GUIDE TO USING THE CARDIFF ASTRONOMICAL SOCIETY'S OBSERVATORY AT DYFFRYN GARDENS
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OPERATING THE CELESTRON 11" HD EDGE TELESCOPE

Introduction

1. Use of the Observatory is restricted to paid-up members of the Cardiff Astronomical Society (CAS). The Observatory is situated in the grounds of the National Trust's Dyffryn Gardens (St Nicholas, Vale of Glamorgan CF5 6SU).

2. Smoking (including vaping) in or close to the Observatory is forbidden, as is the consumption of alcohol. Any serious misconduct could lead to the termination of membership of the Society in accordance with the CAS Constitution.

Alignment of the Telrad finderscope

3. In order for the Telescope to point accurately to objects in the sky, it must first be aligned to known positions (stars) in the sky. The alignment procedure to be followed to achieve this is set out below (see paragraphs 4-10). However, beforethat procedure can be started, the Telrad (red dot) finderscope must first be aligned with the Telescope (initially in daylight hours and later in the dark) as follows:

   (1) Daytime finderscope alignment process

   - connect the Telrad finderscope to the Telescope
   - point the Telescope at a distant land object (if possible, more than 50 yards away) and centre the object in the Telescope's eyepiece
   - using the directional arrow keys on the hand controller, move the Telescope up/down and to the left/right to ensure that the Telrad finderscope is centred on the same object, i.e., the object is in the centre of the red ring

   (2) Night-time finderscope alignment process

   - switch on the power supply to the Telescope and turn on the Telescope

- use the hand controller to centre a bright star in the Telrad's red centre rings 
- check whether the star is centred in the eyepiece of the Telescope
- if yes, move on to paragraph 4 below; if not, proceed as follows
- use the hand controller to position the bright star in the centre of the Telescope eyepiece
- screw the red dot mechanism into the Telrad finderscope and, using the adjustment screws on the finderscope, place the target star in the centre of the cross hairs
- switch on the Telrad finderscope and check whether the target star is in the centre of the red ring 
- if it is, move on to paragraph 4 below; if it isn't, use the adjustment screws on the finderscope to ensure that this is the case and then move on to paragraph 4 below, as the Telrad finderscope should now be successfully aligned with the Telescope.

Three-Star Alignment of the Celestron 11" HD Edge Telescope

4. This Three-Star Alignment procedure is used to ensure that the Telescope will accurately point to objects in the sky. It is started by switching on the Telescope and picking up the hand controller whose screen should display scrolling set-up instructions to be followed. The alignment procedure is started by pressing the ENTER key.

5. Using the No. 9 key on the controller scroll down to "Three-Star Alignment" and press ENTER. Now select three stars in different areas of the sky (i.e. as far apart as possible) and insert a 55 mm eyepiece into the star diagonal of the Telescope.

6. Using the hand controller, centre the first alignment star in the Telrad rings. Then look through the finderscope and, using the directional arrow keys on the hand controller, place the target star in the centre of the cross hairs. When this has been achieved, press ENTER.

7. If the Telrad finderscope has been properly aligned the star should now also be visible in the field of view of the Telescope's eyepiece. Again using the hand controller, centre the star in the field of view and press ALIGN on the hand controller.

8. Now turn to the second chosen alignment star and repeat the process described in paragraphs 4-7 and finish by pressing ALIGN.

9. Repeat this process again for the third alignment star. After pressing ALIGN on the hand controller, wait for the screen on the hand controller to show "Alignment Successful".

10. It is then possible to use the hand controller to select specific celestial objects to observe through the Telescope for which there are various eyepieces.

Solar Alignment of the Celestron 11" HD Edge Telescope

N.B. NEVER LOOK DIRECTLY AT THE SUN WITHOUT USING SUITABLE EYE PROTECTION - PERMANENT AND IRREVERSIBLE EYE DAMAGE MAY RESULT. Also, the Sun should never be observed with any optical apparatus that has not been fitted with a proper solar filter.

11. This procedure is used to ensure that the Telescope will track the Sun for effective solar viewing. Start by removing the front cover from the Telescope and checking that the solar filter has not been damaged in any way. The solar filter can now be installed, but it is essential to check that it has been properly installed.

12. The power supply to the Telescope should be turned on. The screen on the hand controller should show scrolling set-up instructions that are to be followed. Start by pressing the ENTER to start the alignment procedure

13. Using the No. 9 key on the controller scroll down to "Solar System Align" and press ENTER. The controller screen will display pre-determined GPS settings and will then switch automatically to allow various celestial objects to be selected.

14. Again using the No. 9 key on the hand controller, scroll down to the Sun (or to any planet you would like to follow) and press ENTER.

15. Before continuing, it is imperative that the solar finderscope's solar filter is undamaged and fitted in correctly in place. Using the hand controller, the Sun should now be centred in the solar finderscope and then in the eyepiece of the Telescope and press ALIGN on the hand controller whose screen should now display "Align Successful", which means that the Telescope will track the movement of the Sun.

How to hibernate the Celestron 11" HD Edge Telescope

16. Hibernating the Telescope enables it to be completely powered down, but it will retain its star alignment when it is switched back on. The process saves a lot of time and effort.

17. To put the Telescope in Hibernation mode:
    - in the Utilities menu on the hand controller, scroll down to "Hibernate"
    - using the directional arrow keys on the hand controller, slew the Telescope to a position where it will not obstruct the closing of the Observatory roof and press ENTER
    - turn the Telescope off but note that **the Telescope must not be moved when it is in Hibernate, as this will lose the saved star alignment. Similarly, any use of the directional arrow buttons keys on the hand controller while the Telescope is in Hibernate mode will cancel the stored star alignment.**

How to bring the Telescope out of hibernation

18. To bring the Telescope out of Hibernation:

    - Switch on the Telescope and the screen on the hand controller will display "Wake Up".
    - Press ENTER
    - Scroll through the displayed time and site information to check on the current setting and then press ENTER to wake up the Telescope.

[This document was last edited by Peter Crabb on behalf of the Cardiff Astronomical Society on 7th July 2019]