

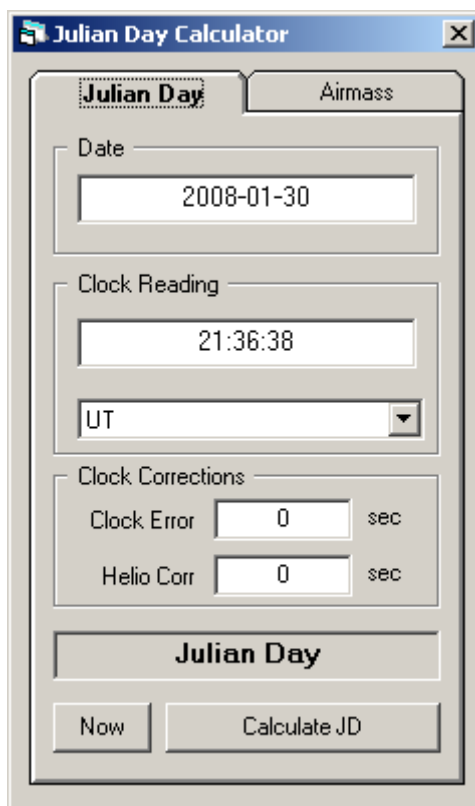
# Julian Day Calculator

## Computes Julian Day and other astronomical values.

The Julian Day Calculator computes the Julian Day number and fraction, given the date, time, and time zone. It replicates the time system used in the photometry tools.

Julian days are the number of days and fractional days counted from noon on the first day of the year 4713 BC at the longitude of Greenwich, England. Julian Day begins at noon (rather than midnight).

Julian days are used in astrometry and photometry because you can find the time interval between two observations by subtracting one Julian day from another.



The image shows a screenshot of a software window titled "Julian Day Calculator". The window has two tabs: "Julian Day" (which is selected) and "Airmass". The "Julian Day" tab contains several input fields and buttons. At the top, there is a "Date" field with the text "2008-01-30". Below that is a "Clock Reading" field with the text "21:36:38". Underneath the clock reading is a dropdown menu currently set to "UT". Below the dropdown are two "Clock Corrections" fields: "Clock Error" and "Helio Corr", both with the value "0" and the unit "sec". At the bottom of the window, there is a large button labeled "Julian Day", and below that, two smaller buttons labeled "Now" and "Calculate JD".

### Julian Day Tab

**Date** This is the date in the format used in the FITS header file.

**YYYY-MM-DD** Enter the year, month, and day in YYYY-MM-DD format, then press the enter key.

**Clock Reading** This is the time in the format used in the FITS header file.

**HH:MM:SS** Enter the hour, minutes, and seconds in HH:MM:SS format, then press the enter key.

**Time Zone** Select the time zone of your clock reading. If your computer's clock reads in UT,

select UT. If it reads in local standard time or local daylight time, use the corresponding setting.

**Clock Corrections** There are correction that should be applied to the clock reading.

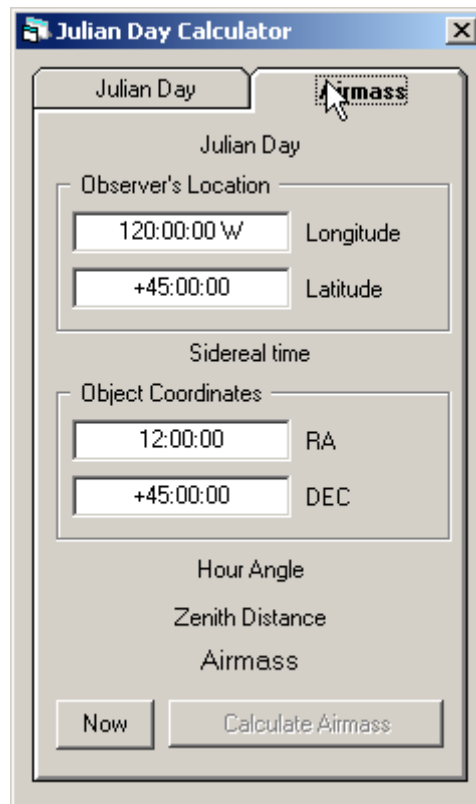
**Clock Error** Enter the error in seconds in your clock's reading. If the true time is greater than the clock time, this value will be positive. If you use a time service such as Dimension 4 to set your computer's clock, this value will normally be zero.

**Helio Corr** This is the heliocentric correction in seconds. This corrects the time of observation on the moving Earth for the offset caused by the speed of light, to the Julian Day at the center of the Sun. Unless you are working on a project that requires Heliocentric Julian Day, this value should be zero.

**Julian Day** This output box displays the Julian Day. More than 2.4 million days have passed since JD zero. The Julian Day Calculator gives the day to five decimal places; for a time resolution of about 1 second. The Julian Day number of 2000 January 1 at 7:14:21 UT is **2451544.80163**.

**Now** Enter your computer's current date and time in YYYY-MM-DD and HH:MM:SS format.

**Calculate JD** Computes the Julian Day.



The image shows a screenshot of a software window titled "Julian Day Calculator". The window has a blue title bar with a close button (X) on the right. Below the title bar, there is a tab labeled "Julian Day" and a button labeled "Airmass". The main content area is divided into several sections:

- Julian Day**: A label above a large empty text box for the result.
- Observer's Location**: A section containing two input fields: "Longitude" with the value "120:00:00 W" and "Latitude" with the value "+45:00:00".
- Sidereal time**: A section containing two input fields: "RA" with the value "12:00:00" and "DEC" with the value "+45:00:00".
- Hour Angle**: A label above an empty text box.
- Zenith Distance**: A label above an empty text box.
- Airmass**: A label above an empty text box.
- Buttons**: At the bottom, there are two buttons: "Now" and "Calculate Airmass".

## Airmass Tab

Julian Day Displays Julian Day using the settings on the Julian Day Tab.

**Observers' Location** Enter your longitude and latitude.

**Longitude** Enter in DDD:MM:SS.ss W format, then press the enter key.

**Latitude** Enter in +DD:MM:SS.ss fomrat, then press the enter key.

**Sidereal Time** Displays the sidereal time at the observer's location.

**Object Coordinates** Enter the RA and DEC of an object.

**RA** Enter the RA in HH:MM:SS format, then press the enter key.

**DEC** Enter the DEC in +DD:MM:SS.ss format, then press the enter key.

**Hour Angle** Displays the object location EAST (-) OR WEST (+) of the local meridian in decimal hours.

**Zenith Distance** Displays the distance from the object to the zenith in decimal degrees.

**Airmass** Display the airmass (the thickness of atmosphere between the object and outer space). At the zenith, the airmass is 1.00.

**Now** Computes all of the quantities above for your computer's current date and time.

**Calculate Airmass** Computes all of the quantities above for the date and time set on the Julian Day Tab.

## JD check values:

1859-11-17 00:00:00 UT= 2400000.5

1900-01-01 00:00:00 UT= 2415020.5

2000-01-01 12:00:00 UT= 2451545.0