also play a factor. Bushnell recommends the use of Energizer Ultimate Lithium AA batteries to obtain maximum battery life. Alkaline batteries may also be used; however, camera performance may be affected. Rechargeable batteries are not recommended, as they have a lower operating voltage and can render the camera inoperable.

WHY IS MY CAMERA TAKING PICTURES WITH NOTHING IN FRONT OF IT?

A camera has what is known as a "false trigger" if the PIR sensor thinks that there is motion and heat in front of the camera lens when there is no subject in the image. These "False Triggers" are the result of placing the camera in an environment where there is motion associated with tree branches creating motion in front of the camera or an area where there is high heat in the foreground and any motion from wind could set off the camera. Setting a camera up over water is also a potential cause for this issue.

To remedy this situation try moving the camera to an area that does not have any of these issues or try changing the sensor level on the menu settings.

If the camera continues to take images when there is no subject in them, try placing the camera in an inside environment and aiming at a location where there is no motion. If the camera continue to show issues, then there is probably an electronic component issue. If this is the case, please contact our customer service to send the camera back for repair.

IS THERE A RECOMMENDED SD CARD BRAND/SIZE?

Bushnell recommends the use of SanDisk SDHC SD cards with a maximum of 32GB storage capacity. For models made before 2010, please reference the camera's instruction manual for the maximum SD card size. For video recording, we recommend the SanDisk Ultra 32GB Class 10 UHS-1 SDHC cards.

MY FIELD SCAN (TIME LAPSE) NOT WORKING PROPERLY.

When using Field Scan, make sure that the stop and start times of Field Scan "A" and "B" do not overlap. For example; do not set the start time of "B" to 8AM if the end time of "A" is 10AM. It's also worth noting that when using video mode for field scan, the minimum interval time is 5 minutes to prevent the potential overheating of the batteries and electronic components. In photo mode the minimum interval time is 1 minute.

HOW DO I ASSIGN A NAME TO MY CAMERA?

After selecting the Camera Name Input parameter, use the left and right arrow keys to select the letters and numbers desired for the camera name. For deleting letters utilize the "←" symbol on the keypad.

WHAT IS THE COORDINATE INPUT FUNCTION ON MY CAMERA?

Coordinate input allows the user to input latitude and longitude coordinates for the camera's location. This data will be embedded in the files saved on the camera's SD card (if "On" is selected). This makes it possible to see each camera's location as a "pushpin" on Google Earth maps when reviewing a folder full of photos from multiple cameras.

WHY ISN'T MY CAMERA SAVING IMAGES/VIDEOS TO THE SD CARD?

If the camera isn't saving images or videos to the SD card try formatting the SD card in the trail camera setup menu (Format Execute). If the problem persists the SD card may need to be reformatted in a computer to a FAT32 file format.

DOES MY CAMERA NEED A SOFTWARE UPDATE?

From time to time Bushnell will release software updates for the Trophy Cam series of cameras.

Note: Installing the incorrect firmware on your camera can brick (permanently lock up) the main circuit board of the camera and render it inoperable.

BINOCULARS FAQs

WHAT DOES CLOSE FOCUS MEAN?

It is the minimum distance an object must be for it to be brought into focus.

I WEAR EYEGASSES, HOW CAN I BETTER SEE THE FULL VIEW THROUGH MY BINOCULARS?

Most Bushnell binoculars are fitted with rubber eyecups that can be twisted or rolled down for an improved field of view with glasses.

I CANNOT SEE AS WELL THROUGH ONE EYE AS THE OTHER WHEN LOOKING THROUGH MY BINOCULARS.

Individual eye strengths vary as do fingerprints. Please refer to the instructions below for your individual type of binocular.

CENTER FOCUS and INSTA-FOCUS

1. Adjust the interpupillary distance.
2. Set the 'diopter setting' (normally on the right lens) to zero and view a distant object.
3. Keep both eyes open at all times.
4. Using a lens cover or your hand, cover the objective (front) lens of the side with the diopter setting ring.
5. Using the focus adjustment, focus on the distant object being viewed.
6. Cover the other objective lens, then view the same object as above.
7. Using the diopter setting adjustment ring, focus on the same distant object as previous.
8. Your binocular should now be adjusted for your eyes. Make a note of the diopter for future use.

* Notes: Zoom Binoculars should be focused at the highest power possible. Perma-Focus® Binoculars do not require adjustment and use your eyes own ability to accommodate, most users have no difficulty with these models.

I SEE TWO 'TUNNELS' WHEN USING MY BINOCULARS, IS THIS NORMAL?

No. The distance between the eyes, called 'interpupillary distance', varies from person to person and your binocular must be adjusted accordingly.

1. Hold your binoculars in the normal viewing position.
2. Grasp each barrel firmly. Move the barrels closer together or further apart until you see a single circular field. Always re-set your binoculars to this position before using.

WHAT BENEFIT DO I RECEIVE FROM HAVING A LARGER OBJECTIVE LENS ON BINOCULARS?

The size of the objective lens on binoculars aids in the binoculars ability to gather light. The larger the lens the more light that is captured giving you a brighter image.

WHAT DOES 8X42 MEAN?

The first number is always going to be the magnification. This will tell you how much closer (8x) the subject will appear when viewing thru the binocular. The second number is the diameter of the objective lens in millimeters.

WHAT IS THE ADVANTAGES OF HAVING A ROOF-PRISM BINOCULAR?

Since the prisms in the binocular overlaps closely, the objective lens and the oculars lens are aligned, the binoculars will be slimmer, more streamlined, less bulky and more rugged than a Porro-Prism binocular.

WHAT IS THE BEST WAY TO CARE FOR AND CLEAN MY BINOCULARS?

When handled with care, your binoculars will provide years of trouble free service. Like any precision instrument your binocular should be given reasonable protection.

1. If binoculars feature rubber "fold-down" eyecups, store them with the eyecups up. This avoids excessive stress and wear placed on the rubber eyecups in the down position. Twist-up and pop-up eyecups can be stored in either position.
2. Avoid banging and dropping.
3. Store in a cool, dry place. Avoid storing in your vehicle as temperature fluctuations and prolonged vibration can damage any optical instrument.
4. Never look directly at the sun with your binocular. It may be very harmful to your eyes.

5. Keep your lenses clean with the following instructions.

- Blow away any dust or debris on the lens (or use a soft lens brush).
- Remove dirt or fingerprints with a soft cotton cloth by rubbing in a circular motion.
- Coarse cloth or unnecessary rubbing may scratch the lens surface causing permanent damage.

6. For a more thorough cleaning, you may use photographic quality lens tissue and cleaner. Always apply the fluid to the paper or the cloth, not directly on the lens. The new microfiber cleaning cloths and "lens pens" are also highly recommended. They do not require cleaning fluid.

RIFLESCOPES FAQ

DO YOU HAVE ANY OTHER SIMPLE TIPS THAT I CAN USE TO IMPROVE MY ODDS?

The following tips can help even the best hunters odds:

- A variable power scope should be set to its lowest power for fast target acquisition. High powers should be reserved for long range, controlled shots.
- Lens caps provide good protection in foul weather by should be removed when stalking or still shooting to save time in snap shooting situations. Take off transparent or tinted covers to avoid image distortion. Bushnell optics are recessed to avoid lens contamination with lens covers removed.
- Using a Bushnell Bore Sighter is recommended after any fall or mishap to assure the zero point of your rifle.
- Storing your rifle and scope overnight in the outdoors will help avoid external fogging of optics. In extreme cold, cycle the action a few times to loosen it up prior to returning to the hunt.

I AM HAVING DIFFICULTY SEEING THROUGH MY SCOPE, ALL IMAGES SEEM BLURRY. HOW CAN I PROPERLY FOCUS MY SCOPE?

Your riflescope needs to be focused only once-for YOUR eyes. If another shooter uses your scope, it must be refocused for their eyes. The following steps will assist in proper focusing of your riflescope with a traditional style focus ring. If you have a scope with a fast focus eyepiece, skip steps 1, 2 and 9.

1. Grasp the knurled eyepiece lock ring and loosen by turning the eyepiece counter clockwise.
2. Turn the lock ring clockwise about five turns.
3. Look through the scope at a bright background such as the sky or a well lighted wall. (Never look at the sun!) Focusing is easier with the scope mounted on a rifle or some firm object.
4. Turn the eyepiece, counter clockwise, until the reticle appears slightly blurred.
5. Turn the eyepiece, clockwise, until the reticle comes into focus.
6. Look away from the scope for a few seconds. Then look back quickly through the scope. If the reticle appears sharp and clear the instant you place your eye to the scope, the focus has been properly set for your eyes. Try this several times.
7. If the reticle appears fuzzy, or requires a little time to come into sharp focus, further adjustment is needed. Turn the eyepiece clockwise another full turn and repeat STEP 8.
8. Keep doing this until the reticle is sharp the instant you put your eye to the scope.
9. When satisfied with your focus, tighten the lock ring against the eyepiece firmly.

HOW CAN I MOUNT MY SCOPE?

Proper mounting is best performed by a professional gunsmith or experienced hunter.

IS IT SAFE TO STORE MY MOUNTED SCOPE IN MY VEHICLE?

As convenient as vehicle storage may be, it can also be detrimental to your scope. Closed vehicles retain very high levels of heat. This intense heat could adversely affect the lubricants and sealants in your scope. Another danger comes from the constant vibration of a traveling vehicle as it can loosen your mounts and affect the zero point of your rifle.

WHAT DETERMINES LIGHT TRANSMISSION IN A RIFLESCOPE?

Three things will determine light transmission: The glass used in the lenses. The use of an anti-reflective lens coating. Effective use of the lenses in the scope.

WHAT IS THE BEST WAY TO KEEP MY SCOPE LENSES CLEAN?

With proper care, your scope should last you a lifetime. When cleaning the lenses, reasonable precautions are necessary. Dry dirt and dust can be removed by air blast or with a soft brush. Fingerprints and lubricants can be wiped off with an eyeglass tissue or a cotton swab and a mild soap solution. Use the lens covers supplied with your scope whenever convenient.

WHAT MAINTENANCE IS REQUIRED ON A RIFLESCOPE?

None, with proper care and mounting, your scope should last a lifetime. Due to the unique internal seals and special lubricants your scope can maintain a dry gas atmosphere to prevent fogging of the lenses in any conditions. No lubricants or solvents are required to preserve mechanical function.

WHAT TYPE OF BATTERY DOES MY RIFLESCOPE TAKE?

Current Models:

Model:	Description:	Battery:
730131	1X28 TROPHY RED DOT SCOPE	CR2032 Lithium
730132A	1X28 TROPHY REDDOT AUTO ON-OFF	CR2032 Lithium

730132P	1X32 TROPHY MP RED GREEN DOT	CR2032 Lithium
730134	1X28 TROPHY R-DOT 4CRS HAIRS	CR2032 Lithium
730134C	1X28TRPHYM REDDOT4XHAIRS-CLM	CR2032 Lithium
730135	1X28 TROPHY RED/GREEN DOT,4RET	CR2032 Lithium
730135P	TROPHY MP 3.5X REDGREEN DOT	CR2032 Lithium
733125E	3-12X56 TROPHY 30MM, IR	CR2032 Lithium
737000V	VIDEOSCOPE	Internal Lithium-Ion Rechargeable
713949I	3-9X40M BANNER, RED GREEN IR	CR2032 Lithium
713959I	3-9X50M BANNER, RED GREEN IR	CR2032 Lithium
714164I	4-16X40M BANNER, RED GREEN IR	CR2032 Lithium
720130	1X23 SPTMN ILL. DOT W/RGS HNGN	CR2032 Lithium
723950MI	3-9X50M SPORTSMAN W/IR	CR2032 Lithium

Archived Models:

Model:	Description:	Battery:
500021	Original Holosight	N Cell Batteries
510021	Compact Holosight	N Cell Batteries
XXXXXX	Lite Sight Riflescope	CR2032 Lithium Battery
XXXXXX	Banner Lite Sight Riflescope	SR 44A Sony
711562	1.5-6X21 BANNER LITE-SITE	A76 Batteries
XXXXXX	Bushnell Trophy Red Dot	CR2032

LASER RANGEFINDERS FAQ

MY RANGEFINDER IS DISPLAYING LOB ON THE SCREEN WHAT DOES THIS MEAN?

This will designate that you have a low battery.

MY RANGEFINDER IS NO LONGER IS ABLE TO PICK UP FURTHER DISTANCES WHAT CAN I DO?

WHAT BATTERY DOES MY RANGEFINDER TAKE?

Current Models:

Model:	Description:	Battery:
204101	Legend 1200 ARC	CR2 Lithium
204100	Legend 1200 ARC	CR2 Lithium
201942	Scout 1000 w/ARC	CR2 Lithium
201932	Scout 1000 w/ARC	CR2 Lithium
202204	Bowhunter Chuck Adams	CR2 Lithium
202201	Sport 600	CR2 Lithium
201921	Sport 450	9-Volt Alkaline
201916	Sport 450	9-Volt Alkaline
204124	Yardage Pro Riflescope	CR2 Lithium

Archived Models:

Model:	Description:	Battery:
200602	Yardage Pro 600	9-Volt Alkaline
200003W	Yardage Pro Legend	CR2 Lithium

201319	Yardage Pro Legend Mossy Oak	CR2 Lithium
200836	Yardage Pro Quest	2 AA Alkaline
201920	Yardage Pro Sport 450	9-Volt Alkaline
200001	Yardage Pro Scout	CR2 Lithium
203000	Yardage Pro Scout Real Tree	CR2 Lithium
201315	Yardage Pro Scout Mossy Oak	CR2 Lithium
202018	Yardage Pro Trophy	9-Volt Alkaline
202020	Yardage Pro Trophy Mossy Oak	9-volt Alkaline
200405	Yardage Pro 400	9-Volt Alkaline
200500	Yardage Pro 500	9-Volt Alkaline
200750	Yardage Pro 750	9-Volt Alkaline
201000	Yardage Pro 1000	9-Volt Alkaline
200880	Yardage Pro 800	4 (AAA) Alkaline
205100	Yardage Pro 1500	9-Volt Alkaline
205101	Yardage Pro 1500 w/ARC	9-Volt Alkaline
201931	Scout 1000 w/ARC	CR2 Lithium
201941	Scout 1000 Real Tree w/ARC	CR2 Lithium

WHAT CLASS OF LASER IS MY BUSHNELL YARDAGE PRO RANGEFINDER?

All Bushnell Rangefinders have a class one laser.

WHAT TYPE OF BATTERY DOES MY YARDAGE PRO SCOUT TAKE?

The Yardage Pro Scout takes a CR2 Lithium battery.

SPEEDGUNS FAQ

CAN SPEED RADAR GUNS READ THE SPEED OF AN OBJECT MOVING IN ANY DIRECTION?

No, Doppler radar can only read the relative speed of targets moving either to or from the radar.

CAN THE BUSHNELL SPEEDSTER TRACK ARROW SPEED?

No

CAN THE BUSHNELL SPEEDSTER TRACK CLUB HEAD SPEED?

No

DOES ANGLE EFFECT ACCURACY?

A 12-degree angle should not effect performance. The Speedster can achieve +/- 1-MPH speed accuracy to a baseball at 75 feet away at a 12-degree angle or less. A 20-degree angle at 60 feet away would result in +/- 3-MPH accuracy.

HOW ACCURATE IS THE BUSHNELL SPEEDSTER?

The Bushnell Speedster provides +/- one-MPH speed accuracy.

HOW DOES RAIN / SNOW EFFECT THE PERFORMANCE?

The Bushnell Speedster is water resistant and performs +/- one MPH accuracy in rain and snow. Weather does not effect accuracy and it is self-calibrating.

HOW DOES THE SPEEDSTER WORK?

Once the trigger is engaged, the Speedster transmits radio frequency energy in the form of waves. The radar transmits 24 billion RF cycles of energy per second at the speed of light, which is 186,000 miles per second. The Speedster measures the difference between transmit and receive signals and relays this information to the DSP to quickly calculate +/- one MPH speed accuracy.

HOW DOES THE USER NEED TO BE POSITIONED IN RELATION TO THE MOVING OBJECT?

The Bushnell Speedster works best when positioned in front of or behind the moving object.

HOW IS SPEED CALCULATED?

Speed is the difference between the transmit frequency and receiver frequency (also known as the "Doppler" shift).

IF IN A MOVING VEHICLE, CAN THE BUSHNELL SPEEDSTER PICK UP THE SPEED OF ANOTHER MOVING OBJECT?

No. However, if you would like to know the speed of the vehicle you are in, point the Speedster at a stationary object, such as the ground.

WHAT IS RADAR?

Radar is an acronym for "Radio Detection And Ranging".

WHAT IS THE BATTERY LIFE OF THE BUSHNELL SPEEDSTER?

Approximately ten 9-inning baseball games.

WHAT IS THE BUSHNELL SPEEDSTER USED FOR?

The Bushnell Speedster can be used to accurately measure and display speeds of many of your favorite sports. It can track speeds of baseballs, softballs, tennis balls, and can be used in ice-skating, auto-racing, horse-racing, track, and other sports where speed is crucial to success.

WHAT IS THE DISTANCE THAT THE SPEED OF A BASEBALL, SOFTBALL OR TENNIS BALL CAN BE READ?

0-75 feet away.

WHAT IS THE DISTANCE THAT THE SPEED OF A CAR CAN BE READ?

0-1300 feet away.

WHAT IS UNIQUE ABOUT THE SPEEDSTER COMPARED TO OTHER RADAR GUNS?

The Speedster uses advanced Digital Signal Processing (DSP) software to filter out bad information, providing valid accurate information. In addition, the Speedster is capable of tracking baseball statistics.

WHAT KIND OF TEMPERATURE RANGES CAN THE BUSHNELL SPEEDSTER BE SUBJECTED TO?

-5 degrees C to 70 degrees C.

WHAT TECHNOLOGY DOES THE SPEEDSTER CONSIST OF?

The Bushnell Speedster contains a K-Band microwave RF (Radio Frequency) transmitter whose signal gets reflected by the target object. The reflected signal will have a "Doppler Shift" proportional to the target speed. This Doppler frequency shift is detected in the receiver, amplified, filtered, and then digitized in an Analog to Digital Converter (ADC), and passed onto the Digital Signal Processing (DSP) chip. Using complex algorithms, the DSP chip filters out false and low level return signals, to identify and display the speed of the desired target. The speed along with various statistics and averages are then displayed on the LCD display.

WHAT TYPE OF BATTERY DOES THE BUSHNELL SPEEDSTER USE?

Six AA's. We recommend using good quality AA alkaline batteries.

TELESCOPES FAQ

DO I HAVE TO BE AN EXPERT IN ASTRONOMY TO ENJOY USING A TELESCOPE? HOW CAN I LOCATE INTERESTING OBJECTS TO OBSERVE?

Most first-time telescope users know little or nothing about the night sky, and you certainly do not need a course in astronomy to enjoy your telescope to the fullest. Begin with the objects easiest to find: the Moon, Jupiter, Saturn, Venus, and Mars. All of these are bright objects even in the midst of a big-city environment and can be located by using star maps in popular monthly magazines such as *Astronomy* or *Sky & Telescope*.

DO I NEED TO TAKE MY TELESCOPE OUT IN THE COUNTRY, AWAY FROM CITY LIGHTS, TO REALIZE ITS FULL POTENTIAL?

Some types of objects (e.g., nebulae and galaxies) are best observed in a dark-sky environment, although even many of these are clearly observable through small telescopes in the city. The Moon and planets, by contrast, can be studied about equally well from the city or country. The basic rule is that while observations made outside the city generally reveal more detail, particularly in deep space, there are still a great many objects within the grasp of a small telescope in urban areas.

DOES BUSHNELL HAVE ANY HINTS FOR BEGINNERS ON VIEWING THROUGH A TELESCOPE?

Certainly, here is an excerpt from one of our publications:

For beginners it is best to put in some practice by viewing terrestrial objects during the day. Initial experience can be gained during this time of the operation and use of your telescope. If your telescope is equipped with a moon filter, be sure to remove it from the ocular, do this before viewing objects and only use the filter(s) for their intended use.

Never mount more than one accessory (except moon filter) with your ocular lens. This shifts your focal length and prevents you from getting a proper focus, (Example: Barlow and Star Diagonal, 20mm ocular lens).

Let's talk about POWER: It's a natural tendency for all of us to want to magnify the moon, planets and stars as much as possible so as to be able to see it as closely as we can. Wouldn't it be wonderful to see the "canals" on Mars or the ice cap on Jupiter or the Apollo landing sights on the moon?

Yet, the pure and simple physics of light transmission, refraction and magnification through optical lenses make this a very challenging task. As one seeks to increase magnification of an image, more and more of the light is lost or reflected. And as more magnification is achieved, the more interference occurs from ambient or casual light sources, as well as from the atmosphere itself. That is why the more experienced telescope user knows that viewing is generally more enjoyable at lower powers.

That is why we suggest you begin learning about your new telescope by starting at the lower powers. After you gain some skill and practice at low powers, you can carefully move up when viewing conditions are best. By starting with the lowest powered ocular lens, this allows you to focus in and find objects prior to using the higher powered oculars (5mm, 6mm, 4mm or 2x Barlow) produces a smaller field of view. If the image is fuzzy at higher magnification, drop down to a lower magnification as the atmospheric conditions are not sufficient to support the high magnification at observation time. Remember, the higher the number on the ocular, the lower the power. To figure the power of an ocular lens you divide the number on the ocular into in to the focal length of the telescope. (Example: $700\text{mm}/20\text{mm}=35\text{x}$). Avoid touching or jarring the scope while viewing. This results in vibration that causes the image to shimmy or move. Also make sure that all assembly screws are secured as tightly as possible. When viewing at night, allow at least 15 minutes for your eyes to become adapted to the dark. If you wear glasses, remove them when viewing through your scope unless you have an astigmatism.

HOW DO I DETERMINE THE POWER OF MY TELESCOPE?

The power of your telescope can be determined by dividing the focal length of the objective lens by the focal length of the eyepiece. The eyepiece focal length is the number printed on the eyepiece (for example: 1000 divided by $25=40\text{X}$).

HOW DO YOU ALIGN THE FINDERSCOPE?

Aligning the finderscope can be accomplished following these steps.

1. With the 20mm eyepiece in place, point the telescope at some well-defined land target (e.g. a telephone pole or building) at least 200 yards away. This may be done manually or by using the fine tracking controls (control knobs). With target object centered in the field, tighten the control lock knobs.
2. Look through the finderscope and tighten or loosen, as appropriate, the finderscope's alignment screws until the crosshairs of the finderscope are precisely centered on the same object already centered in the telescope's field of view.
3. Once this is accomplished objects located first in the finderscope's field of view will also be centered in the main telescope. (Note: the image presented by the finderscope will be upside-down and reversed)

MY EQUATORIAL MOUNT TELESCOPE SEEMS UNSTEADY, HOW CAN IT BE STABILIZED?

Properly balancing the scope will make it easier to work with. Use the following steps to help you out.

1. Arrange the telescope so that the telescope body is horizontal to the floor (latitude of 0 degrees). Loosen the R.A. (right ascension) lock-knob. With R.A. lock loosened, the telescope mount will turn freely about the polar axis. Rotate the telescope about the polar axis so that the counterweight shaft is parallel to the ground (horizontal).

2. Loosen the counterweight's lock screw, and slide the counterweight along the shaft until the telescope remains in any given position without tending to drift in either direction. Then re-tighten the counterweight lock screw to lock the counterweight in position.
3. To balance the telescope about the declination axis. First loosen the declination lock knob, then slightly loosen the clamp ring screws so that the telescope main tube can slide inside the rings. Slide the main tube up or down inside the rings until the telescope is balanced about the declination axis. Re-tighten the clamp ring screws. The telescope is now balanced.

WHAT ARE THE BEST CONDITIONS FOR OBSERVING?

Good or poor viewing is not always determined by the optics of a telescope. There can be external factors determining the quality of an image. The blanket of air surrounding the earth is constantly in motion. This shifting and swirling of the atmosphere causes a poor image especially at higher powers. This constantly changes so some nights may be better for viewing than others.

Optical distortions made by the rippling of air currents emitting above a heated surface or area can cause a poor image. Objects are more distinct when viewing straight up because you are only viewing through an atmosphere of about 10 miles thick. This is opposed to an atmosphere 15 miles thick at 45 degrees, and over 100 miles thick near the horizon.

Light pollution: If possible avoid using your scope around lights (street lights, house lights, etc.). A high magnifying telescope is very sensitive to light, resulting in a washed out image or an annoying glare. The effects of bright light become more obvious near cities. Many of the stars seem to disappear near the city horizon.

Moonlight can be another factor. The harsh glare from a full or bright moon can dim nearby stars and planets. The moon itself is best viewed during the phases near the area dividing the darkness and sunlight.

Avoid viewing through an open window (never view through a closed window). The air currents caused by the inside/outside temperature, especially during the cold season makes quality observation impossible.

A bank of clouds is impossible to view through. Fortunately these are constantly moving. When stars twinkle rapidly, this is a result of the warm and cool air mixing. This results in poor viewing. Try to observe on nights when the stars have a steady 'burn' like the planets. A heavy haze causes poor viewing but a faint haze usually means a still atmosphere and good viewing may be possible. Stars always appear as pinpoints of light. They are at such great distances that any discernible size difference between very low and high magnifications within the telescope is impossible. The light gathering power of the telescope allows you to see stars and planets that your eyes would not normally see within the solar system.

Most telescopes give their widest field of view at lowest power - usually not more than 1-1/2 degrees. This means it is frustratingly difficult to find anything in the sky with the telescope alone. A small telescope called a finderscope is mounted parallel on the side of the main scope to get around this problem. The low powered finderscope with its four to six degree field of view and central crosshairs permits precise aiming before you look through the main body of the telescope.

WHAT CAN I SEE WITH MY TELESCOPE?

Telescopes with power ranging from 25X to 50X can be used to view Star Clusters and Nebulae. 90X to 120X telescopes can view galaxies. Most planets can be seen at 150X and higher.

WHAT DO THE NUMBERS ON THE EYEPIECE MEAN?

The numbers of the eyepiece represent the focal length of the eyepiece.

WHAT IS THE DIFFERENCE BETWEEN A REFRACTOR TELESCOPE AND A REFLECTOR TELESCOPE?

Refractor telescopes use lenses only (no mirrors or prisms). The refractor is essentially a closed tube design. It is mechanically uncomplicated and basically maintenance free. Refractors are generally used for astronomical viewing; however, they can be used for terrestrial purposes beyond 100 feet.

WHY IS THE IMAGE IN THE TELESCOPE UPSIDE DOWN AND REVERSED FROM RIGHT TO LEFT?

An upside down and reversed image is a common characteristic of most astronomical telescopes. Since telescopes are used for astronomical viewing orientation is not important. The image in the finderscope will also be upside down and reversed.
