

OffsetPointing & References (Ref1, Ref2)

The reference positions(**Ref1** and **Ref2**) are used to define the coordinates for some offset pointing reference (e.g. background, sky, nearby standard, etc...).

The reference coordinates can be loaded from either the Command position, the current Telescope position or the Command+Offset position. This is selected by clicking on either the Ref 1 or Ref 2 buttons which will bring up a popup menu with these options. The Ref 2 button also allows the additional option of specifying the position relative to Ref 1 under the "Relative Offset from Ref1" selection. After making your selection the appropriate values are loaded into the specified position buffer.

Command - This will load the information on the last object that the telescope was commanded to move to. It also retains information about the object (such as non-sidereal track rates or minor planet motion). When the telescope is sent to this reference position, all of this information will be used to calculate the telescope movement and tracking.

Telescope - This will load the current telescope position into the buffer. No other information is loaded.

Command+Offset - Same as the Command option except the offset coordinates (as displayed on the TCSGUI offset display) are added in.

Relative Offset from Ref 1 - This will bring up a window for the user to specify an offset from the Ref1 position. The offset may be specified as either RA & Dec coordinates or by arcsecs of distance on the sky in which the $\cos(\text{dec})$ factor is accounted for on the RA scale.

Regardless of how it is specified in this window, the location displayed in the Ref 2 buffer will be in RA & Dec and not in absolute arcsecs.

The Ref 2 - Ref 1 can be used in one of two ways. The first/default way is to simply display the difference between the two Ref points. However, you can use this to specify the exact distance Ref2 should be away from Ref1. Clicking on the Ref2 - Ref 1 button brings up a dialog box in which you can specify the distance (in arcseconds) that Ref 2 should be from Ref 1 for each axis. After clicking on OK, Ref 2 will then be updated.

After a reference position has been loaded, a "Go Ref #" will appear next to the "Go Next" button on the top of the TCSGUI. Selecting this button will automatically move the telescope to the specified reference position. Note that it is not necessary to press the "GoNext " button in this case.

The speed at which the telescope moves to a reference position via the "Go Ref #" buttons is controlled by the Reference Rate value. This value may be changed under the Tools->Handpaddle Rates menu. The default speed is 600 arcsec/sec. Large values may cause the telescope to overshoot the location when making small moves.

You may also move to a reference position by loading it into the Next buffer. To load a Ref position into the Next buffer, click on the small down arrow located between the RA & DEC

coordinates of the Ref position. Then click GoNext to move to the specified reference position.

Both Ref1 and Ref2 buttons have a selection called Done & Reset. Choose this selection after you no longer use Ref1 and/or Ref2. Otherwise, the Go Ref # will stay on the top of the TCSGUI until the next time TCSMON is restarted.