

# Astro

## Tutorial (draft)

The aim of this tutorial to introduce Astro program functionality and show how to operate with it. It will be done by describing work flow with this program.

### 1. Start program

After successful program start on display appears main window (fig. 1). The main view consists of selected object data and current object position, Time and Date for observer, telescope position, manual control panel and telescope panel with additional information.

The screenshot shows the 'AstroLab' application window. It features a menu bar with 'Object' and 'Tools'. The main area is divided into several panels: 'Object' (with fields for Star name, epoch 2000, Now, Right ascension, Declination, Altitude, Rise time, Hour angle, Set time), 'Positioning' (with Current and Set point columns for Right ascension, Declination, and Focus), 'Control' (with input fields for Right ascension, Declination, and Focus, and buttons for Manual, Move, and directional controls), 'Time&Date' (showing Local Time, Greenwich Time, Julian Day, and Sidereal time), and 'Telescope' (showing Temp in tube, Temp under tube, chair pos, and Kupol). A status bar at the bottom indicates 'Program starts'.

Object		
Star name	epoch 2000	Now
Right ascension		
Declination		
Altitude	Rise time	
Hour angle	Set time	

Positioning		
	Current	Set point
Right ascension	0:52:56.48	0:52:56.48
Declination	-0:42:17.1	-0:42:17.1
Focus	0.3	0.1

Control		
Right ascension	<input type="text"/>	↑
Declination	<input type="text"/>	← ↓ →
Focus	<input type="text"/>	- +
Manual	Move	h ' "

Time&Date	
Local Time	EEST 21:08:20
Greenwich Time	2011/9/12 18:08:19
Julian Day	2455817.25579
Sidereal time	19:19:47.06

Telescope	
Temp in tube	25.2
Temp under tube	21.2
chair pos	home
Kupol	somewhere

Program starts

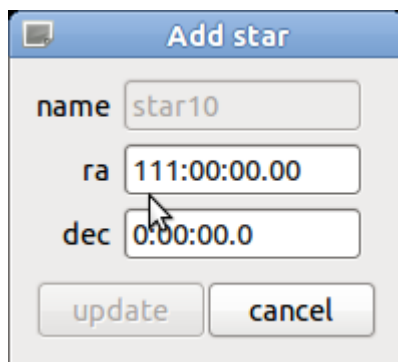
Fig 1: Main view

## 2. Object (star) adding, editing

You can add new object to database through menu Object/Edit Objects or by using shortcut ctrl+e. Dialog window should appear on the main view (fig. 2)

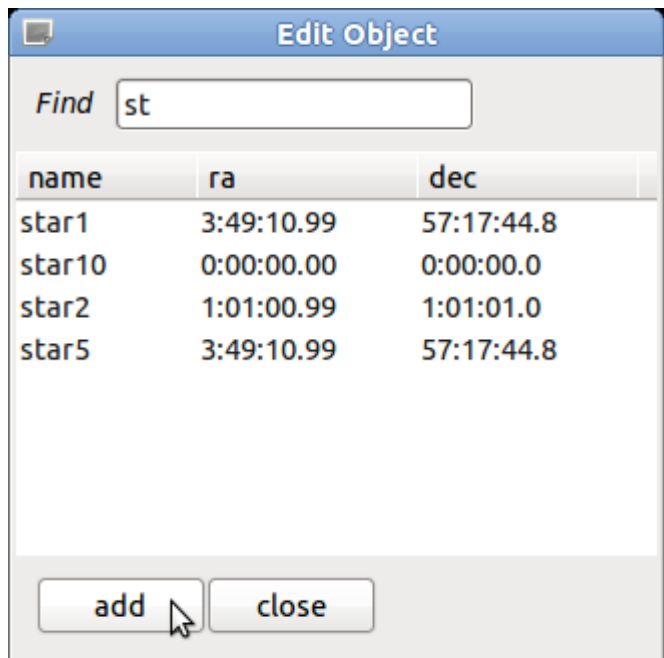
Find field filters search result set by input.

You can add new object by pressing Add button or edit selected object by double click on star name (fig. 3). For coordinate input forming colon separation is used. For example degrees coordinate 10:10:10 means 10 deg 10 min 10 sec.



The 'Add star' dialog box has a title bar with a close button. It contains three input fields: 'name' with 'star10', 'ra' with '111:00:00.00', and 'dec' with '0:00:00.0'. A mouse cursor is pointing at the 'ra' field. At the bottom are 'update' and 'cancel' buttons.

Fig 3: Object update



The 'Edit Object' dialog box has a title bar with a close button. It features a 'Find' input field with 'st'. Below is a table with columns 'name', 'ra', and 'dec'. The table contains four rows: 'star1', 'star10', 'star2', and 'star5'. At the bottom are 'add' and 'close' buttons. A mouse cursor is pointing at the 'add' button.

name	ra	dec
star1	3:49:10.99	57:17:44.8
star10	0:00:00.00	0:00:00.0
star2	1:01:00.99	1:01:01.0
star5	3:49:10.99	57:17:44.8

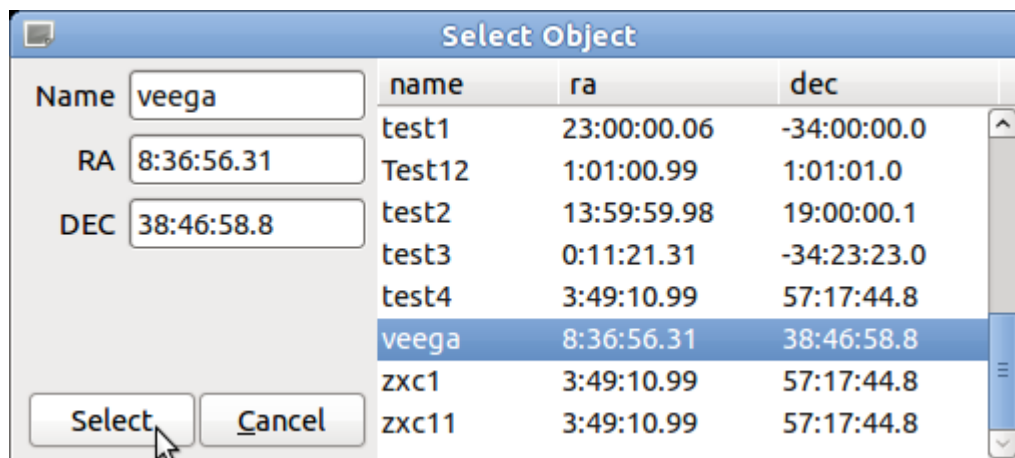
Fig 2: Edit dialog

If coordinate input is wrong Update button become inactive. After pressing update changes will be written into database immediately.

Also you can delete object by selecting object and pressing del button on the keyboard.

## 3. Object (star) selection

You can select observation object through menu Object/Select Object or by using shortcut ctrl+o. Dialog window should appear on the main view (fig. 4). The result list is filtering dynamically by inputted name.



The 'Select Object' dialog box has a title bar with a close button. It contains three input fields: 'Name' with 'veega', 'RA' with '8:36:56.31', and 'DEC' with '38:46:58.8'. Below these is a table with columns 'name', 'ra', and 'dec'. The table contains eight rows, with 'veega' highlighted. At the bottom are 'Select' and 'Cancel' buttons. A mouse cursor is pointing at the 'Select' button.

name	ra	dec
test1	23:00:00.06	-34:00:00.0
Test12	1:01:00.99	1:01:01.0
test2	13:59:59.98	19:00:00.1
test3	0:11:21.31	-34:23:23.0
test4	3:49:10.99	57:17:44.8
veega	8:36:56.31	38:46:58.8
zxc1	3:49:10.99	57:17:44.8
zxc11	3:49:10.99	57:17:44.8

Fig 4: Object selection

Selection can be done by pressing Select button or by double click on star name. You also can add new object if you will put unique star name and correct coordinates into fields.

#### 4. Selected object information

After object selection main view will apply selected object coordinates and show detail information about its current position (fig. 5).

The coordinates (ra, dec) for epoch2000 and current epoch will be displayed in Object panel.

Also telescope altitude and hour angle will be shown.

For every object program tries to calculate Rise and Set times, if it not possible the always or never state will be shown (star is always visible or never sets).

The screenshot shows the 'AstroLab' application window. The 'Object' panel displays information for the star 'veega'. It shows coordinates for epoch 2000 and the current epoch (Now). The 'Time&Date' panel shows local time, Greenwich time, Julian day, and sidereal time. The 'Telescope' panel shows temperature in and under the tube, chair position, and kupol position. The 'Positioning' panel shows current and set point coordinates and focus. The 'Control' panel has input fields for Right ascension, Declination, and Focus, along with directional buttons and a 'Move' button. The 'Program starts' panel is at the bottom.

Object		
Star name	veega	
	epoch 2000	Now
Right ascension	8:36:56.31	8:37:42.09
Declination	38:46:58.8	38:44:23.5

Altitude		Rise time	
7:44:45.9		always	
Hour angle		Set time	
11:06:52.04		always	

Positioning		
	Current	Set point
Right ascension	0:52:56.48	0:52:56.48
Declination	-0:42:17.1	-0:42:17.1
Focus	0.3	0.1

Control		
Right ascension	<input type="text"/>	↑
Declination	<input type="text"/>	← ↓ →
Focus	<input type="text"/>	- +
<input type="button" value="Manual"/>		<input type="button" value="Move"/>
		h ' "

Program starts

Fig 5: Selected object info

## **5. Automate telescope moving**

After object selected and if object is “visible” for telescope in PC mode you can start to automate moving by pressing Move button. The aim position will be shown in Positioning panel, you can also track telescope current position by using this panel.

## **6. Manual mode**

Astro program supports two main modes: auto and manual.

If manual control is needed, you can catch control by selection Manual mode (Auto/Manual button).

In control panel you can manually move telescope by using keyboard arrows or corresponding buttons.

## **7. Time & Date panel**

Time and Date panel shows local time, Greenwich time, Julian date and Sidereal time (GST not LST)

Interface is totally translatable in can be translated into any language.