



# MAXBRIGHT® II BINOVIEWER



## Manual

Thank you for your purchase of the Baader MaxBright® II Binoviewer! Properly used, this sophisticated optical accessory will provide you with a lifetime of amazing views. To ensure optimal performance, please read this instruction manual before using your binoviewer.



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# BAADER PLANETARIUM

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# Baader MaxBright® II Binoviewer

– DEVELOPED ESPECIALLY FOR ASTRONOMY –

- Thanks to its large 27 mm prisms with 25.5 mm free aperture (on the telescope side even 26 mm), the MaxBright® II Binoviewer offers a significantly larger field of view than cheaper binoviewers. The free aperture is only slightly inferior to many more expensive bino-viewers like our Mark V Großfeld (Giant) binocular (with 30 mm prisms).
- Its features range from 7-layer multilayer anti-reflective coatings on all glass air surfaces through a high-performance beam splitter with dielectric splitter layer to self-centering ClickLock® quick clamps for both eyepieces, which have been specially redesigned for the MaxBright® II.
- Eyepiece clamps with diopter adjustment for both eyepieces allow perfect re-focusing for each eye – this is essential for using any bino-viewer.
- Because of the 1:10 power gear ratio, a gentle, small rotation by 20° of the Click-Lock® ring is enough to securely clamp every 1¼" eyepieces – or to release it later. Such a small rotation results in a lock which is at least as tight as a single clamping screw which is tightened with much more force.

We offer several Glasspath Correctors for our binoviewers, which are designed to correct spherical aberration. They are also designed to remove colour aberration which will occur because of the long light-path through the glass prisms in the binoviewer, if it is used with fast telescopes (with focal ratios between  $f/4$  and  $f/7$ ) because of the highly convergent light beams present in these instruments.

Also, as a Glasspath Corrector moves the focus away from a telescope – similar to a Barlow lens – you can use the binoviewer with almost any telescope. Only if you use "slow" telescopes like Schmidt-Cassegrains (SC), you do not need a glass- path compensator, because the lightbeams do not converge at such a wide angle. Nevertheless, they can still be used to achieve different magnifications. The sharpness will increase even when used with SC- and HD-telescopes.

These "colour-abberation correctors" are an important addition to the binoviewer. The peculiar housing of the three models with a clamping collar is designed to be inserted between T-2-screw-connections. This way, these lenses can be used with all telescopes, in different places of the light path, and you can achieve several distances for projection.

The MaxBright® II Binoviewer is made according to high quality standards. The optical polish of the prisms, all coatings and last, but not least, the optical adjustment and orthogonality of the 27 mm large prisms are so precise that the image doesn't deteriorate even at highest magnifications.

***If you you want to experience the universe relaxed with both eyes open, then the MaxBright® II Binoviewer is the right choice for you!***

## Scope of Delivery and Accessories



1. MaxBright® II Binoviewer
2. Rotatable T-2 Coupling Nut (pre-mounted)
3. Zeiss microbayonet (dovetail ring)
4. Spanner tool to fix T-2 adapter or Zeiss-Microbayonet to the bino-viewer.
5. ABS hard-top case with compartment for a T-2 star diagonal and a nosepiece



**Please note:** This is only the scope of delivery of the MaxBright® II Binoviewer #2456460. The MaxBright® II is also available in different sets which include further accessories. These accessories are also described in this manual, but they are not further specified here. For more information, please visit:

**[www.baader-planetarium.com](http://www.baader-planetarium.com)**

Not included are Glasspath Correctors (which version you need depends on your telescope), eyepieces, star diagonal and T-2-adapter (these also depend on the kind of telescope which you want to use the binoviewer with).



The hard-top case of the MaxBright® II is prepared for further accessories like a T-2 star diagonal with an attached 2" nose-piece.

## Optional Accessories

### Glasspath Correctors (GPC)

A Baader Glasspath Corrector (GPC) fulfills two critical roles. Firstly, it corrects the glass path – that's the amount of glass through which light passes on its way through the prisms and which causes chromatic aberrations (colour errors) with fast telescopes. Secondly, the GPC magnifies the focal length and moves the focal point of the main telescope. You will find more information about choosing the right compensator in the addendum starting at page 20.

The GPCs with a Z in the part number are for use with the Zeiss microbayonet. They are inserted "upside down", directly into the binoviewer.

Part Number	Factor	Focus gain
#2456314 / #2456314Z	1,25x	ca. 20 mm
#2456316 / #2456316Z	1,7x	ca. 35 mm
#2456317	2,6x	ca. 65 mm
#2456300	1,7x	ca. 80 mm – 2" Glasspath Corrector for Newton, to attach to the Zeiss microbayonet
#2456305	1,8x	ca. 80 mm – 2" Glasspath Corrector for Refractors and Schmidt-Cassegrains. Requires T-2 Maxbright mirror star diagonal #2456100



#2456305  
1,8x GPC for  
Refractors and  
Schmidt-Cassegrain



#2456300  
1,7x GPC and  
coma corrector for  
Newtonians

GPCs to be inserted into star diagonals or MaxBright® II body



T-2 Glasspath Corrector  
Factor 1,25  
#2456314(Z)



T-2 Glasspath Corrector  
Factor 1,7  
#2456316(Z)



T-2 Glasspath Corrector  
Factor 2,6  
#2456317

### 1¼" and 2" Nosepieces

A T-2 nosepiece in 1¼" (31,8mm, #2458105) or 2" (50,8 mm, #2408150) is used to connect the binoviewer either through the pre-installed T-2 coupling nut or the optional TQC quick changer with a focuser/eyepiece clamp. They can also be used to use a T-2 star diagonal at 1¼" or 2" focusers.



#2458105  
1¼" nosepiece



#2408150  
2" nosepiece

## 1¼" Star Diagonals

The optical length (that is, the necessary back-focus) must be added to the optical length of the binoviewer.

Part Number	Name	Optical Length
#2456100	T-2 Maxbright mirror diagonal dielectrical mirror made of Sitalt glas ceramic	43 mm
#2456005	T-2 90° star diagonal (32 mm Baader Prism)	35 mm
#2456095	T-2 90° star diagonal (36 mm Zeiss Prism) wit BBHS® coating	38,5 mm
#2456130	T-2 / 90° Baader Astro-Amici-Prism with BBHS® coating, for upright images	48 mm
#2456103	Baader T-2 BBHS® star diagonal (mirror)	43 mm
#2458055	FlipMirror II star diagonal – to switch between straight-through and 90° light path	59 mm



T-2 / 90° star diagonal  
(Zeiss) Prism with BBHS® coating  
#2456095



T-2 / 90° Maxbright  
mirror diagonal  
#2456100



T-2 / 90° Amici-Prism  
witt BBHS® coating  
#2456130

T-2 / 90° star diagonal  
with 32 mm Prism  
#2456095



T-2 BBHS® mirror star diagonal  
#2456103



Baader FlipMirror II  
star diagonal  
#2456100



## 2" Star Diagonals and Herschel Wedge

The optical length (necessary back-focus) of all components must be added to the optical length of the binoviewer. For a shorter connection, you can remove the 2" Clicklock® clamp of our star diagonals. Then you can attach the binoviewer directly to the housing with the 2"/T-2 adapter #1508035 as shown in the image to the right.

The following table gives the optical length without the Clicklock®-clamp.



MaxBright II with 2" BBHS® star diagonal #2456115

Part Number	Name	Optical Length
#2956100	Baader 2" ClickLock® Mirror Diagonal	71,5 mm
#2456115	Baader 2" BBHS® Mirror Diagonal	71,5 mm
#2456117	Baader 2" BBHS® Prism Diagonal	59,5 mm
#2456120	Baader 2" Astro-Amici-Prism with BBHS® coating	85 mm
#2456500P / #2456500V	2" Baader Safety Herschel Wedge (Photo/Visual) for solar observation	67 mm

See page 16 for information about removing the 2" nosepiece.



Baader 2" ClickLock® mirror diagonal with 2" ClickLock®-clamp #2956100



Baader 2" BBHS® mirror diagonal with 2" ClickLock®-clamp #2456115



Baader 2" BBHS® prism diagonal with 2" ClickLock®-clamp #2456117



Baader 2" Astro-Amici Prism with BBHS® coating #2456120



Safety Herschel Wedge #2956500P / #2956500V

### **Please note:**

Some T-2 threads may be a little bit too short for the T-2 coupling nut of the MaxBright II. We have included a T-2 spacer ring which can be placed into the female thread of the coupling nut.

# Configurations

There are many possible ways to adapt the Baader MaxBright® II Binoviewer to your telescope. To keep the required back-focus as short as possible, you can attach it directly to the T-2-threads of matching accessories. With the optional TQC Heavy Duty T-2 Quick Changer #2456313A, you can change the orientation easily. You can realise almost every combination with the Astro-T-2-System.

## How to find the perfect Star Diagonal

When the binoviewer is used with refractors and Cassegrain telescopes, it is much more comfortable to use a diagonal between the telescope and the binoviewer. Unfortunately, many cheaper 1¼" star diagonals are not a good choice because they were only designed for an eyepiece which is fitted directly into the eyepiece holder. So close to the eyepiece, the optical quality of the star diagonal does not have to be very high. On the other hand, all of our star diagonals are of such a quality that they can be used up to 160 mm in front of the focal point. To achieve this, all optical surfaces have to be of a very good quality and very precisely polished.

When choosing a star diagonal, care must be taken to ensure the safety of the binoviewer and eyepieces. Many cheaper 1¼" diagonals are simply not up to the task of supporting a binoviewer setup, especially with two heavy widefield eyepieces. Plastic bodies, small locking screws and a generally lightweight construction are inadequate to safely hold heavy accessories like a binoviewer. Unfortunately it's quite common to hear about heavy and expensive eyepieces being dropped to the ground (and broken) because of the poor locking system on these budget diagonals.

This is compounded by the extra height (and increased leverage) imparted by placing the binoviewer on top of the diagonal's existing eyepiece clamp (which also consumes a large amount of precious back-focus). This is a large problem if you use 2" star diagonals. An eyepiece clamp can use approx. 60 mm of optical length. That is why the 2" Clicklock® of our BBHS and Clicklock® star diagonals can be removed, so that you can attach the binoviewer (or a camera body) directly onto the housing of the star diagonal. You need the optional adapter T-2/2" #1508035 with an optical length of only 0.5 mm.

The perfect solution for this problem consists of using a Baader T-2 diagonal. Our T-2 diagonals are equipped with T-2 threads allowing the binoviewer to be mounted **directly** onto the diagonal body. The result is a very sturdy connection utilising the minimum amount of back-focus possible. These diagonals feature prisms or mirrors of the absolute best optical quality, incorporated into a solid one-piece precision machined metal body perfectly suited to hold the heaviest accessories.



The MaxBright® II can be attached directly to our 2" star diagonals with the 2"/T-2-adapter #1508035 – as shown here with Baader Classic Orthos and the 2" BBHS® mirror diagonal#2456115



If your telescope is equipped with a 2" eyepiece clamp, you can use the binoviewer with an optional 2" nosepiece # 2408150. You can attach it either directly to the binoviewer with the TQC QuickChanger, or to an optional T-2 star diagonal.

## How to find the perfect Glasspath Corrector

For telescopes with an f-ratio of about f/7 or faster, you need a Glasspath Corrector (GPC) to correct the colour aberrations introduced by the prisms at such fast telescopes. It also moves the focal point outwards, which is necessary to reach focus at all at some telescopes. Besides three GPCs especially for the astro T-2 system, there are also two special 2" GPCs, one for Newtonians and one for lens telescopes and Schmidt-Cassegrains. You can find more about choosing the best GPC in the addendum, starting at page 20.

## How to find the perfect Eyepieces

The MaxBright® II Binoviewer features an optical window with a clear aperture of 26 mm, so you can use (almost) all standard 1¼" eyepieces.

The maximum outside body diameter of eyepieces that can be used with the binoviewer is about 58 mm. If the binoviewer is used with eyepiece having a larger diameter, for example the Pentax XW, you may have problems reaching the correct separation between the two eyepieces if the interpupillary distance between your eyes is less than 60 mm.

For observing the planets with high resolution, we recommend our Classic Ortho or even Carl-Zeiss-Abbe eyepieces. For general observations, we recommend the Hyperion 68° and the Morpheus 76° wideangle eyepieces. These provide large eye relief and are very comfortable to use.



Two 36 mm Hyperion® Aspheric at the MaxBright® II Binoviewer



The Eudiascopic 35mm-eyepieces show a very large field of view, in spite of having only a 1¼" nosepiece.

It is extremely important to choose pairs of identical eyepieces made by the same manufacturer in the same period of time. It is quite common to find significant differences (optically and mechanically) in eyepieces of the same brand and type built at different periods of time. If you do not use identical eyepieces, you may experience problems merging the two images, because the brain can't handle these different images.

## Largest Field of View

Usually, eyepieces with a focal length of 32 mm provide the largest possible field of view; eyepieces with longer focal length can give you "only" a brighter image because of their lower magnification. The reason for this is that the nosepiece (with the field stop inside of it) physically limits

the part of the sky which you can see in it. That's why a 32 mm Plössl with about 50° apparent field of view usually shows already the largest true field of view. Nevertheless, we have two eyepieces which can show you even more. This is only possible because their field stop is not inside of the nose piece. These two eyepieces suitable for binoviewing are:

- Eudiascopic 35 mm eyepiece 1¼" # 2404105 with 45,6° field of view. This is almost as large as the field of view of 32 mm 2" Erfle eyepieces.
- Hyperion® Aspheric 2" eyepiece 36 mm # 2454636 – 50° field of view with the included 1¼" adapter.

Both eyepieces avoid the "tunnel view" which is typical for longer focal lengths, so that they combine lower magnifications and a convenient field of view.

## Using Zoom-Eyepieces

Many economically priced zoom eyepieces only have a small field of view which decreases with higher magnifications. Furthermore, they have a low optical quality especially at higher magnifications.

In contrast to standard zoom-designs, our Hyperion® Universal Zoom Mark IV eyepieces are made so that they provide the best sharpness and the largest field of view at the highest magnification. Simple zoom-eyepieces are designed the other way round. That's why we recommend especially the Hyperion® Zoom eyepieces for use with a binoviewer. The precise click stops at 8/12/16/20/24 mm make it easy to set both eyepieces to the same magnifications.



MaxBright® II Bino-viewer with FlipMirror II Star Diagonal and two Hyperion® Universal Zoom Mark IV eyepieces on a Schmidt-Cassegrain.

## Using rubber eyeshields

If your eyepieces are equipped with round rubber eyeshields (like e.g. our Hyperion or Morpheus eyepieces), leave them in an upright position, unless you are wearing glasses. If you need to wear glasses, fold the eyeshields down to see the complete field of view. If you are using eyepieces like the Baader Classic Orthos, it is best to use the eyeshields with the folding side wing.

**Please note:** If you are very short-sighted, you should wear the glasses for observations with the binoviewer – focusing will be easier then. This is also valid in the case of astigmatism, which is best corrected with glasses (or contact lenses) – you can't correct for astigmatismus only with the diopter adjustment.

## Setting the Interpupillary Distance

Interpupillary distance (the separation between the centres of the eyes' pupils) varies from person to person. The binoviewer should be adjusted to match your interpupillary distance. Using both hands, hold the body of the binoviewer like a pair of binoculars. While viewing a distant object (daytime) or a bright star field, rotate the two halves of the binocular body about the central pivot until you see the field of view as a single sharp circle with both eyes.

## Adjusting Left-Right Focus (Diopter Compensation)

Many people require a different focus setting for their left and right eyes. That's why you set a different distance to the body of the binocular for each eyepiece. This diopter adjustment can be easily achieved. Adjust the focus of both eyepieces as follows:

1. Set the inner rings for the diopter compensation (marked with Up/Down) to somewhere in the middle. If you rotate them, you'll see how the upper end of the eyepiece clamp moves.
2. With the telescope aimed at an object, close the right eye and look into the left eyepiece. Using the telescope's focus mechanism, adjust until the image is sharp.
3. Close the left eye and with the right eye look into the right eyepiece. Rotate the right eyepiece holder until you see a sharp image. If you reach the limit of the focus travel, use the telescope's focus mechanism to adjust the image until it is sharp – then switch back to the left eye and rotate the left eyepiece holder for a sharp image.
4. Now you can look with both eyes into the eyepieces. You can now focus for different eyepieces or addition of other components to the optical path by using just the telescope's focus mechanism.

**Please note:** If the dioptric difference between your eyes is very large (more than 5 – 6 diopters), you may find that even with one eyepiece holder adjusted fully in and the other fully out, you cannot bring both to focus. If so, you may want to view while wearing your eyeglasses. Alternatively, you may unlock the eyepiece in the fully extended holder and lift it out a few millimeters to compensate for the strong difference between your eyes.



The lower ring collar is used for the diopter adjustment – compare the position of the eyepiece clamp on the left and on the right.

# Connecting the MaxBright® II Binoviewer to a Telescope

There are many options to connect the binoviewer to your telescope. Depending on the back-focus and the optical design of your telescope, you can choose the option which best fits to your needs.

## Assembly with T-2 Coupling Nut

*With glasspath correctors 1,25x #2456314, 1,7x #2456316 or 2,6x #2456317*

When delivered, a T-2 counter nut is pre-mounted to the MaxBright® II Binoviewer.

Tip: By changing the Glasspath Corrector, you can achieve different magnifications with one pair of eyepieces.

## Option 1: Assembly with a T-2 Star Diagonal

Especially with a prism diagonal, this is the most common option, because a prism allows for a very short light path. By using the T-2-thread of our star diagonals, you can remove its eyepiece clamp and save several centimetres of back-focus. The lightpath of a prism is shorter than that of a mirror.

When using the T-2-thread, you simply screw one of the GPCs #2456314, #2456316 or #2456317 into the star diagonal (without the centering plastic ring which is included with the glasspath corrector). Our star diagonals provide a matching thread for this. You can find an overview of the different models and their optical lengths on page 5.

To use a T-2 star diagonal at a telescope without T-2-thread (but with a standard eyepiece clamp), you need in addition either the 1¼" nosepiece #2458105 or the 2" nosepiece #2408150.

1. Remove the dust covers of your star diagonal.
2. Screw the glasspath corrector into the body of the star diagonal as shown in the picture to the right.
3. If necessary, attach a 1¼" nosepiece #2458105 or a 2" nosepiece #2408150 to the other side of the star diagonal.
4. Remove the dust caps from the binoviewer and attach the star diagonal to its T-2-thread. Turn the counter nut until both parts are connected securely. Untighten the counter nut slightly to change the orientation of the binoviewer, if necessary.



MaxBright® II Bino with 1¼" star diagonal and 2" nosepiece



Inserting the glasspath correctors 1,25x, 1,7x and 2,6x into the Baader T-2 star diagonals.

## Option 2: Assembly with a 1¼" (or 2") Nosepiece, without Star Diagonal

If your telescope has got enough back-focus or if you want to use it for straight-through-viewing, you can attach a 1¼" or 2" nosepiece directly to the binoviewer.

1. Remove the dust cover from the binocular's T-thread

### 2a. 1,25" Nosepiece:

Screw one of the Glasspath Correctors #2456314, #2456316 or #2456317 into the 1,25" nosepiece #2458105.

### 2b. 2" Nosepiece

Put the black plastic ring which is included with the glasspath corrector over the thread of the GPC. Now place the GPC into the 2"-nosepiece #2408150.



The glasspath corrector is simply screwed into the 1,25" nosepiece.

3. Now use the T-2 counter nut of the binoviewer to fix the nose piece with the glasspath corrector to the binoviewer. Rotate the counter nut until the nosepiece holds tight.
4. Now put the binoviewer into the focuser of your telescope and secure it.
5. Remove the dust covers from the eyepiece clamps by opening the Click-Lock®-clamps. Simply rotate them to open the clamps. Please note: Both clamps work in opposite directions!
6. Insert two eyepieces with the same design and focal length into the binoviewer. Clamp them by turning the Clicklock® clamps.



This image shows how the glasspath corrector is inserted into the optional T-2"/2"-adapter. The black plastic ring covers the thread of the GPC, so that it will be centered in the adapter.



### **Please note:**

The Zeiss glasspath correctors 1,25x #2456314Z and 1,7x #2456316Z can be reconfigured for use with the T-2-adaptation by turning the lenses upside-down.

Once the glasspath corrector is placed and centered in the 2"/T-2 nosepiece, you can screw it onto the T-2 counter nut of the binoviewer.

## Assembly with Zeiss Microbayonet

With glasspath correctors 1,25x #2456314Z, 1,7x #2456316Z or 2,6x #2456317

For this, you need the optional TQC Heavy Duty T-2 Quick Changer #2456313A.

To use the included dovetail ring, you need to remove the T-2 counter nut first. Use the included tool **4** for this. Set it into the two holes inside of the nut to unscrew the T-2-adapter from the MaxBright® II Binoviewer (as shown below). Then you can easily screw the dovetail ring onto the M34-thread of the binoviewer.



Remove the inner ring with the included tool



The M34-thread without the adapters



Screw the Zeiss-dovetail ring onto the M34-thread

### Option 1: Assembly with a T-2 Star Diagonal

1. Remove the dust caps from the TQC Quickchanger.
3. a) GPC 1,25x and 1,7x:  
Screw the GPC into the chrome dovetail ring at the front end of the binoviewer (image below, to the right).  
b) GPC 2,6x:  
Screw the GPC into the T-2 star diagonal. (image below, to the left)
4. Screw the TQC Quickchanger onto the T-2 star diagonal (or onto the T-2 nose-piece, if you don't use a star diagonal).

#### 2,6x GPC



The 2,6x glasspath corrector is inserted into the T-2 star diagonals as shown here.

#### 1,25x + 1,7x GPC



The two 1,25x and 1,7x glasspath correctors are mounted into the dovetail at the binoviewer

5. Attach the TQC Quickchanger with star diagonal and T-2 nosepiece at the binoviewer.
6. Attach the binoviewer to your telescope and make sure that the connection is sturdy.
7. Remove the dust covers from the eyepiece clamps by opening the ClickLock®-clamps. Simply rotate them to open the clamps. **Please note:** Both clamps work in **opposite** directions!
8. Insert two eyepieces with the same design and focal length into the binoviewer. Clamp them by turning the Clicklock® clamps.



The 2,6x glasspath corrector can be screwed into the 1,25" nosepiece.

### Option 2: Assembly without Star Diagonal

You can connect the ring dovetail of binoviewer directly to a nosepiece, too, if you don't want to use a star diagonal. Because of the necessary quickchanger, the optical length increases a little bit. Nevertheless, this may be useful e.g. if you want to use the binoviewer with several telescopes.

The two glasspath correctors with factor 1,25x and 1,7x can be screwed into the ring dovetail, as described for option 1. Then, you can use the TQC quickchanger #2456313A to connect the binoviewer to every T-2-thread, either directly at the telescope or to a nosepiece.

The 2,6x glasspath corrector must be inserted into the 2" nosepiece #2408150. For this, you need the plastic spacer ring which is included with glasspath corrector (image below). Insert the GPC into the nosepiece and screw the TQC quickchanger onto the nosepiece. Now you can use the MaxBright II with every 2" focuser.



This image shows how to insert a 2,6x glasspath corrector into the optional T-2/2" adapter. The black spacer ring fits onto the thread of the glasspath corrector and centres it in the nosepiece.

**Please note:**

The T-2 glasspath correctors 1,25x #2456314 and 1,7x #2456316 can be reconfigured for use with the Zeiss dovetail by turning the lenses upside-down.



Once the glasspath corrector is centered in the 2"/T-2 nosepiece, it can be screwed onto the quickchanger, which fits onto the ring dovetail of the binoviewer.

## Assembly with 2" Newtonian 1,7x Glasspath Corrector®

As described before, you need to replace the T-2 counter nut with the Zeiss microbayonet. The 1,7x glasspath corrector is then attached to the binoviewer instead of the TQC quickchanger. The TQC is not necessary for this setup.

The 2" Newtonian glasspath corrector #2456300 provides you a focus gain of approx. 80 mm. It is the only chance for many Newtonian telescopes to reach focus without moving the main mirror.



## Assembly with the 2" Glasspath Corrector 1.8x for Refractors and SC's

As described before, attach the Zeiss microbayonet to the MaxBright II instead of the T-2 counter nut. Attach the Glasspath Corrector to one side of the T-2 Maxbright Mirror #2456100 and the TQC QuickChanger to the other side. For the GPC to work correctly, the distances have to match exactly, which is why you must use the T-2 Maxbright Mirror and no other star diagonal.

Then put the 2" 1.8x Glasspath Corrector #2456305 with the attached star diagonal into the 2" eyepiece holder of your telescope and secure it. Then you can attach the binoviewer at the TQC QuickChanger and insert the eyepieces.



**PLEASE NOTE:** This GPC is inserted deeply into the telescope, therefore it can only be used with Schmidt-Cassegrains with a sufficiently large baffle, or at telescopes without correctors close to the visual back. It can not be used with Petzval, EdgeHD or some Maksutov-telescopes with corrector lenses close to the eyepiece holder.

## Assembly with 2" Star Diagonals

*With Glasspath Correctors 1,25x #2456314 (Z), 1,7x #2456316 (Z) or 2,6x #2456317*

To use a 2" star diagonal, you first have to remove the 2" eyepiece clamp as described on page 7, then screw the SC/T-2-adapter #1508035 into the housing.

Next place the plastic spacer ring above the thread of the glasspath corrector. Now insert the glasspath corrector into the T-2/SC-adapter. It is held safely in place as soon as you attach the quickchanger or the binoviewer.

**Exception:** The two glasspath correctors 1,25x #2456314Z and 1,7x #2456316Z for Zeiss micobayonet are mounted in the ring dovetail as described before.

The 2" ClickLock®-clamps of our 2" star diagonals and the Herschel Wedge (see below) can be removed. For this, you need to remove the small screws, as shown here for the BBHS® mirror diagonal #2456115, or in the case of the Herschel, you need to





Remove 2" ClickLock® with an Allen wrench



2"/T-2-adapter # 1508035



Mirror diagonal with revealed SC-thread



Mirror diagonal with threaded 2" / T-2-Adapter

unscrew the clamp. Then you can access a female 2"-SC-thread, into which you can screw the 2"-SC/T-2-adapter # 1508035. The glasspath corrector is inserted into the 2"-SC/T-2-adapter.

Now you can attach the MaxBright® II either directly to the prism with the T-2 counter nut, or you attach the optional TQC quickchanger #2456313A to the housing, to use the Zeiss microbayonet.



Star Diagonal with T-2 adapter and glasspath corrector



Star diagonal with optional T-2 quick-changer



Binocular with T-2 quickchanger at the 2"-Clicklock® mirror diagonal

## Further Adaptations

### Solar Observations with the Baader Safety Herschel Wedge

Binoviewing is especially impressive when you look at the sun – you'll see it in 3D, like a ball floating in space. Delicate surface details will be much more obvious compared to monocular viewing. The MaxBright® II Binoviewer is uniquely suited to provide outstanding views with the 2" Baader Herschel Solar Prism, an optical accessory designed for refractor telescopes to permit safe, high-resolution observation and imaging of the solar photosphere. As the Herschel Solar Prism does not have T-2 threads on the top, a T-2/2" adapter ring # 1508035 is required. Inserting the binoviewer into the 2" eyepiece holder is not recommended as it may not be possible to reach focus on many refractors due to the long optical path length of the various components.

**CAUTION:** Before you start exploring the Sun it is very important to be informed about all the possible risks of solar observation. Please take a careful look at the manuals of all the equipment and filters before pointing your telescope at the Sun.

## Adapting the MaxBright® II to the Cool Ceramic Safety Herschel Wedge

We recommend to use the Zeiss microbayonet in combination with the optional TQC-quickchanger #2456313A instead of the T-2 counter nut, because you can then screw the glasspath correctors 1,25x and 1,7x directly into the binoviewer. For the 2,6x GPC, please see the note at the end of this chapter.

You need the adapter #1508035 to connect the binoviewer to the Herschel Wedge. The adapter changes the 2" female thread of the Herschel wedge into a male T-2-thread. The 2" female thread is hidden under the 2" ClickLock®-clamp.

Once you have removed the 2" Clicklock®, you'll see a 2" inverter ring (2" male thread), onto which the 2" filters OD 3.0 and Solar-Continuum are screwed. Remove the filters from the inverter ring and attach them to the 2"/T-2 adapter #27. Then screw the adapter with the filters into the housing of the Herschel Wedge. Now you can screw the TQC QuickChanger #2456313A onto the T-2 thread of the adapter #27. Finally, attach the binoviewer to the TQC, as usual.

The glasspath correctors 1,25 and 1,7 are to be screwed directly into the binoviewer, without the black plastic ring. The 2,6 glasspath corrector must be put into the SC/T-2-adapter #1508035 together with the black spacer ring. It is locked in place by the quickchanger and the dovetail ring of the binoviewer. You can find a detailed description in the manual of the Herschel Wedge.



Herschel Wedge without Clicklock®, but with T-2-adapter #1508035.



Herschel Wedge with TQC Quick-Changer



Binoviewer and glasspath corrector on the Herschel Wedge

**CAUTION:** If you mount a glasspath corrector inside the SC/T-2-adapter #1508035, it will hit the filter which is also screwed into the adapter. This is always the case with the 2,6x GPC, but also with the other GPCs, if you do *not* use the Zeiss microbayonet. If you use a GPC in the SC/T-2-adapter, you must not screw the 2" filters completely into the adapter.

## Assembly with the Universal Alan Gee II Telecompressor for Schmidt-Cassegrains

For Schmidt-Cassegrains, the Universal Alan Gee II (UAG II) Telecompressor #2454405 offers an interesting opportunity to almost double the field of view. It changes the focal ratio of a typical Schmidt-Cassegrain from f/10 to f/5.9.

It can be attached directly onto the T-2-thread of the MB II (and MB I) binoviewer. To attach the UAG II onto the star diagonal, the included 7.5mm T-2 extension ring

#1508153 is required. Alternatively to the included 7,5mm extension, you can use the T-2 Quick-Changer System (TQC/TCR) #2456322

The T-2 star diagonal can then either be attached to the SC-thread of the telescope with the help of the BTA-adapter #2408160, or you can use a 2"/T-2 nose-piece #2408150 if the telescope is equipped with a 2" ClickLock® eyepiece clamp (#2956220 for C8 and C925; #2956233 for C11 and C14). The simple clamping screw of the standard 1,25" visual back is not strong enough to keep the heavy combination of binoviewer, eyepieces and star diagonal securely in place.



The Universal Alan Gee II ① is connected with the help of the included 7,5mm extension ring ② onto the T-2 star diagonal ③. The star diagonal is attached to the telescope either through the BTA-adapter for Schmidt-Cassegrains #2408160 ④ or a 2"/T-2 nose piece #2408150 ⑤.

### Shortest possible Adaptation *without* Glasspath Corrector

In combination with telescopes with long focal lengths (f/10 or slower), it may be interesting to screw the binoviewer directly onto the star diagonal. This gives you a very short (and theft-proof) adaptation, which is ideal for public observatories. In addition, you can screw a T-2 star diagonal directly onto our Baader Diamond SteelTrack focusers with the optional T-2-adapter #2957202 – very compact, and protected from "accidental removal". To do so, you have to remove the T-2 counter nut or the Zeiss microbayonet.

The shortest possible adaptation can be achieved with the prism diagonal #2456005 (T-2 90°, with 32 mm Baader prism).

You also need the T-2 Locking Ring #2458271 and the Slip Ring #2458272. Screw the Locking Ring onto the male thread of the T-2-prism and put the Slip Ring between binoviewer and locking ring. The raised surface of the slip ring should face towards the binoviewer and the flat one towards the star diagonal. Now screw the binoviewer onto the prism and fix it in the desired position with the locking ring. The slip ring lets you still set the interpupillary distance.



If the handle of the locking ring ends up in an uncomfortable position, you can change its position. It is only screwed into the ring, you can put it into any of the three threaded holes which are all around the locking ring, each 120° apart.



# Addendum

## Addendum 1: The right Glasspath Corrector

### Back-Focus

Sometimes referred to as “in-focus” or “in-travel”, back-focus is an important factor to consider when choosing a binoviewer or any other long accessory (cameras, Herschel Wedge, etc). Back-focus is simply the distance from a telescope’s focal point to the surface of its fully retracted focuser. Any accessory inserted into the focuser consumes some of this back-focus – star diagonals, eyepiece adapters, reducers, cameras, eyepieces, etc. In order to reach focus, the focal plane of an eyepiece or camera must be positioned at the telescope’s focus.

To aid in determining the total path length when using various components, our listing of Baader Astro T-2 System™ includes the optical path length for each product. If the stack-up of parts is longer than the telescope’s back-focus, it will not be possible to reach focus.

Unfortunately, there is no consistency in the telescope industry for the amount of back-focus a telescope provides. *Very few manufacturers provide the back-focus specifications for their scopes. Thus, the best way to determine your telescope’s back-focus is to measure it yourself.* To reduce the possibility of errors, it is best to measure the back-focus using all adapters or star diagonals that will be present when using the binoviewer.

Newtonians typically have the least amount of back-focus; in order to extend the focal point well past the focuser surface, a larger secondary mirror would be required, or at least moving the primary mirror up the tube – which of course creates its own issues, too. This increases the central obstruction resulting in a loss of contrast and increased cost. For this reason, we offer a large 2" 1,7x Glasspath Corrector that is designed specifically for Newtonians. This compensator also corrects the off-axis coma that affects fast Newtonians and reduces the required back-focus to 31 mm!

Most Schmidt-Cassegrain and Maksutov telescopes provide large amounts of back-focus due to their movable primary mirror. It may be possible to use a binoviewer without a compensator, though our 1,25x Glasspath Corrector is recommended for its colour correction and to keep the focal length of the telescope closer to its optimal design.

Refractors vary considerably in the amount of back-focus they provide, sometimes even within the same model line. Even if a refractor will come to focus without a compensator, it is again recommended that at least the 1,25x Glasspath Corrector should be used for colour correction or to allow the use of longer focal length eyepieces while still providing higher magnifications.

### How to measure the back-focus of my telescope?

**The best method for finding out the back-focus of your telescope is: Do a measurement!** Don't forget to attach all the adapters you will need for the binoviewer before measuring the back-focus.

The easiest way to measure back focus is to point your scope at the Moon (with all accessories, but without an eyepiece) and project its image onto a white card. The

focuser should be fully retracted. Hold the card behind the empty focuser or above the star diagonal and find the position where the image of the Moon comes to sharp focus. This position is your telescope's focal plane. Measure the distance from the card to the end of the focuser or the top of the star diagonal. This is the amount of available back-focus for additional accessories – for example, a binoviewer plus eyepieces. Armed with this information, refer to the first row of the table below. First, subtract the recommended 5-10 mm from your back-focus value to allow for differences in eyepiece design and vision. Then, find the first column with a value less than your adjusted back-focus. The heading of this column indicates the appropriate Glasspath Corrector.

Item Nr.	Configuration with various Baader Glasspath Correctors	No GPC	T-2 1,25x GPC	T-2 1,7x GPC	T-2 2,6x GPC	2" 1,7x Newton GPC	2" 1,8x RT/SC GPC
	Straight-through (only with nosepiece)	110	92	77	44	31	n/a
#2456005	T-2 Prism Diagonal 32 mm	148	131	116	83	n/a	n/a
#2456095	T-2 Deluxe Zeiss Prism Diagonal	151	134	119	86	n/a	n/a
#2456103	T-2 BBHS® Mirror Diagonal	153	136	121	88	n/a	n/a
#2456130	T-2 Deluxe Amici-Prism, 90° (for upright images)	158	141	126	93	n/a	n/a
#2456100	T-2 / 90° Maxbright Mirror Diagonal	153	135	120	87	n/a	31

Table 1: Combinations of Glasspath Correctors (GPC) and the MaxBright® II Binoviewer. Required back-focus in mm. n/a = not applicable

Please note: The lengths are approximate values; allow for some variation e.g. for diopter adjustment.

Some telescopes don't have enough back-focus for any of our glasspath correctors. Try to avoid 2" star diagonals, because they have a long optical length which requires a longer GPC and results in a higher minimum magnification. You can achieve lower magnifications (and thus a larger field of view) by using our very compact star diagonals which were designed especially with binoviewing in mind.

Users of Newtonian telescope may get the most out of the typical short back-focus by choosing either the 2,6x glasspath corrector or, if a 2"-focuser is available, by using the even shorter 2" GPC for Newtonians. You may also try to move the main mirror closer to the focuser by about 15 mm, so that they may use the next-smaller GPC.

### Choosing a Glasspath Corrector

The Baader Glasspath Corrector fulfills two critical roles. First, it corrects the chromatic aberration (colour error) caused by the long light-path through the binoviewer glass prisms. Second, the corrector magnifies and extends the focal point of the main telescope.

The focal extending aspect is vital to using a binocular viewer with most telescopes. Due to the basic design of all binocular viewers, light must travel an additional 110mm or more before reaching the focal plane of the eyepieces. Many telescopes, especially Newtonian reflectors, do not have sufficient back-focus (in other words, not enough focuser in-travel) to achieve focus with such an optically long accessory. By using a Glasspath Corrector, the focal point of the telescope can be extended sufficiently to accommodate the length of the binoviewer.

It also compensates the colour aberrations which would otherwise occur because of the huge amounts of glass inside of the binoviewer. A GPC is more than a simple Barlow element! The optical design is from Carl Zeiss and Astro Physics – we have tested many lens systems from other sources which only extend the focal point, but which do not remove the colour aberrations.

Another benefit of the GPC is to provide additional magnification ahead of the binoviewer. For high magnifications (for example, planetary observation), it is preferable to magnify the image before the binoviewer, rather than to use shorter focal length eyepieces. By magnifying prior to the binoviewer, the effects of any optical tolerances and misalignments in the centering of the eyepieces are reduced. Additionally, longer focal length eyepieces tend to have longer eye relief and are more comfortable to use. In general, for binoviewing use we recommend eyepieces with focal lengths of 5 mm or longer. It is also less expensive to purchase an additional corrector to provide additional magnifications rather than to purchase additional pairs of eyepieces.

We recommend first choosing the lowest-power corrector that will allow your scope to reach focus. This will permit the widest possible field of view. In addition, one or more higher powered compensators can be added to give a greater range of magnifications.

For selecting the matching Glasspath Correctors, you need to measure the back-focus of your telescope first, as described in the previous chapter. Table 1 on the previous page then tells you, which compensators will work.

Please Note: The distances in the table are approximate and are measured from the front mounting flange of the binocular viewer or nosepiece to the top surface of the eyepiece holders. Many eyepieces have their focal points located ahead of or behind their shoulder. The effects of an eyepiece's focal point location are not taken into consideration here and thus the distance required to reach focus will usually vary from these values. Additionally, those who are near or far-sighted will also find that more or less back-focus is needed. *For these reasons, we recommend at least 5 – 10 mm additional back-focus.*

Let's look at an example. The Takahashi Sky90 SV Teleskop is found to have 160mm of back-focus as measured from the rear surface of its stock 2" eyepiece clamp to its focal point. Referring to Table 1, this scope can reach focus without a Glasspath Corrector, even when using the Baader Deluxe Amici erecting prism. Anyway, we would recommend either the 1,7x or 2,6x corrector. This would provide the ability to use the binoviewer with no compensator for low-power wide field viewing or with the higher powered corrector for optimum image quality at higher magnification for planetary observations. Otherwise, the colour aberration would harm the image quality at high magnifications. Only for wide-field observations e.g. of the Milky Way at low power, you can work without the Glasspath Corrector.

## Addendum 2: Servicing and Maintenance

Your Baader binoviewer does *not* require any special or periodic maintenance. If the binoviewer should need servicing please return it to the shop where you purchased it, directly to Baader Planetarium or to a facility recommended by the authorised distributor of Baader products in your country.

Please do not attempt to open the binoviewer. Doing so will void the warranty. The optical collimation (alignment) of the internal prisms is the most important technical aspect of a binocular viewer. Baader Planetarium has gone to great lengths to produce the most accurately collimated binoviewer possible. If your binoviewer has been accidentally dropped or otherwise physically damaged, it is possible for it to lose its optical alignment and require servicing to restore the collimation of its prisms.



Baader Optical Wonder is perfect for cleaning optical surfaces. It causes no scratches and cleans without leaving residues.  
#2905000

physically damaged, it is possible for it to lose its optical alignment and require servicing to restore the collimation of its prisms.

If moisture should form inside of the binoviewer, never try to remove it manually! Store the binoviewer in a warm and dry place without dust caps. Wait until it is completely dry before storing it in the box.

Generally the glass surfaces of your binoviewer will not require anything more than a burst of clean air from a blower bulb in order to remove dust. Avoid touching the optical window lens or the prisms inside the eyepiece holders with your fingers. Should you touch them, it is advisable to clean them promptly, since the natural grease of fingerprints contain weak acids which can corrode the optical coatings of the lens/prisms. Before cleaning fingerprints or other dirt spots, first remove dust with a soft brush and a burst of clean air. To achieve the best results, we suggest you use a few drops of Baader Optical Wonder Fluid on a Baader Optical Wonder Cloth. This combination does not scratch or damage optics and won't leave a halo, film, chemical residue or tissue fibres. Additionally, unlike many cheaper microfibre cloths, Optical Wonder Cloth is antistatic, inhibiting the attraction of dust onto freshly cleaned optical surfaces.



Baader Optical Wonder Cleaning Fluid is the perfect cleaning fluid for sensitive optical surfaces. It removes dirt, fat and fingerprints from modern, multi-coated lenses without leaving stains or residues.

Item-Nr.: #2905007

Never spray the cleaning fluid directly onto the glass surfaces! The fluid might soak into the housing and distribute dirt in such a way that the binoviewer becomes useless. Always apply the fluid only to the cloth and never to the lenses!

### **IMPORTANT WARNING!**

Do NOT try to disassemble the binoviewer and do NOT try to clean it inside!



Baader Optical Wonder Cleaning Fluid and Micro Fibre Cloth are also available as set.  
Item-Nr.: #2905009

## **Problems, Maintenance and Warranty**

If you should happen to notice problems or defects inside your binoviewer, NEVER try to open it yourself and do not request service from personnel not authorised by Baader Planetarium. Doing so will void the warranty. If you have any problems or questions about the use of the binoviewer or its optional accessories, please contact Baader Planetarium or your local distributor.

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