



User Manual

Explore Scientific HR Coma Corrector



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.

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.

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HR Coma Corrector with helical focuser
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Working with the corrector

Congratulations on the purchase of the Explore Scientific HR Coma Correctors. You can use the HR Coma Corrector visually and photographically. When you receive the HR Coma Corrector, it is assembled for visual work. Two big parts are connected for this purpose – the base unit that includes the optical system of the HR Coma Corrector and the attached helical focuser. A small radial Allen screw secures the helical focuser. This Allen screw can be removed by using a 2mm Allen key (not part of the delivery).



Figure 1: Front view



Figure 2: Back view with 2mm Allen key for the locking screw

Visual use

First use:

Using the HR Coma Corrector is plain simple. Insert the HR Coma Corrector into the focuser of your telescope and focus on the zero position of the corrector. The zero position is the position where the focus of the combined optical system is located on the plane of the rear end of the corrector, while the corrector helical focuser is screwed out by 13,5mm.

Let us configure the HR Coma Corrector first. At the side of the HR Coma Corrector you will notice a groove that contains a laser-etched scale. It shows you marks in 1mm divisions – 4 to one side and the 5th to the other side for better overview. Screw the top end of the helical focuser out, until the rim of the movable part is 13,5mm above the lower end of the helical, as shown in figure 3.



Figure 3 Zero Position

If you are using the HR Coma Corrector for the first time you have to find the correct focus position of the combined telescope/corrector system first. With the helical at 13,5mm the focus of the combined optical system should be on the plane of the end of the helical (where you insert the eyepieces). You can verify the correct focus position by glueing a strip of frosted tape across the end of the helical and then focus a very bright object by using your telescopes focuser only (do NOT use the helical now) – like the moon - on this screen. When the moon appears to be sharp you can lock the focuser of your telescope – it is not needed any more.

Now remove the tape and insert a eyepiece into the corrector and secure it with the locking screws. Focus the eyepiece with the helical focuser by rotating the eyepiece - without touching the telescopes focuser. If you know the internal position of the field stop of your eyepiece, you can rotate directly until the correct value appears on the scale. If you – for example – know that the field stop is located 3mm below the reference surface (upper end of the eyepiece barrel), screw the helical to $13,5+3=16,5$ mm and then do the fine focusing.



Figure 4: HR Coma Corrector with eyepiece that has a field stop 3mm below reference

If you are looking through the eyepiece now, you should see a optimal sharp picture – the middle of the field of view should be as sharp as usual (without corrector), but the rest of the field of view will appear sharp also (please notice that this is only valid for very good eyepieces that do not cause any aberrations by themselves. The HR Coma Corrector cannot correct eyepiece aberrations or aberrations that occur because of manufacturing issues of the telescope system). If this is not the case, you can play with different positions of the helical focuser (you have to refocus everything with the telescope focuser, of course). Technical changes, telescope parameters (see chapter “Photographic use” below) and manufacturing tolerances in the eyepiece or the corrector can shift the optimal focus position. You should take some time in a bad night to play with different settings, so you can be sure to have the optimal position. Once found, keep this position in memory for future observations.

Observing with the corrector:

Insert the eyepiece into the HR Coma Corrector and rotate it, until the scale shows the correct position. Insert the whole unit into the telescope focuser and do fine focusing. Lock the telescope focuser and refocus with the helical focuser only when you have changed the eyepiece.

Photographic use

For Astrophotography, the helical focuser of the HR Coma Correctors has to be removed. Remove the small radial Allen screw so that you are able to unscrew the helical focuser from the corrector body (See figure 2). You can attach the camera via two adaptors that come with your HR Coma Corrector: one adaptor with T2-thread, that you can use together with different camera bodies, like DSLRs. Please notice that you need an additional T2-ring for your specific camera model. This T2-ring is not included with the HR Coma-Corrector.



Figure 5: HR Coma Corrector with T2-Adaptor, T2-Ring and camera

Screw the adaptor with the label M42x0.75 onto the HR Coma Corrector, and secure the adaptor with the Allen screw that you have removed from the helical focuser. Please do not overtighten – this may damage the thread. Then you can screw the T2-adaptor that fits your camera type onto the thread of this connector and insert the whole unit into the camera. Ready.

Theoretically the optimal focus position shifts between telescopes – it depends on the focal length of the telescope. In practical use this does almost always make no difference – the color sensor of a DSLR will not be able to resolve the slight changes in performance caused by this small shift. So you can simply attach the camera with the procedure above and get perfect results. If you are using a black/white CCD-camera however, you might want to use the optimal focus distance. The HR coma corrector is delivered such that you have the focus position 55mm behind the corrector with the T2-adaptor. Those 55mm are ideal for a 200mm f/4. If you are using telescopes with a longer focal length this optimal focus position is shifting outwards. Here are a few numbers:

800mm focal length: 0mm
1000mm focal length: +1mm
1200mm focal length: +1,5mm
1600mm focal length: +2mm
2000mm+x focal length: +2,5mm

Please don't take those number as gospel – in practical use there is no shortcut around testing the equipment with different distances as manufacturing tolerances in camera, corrector and telescope will shift the optimal focus from its desired position.

Service and Maintenance

General

Your Explore Scientific coma corrector is a precision instrument that will provide many years of fun. When you are treating this corrector 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



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