BAADER
SOLAR PROJECTION SCREEN

Building Instructions

Congratulations for your purchase of the Baader Solar Projection Screen (BSPS). In this manual, or in the german video (with subtitles),you will find the instructions for assembling the BSPS body for the first use.

Before using the BSPS for the first time, please read the separate user manual which you can find at *www.baader-planetarium.com/bsps*.

youtu.be/KjxGRSmj8Ss

Contents

Properties

- For lens telescopes with apertures of up to 6", ideal for telescope focal lengths of 400-1000 mm and aperture ratios of ~f/6 or slower (also f/4 for apertures of less than 65 mm)
- Backlit projection screen for safe solar observation
- Required back focus: ~3 cm
- Sturdy cardboard housing; a template for a 3D-printed housing in STL-format can be found at *www.baader-planetarium.com/bsps*
- You also need
  - A suitable projection eyepiece (recommended: Baader Planetarium Classic Ortho/Plössl), depending on the focal length of the telescope, as well as
  - A variable eyepiece projection adapter.
    Recommended: Baader Planetarium OPFA 1¼" *#2458141* or 2" *#2458142*)

Never look at the Sun with the naked eye or without appropriate filters. You risk permanent eye damage. Tainted glass, blackened film, CDs or double sun glasses do not offer sufficient protection, not even during sun rise or sun set.

Cover or remove finder scopes.

Scope of Delivery

1. Top of the Projection Box
2. Sides and floor of the Projection Box
3. Sides of the Projection Box
4. T-2 adapter plate
5. Projection screen

The mounted BSPS on a Celestron AstroMaster 70AZ Refractor

Assembling the BSPS

The Solar Projection Screen is made out of several parts which have to be assembled once. For assembling, we recommend a ruler, a pencil with an eraser and maybe a pair of tweezers. Please read the instructions before assembling the projector box.

The box is made out of sturdy cardboard. At *www.baader-planetarium.com/bsps* you can also find files for 3D-printing a box at home.

Assembling the Cover

1 Start with the top. For this, you need the cardboard with the cover **1** and the projection screen **5**. Do not remove the protective film from the projection screen yet!

2 Remove the cardboard piece for the cover **1** and fold it as shown in the illustration so that the edges are folded inwards. Please note: Only the inner fold is bent along its entire length. For the outer fold, only the tabs *with* the adhesive surface are bent; the tabs *without* the adhesive surface must not be bent. They should point away from the adhesive surfaces.
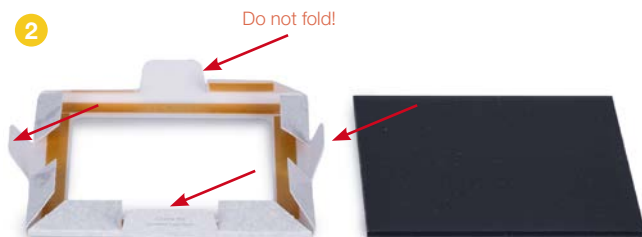
Use a ruler or the projection screen to fold the edges neatly.

3 Check that all edges are neatly folded. Place the projection screen in the cover to test if it fits.

3

4 If everything fits, remove the protective film from *one* side of the projection screen **5**. Place the cover on a flat, clean surface. Do not remove the protective strips for the adhesive surfaces yet!

4

5 Now place the screen in the cardboard. The side with the protective film still attached must face downwards. Check that the screen is exactly centred and does not protrude into the narrow edges on either side by folding up the thin edges.
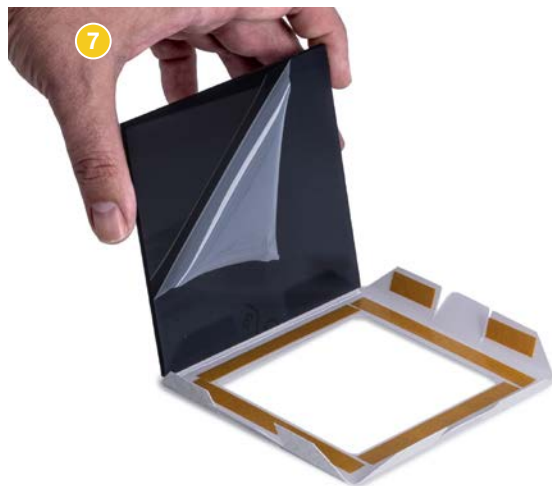
5

6 Now you can remove the adhesive strips from the two tabs you used to align the screen (left image) and stick the tabs to one side of the screen (right image). The screen is now fixed at the first edge.


7 Once the screen has been secured with the first two adhesive tabs, lift it again. You can now remove the protective film from the second side of the projection screen.

**8** Remove the four long adhesive strips from the cover, too.

9 Carefully lower the screen. First press the narrow side edge of the cardboard onto the projection screen so that it sits centrally in the top part and does not protrude on the other side. It is best to place it on its edge so that the tabs can be bent neatly. The screen is now attached to the cover.
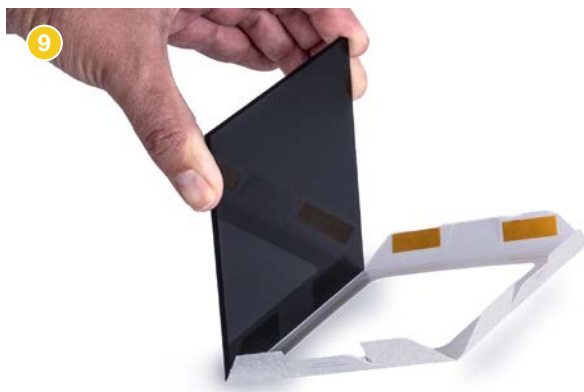
10 Now glue the remaining tabs one after the other around the inside of the projection screen.

10
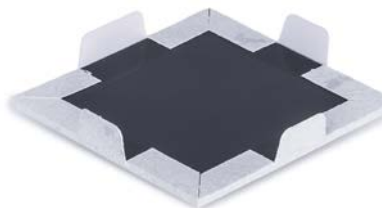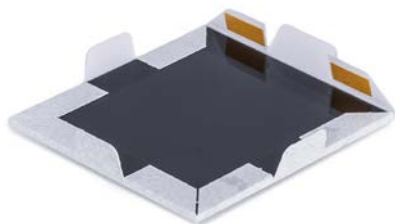
11 The finished cover: The projection screen is securely glued into the cardboard, and the four tabs are sticking out. Place it on the protruding tabs to avoid scratches.
If necessary, remove any fingerprints with a soft cloth (see the cleaning instructions on *page 17*). Now it's time to build the housing.

11

Assembling the Housing

① Remove the two remaing parts **②** and **③** from the cardboard sheets.

② Fold along the fold lines as shown in the illustration. All parts are folded inwards (towards the unprinted side), with the exception of the three adhesive tabs (black arrows) on the inner bottom. The two rectangular adhesive tabs (red arrows) are folded *only once* and then stand perpendicular to the bottom.
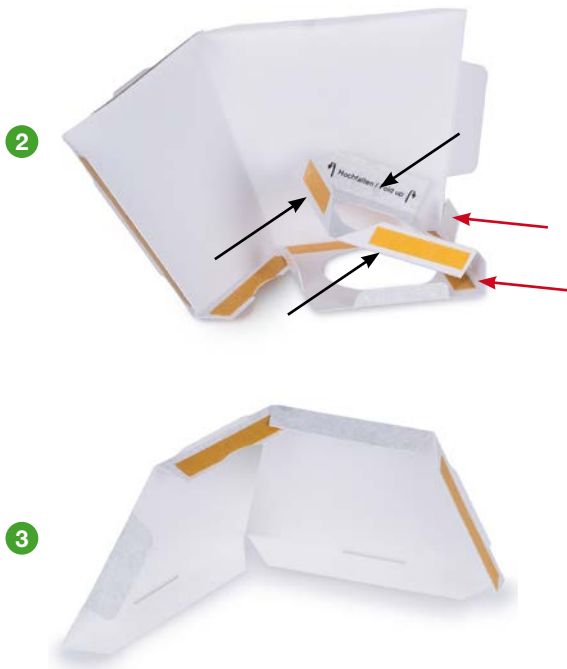
3 Insert the tab on the bottom section through the slot on the side section. Always check first to see if the part fits properly (this also applies to all subsequent steps) before attaching it permanently. Then glue the two parts together. Please note: This tab has adhesive strips on both sides. Do not remove the adhesive strip on the unprinted inner side yet; *use the adhesive strip on the printed outer side*.

3

Do not remove the protection from the upper adhesive strip; use the adhesive strip on the bottom side.

4 Now glue the two side pieces **2** and **3** together. First insert the tab through the slot to align the two pieces (left image). Connect them on the side where you just glued the bottom together. Then remove the protective film from the adhesive tape, fold the tab over and glue the pieces together (right image).

4

2

3

3

2
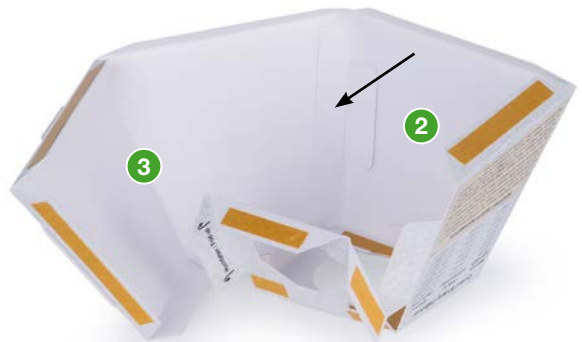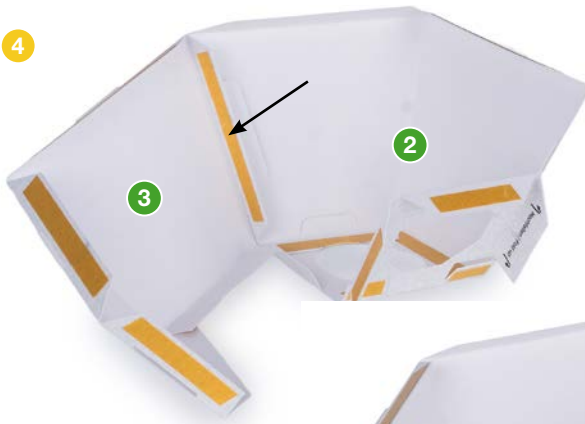
5 Now insert the last tab of the inner base into the corresponding slot on the side piece **3**, align the two parts with each other, remove the protective film from the adhesive strips and glue the parts together.
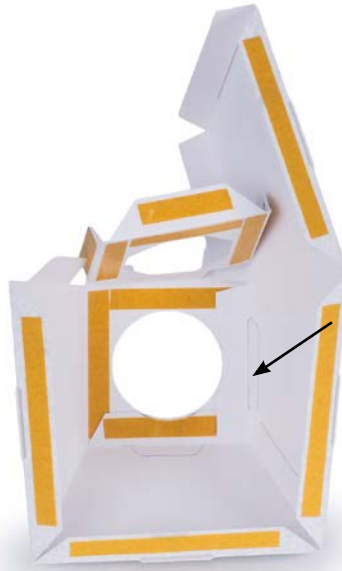
6 Place the T-2 adapter plate in the base to test it. The protruding collar must face outwards and fit through the round hole. Remove the adapter plate again to remove the protective film from the adhesive strips, then glue it onto the bottom.

7 Glue the second base part on the upper side of the adapter plate. To do this, first remove the protective strips from the adhesive strips on the large surface. The two rectangular adhesive tabs (red arrow) are facing upwards; the tabs at the side are attached in the next step.
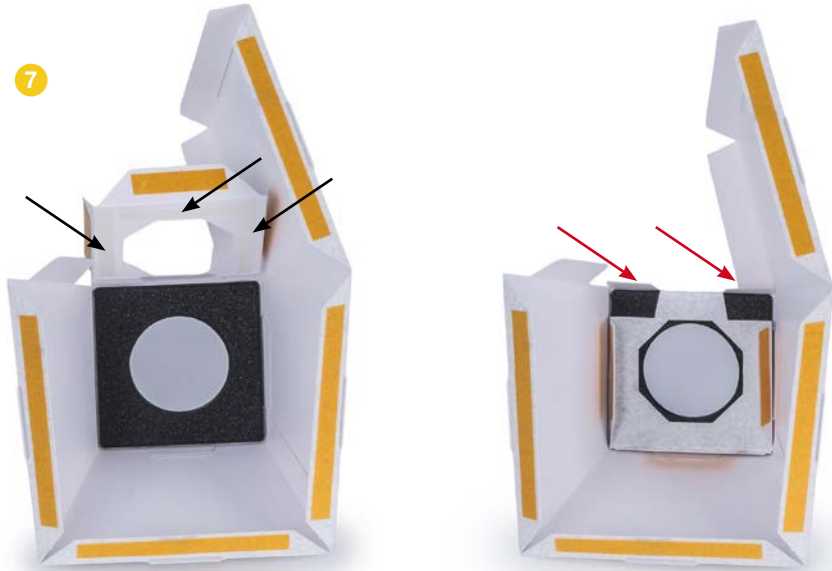
8 Now glue the three adhesive tabs at the side (black arrows) to the inside of the side panels. The base is now closed on three sides (image on the right). The tab of the last open side panel and the two rectangular tabs of the base with the adhesive strips point upwards/inwards (red arrows in the image below).
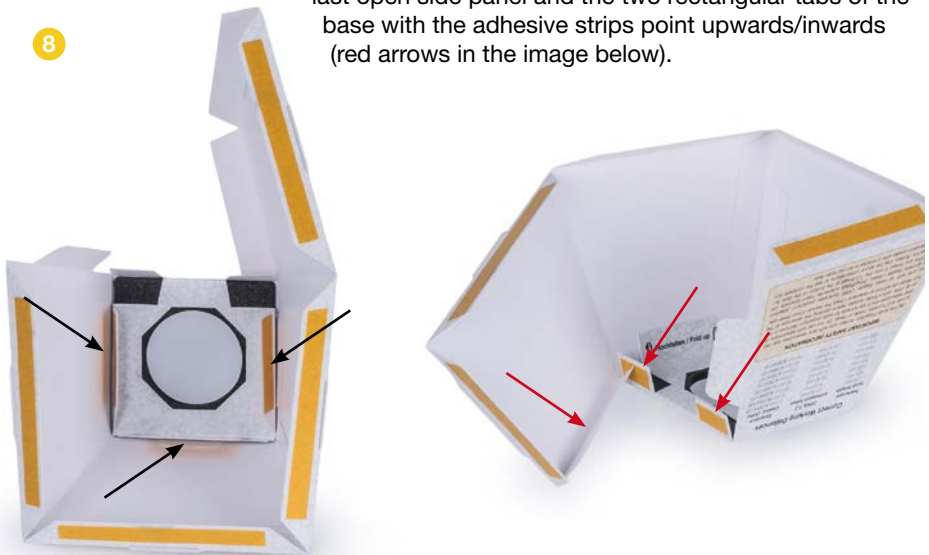
9 Close the case by inserting the side tab into the corresponding slot and aligning the parts with each other. CAUTION: The two bottom tabs must face the inside of the case as shown in step 8! Then remove the adhesive strip from the side tab and glue the case together.

10 Now glue the two rectangular tabs to the long tab that you had previously folded up. Use tweezers if necessary to remove the protective film.

17 Now you can place the cover on the housing. The tabs must fit into the corresponding slots to ensure that the parts are seated correctly. Please note: One of the tabs is wider; start with this one.

Insert the wider tab of the cover into the corresponding slot in the housing.

Before removing the adhesive strips, check again that all four tabs fit into the corresponding slots.

Wider Tab

Tip: Make sure that the inside of the projection screen is clean – it will not be accessible later.

If everything fits, remove the adhesive strips and join the two parts together so that the tabs align the lid with the base.
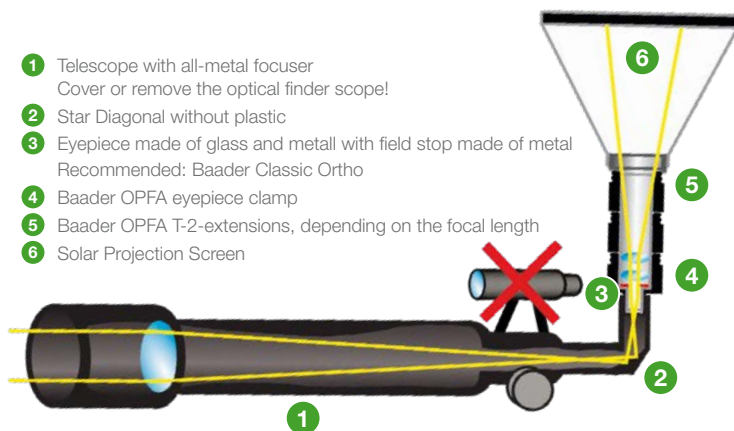
18 Use a pencil with an eraser at the end to press down the adhesive strips.

Done! Now the eyepiece projection adapter with the eyepiece inserted (not included) can be screwed onto the thread.

**Before each use, check that the box is intact
and that no parts have come loose!**

Quick Start & Short Instructions

1. Telescope with all-metal focuser
   Cover or remove the optical finder scope!
2. Star Diagonal without plastic
3. Eyepiece made of glass and metall with field stop made of metal
   Recommended: Baader Classic Ortho
4. Baader OPFA eyepiece clamp
5. Baader OPFA T-2-extensions, depending on the focal length
6. Solar Projection Screen

Configuration of the Solar Projection Screen at a telescope.

Take care of the usual safety measures for observing the Sun. Put all covers onto your telescope and all other optical instruments which may be on the same mount. Do not forget your finder. If possible, remove it or replace it with a solar finder.

Insert the appropriate eyepiece into the eyepiece projection adapter (both sold seperately) and set the length as described in the seperate manual. Then screw the eyepiece projection adapter onto the projection box. Connect the star diagonal to the projection adapter (via the eyepiece clamp, or directly with a T-2-thread, depending on the available back focus) and attach it to your telescope. Check that it is securely fastened.

Then point the telescope at the Sun, center it on the screen and focus as usual, until you see a sharp image. Important: The diameter of the image of the Sun must be at least 6 cm. Increase the distance between eyepiece and projection screen or use another eyepiece, if the image is smaller. You can stop down the telescope to reduce the heat stress for yoiur star diagonal.

Onnly use the BSPS with with suited eyepieces and focals lengths (see the seperate manual) and *never* without an eyepiece.

In principle, there is no time limit for observation. However, give your eyes a break every three minutes or so. Look at the image from the side, not directly from above.

At *www.baader-planetarium.com/bsps*, you can find the full instruction manual – read it before using the BSPS for the first time!

The 3D-printed Housing

You can find the STL-files for replacing the carton housing with a 3D-printed housing at *www.baader-planetarium.com/bsps*. We beg your pardon that we can not offer producing it for you – however, there are many businesses who can print it for you, if you do not have access to a 3D-printer.

The 3D-model also contains a protective cover for the screen, on which you can find the security information in German or English.

We recommend the following settings:

- Material: PETG or other UV- and heat-resistand materials
- Layer Thickness: 0,2 mm
- Infill: 15%
- Perimeter: 3 (due to the holes for the screws)
- Supports: None

You also need eight screws. The housing is designed for Spax universal screws WIROX A9J with countersunk head, size 4x20 mm.

To assemble it, you just have to put the adapter plate with the T-2-thread **4** of the BSPS into the projection box **6**. You can keep it better in place with some double-sided sticky tape, if necessary.

Then place the inner part **7** onto the adapter plate and lock it from the outside with four 4x20 wood screws.

Put the projection screen **5** into the top of the box and keep it in place with the cover **8**. Use another four screws to fix it on the box.

Finally, insert the protective cover **9** to save the screen from damage when you don't need it.
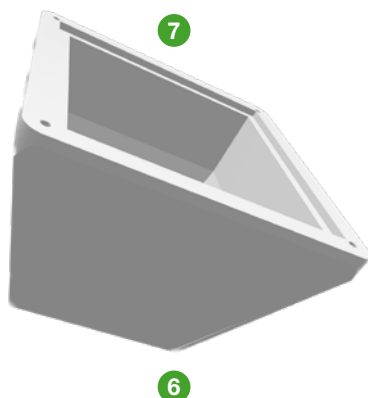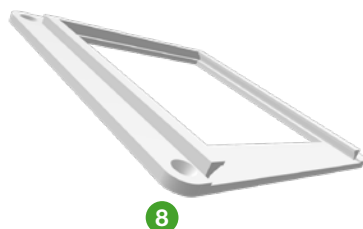
The finished 3D-printed Solar Projection Screen with most important safety instructions on the cover

Cleaning

Store the box in a safe and dry place.

  For cleaning the projection screen, you can use:

- Lukewarm water with a little bit of dishwashing detergent
- Isopropanol or benzene-free petroleum ether
- Soft, lint-free cloth, lens cloth or soft viscose sponge
- Do not put cleaning fluids onto the cardboard
- Never rub the screen completely dry. Otherwise, it would become electrostatically charged, which in turn attracts dust. It may also result in scratches on the surface
- Make sure that the cleaning agent does not contain any benzene, ethanol, alcohol, organic material or thinners.
- Abrasive cleaning agents are generally not suitable for cleaning!

www.*baader-planetarium*.com