

EXPLORE[®] SCIENTIFIC

User Manual

Explore Scientific Truss Tube Dobsonian Telescopes



DANGER!

Never use a telescope for solar observing without a special filter! Immediate permanent damage to your eyes will occur as soon as you are pointing the telescope at or near the sun. Since eye damage will occur faster than your eye lid closing reflex and it is very often painless you will react too slow – and the permanent eye damage will already have taken place. Never point your telescope or the finder scope at or near the sun. Never look through your telescope while it is moving. Never leave your telescope alone during the daytime without covering the main mirror. Realize that even skew sun rays can be concentrated by the mirror and cause burns in the vicinity of the telescope, eye damage and fire. During a observation children have to be supervised at all times.

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All Explore Scientific telescopes and telescope accessories are subject to constant technical improvement. Minor changes of product specifications that happen during the improvement of the product are subject to change without notice.

Please keep this manual for future reference and do not throw it away.



Figure 1

Figure 1: Telescope parts overview

1. Focuser with 10:1 reduction
2. Secondary cage unit with secondary mirror
3. Collimation-tool for the main mirror
4. Trusses
5. Altitude wheels
6. Rockerbox
7. Lid mirror box
8. Mirror box
9. Red dot finder

Unboxing and checking the content

When you open the box you should see the following picture (figure 2):



Figure 2

The trusses are already assembled in four pairs. At the bottom of the picture you will notice the collimation tool that will help you collimating the main mirror of the telescope. Carefully remove the parts from the box, unwrap them and remove the foam parts that secure the rest.



Figure 3

Now you can see two boxes – on the left side there is the box that contains the mirror box and there is the box that contains the rocker box to the right. On the outer left you can see one of the altitude wheels, the stray light cover for the secondary cage is visible in the upper part of the box. Remove all parts from the box and unwrap everything.

When you open the lid of the mirror box you will see the following picture:

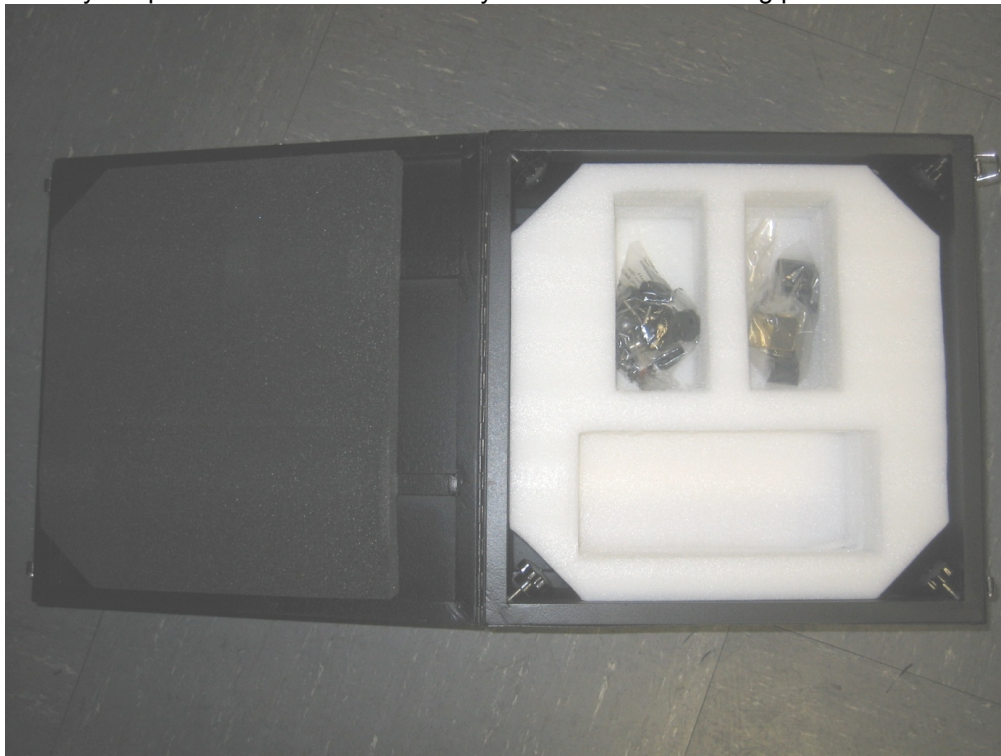


Figure 4

Inside the mirror box you will see a foam insert that contains some small parts and the red dot finder. This foam insert also serves as a transport securing device for the main mirror. It also gives you the opportunity to store/transport eyepieces or accessories. Remove the insert and also remove the protective paper from the main mirror. Please keep the protective paper and try to avoid the contamination with dirt – the soft paper is the ideal protection against dust without giving off fluff. In the other box there is the secondary cage unit and the rocker box (See figure 5):



Figure 5

Take both parts out of the box and carefully remove the protective paper from the secondary mirror.

Contents

Two yellow altitude wheels
Rockerbox
Red dot finder

Secondary cage with finder bracket and 2" focuser with reduction (10:1)

4 Pairs of trusses

Collimating tool for the main mirror

Main mirror box

Stray light protection

12 Screws:

4 short screws with knob to secure the secondary cage to the truss pairs

4 long screws with knob to secure the altitude wheels directly to the main mirror box itself

2 long thinner screws with knob to connect the altitude wheels to the lid of the main mirror box

Assembly

If you are assembling your telescope for the first time you should try it inside the warm room first. This also prevents screws from vanishing in the grass when they fall down.

Place the mirror box onto a table in front of yourself. We recommend to attach the altitude wheels to the mirror box first. You will notice that each altitude wheel has three holes. Two of the holes match the threaded holes on the mirror box, the third hole matches the threaded hole in the lid of the mirror box.

Important: You have four possibilities to attach the altitude wheel onto the mirror box of the telescope. There are two sets of holes on both sides of the mirror box. The idea behind this is, that this gives you a additional degree of freedom to balance your telescope. If you are just using lightweight eyepieces (1,25") we recommend you to attach the altitude wheels to the lower set of holes. If you are using a coma corrector, heavy eyepieces or both we recommend you to use the upper set of holes. Though the distance of the holes in the altitude wheels appears to be similar, the orientation of the wheels on the mirror box DOES matter – holes will not align if the altitude wheels are mounted in the wrong orientation. We recommend to mark the position of the altitude wheels so that everything works on the first try next time you assemble the telescope. I prefer luminescent color – this enables me to assemble the telescope in complete darkness so that my eyes can adapt to the night sky faster. Luminous color or luminous stickers are available from model making sources.

Now you have attached the altitude wheels onto the mirror box. Now place the rocker box onto the ground and insert the mirror box into the rocker box. Make sure that the two fans on the back of the mirror box are on the side of the rocker box that has the deep undercut (see figure 6).

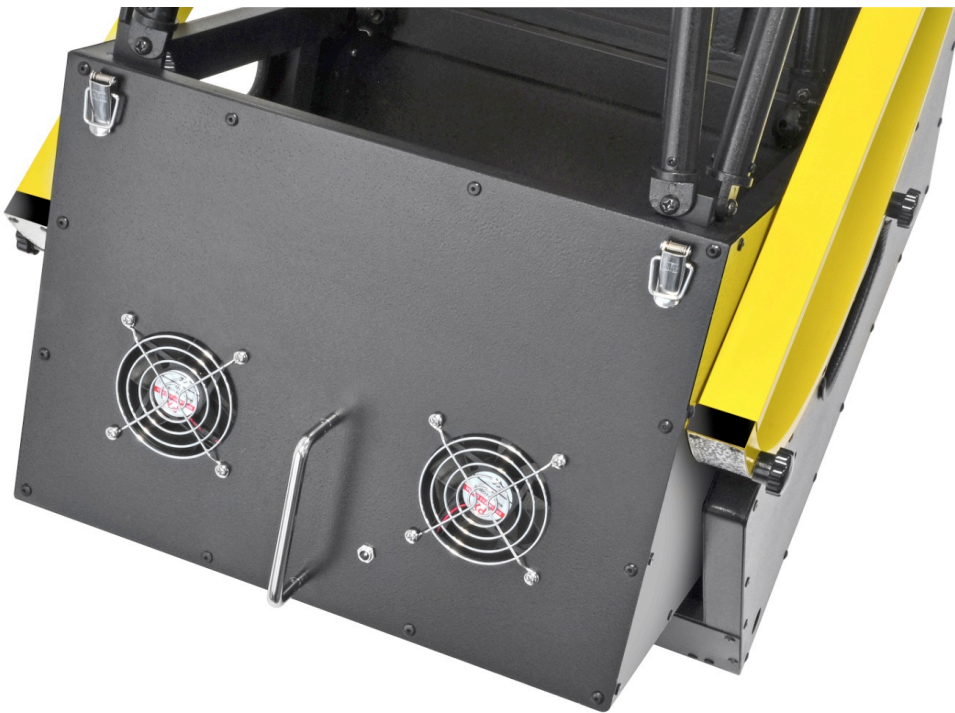


Figure 6

Now take a look at the mirror box from above. You will notice threaded rods that are sticking out of the corners of the mirror box. There is a wing nut riding on each of those inward pointing threaded rods. Unscrew the wing nuts until the end of the threaded rods, but take care that they don't come off – they could fall onto the main mirror.

Take a look onto the truss pairs that were delivered with the telescope. Each pair of trusses is connected by a metal bracket that has a groove on the other side. Slide the bracket with the groove over the treaded rod and fasten the trusses with the winged nut. Attention: after you have fastened the wing-nut you have secured the trusses to the mirror-box – but are still able to swing freely from side to side. Make sure that the trusses are not able to bump into something valuable – like your head. You can prevent the trusses from moving too freely by fastening the screws that hold them a bit tighter. Remember that you have to move the trusses later – do not tighten them to a point where you cannot move them later.

Now take the four short screws with the knobs – it is time to attach the secondary cage unit. Originally the telescope is designed to have the focuser oriented on the right side, so that the red dot finder is above the focuser when you move the telescope.

Important: During the attachment of the secondary unit please make sure that you have control of the secondary cage at all times. If you are doing this for the first time you will need a few minutes to get accustomed to the procedure, since you have to hold the secondary cage with one hand and align the truss holes and the threaded hole of the secondary unit and insert the

screw with the other hand. If you are doing this for the first time, the help of a second person is very handy. Align the holes in the upper ends of an opposing pair of trusses, stick a screw through both of them and insert the screw into one of the threaded holes in the lower end brackets of the secondary cage. Do not fully tighten the screws until all four screws are inserted correctly – trying to force a screw into the threaded hole on the secondary unit will damage the thread. If assembled correctly, that screws will go into the threads without the use of force. After all four screws are successfully placed into the threaded holes in the secondary unit, fasten the screws.

Now attach the stray light cover to the secondary unit by pressing the four velcro pads onto their corresponding counterparts on the secondary unit and attach the red dot finder by sliding it into its bracket. The telescope is now fully assembled.

Collimating the optical systems

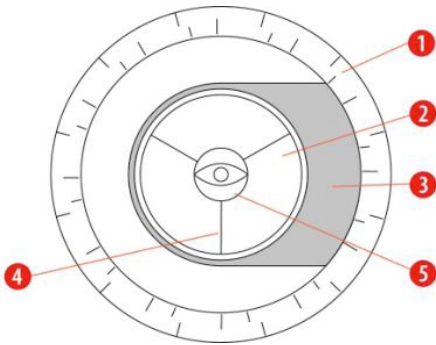
All Explore Scientific Telescopes are leaving our factory collimated – they get collimated during their final quality insurance test. However – a telescope that was disassembled has to be freshly collimated after reassembly. Collimating a telescope is a straightforward procedure that is not very difficult. However – due to the fast optical system of the telescope and the sophisticated collimation unit that is unique in the Explore Scientific dobsonians we will discuss this in detail. Do not get repelled by the length of the description – we are just doing this in sake of completeness. The whole procedure is not difficult, and collimation after reassembly takes only a few minutes, if you have numbered your trusses and reassemble your telescope the same way it has been disassembled.

Basically the collimation of the telescope is done in three steps:

Rough Collimation

Collimating the secondary mirror

If we have a look at figure 7, we see the picture that you would get when you are looking through a beginner telescope with long focal length (with the eyepiece removed). If the telescope is collimated the astronomer should see the concentric images of his eye, the secondary mirror, the main mirror and the focuser.



However, your Explore Scientific dobsonian has a much faster f-ratio. For this reason the secondary mirror has to be shifted from its centered position in two directions – away from the focuser and towards the main mirror (by the same amount).

This offset is a few mm in both directions. You do not have to take care of this – we already did that at the factory. We are just mentioning it here in case you are looking at the secondary cage from above and recognize the fact that the secondary is off center. You can test the correct rough collimation like this:

1. Remove the eyepiece from the focuser and look through it. The secondary should appear round as in figure 7. If the secondary does not appear round, tilt

it with the three collimation screws that are located on the back side of the

secondary holder.

2. Next check the reflection of the middle point of the main mirror in the secondary. If the reflection of the mark on the main mirror is not in the center of the secondary, center it by using the three collimation screws like you did in step 1.



Figure 8

Adjusting the main mirror

If the secondary appears round and the mark on the main mirror is centered in the secondary we will collimate the main mirror. This has to be done when the reflection of your eye and the reflection of the secondary on the main mirror (5, figure 7) are not concentric. Insert the collimating tool into one of the collimation screws that are located on top and on each side of the main mirror. When you turn the collimation tool you will notice that the hexagonal head of the tool will lock into the hexagonal head of the collimation screw. Now you can adjust the main mirror by turning the collimation tool (see figure 8). Adjust the screws until the eye and the reflection of the secondary are centered in the main mirror. Practice this until you get a feeling what a turn at one of the collimation screws is doing. When you have centered all images as in figure 7 the rough collimation of your telescope is finished.

Fine Collimation

During fine collimation we watch Polaris with high magnification. Please take care that the telescope has time to adapt to the ambient temperature before starting collimation – this will need up to 30 minutes (otherwise you will not get a good star image). You may use the fans to speed up this process. If the telescope is collimated well, you will see a system of dim rings of light surrounding a central bright spot (the so-called airy disc). You will also notice a dim cross of light coming from this airy disc – this is the diffraction that is caused by the secondary spider vanes. We have left this cross out of the next figures for clarity. What we want to see is shown in figure 11 – a central airy disc that is surrounded by concentric rings. However, it is much more likely that the picture will be different – more like figure 9. Please notice that it is essential that you always center the star – outside the optical axis all stars do show some distorted images. Please also notice that you get those images only during moments of perfect steady air – air turbulence will distort this image. However the collimation goal remains the same – getting a concentric star image. So let us assume you have good seeing and your eyepiece shows you something like figure 9:



Figure 9

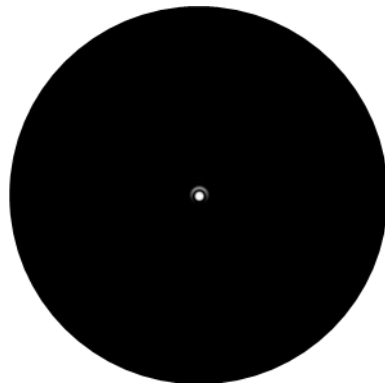


Figure 10

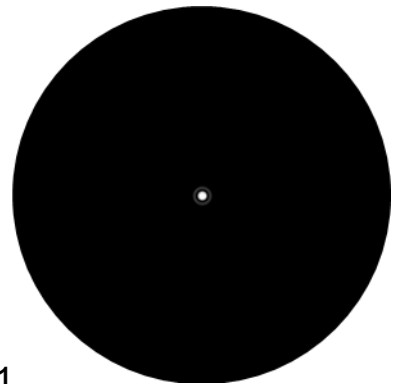


Figure 11

Try turning the main mirror collimation screws – when you are turning the right screw in the right direction, you will notice that the comatic tail is getting shorter (figure 10):

Remember to recenter the star after you have turned a screw. When the telescope is perfectly aligned, you will see the picture of figure 11 (when the air is perfect). During the use of your telescope you will get a feeling for this – it does not make sense to spend a lot of time on collimation when the air is moving too much. During those nights it makes no sense in watching the planets with high magnification – you will not get a sharp image even with perfect collimation:

Important: Outside the optical axis (the middle of the field of view) all stars will be distorted and show comatic tails with the tails directed to the edge of the field of view. If you are using cheap eyepieces those star images will be even more distorted because the off-axis aberrations of the telescope and the eyepiece will add up. For this reason it is essential to recenter Polaris after every turn of a collimation screw – because the turning of the screw will also shift the star from its centered position. As mentioned before it may not be possible to get a sharp star image during periods of turbulent air. In this case try to achieve a symmetric image during collimation and abort the process, if you don't see any more improvement. During those nights it is not recommended to use high magnification. Try to enjoy low magnification objects like nebulae, clusters and galaxies in those nights instead of fretting over the bad conditions.

Using your Dobsonian

Your Explore Scientific dobsonian is a optical precision instrument. Keep that in mind and use the telescope with care. Damage that is due to improper handling is not covered in the warranty. Try to avoid exposing your telescope to vibrations – this may cause the telescope to loose collimation.

Aligning the viewfinder

The red dot that is used by the finder scope is not readily visible during the day. For this reason you should align the viewfinder during during nighttime.

1. Insert a eyepiece with low magnification into the focuser of the telescope and make sure that the red dot finder scope has loaded batteries and is switched on.
2. Look through the eyepiece and center a object that is easy to find at a minimum distance of more than 800m, like a street lamp.

3. Look through the red dot finder and move your head until you see the red dot of light that is projected onto the glass window. Adjust the finder with the two screws until the red dot is on top of the object that is centered in the telescopes eyepiece.

Now you are ready to make observations with the telescope.

You can fine-tune the finder collimation on a celestial object, like a bright star or a crater on the moon. Center the object and then move the red dot on top of it like in step 3.

Focuser

The focuser of the Explore Scientific truss dobsonian is equipped with a 10:1 reduction (figure 12).



Figure 10

This reduction makes fine focusing easy. You can lock the focuser by using the locking screws on the upper side of the focuser. Tighten the screws until you feel some resistance – the focuser draw tube is now locked, and will not move.

Notice:

Never try to force the focuser beyond the stops. Do not turn the focuser knobs while the focuser is locked. Turning the focuser knobs while the focuser is locked may result in damage to the focuser and is not covered by the warranty.

Astronomical observations

The first observations with the new telescope should be performed during dusk, so that you get familiar with your new telescope quickly. Always remember never to look at or near the sun! Choose a object that is easy to find and far away – a mountain top, a lighthouse or suchlike. Roughly point the telescope on the object. Now look through the finder scope and move the telescope until the red dot of light appears centered onto the object. If you are looking through a eyepiece with low magnification, you should now be able to see the object in the telescope. Focus the image carefully, center it in the field of view and fine tune the alignment of the finder if necessary. Now that you are getting more familiar with the telescope you can try to watch the moon (if visible); it should be possible to use the telescope without additional light now without problems. The moon can be observed best during the periods where less than 50% of its surface are bright. So you can see the detailed shadows that the sun is causing when the light hits the craters from the side angle – creating a 3D-like experience. We recommend using a neutral density filter for the moon that reduces the glare. During full moon the surface appears evenly bright without contrast and prominent structures.

If you are spending a few successive nights watching the moon you will notice the change in the appearance of the mountains, craters and marea due to the change of the phase of the moon – a very interesting effect!

The planets

During their orbit around the sun the planets are continuously changing their position on the sky. You can find the actual position of the planets in astronomy circulars and soon on the information center of the Explore Scientific homepage. The following planets are especially suited for observations with your telescope:

Venus:

The diameter of Venus is about 9/10 the diameter of the Earth. When Venus is orbiting the sun the astronomer can observe the change of the light phases of Venus during this orbit: Sickle, half Venus, full Venus – very much like the phases of the moon. The planetary disc of Venus appears white because the sunlight is reflected by a compact layer of clouds that covers all surface details. Venus is only visible before dawn and shortly after dusk in the vicinity of the sun, so be careful not to look into the sun.

Mars:

The diameter of Mars is about half the Earth's diameter. In a telescope Mars appears as a tiny red-orange disk. Maybe you will see a tiny white patch when you look at the polar regions that are covered in ice. About every two years, when Mars and Earth reach their smallest distance you can discover new features.

Jupiter:

The biggest planet in our solar system is Jupiter with about 11 times bigger equatorial diameter than the Earth. The Planet appears as a disk that is covered in dark lines. Those lines are cloud bands in the atmosphere of Jupiter. Even with low magnification 4 of the 67 moons of Jupiter are visible – the so called Galilean moons (Io, Ganymed, Europa and Callisto). Because those moons are orbiting Jupiter the visible number and position changes. Sometimes a moon passes above the planetary disc of Jupiter – then the shadow of the moon can be spotted on the planet as a sharp dark spot.

Saturn:

Saturn has a diameter about 9 times the Earth's diameter and appears as small roundish disc. You can see the rings of Saturn on both sides of the planetary disc. Galilei, who was the first human observer of this planet in 1610 couldn't know that the planet had rings – he described that Saturn had „ears“. The rings of Saturn mainly consist of billions of icy particles – from tiniest dust

up to the size of a house. The biggest division in the rings, the so called “Cassini division” should be easily seen with your telescope in nights of steady air. The biggest of the 62 moons of Saturn, Titan, is also visible as a bright, starlike object in the vicinity of the planet. Up to 6 moons can be detected in your telescope.

Deep-Sky-Objects

To locate constellations, stars or „deep-sky-objects“, it makes sense to use a star chart. We will list a selection of deep sky objects here:

Stars are giant objects that mainly consist of gas. Due to the nuclear fusion in their core they radiate energy and shine. The stars are extremely far away. Because of this vast distance they appear as tiny spots of light in your telescope, despite their size – no matter how big your telescope is.

Nebulae are giant interstellar clouds of gas and dust. Within those clouds new stars are born. The premier nebula on the northern hemisphere is the Great Orion Nebula, a diffuse nebula that looks like a fuzzy patch of light. M42 is 1600 light years away from Earth.

A **open cluster** is a group of young stars that were born in a single diffuse nebula not too long ago (on an astronomical time scale...). The Plejades are a open cluster in a distance of about 410 light years. You can see several hundred stars in the telescope.

Constellations are big patterns of stars that were believed to be celestial representations of men, gods and objects by the old civilizations. Those patterns are too big to be observed at a single glance through a telescope. If you want to become familiar with the constellations, start with a pattern that is easy to find, like the Big Dipper in the constellation Ursa Major. Try to locate the other constellations in the neighborhood of this constellation in the second step and move on to even more distant patterns. Galaxies are gigantic accumulations of stars, nebulae and clusters that are held together by gravity. Most galaxies have a spiral shape (like for example our own galaxy, the Milky Way), but there are also galaxies with elliptical or irregular shapes. The closest spiral galaxy is the Andromeda Galaxy (M31). The core of M31 looks like a bright patch of light in your telescope – under dark clear skies you will be able to detect features in this object with your telescope.

Tips and Tricks

Marking with luminous paint: As noted above in the section about assembly it is very helpful to mark the positions of the altitude wheels and the trusses. This helps assembling the telescope at night, and keeps collimation issues at a minimum.

There are only a few things that are as frustrating as losing screws in the grass – you are spending time driving to a remote place, and then observation is not possible because a screw just made a escape into the grass and is hiding. For this reason I also recommend to mark your screws with a patch of luminous paint – it makes finding lost parts a lot easier, and you are able to find them without making a lot of light yourself – which would disturb the night vision of other observers. With time the paint or the stickers will lose their luminosity – but this is no problem. I always pack the screws into my pocket – together with my white flashlight. Then I illuminate the parts inside my pocket with the flashlight for a few seconds – this reactivates the luminosity without disturbing other observers.

Image orientation: You may have noticed that objects appear to be upside down and mirrored in your telescope. This is the case in almost every astronomical telescope and does not cause any problem during astronomical observations. Because of the Earth's rotation all objects seem to drift across the field of view. To compensate this movement you have to move the telescope smoothly and slowly. The higher the magnification the more accurate this tracking movement has to be. Another solution is to place the object on the eastern rim of the field of view and let it drift across the field, then reposition it on the eastern rim again. However – this method only works with good eyepieces that are delivering a sharp image up to the edge of the field.

Vibrations: Try to avoid touching the eyepiece during observations. Touching the eyepiece and the slight shiver of the hand will cause unsteady views.

Night vision: Give your eyes some time to adapt to the darkness. This takes about 20-30 minutes after an exposure to a bright light – even if it is a short exposure. Use a dim light with a red filter to read star charts or draw objects – dim red light does not influence the dark adaption very much.

Observations through a window are very disadvantageous (even if the window is open). The light that is gathered by the telescope has to pass a lot of air and glass layers, causing severe image deterioration.

Planets and other objects that are close to the horizon are severely influenced by air movement and absorbance. It is much better to time your observations in a way that those objects are close to the meridian, so that they are on their highest position possible. If the image is dim or moving fast, use a smaller magnification. Using too much magnification is a mistake that is made very often by beginners.

Warm Clothing: Even in the summer the nights may get very cold during clear nights, especially on the mountains. Always remember to bring warm clothing like thick jackets, beanies, gloves, winter shoes and thick socks – even if you were sweating during the day. It is hard to enjoy even the best night when you are freezing!

Explore your observing site during the day: The ideal site should be far of frequently used streets and other light sources that would prevent your eyes to become dark adapted. Keep in mind that it is likely to get foggy in the vicinity of open water, such as river valleys or lakes. The ground should be solid and relatively flat. You can observe in the city, but try to get to a place some distance away, where you can see the milky way if possible. You can get really good conditions as close as 50 km outside of cities. An old astronomer's quote says: “ you cannot really replace a dark sky by anything than a darker sky”

Calculating magnification

The magnification that a telescope gives you at the sky is determined by two factors: The focal length of the telescope and the focal length of the eyepiece. You will find the focal length of almost all eyepieces written on the eyepiece body.

The focal length of the 10” Dobson = 1270 mm.

The focal length of the 12” Dobson = 1525 mm.

The focal length of the 16” Dobson = 1826 mm.

The focal length of the 20” Dobson = 2032 mm.

The magnification is changed by changing the eyepiece.

The magnification is determined by the following formula:

Magnification = telescope focal length/eyepiece focal length

For example a 12" dobson and a 24mm eyepiece:

Magnification = 1525mm/24mm = 64x

The eyepiece type, like Modified Achromatic, Plössl or Super Plössl, does not have any influence on the magnification, but determines other optical properties like apparent field, chromatic error correction and flatness of the field of view.

The maximum usable magnification is about 2 times the diameter of the aperture in mm (at 12" =305 mm for example, about 600x). However, in nights of bad to average seeing much lower magnifications will produce a more detailed and steadier image. High magnifications should only be used during periods of extremely steady air on special objects, like double stars. When you are starting to observe a object, always start with a low magnification. Then center the object in the field of view and focus with care. Now you can try a higher magnification. When the image is becoming fuzzy or is moving, go back to the last magnification. Atmosphere – and thus seeing conditions – is always changing. Please notice that a sharp image at a low magnification will show you more than a over magnified fuzzy view.

Specifications

10" Model

Tube: Open truss design

Upper tube ring: Metal tubing, incl. secondary spider and holder, plus focuser and truss connectors.

Mirror box: with main mirror and cell, fans and truss connectors

Trusses: Powder coated aluminum with connectors.

Secondary spider: 4-arm, steel

Main mirror: 10" (254 mm), parabolic, BK-7 like glass, aluminum coated with protective layer,

Focal length: 1270 mm

Focal ratio: f/5

Resolving power: 0,51 arc seconds

Visual limiting magnitude: approx.14.5 mag

Focuser: 2" rack and pinion 1:10, aluminum, with 1,25" reducer.

Mount: Dobson

Finder: Deluxe red dot finder

Tube weight: 20,2 kg.

Rocker box weight: 6,7 kg.

Total weight: 26,4kg

12" Model

Tube: Open truss design

Upper tube ring: Metal tubing, incl. secondary spider and holder, plus focuser and truss connectors.

Mirror box: with main mirror and cell, fans and truss connectors

Trusses: Powder coated aluminum with connectors.

Secondary spider: 4-arm, steel

Main mirror: 12" (305 mm),), parabolic, BK-7 like glass, aluminum coated with protective layer,

Focal length: 1524 mm

Focal ratio: f/5

Resolving power: 0,43 arc seconds

Visual limiting magnitude: approx.14.5 mag

Focuser: 2" rack and pinion 1:10, aluminum, with 1,25" reducer.

Mount: Dobson

Finder: Deluxe red dot finder

Tube weight: 22,9 kg.

Rocker box weight: 7,1 kg.

Total weight: 30 kg

16" Model

Tube: Open truss design,

Upper tube ring: Metal tubing, incl. secondary spider and holder, plus focuser and truss connectors.

Mirror box: with main mirror and cell, fans and truss connectors

Trusses: Powder coated aluminum with connectors.

Secondary spider: 4-arm, steel

Main mirror: 16" (406 mm),), parabolic, BK-7 like glass, aluminum coated with protective layer,

Focal length: 1825 mm

Focal ratio: f/4,5

Resolving power: 0,32 arc seconds

Visual limiting magnitude: approx.16 mag

Focuser: 2" rack and pinion 1:10, aluminum, with 1,25" reducer.

Mount: Dobson

Finder: Deluxe red dot finder

Tube weight: 30 kg.

Rocker box weight: 10 kg.

Total weight: 40 kg

Optional accessories

There is a large portfolio of Explore Scientific accessories available for your telescope. All Explore Scientific accessories meet the high quality standard that has made our brand famous.

For a complete overview of available Explore Scientific accessories please refer to our homepage at www.explorescientific.de!

Explore Scientific eyepieces: Our eyepieces do not only provide the magnification you desire, but also give you a comfortable eye distance. Our eyepieces excel in their respective price class with elaborate coatings that boost contrast, a large apparent field of view and excellent image sharpness. Explore Scientific eyepieces will give you everything you want from premium eyepieces. It is recommended to get a set of three or four eyepieces for different observing needs, like 9mm, 14mm, 24mm and 30 mm so that you have a optimal choice for your whole usable magnification range. If you want to use 2" eyepieces, please remove the reducer that is delivered with the focuser.

Explore Scientific nebula filters with protocol

The most irritating problem in the observation of dim objects outside the solar system - besides the seeing conditions - is the brightening of the night sky due to artificial lights. Street lights and other lamps are brightening the naturally black sky. As a consequence the contrast and the visibility of deep-sky objects are seriously affected. Depending on the nature of the celestial object you can block some of the unwanted light and thus enhance the visibility of those objects in non-optimal sites.

The Explore Scientific nebula filters come with a individual test protocol - so you can be sure to get excellent filters. The portfolio of Explore Scientific accessories is constantly improved - just have a look onto our homepage from time to time.

Additional useful accessories can be found at our internet homepage at www.explorescientific.de, in the ads in most popular astro magazines and our other webshops like www.teleskope.com and www.optical-systems.com

If you have any question regarding this product, please call our customer service. In case of the unlikely event that your telescope needs service or repair at our facility, please contact our service department before sending anything back. Our service will also give you the address of the service department and will help you with the shipment. Please provide your full name, address and telephone number during the day so that we are able to contact you. The large majority of the service issues can be dealt with on the phone without sending anything back to us.

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Service and Maintenance

General

Your Explore Scientific truss dobsonian is a precision instrument that will provide many years of fun. When you are treating this telescope with the same care as for example a expensive camera, it is very unlikely that you will ever need to return it for service or maintenance.

Please notice the following rules:

- a) Try to avoid cleaning the optics. A little dust on the optical system will not deteriorate the performance of the optical system by any noticeable amount. A little dust should not be a reason to clean the optics.
- b) If cleaning the optics is necessary it is best to brush away the dust with a fine camel hair brush as it is used for photographic equipment. Please do NOT use pressurized air or microfiber cloth as it is often recommended for glasses. Remember - the optician that recommends this microfiber cloth is making turnover, when you come with your scratched glasses and need new ones. There is only one real reason to clean the optics - when you have gathered a layer of pollen during your spring observing sessions. The sugar in that pollen is consumed by bacteria that will return the favor in form of acid excretion - which will damage the coating.
- c) Organic dirt (fingerprints etc.) can be removed from the optical surface with a mixture of 3 parts distilled water and one part isopropanol. You may add a very little bit of glass cleaner to the mix. Only use soft, white cosmetical tissues.

Soak the mirror to dissolve the dirt and remove the fluid with short, cautious strokes. Remember to change tissues every few strokes.

- d) While you are using your telescope during the night you will eventually have dew condensing on the surfaces. This will not cause any trouble – your telescope is designed to take a little moisture without problems. When you store the telescope, however, we recommend to wipe the surfaces (except the optics) with a dry cloth and give the telescope some time to evaporate the water on the optics by putting the telescope into a dry room with the lid of the mirror box open. Wait until all water has dried off until you store the telescope.



Recycling

Please dispose the package properly. Please note that you have to consider the legal obligations when you want to recycle the telescope. You will get the actual recycling regulations from your local recycling agency or the ministry that issued the regulations.

Warranty

The warranty is valid for 5 years and starts at the day of the purchase. Please keep your invoice as proof of purchase. Should you encounter any problems with the telescope, please contact our service department – please do NOT send anything without contacting us in advance. In many cases we will handle the transport for you, and most of the problems can be dealt with on the phone without the need for you to send anything. If the problem occurs after the void of the warranty, you will get free offer about the repair costs.

Important shipping information:

Please try to avoid damage during transport by using the original boxes. Please do not forget to add a copy of the invoice and a problem report with the shipment. Additional customer rights are not impaired by this warranty.

Service-Hotline: +49 89 13 01 00 30

Product description:

Serial-#:

Problem description:

Name:

Postal code / City:

Street:

Telephone:

Date of Purchase:

Signature:

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