

# COLEMAN® TELESCOPE

**AT70**



**INSTRUCTIONS & OWNER'S MANUAL**

*Please retain the packaging and instructions for further reference, as they contain important information.*

## **INTRODUCTION:**

***Congratulations*** on your purchase of the precision crafted AT70 COLEMAN telescope. With the proper care and handling of your telescope, you will enjoy years of viewing pleasure.

As an astronomical device, the AT70 telescope has been designed for both a beginner and advanced star gazer. It provides views of the moon and planets, as well as dozens of galaxies, star clusters, and nebulae.

As a terrestrial (land) telescope, the AT70 brings the world's natural wonders closer. It delivers superb scenic views and allows for observation of animals and landscapes from a distance. To obtain the best performance from your telescope, please carefully read this manual.

***WARNING! DO NOT VIEW THE SUN THROUGH A TELESCOPE!  
SERIOUS INJURY TO THE EYES MAY OCCUR***

***For use by an adult or under the supervision of an adult***

# PARTS LIST FOR AT70 Telescope:

## ASSEMBLED VIEW



1. Tripod
2. Telescope Optical Tube
3. Focusing Tube
4. Erecting Diagonal Prism
5. Eyepieces (K10, K25)  
Eyepiece Cases (2)
6. Finderscope with bracket attached
7. Objective Lens
8. Front Dust Cap (not shown)
9. Fixing Screw
10. Elevation Adjustment Knob
11. Elevation Locking Knob
12. Padded Carrying Case
13. Astrowatch Software CD  
(not shown)

## INCLUDED ACCESSORIES



**WARNING!**  
**CHOKING HAZARD**  
Small parts. Not suitable for  
children under 3 years.



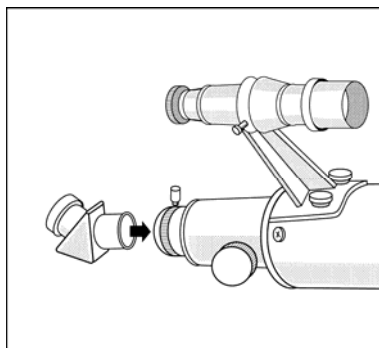
CONFORMS TO EN71



*Specifications, colors, packaging, and/or contents of this manual are subject to change without notice.*

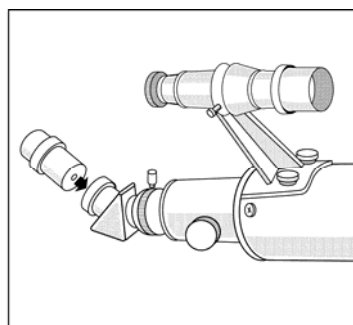
## ASSEMBLY:

- 1) Carefully remove all parts from the cardboard cartons and lay them on a flat surface in order to take an inventory of all the pieces. Keep your box for storage or in case you ever need to ship your telescope.
- 2) Remove the tripod (1) from the box. Set the tripod on a level surface and fully spread the legs.
- 3) Remove the telescope optical tube (2) from the box.
- 4) Position the telescope optical tube (2) on top of the tripod head, aligning it to the fixing screw (9). Connect the telescope optical tube to the tripod and secure it in place by tightening the fixing screw. *DO NOT OVERTIGHTEN.*
- 5) Remove the erecting diagonal prism (4) from the box. Insert it into the focusing tube (3). Secure the erecting diagonal prism in place by tightening the set screw. (See Illustration 1)



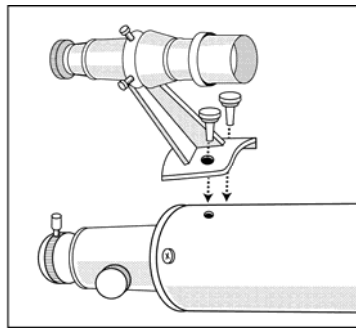
(Illustration 1)

- 6) Remove either the K10 or K25 eyepiece (5) from its protective case. Insert the eyepiece into the erecting diagonal prism. Secure the eyepiece in place by tightening the set screw. (See Illustration 2)



(Illustration 2)

7) Remove the finderscope and the finderscope bracket (6) from the box. Remove the two knurled thumbscrews from the telescope main tube (See Illustration 3). Position the finderscope bracket onto the telescope tube so that the holes in the base of the bracket line up with the exposed holes in the telescope tube. Replace the two knurled thumbscrews and tighten securely (See Illustration 3). Insert the finder scope into the bracket and tighten the knurled thumbscrews to keep the finder scope securely in place.



(Illustration 3)

The basic assembly of your telescope is now complete and ready for observing far away celestial and terrestrial objects.

# HOW TO USE YOUR COLEMAN AT70

## A. FINDER SCOPE ALIGNMENT

Since a telescope by design has a narrow field of view, it can be challenging to locate the particular object you wish to view. For this reason the telescope is fitted with a low-power, wide-field miniature optical device called a finderscope. Always use your finderscope to first locate the object you would like to view. **The finderscope should be aligned with the main telescope tube before you begin using the telescope**, in order that both the telescope and finder scope are positioned to provide exactly the same angle and view.

**Note: Objects in the finder scope are upside down. This is normal and is common to all astronomical telescopes.**

## B. COMPLETE THE FOLLOWING SETTINGS IN DAYLIGHT:

- 1) With either the K10 or K25 eyepiece in the erecting diagonal prism, rotate the tripod head toward an object you have selected to view. Direct the tripod head to an easily recognizable, stationary object that is at least 200-300 feet away.
- 2) When the telescope is pointing in the general direction of the object you wish to view, adjust the horizontal position and vertical elevation (up and down angle). The vertical elevation adjustment is done by rotating the elevation adjustment knob (10), or by gently moving the telescope up or down until it is aligned with the object to be viewed. You may lock the telescope into position with the elevation locking knob (11).
- 3) Look through the finderscope (6) and refine the elevation as described above. Center the object in the field of view. You may also adjust the finderscope by simply releasing one of the small adjusting screws holding the finderscope and re-position the finder scope until the object is centered within the X-shaped crosshairs.
- 4) All screws should be completely tightened as soon as the view through the finder scope coincides with the view of the main telescope.
- 5) You may need to repeat this procedure to ensure a perfect alignment.
- 6) Look through the eyepiece and focus the image by slowly rotating the pinion focusing knobs. These knobs are located at the rear of the telescope optical tube.
- 7) For the various telescope powers, please refer to the next section **ABOUT MAGNIFICATION**.

## C. ABOUT MAGNIFICATION:

The magnification power of a telescope indicates how much an image is enlarged or how big and close it appears to the viewer. The focal length of the eyepiece, combined with the focal length of the telescope, determines the magnification power. To calculate the power of your telescope with any particular eyepiece, simply divide the focal length of the telescope (400mm) by the focal length of the eyepiece (indicated in "mm" on the eyepiece collar).

Example: 
$$\frac{400 \text{ mm focal length (tube)}}{10 \text{ mm focal length (eyepiece)}} = 40\text{X magnification power}$$

<u>EYEPIECE</u>	<u>POWER</u>
K10	40x
K25	16x

When you are looking at astronomical objects, you are looking through a column of air that reaches to the edge of space, and that column of air seldom stays still. Similarly, when viewing over land (terrestrial viewing), you are often looking through heat waves radiating from the ground, homes, buildings, etc. Your telescope may be able to provide very high magnifications, but you often end up magnifying all the turbulence between the telescope and the object you wish to view. The level of magnification required depends on the object. Optimal performance is obtained if the magnification is typically not more than about 30x for every 10mm of objective lens diameter. Another good rule of thumb is that the usable magnification of a telescope is about 3x per mm of the aperture (for the AT70, the aperture is 70mm) under good conditions. Thus, magnification of around 210x or less is ideal for a telescope with a 70mm diameter objective lens (aperture) and is best for observing most celestial objects. A lower magnification power and a wider field of view are advisable for observing galaxies and nebulae. The highest magnification power should be used for highly detailed observations of the moon, Jupiter, Saturn, or any object that is quite bright.

#### **D. ABOUT YOUR REFRACTOR TELESCOPE:**

Your telescope has a refractor type optical design. It uses lenses to gather and focus light. The combination of the front objective lens and eyepiece gathers more light than the human eye is able to collect on its own, focus it, and present the viewer with a brighter, clearer, and magnified virtual image. Light enters the open end of the telescope tube. The objective lens refracts or bends the light. This refraction causes parallel light rays to converge at a focal point, while those not parallel converge upon a focal plane. This results in a focused image which is enlarged for viewing through the eyepiece.

The primary front objective lens is a precision ground and polished component that is precisely positioned at one end of the optical tube, and is pre-aligned for maximum performance at the factory and should not need any adjustment. **Therefore, never tamper with or remove the lens at this end of the optical tube. Doing so will void your warranty and affect or damage the performance of your telescope.**

#### **TECHNICAL SPECIFICATIONS:**

*Objective Lens Diameter: 70mm (2.75")*  
*Maximum Magnification: 40x*

*Focal Length: 400mm*  
*Eyepieces: K10mm, K25mm*

*Accessories: Erecting Diagonal Prism, 5x24 Finderscope, Astronomy CD, Carrying Case*

## **E. USING YOUR TELESCOPE:**

- 1) It is recommended to use your telescope outside or at times through open windows. Your view can be distorted by reflections in the glass of a closed window or at times by air currents of differing temperatures passing through an open window.
- 2) Let your telescope adjust to the outside temperature. Your telescope will perform much better if the temperature of the mirrors, eyepiece lenses, and the air inside the tube are the same as the outside temperature. It may take up to 30 minutes to equalize the temperatures when the difference in temperatures is extreme.
- 3) Find a location far from glaring light. If you live in an urban area, your viewing will probably improve the farther you move away from the city's lights. The sky glow of a town or city can dramatically reduce the telescope's performance and viewing capabilities.
- 4) Remove the dust cap from the end of the telescope. The open end of the optical tube should be pointed toward the subject you wish to observe.
- 5) Begin your viewing session by using only the K25 eyepiece. It will give you the widest angle and the brightest, sharpest views. Adjust the angle and position of the telescope as outlined in the previous sections.

When possible, avoid sudden temperature changes, as the moisture in the air will condense on the mirrors and eyepiece lenses. Should this occur after bringing your telescope indoors, remove the dust caps and allow the moisture to evaporate naturally. Point the telescope downward to minimize the collection of airborne dust. Once all of the moisture has evaporated, replace the dust caps.

## **F. A NOTE ON TERRESTRIAL VIEWING:**

When viewing through a standard telescope, you may notice that when you observe a terrestrial object on land or water it appears upside down.

To correct this, the COLEMAN AT70 is equipped with an erecting diagonal prism (4). This accessory is inserted in the eyepiece holder of the telescope between the eyepiece and the telescope. With the erecting image diagonal, objects will appear in their proper orientation for terrestrial and land observation.

**NOTE: The eyepieces must be used together with the erecting diagonal prism.**



## **G. CARE AND CLEANING OF THE OPTICS:**

The optical components of a telescope will get dirty over time. Dirt or dust on a lens should be removed with the utmost care. A considerable amount of dirt or dust would have to accumulate on the optical surface before your view would be compromised.

- 1) Keeping dust caps on during storage and transport will reduce dust collection.
- 2) Condensation may collect on the optical surfaces when the telescope is not in use. Remove the dust caps and allow the moisture to evaporate naturally. Point the telescope downward to minimize the accumulation of airborne dust.
- 3) Once all moisture has evaporated, replace the dust caps.
- 4) Filtered, compressed air may be used to remove surface dust from lenses and mirrors. Remove the dust cap. Once removed, point the can away from the lens and gently expel some air and any condensation or dust that has accumulated on the discharge tube. Spray the lens or mirror with short bursts of air to carefully remove the dust particles. Clean eyepieces and optical surfaces with special lens paper only. Eyepieces should be handled with care. Avoid touching optical surfaces.

***DO NOT HOLD THE TRIGGER OF THE COMPRESSED AIR CAN FOR EXTENDED PERIODS BECAUSE PROPELLANT MAY ESCAPE AND DAMAGE THE OPTICAL SURFACES.***

If, after several attempts, you cannot remove the particles, take the telescope to an optical professional for cleaning.

If you keep the dust caps on your telescope when it is not in use and avoid handling the lenses or mirrors, only minimal optical maintenance of your telescope should be required. Extensive cleaning is usually only necessary every few years.

## **H. WHAT TO LOOK FOR IN THE NIGHT SKY:**

There is a whole universe of objects you could view at night, so where do you start? We recommend starting with the most prominent objects first.

### **The Moon**

The moon is the easiest target to find at night. When the moon is in full position, it bathes the night with a silvery light that washes the sky of all but the brightest objects. The best time to view the moon is not when it is full, but rather when it is less than half full. The dividing line between dark and light on the moon, called the terminator, shows the best detail in the craters and mountains.

### **The Planets**

The planets, our solar system companions, range in size and substance from moon-size rocky bodies to giant gas balls, which could hold Earth 1,000 times over. To find the planets, you will need information about their times of visibility. The included Astronomical Software CD or an astronomy magazine will give you the locations of the planets as they change position from month to month. The Internet is also an excellent source of information, offering star charts, maps, and more!

The popular and more familiar constellations often provide the easiest landmarks to help find the planet's locations and paths of orbit. Most people have looked up at the sky at night and seen some of the planets without even realizing it. A planet looks like a bright star but does not twinkle like a star does; it looks like a tiny ball. Venus, Mars, Jupiter, and Saturn are the easiest planets to view. Mercury is dimmer, usually below the horizon, and more challenging to find.

Each of the planets provides interesting views. Venus is covered with clouds so all that is visible is an extremely bright light, the brightest next to the moon. However, Venus, like the moon, goes through phases. As it travels around the sun, different areas of its surface are illuminated, producing crescent shapes of varying sizes. Mars is the red planet. When it is above the horizon, it is noticeably red and stands out like a beacon in the night sky. The apparent brightness of Mars varies as the planet orbits around the sun and throughout its period of visibility, it will look brighter or dimmer depending on its distance from Earth.

Jupiter is the largest planet in our solar system and the second brightest next to Venus. Jupiter has many moons, four of which are often visible through your telescope when viewing conditions permit. As you watch them throughout the evening, you will see that they change position relative to each other and to Jupiter. It is possible with careful planning to actually see one of the moons disappear either in front of or behind Jupiter as it orbits around the planet. Another great feature of Jupiter is its cloud belt. Jupiter is alive with weather activity and its clouds have formed over time into belts visible through telescopes in the right atmospheric conditions.

Saturn, the second largest planet, is not as bright as Jupiter and so its moons are not as visible through small telescopes. The large rings that encircle Saturn are spectacular to observe, however. The planet and its rings appear pale yellow. The major division in the rings, the Cassini division, is possible to see if you keep the telescope firmly in position.

Uranus and Neptune are the last of the solar system's gas giants. They do not provide as spectacular a sight as Jupiter or Saturn, but are nonetheless rewarding to see.

***Beyond our solar system there are many more objects to be found. Galaxies, nebulae, and star clusters abound!***

## **I. ABOUT THE INCLUDED ASTRONOMY SOFTWARE CD:**

Navigate the heavens like the professionals. TheSkyX First Light Edition makes an ideal companion to best enjoy your new telescope. Its intuitive user-interface always keeps you grounded while exploring the wonders of the night sky. Point and click to learn the names and coordinates of celestial objects. Quickly create observing lists of the interesting objects that are visible from your backyard with the What's Up? feature. Print finder charts to assist locating those faint, fuzzy objects in the eyepiece. Zoom in for up-close views of the planets, including the Moon, and Jupiter and Saturn's major moons. Watch animated tours demonstrating fascinating astronomical phenomena.

A descriptive digital user guide offers helpful tips, and in-depth descriptions on hundreds of celestial wonders offer hours of edutainment for you and your family.

## **J. FREQUENTLY ASKED QUESTIONS:**

### **1) How far can I see?**

If you stand outside and look up at the night sky on a clear evening, you can see hundreds of stars without the aid of your telescope. The telescope is a light-gathering instrument that magnifies the view—providing significantly more detail and unveiling more stars, nebulae, and celestial objects. With the aid of a telescope, you will be able to enjoy exciting views of Saturn’s rings, Jupiter’s major moons, the Orion Nebula, and much more.

### **2) Why can’t I see anything through my telescope?**

If you see only gray or black when looking through your telescope, even after searching for an object to view, it is very likely that you are using an eyepiece that is too powerful. To solve this problem always start with the lowest power eyepiece at first, and only insert the higher-power eyepiece after you have located an object.

### **3) When I use my high-power eyepiece, everything looks much darker. Why?**

As magnification in a telescope increases, brightness diminishes. Conversely, brightness increases when magnification is reduced. If an image appears too dark or unclear, use a lower-powered eyepiece. Views of small, bright objects are superior to those of large, dark, or blurry ones! Atmospheric conditions, air currents, as well as light and air pollution also affect viewing quality.

### **4) As I look through my telescope, why do objects in the sky appear to move?**

The constant rotation of the Earth makes things appear to move. Lower-power eyepieces will reduce this effect of movement considerably and allow you to observe an object for a longer duration before you have to readjust your telescope.

### **6) Whom do I contact for more information and product questions?**

For any inquiries, parts, warranty or service information, please contact:



**Phone:** 800-441-1100

212-947-7100

**e-mail:** customerservice@elitebrands.com **or** support@elitebrands.com

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