

**Institute of Theoretical Physics and Astronomy**

# **Telescope control software**

## **User's guide**

for Moletai observatory  
1.65m and Maksutov telescopes

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## Introduction

This document is a user's guide to operate computer controlled telescopes at Moletai observatory.

The telescope control system is based on two step motor controllers from JVL company (Denmark) and original software, which consists of a number of programs:

telescope – graphical user's interface

tckv – the main program, performs all necessary calculations and interfacing to motor controllers.

correct – performs telescope positioning and movement corrections.

dome - performs dome and telescope position synchronization

fasu – performs filter wheel control and shutter when CCD camera is used.

Encoder – if the telescope has the encoders mounted (in case of 1.65m telescope), the program performs interfacing to the position encoders.

Gpsd – performs system clock synchronization with GPS receiver.

## Starting observations

1. Switch on the telescope power supply.
2. Switch on the telescope control PC.
3. Log in as observer.
4. Launch the program telescope. Upon a successful startup one will be presented with the GUI as shown in fig. 1 and requested programs will be launched.
5. To open the mirror, click on the icon



6. To start hour tracking, click on the icon



7. To enter new target coordinates, click on the icon



and you will be presented with the dialogue window. Fill in and click OK to accept input or Cancel to discard.

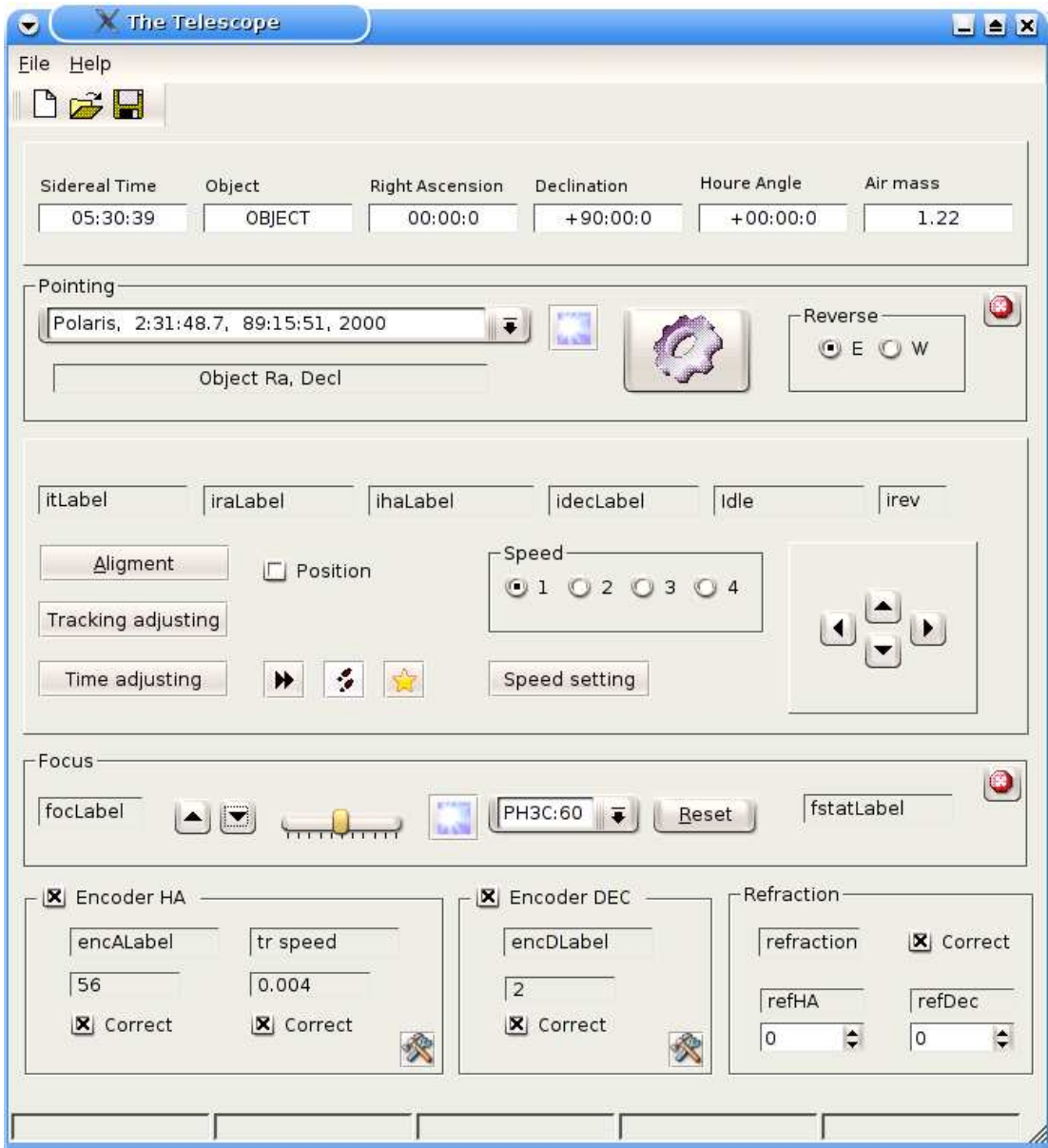


Figure 1. GUI of telescope control program.



8. Click on the icon to point the telescope to newly entered coordinates. During the movement of the telescope some information is displayed on status bar of GUI. The pointing is accomplished when Tracking is indicated. If you need to cancel pointing, click on the icon



## Come to an end...

1. Choose item HOME from the list of coordinates and click on the icon



2. The telescope will move to the position corresponding:  $\alpha=0^{\text{h}} 0^{\text{m}} 0^{\text{s}}$  and  $\delta=55^{\circ}18'$

3. Close the mirror by clicking on the icon



4. Exit the program by choosing File – Exit.

5. Switch off the telescope power supply.

6. Switch off PC.

More details...

See it clear ... or focusing

To change the focus click on

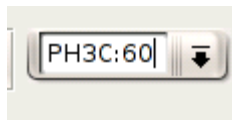


or



and hold down the right mouse button. The current focus value is displayed in the window.

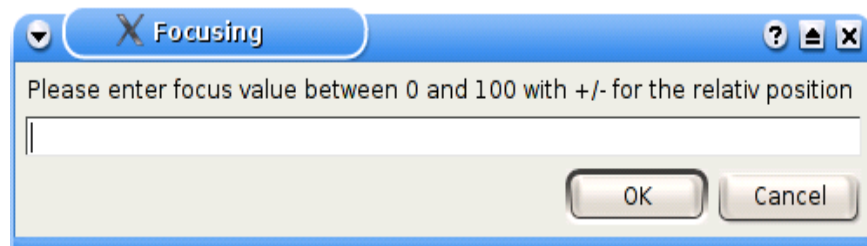
There are some predefined focus positions which can be chosen for a particular instrument. Click on



and choose the required value from the list. If you want to set a specific value of focus, click on

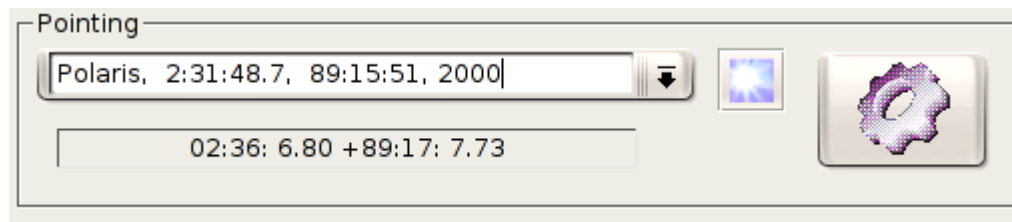


and you will be presented with a dialogue window.



## Using XEphem...

The program can be used together with an interactive astronomical ephemeris program for X window system “Xephem” by E.C. Downey for input of coordinates of celestial objects. Just click on “Telescope GoTo” item on the Xephem menu and the coordinates of the selected object will be entered in.

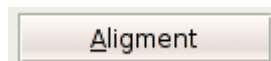


To point the telescope to a newly entered position, click on the gear icon.



## Alignment of the telescope...

In case of Maksutov telescope which currently has no encoders mounted, the procedure of alignment is necessary every time when telescope had been moved manually and after switching power on. Click on



you will be presented with the coordinates input dialogue, fill in and click on OK.

In case of 1.65 m. telescope, this will be done automatically at startup of the program.

## Using the autoquider...

The autoguiding system is based on SBIG CCD camera, which is placed in free space of focal plane of the telescope. To point the CCD camera to a chosen target use the offset knobs and the scale. To make things easier, use one option from GUI which calculates coordinates of the guiding star on the focal plane of the telescope. Click on



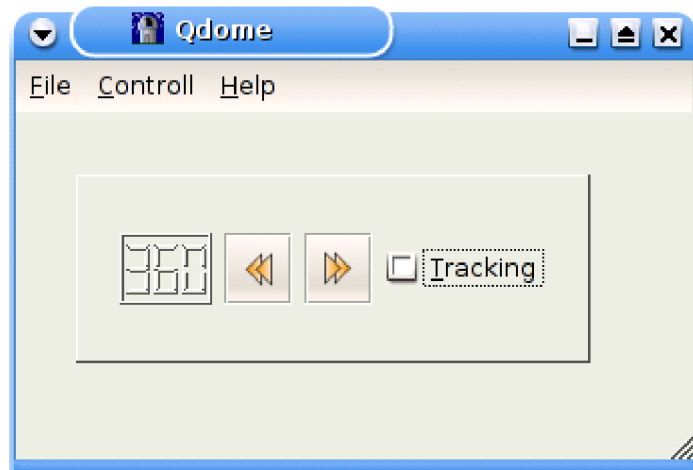
and you will be presented with a dialogue window. To enter guiding star coordinates click on



or use Xephem “Telescope GoTo” command output. Click on “Apply”, and focal plane coordinates X, Y of the guiding star will be calculated for you.

## Synchronizing the dome...

Launch the program qdome. You will be presented with the GUI.



Check “Tracking”. That is all.  
GOOD LUCK!