

# BAS – Celestron CPC 9.25 Telescope User Guide

This is a brief guide to setting-up and observing with the Celestron CPC 925 Schmitt Cassegrain telescope.

## The Safety of You and the Telescope

The telescope is very heavy. And, its storage box is very heavy and awkward to lift and place into (or remove from) vehicles.

BAS strongly recommended any lifting of the telescope and its storage box be performed by two people. Also, the removal of the telescope from the box and placement on the tripod should only be attempted by two people.

The storage box has wheels and detachable “wheel barrow” handles for easier movement. Or, the simple rope handle can be substituted for the wheel barrow handles.

## Telescope Components

To use the telescope, you will need:

- CPC 9.25 telescope
- Tripod and center support bracket
- Hand controller
- Charged 12v battery and telescope power cable
- Finderscope
- Visual back and diagonal mirror eyepiece holder
- Eyepieces
- A planetarium app (SkySafari or similar app) on a mobile device is also recommended
- Dew shield

## Setting Up the telescope

### *Tripod and attaching the telescope*

Place the tripod on firm ground and fully spread the legs. Adjust the length of one, or more, legs if necessary to level the tripod top. Use the bubble level in the tripod top as the levelling guide.

Ensure the tripod positioning pin is poking up above the top of the tripod (this pin is used to initially center the telescope on the tripod top).

Before attempting to lift the telescope into place, make sure the optical tube is pointed in the downward position aiming at the telescope base (where all the electronics attachment sockets are).

Lift (two-person lift is strongly recommended) the telescope from its storage box and place the telescope base on the tripod top. Maintain a very firm grip on the telescope. The tripod positioning pin needs to slip into a hole in the bottom of the telescope base. You should feel the telescope “clunk” down about 1cm when properly centered on the pin. Maintain a firm hold on the telescope side handle (the telescope is still at risk of falling to the ground). Slowly rotate the telescope base on the tripod top until you feel another “clunk” as the telescope base matches the location of the three mounting bolts that are on the under-side of the tripod head. Screw the three bolts into the telescope base. The telescope is now attached to the tripod and no longer at risk of falling.



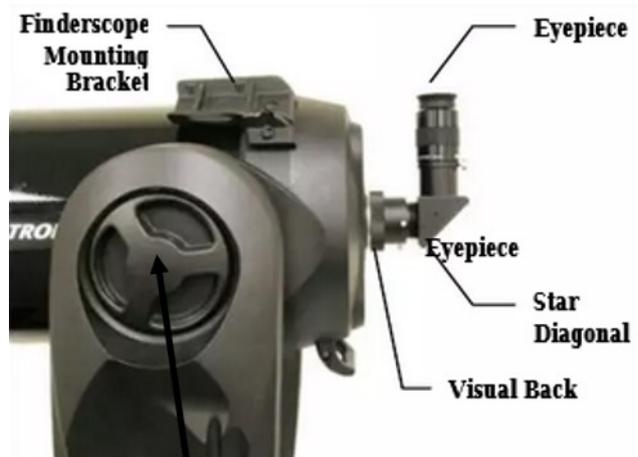
**Attaching components to the telescope**

Attach the hand controller and 12v battery power cable.

On the left-side “shoulder” of the telescope there is a large three-spoked circular knob moulded into the telescope fork arm. This is the declination (up/down movement) knob. It locks/unlocks the free movement of the optical tube in the up/down range of motion. Unscrew the knob and tilt the optical tube to aim the from corrector plate lens toward the sky. Retighten the knob.



In the center of the telescope base is a similar knob (right ascension locking knob) that allows the telescope to be rotated. If you wish, you can unscrew this knob and turn the telescope to face a different direction – and then retighten the knob.



(Once you have completed the star alignment procedure (explained below), do not unscrew either of these knobs to move the telescope to point in a different direction. If you do so, you will mess up the star alignment and the telescope will no longer be able to find the objects you ask it to point to.)

**Declination (up/down) locking knob**

**Attach the finderscope, visual back and star diagonal**

The finderscope is held in a quick-release bracket. Slide this bracket onto the finderscope mounting bracket on the top of the telescope. Tighten the two bracket attachment screws.

Screw the visual back threaded ring onto the short threaded tube on the back of the telescope. The threaded ring can be loosened (and then retightened) at any time during your observing session if you need to tilt the star diagonal and eyepiece to a different angle for easier access.

Insert the eyepiece with the largest MM number on it, most likely 25mm. The bigger the mm number the wider field of view the eyepiece provides. Having a wide field of view usually make it much easier to find and observe objects than narrow field eyepieces, such as a 10mm.

Provided the telescope is not aiming anywhere towards the Sun, remove the dustcover from the front lens.

### ***Aligning the finderscope with the telescope***

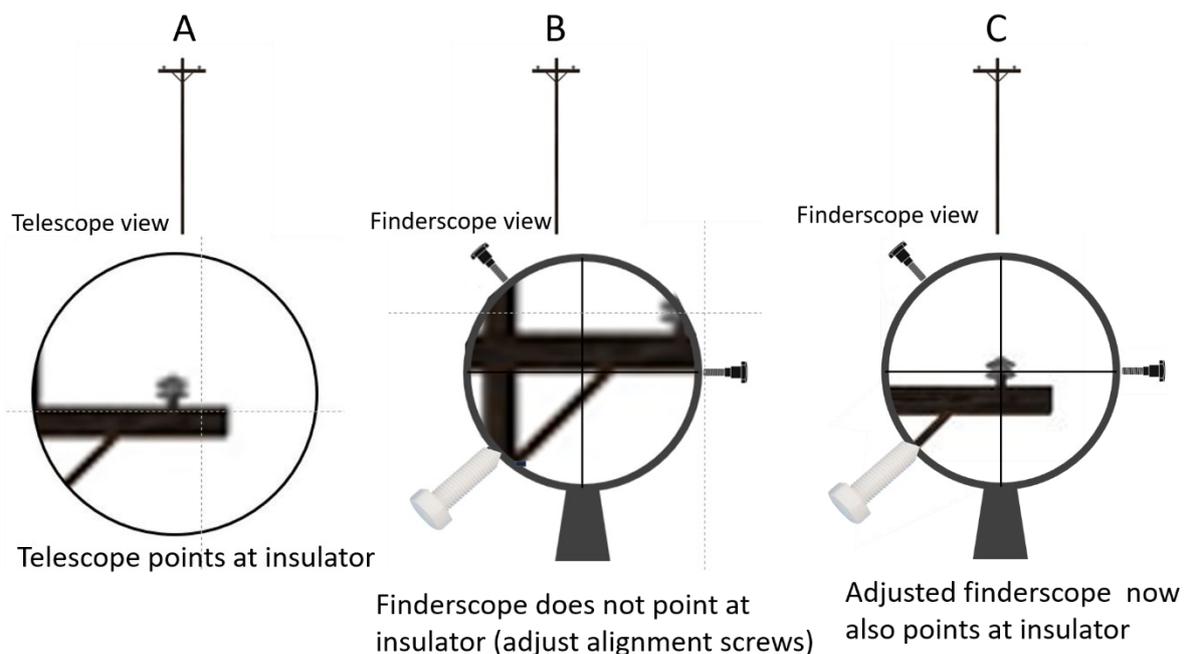
Make sure you never point the telescope or finderscope towards the sun at any time!

If the finderscope does not point to the same patch of sky as the main telescope it will be very difficult to complete the 2-star alignment procedure (explained below). In essence, the finderscope and main telescope would be “cross-eyed”, and aim in different direction.

There are three alignment screws (one is a nylon bolt) on the rear of the finderscope. By screwing these screws in/out you can move where the crosshairs in the finderscope point. You need to unscrew one side in order to be able to screw an opposite screw inwards.

Unscrew the declination knob and the right ascension knob. Point the main telescope at a distinctive object, such as a power pole, about 100m or more away. Center a distinctive point such as an insulator on the pole top (example A below). Tighten both knobs again to stop the telescope from moving.

Now look through the finderscope. It may not be pointing exactly at the insulator on the pole (example B below). But you need to make it do so. Use the three adjustment screws on the rear of the finderscope to place the crosshairs over the same insulator (example C below) centered in the main telescope view.



You now have the finderscope properly aligned with the main telescope.

### ***Attach the dew shield***

Attaching the dew shield is not essential. However, it is recommended in humid weather where the nighttime temperature is expected to drop. It is best to attach the dew shield when the telescope is first set up, rather than waiting until dew starts to condense on the front corrector plate lens. By then it is too late.

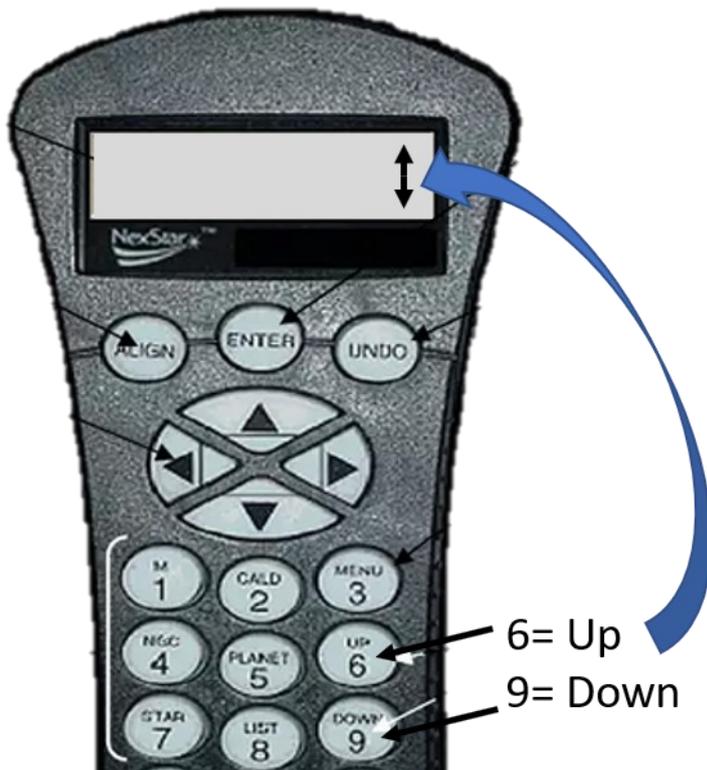
The supplied Astrozap dew shield is the 12v DC powered version. However, the battery supplied with the telescope has insufficient capacity to drive the dew shield. But this is not a problem as even without power the dew shield can stop the condensation of dew on the lens for many hours. Simply fit the shield over the front of the telescope so that ~80% of the shield extends out beyond the front of the corrector plate lens.



## **Power-on the telescope and input initial settings**

### ***A note about the Hand Controller***

There are times when the hand controller LED screen will display an up/down arrow on the righthand side. This means you are being asked to select something from a list of options. You use the 6 and 9 keys to scroll up or down through the options list.



6= Up  
9= Down

The Celestron CPC telescope has a GPS chip to inform the telescope of its current location. However, this chip no longer works in the BAS CPC. So, you need to follow a slightly different initialization procedure to that listed in the telescope user manual. We need to tell the telescope the current time, date and international time-zone.

You are strongly recommended to familiarize yourself with the CPC Menu Tree (at the end of this document) before launching into the next steps.

### ***Initial settings***

Turning GPS OFF and setting the current date, time and time zone.



		<p><u>However</u>, if the hand controller display reads “Press ENTER to Turn GPS off” you need to do as instructed and <b>press ENTER</b>. The GPS is now <u>turned OFF</u>. Now press the <b>UNDO</b> button to exit this menu area. Press the UNDO button a couple of times to get back to the CPC READY screen</p>
<p>Scroll through the menu system to set the current date, time and time zone.</p>	<p><b>CPC READY</b></p> <p><b>UTILITIES</b> <b>SCOPE SETUP</b></p> <p><b>SCOPE SETUP</b> <b>SETUP TIME-SITE</b></p> <p><b>TIME hh:mm:ss</b> <b>xx:xx:xx</b></p> <p><b>SELECT ONE</b> <b>STANDARD TIME</b></p> <p><b>SELECT TIME ZONE</b> <b>ZONE 10</b></p> <p><b>DATE mm/dd/yy</b> <b>xx:xx:xx</b></p>	<p>From the CPS READY screen, press the MENU button. Use the Up 6/Down 9 buttons to scroll through the options <u>until SCOPE SETUP is displayed</u>. <u>Press ENTER to enter this menu area</u>.</p> <p>When “Setup Time-Site” is displayed, press ENTER.</p> <p>The telescope is now asking you to key-in the current time in 24 hour format – hours:minutes:seconds, perhaps 19:33:12. Press ENTER when all digits inserted.</p> <p>If daylight saving does not apply, press ENTER to select standard time.</p> <p>Queensland is in international time zone +10. Press ENTER of “ZONE 10” is displayed, or use the Up/Down keys to move to 10, then press ENTER.</p> <p>Key in the current date in American mm:dd:yy format. Press ENTER.</p>

## 2-Star Alignment

You are now ready to align the telescope with the stars in the sky. But to do this you needed to first set the correct time, date and time zone in the telescope. But that is now done.

Before you start the alignment process you will need to familiarise yourself with some of the brighter stars in the sky as the telescope will soon ask you which two stars you want to align it to. At the rear of this document are four star charts, two for early April and two for early August. One chart for

each month looks towards the northern sky and the other the south. The telescope has a database of about 50 stars it will accept as alignment stars.

Pick an appropriate star chart and find two stars highlighted (underlined) on the chart that you can identify in the sky. Having a mobile device with a planetarium app, such as SkySafari, beside you will make this task easier and more reliable.

Until you complete the two-star alignment procedure, the telescope has no idea where it is pointing in the sky or where objects are located. The star alignment procedure gives the telescope the accurate location of two initial stars. From this, it can then determine the location of all the thousands of objects in its database. So, the initial star alignment procedure is critical to a successful night under the stars.

Task	Hand Controller Message Displayed	Note
Tell the telescope you want to use the TWO STAR ALIGNMENT method.	<p><b>CPC READY</b>  <b>Press ENTER to begin alignment.</b></p> <p><b>ALIGNMENT</b>  <b>TWO STAR ALIGNMENT</b></p> <p><b>TIME hh:mm:ss</b></p> <p><b>ZONE 10</b></p> <p><b>DATE mm/dd/yy</b></p>	<p>Press the UNDO button a couple of times until you get back to the CPC READY message.</p> <p>Press the ENTER button and use the Up/Down buttons to select <b>Two-Star Alignment</b>, press ENTER. (<u>Do not select the AUTO TWO STAR option</u>).</p> <p>The telescope will ask you to enter the TIME, however, this should already be correct, so hit ENTER to accept the displayed time. Similarly, you will be asked to set the Zone and then the DATE. In each case just press ENTER to accept the correct information you entered earlier.</p>
Select your first alignment star and align the telescope to it. Repeat with the second alignment star	<p><b>Star 1</b>  <b>Xxxxxx</b></p>	<p>The telescope will display the name of a star which it believes is currently visible in the sky. If you do not want to use this specific star as your first alignment star you use the Up/Down keys to scroll through the list of stars. When you are happy to use the star named in the display, hit ENTER.</p>

	<p><b>Centre the star in the finderscope. Press ENTER when ready.</b></p> <p><b>Star 2 Xxxxxx</b></p> <p><b>Centre the star in the finderscope. Press ENTER when ready.</b></p> <p><b>Centre the star in the eyepiece. Press ALIGN when ready.</b></p> <p><b>Align Success</b></p>	<p>Now use the left/right &amp; up/down direction keys (the central four controller keys with black triangles on them) to move the telescope towards the named star. Once you get reasonably close to the star, start looking through the finderscope and continue to move the telescope up/down/left/right until you have the named star under the finderscope crosshairs. Then press ENTER.</p> <p>You now repeat the process. Initially align the second star. Use the Up/Down keys if you want to select a different star to the one prompted by the telescope. Centre the second star in the finderscope crosshairs and then hit ENTER. Then centre the star in the telescope eyepiece and hit ALIGN.</p> <p>If the telescope math determines that you have accurately aligned it on the selected stars you will see the message "Align Success". You are now ready to observe objects.</p>
	<p>Align Fail</p>	<p>If the alignment fails you need to repeat the Two Star Alignment procedure. Start by clicking the UNDO button a couple of times to get back to the CPC Ready message and then repeat the procedure, making sure you have aligned the telescope on the correct stars. Use your planetarium app (SkySafari is recommended) to help identify the alignment stars correctly.</p>

## Observing Objects

Some of the hand controller number keys provide direct access to catalogs of objects.

**Key 1/M** – list the Messier objects. These are bright objects that Charles Messier thought looked a bit like comets. Press the 1/M key and use the Up/Down keys to select an object. Then press ENTER and the telescope will slew to the object.

**Key 2/CALD** – list the Caldwell objects. It operates the same as key 1/M.

**Key 4/NGC** – list thousands of NGC list (New General Catalog). Each object has a xxxx four-digit number. Key in your desired four digits and hit ENTER. The telescope slews to the object.

**Key 5/Planets** – lists the planets currently visible. The procedure is the same.

**Key 7/Star** – lists named stars.

**Key 8/List** – provides a drop-down list of 15 different catalogs and types of objects. Use the Up/Down keys to select a category from the list, press ENTER and then scroll through each detailed list in the same manner as for the keys outlined above.

The listed options are: named stars; named objects; asterisms; tour; variable stars; double stars; CCD objects; Abel objects; IC or Index Catalog; Messier catalog; NGC catalog; SAO catalog; solar system; constellations.

**Key 0/Tour** – lists a selection of objects that you can observe as a general tour of objects currently visible.

**Key INFO** – provides information about the object you have asked the telescope to slew to. Click the key to learn more about the object. Click UNDO when finished.

When you have finished using the telescope, turn the power switch OFF. Carefully pack the equipment away.

If the telescope and equipment is covered with condensation, leave the storage box open and components (such as eyepieces) unpacked for a day or so when you get home to properly dry out. Packing optical equipment away while moist causes mold to grow on optical surfaces. That is a very bad thing.

Please treat the equipment carefully, as if you own it and paid far too much money for it.

## CPC Menu Tree

From the “CPC Ready” position displayed on the hand controller, there are three sections of the menu system you can reach via a single button press. Pressing the **MENU or 3** button takes you to the main MENU options (the lefthand column of the menu tree). Pressing the **ALIGN** button takes you to alignment menu options. Pressing the **LIST or 8** button takes you to a list of categorized objects you can slew the telescope to (the righthand column of the menu tree).

