

# The Telescope Dome – Acre Road

The telescope in the main dome is a Meade Schmidt-Cassegrain system. It is equatorially mounted on a concrete pillar. Its chief characteristics are:

diameter	305 mm (12 in)
focal length	3048 mm (120 in, or 10 ft)
focal ratio	$f/10$

It is fitted with drives for right ascension and declination and tracks reasonably well – this being subject to the mechanical setting of the instrument on the pillar (i.e., the alignment of the polar axis). The pointing of the telescope can be controlled by manually or by computer. Once the telescope has been set on a known star, other objects can be directly acquired using the keypad handset or by the computer.

Before using the telescope it is **VERY IMPORTANT** to be aware of three **DO NOTS**. Serious damage (expensive to repair) **WILL** result if these points are not heeded:

- Do not plug/unplug the handset when the telescope is powered up.
- Do not attempt to move the telescope manually in either RA or Dec when the telescope lock-levers are clamped.
- Do not use the ‘Dec manual slow motion’ knob when the telescope is powered up.

## Operating the telescope

There are procedures for running any telescope and it is important to stick to them. They might appear to be over-elaborate, but there are good reasons (usually not explained) behind them. For example, the dome should be opened before the telescope covers are removed; this allows dust (or lurking water drops) to fall without contaminating the optics. It is useful to have the manufacturers manual at hand if you have difficulty following the abstracted instructions below – you will need it in any case for the stellar catalog reference numbers.

There are several local lights and ‘sensored’ floodlights that can be killed if desired (see separate sheet on how to do this).

1. A *Golden Key* is required to open the dome building. With this key, it is unnecessary to disarm the burglar alarm system, although this might already have been done if access has been via the Main Observatory Building.

On entering the dome it is prudent to slide the inside bolt so that the door can only be opened from the inside. Turn off the convector heater, if its was on. It is normally on to prevent condensation within the dome. This means of course that the telescope will be warm, and it will take 30 minutes for the telescope to thermalise and for the seeing conditions to improve to the ‘Glasgow best’.

2. Make sure that the red lights illuminating the upper floor are on – there is a switch on the lower floor. Enter the observing floor by the spiral staircase. Drop the three floor panels to prevent people falling down the stair in the dark. The two outer panels should be closed first, followed by the middle one.
3. The power unit for the telescope is next to the telescope, at the base of the pillar. Switch on the mains and rotate the knob on the power control box to ‘dial’ a few hours of running time. (This system is to prevent the telescope from running for long periods – in case the switch-off procedure is forgotten at the end of the night!).
4. The dome should have been parked so that the slit is on the immediate left at the top of the stair. Pull back the locking bolt (inside/bottom-left of slit) and open the slit by rotating the wheel. Check that the dome can be turned by the electrical control box on the wall – YELLOW or GREEN button, depending on the direction required, RED to stop. To reverse the direction, the dome must be stopped first.
5. Remove the lens/mirror caps from the telescope(s) and place them in a safe place so that they do not get damaged – not on the floor.
6. Slide the drive switch to ON (top right on control block beneath the fork of the telescope mount – make sure that you have not switched the adjacent N/S control for running the telescope in the southern hemisphere). The LEDs at the upper left of the block should illuminate and flicker to show that power is being used by the drive motor. The handset should also indicate that the system is functioning – this takes a few seconds to establish. The telescope can now be slewed N/S/E/W according to the chosen button on the handset.
7. The encoders now need to be set in register. The system’s memory has been set for longitude  $-4^{\circ}18'$  and latitude  $55^{\circ}54'$  and the internal clock should be correct to UTC. There are several ways of setting the encoders. If you are controlling the telescope with a computer, using the ‘Starry Night’ package, the software will allow you to align on any object. Simply slew the telescope to a bright star or planet by hand and then align to the corresponding screen object using a right-hand mouse click (see software instructions for more details). The drives can also be aligned manually as follows:
  - Set the handset to the POLAR menu option.
  - Enter the catalog number of a conveniently placed star (e.g., Star #214 for Vega [ $\alpha$  Lyr]).
  - Centre it as viewed through the telescope eyepiece. This can be done by using, in turn the Slewing, Finding, Centering and Guiding motions.
  - Press and hold the ENTER key until the display reads ‘Co-ordinates Matched’.
  - If the lock-levers to either the RA or Dec are released at any time, the encoders will lose register and the above procedure will be required again. If you are moving from object to object, just prior to the next acquisition, the current object can be used as a reference to ‘refresh’ the encoders – in this way accumulative errors caused by inaccurate setting of the telescope (level, tilt and azimuthal errors) can be minimized.

With a diagonal, images appear correctly orientated up-and-down, but are reversed left-to-right.

## Closing down procedure

At the end of the observing session the telescope should be put to bed and the dome made secure. Essentially, this is the reverse procedure to getting the telescope running.

1. Switch off telescope drive at the equatorial block.
2. Release the lock levers on the RA and Dec and return the telescope to a position approximately pointing to the equator on the meridian – lock both levers.
3. Replace all the covers on the lenses/mirrors.
4. Rotate the timer control to switch off the power to the telescope. Switch off at the wall mains socket.
5. Close the dome.
6. Rotate the dome to be at a position close to the stair.
7. LOCK the dome using the bolt at the inner bottom left. You may have to jiggle the slit with the steering wheel to get a proper location of the bolt.
8. Open the floor above the stair and secure the panels to the wall using the hook and eye retainers.
9. On the ground floor switch off the observing floor lights.
10. Complete the observers' log book.
11. Switch the heater on.
12. Leave the building and lock with the *Golden Key*.