

Installation

To get Planetarium up and running you need to:

1. Download the Planetarium archive [planet20.zip](#) (if you have not already)
2. [Unzip](#) the files contained in planet20.zip
3. Decide [which files](#) you want to install
4. [Install](#) the files on your PDA device
5. Start Planetarium and [enter the registration code](#) (if you have purchased Planetarium, otherwise the program runs as demo version)

If you upgrade from a previous version:

You may decide not to install these files:

- PlanetariumDB.pdb - the location list
- UserObjsDB.pdb - the objects list
- PlnCometsDB.pdb - comets and asteroids

If you have entered personal locations you should not install the file PlanetariumDB.pdb. If you want to install it, export your personal locations to a memo so that you can reimport them after installing the file. (See the chapter "[Databases](#)" for more details.)

If you have entered user objects yourself, you should not install the file UserObjsDB.pdb. If you want to install it, export your personal objects to a memo so that you can reimport them after installing the file. (See the chapter "[Databases](#)" for more details.)

This is a list of errors that were corrected in the last release. You can enter them manually:

- M25 is IC4725 (not NGC)
- M82 had the wrong icon. It should have the same icon as M81
- in the double star list omicron dra should have ra/dec of 18h51m / 59.4
- C89 is NGC6087 (not NGC6067)

If you have entered orbital elements for comets and asteroids you should export your personal entries to a memo so that you can reimport them after installing the file PlnCometsDB.pdb. (See the chapter "[Databases](#)" for more details.)

Notes about installing Planetarium on a memory card or memory stick

- You can only install the file planet20.prc on the memory card.
- All the other files (PlnStarsXXXX.prc, PlanetariumDB.pdb, UserObjsDB.pdb, PlnCometsDB.pdb) must stay in main memory.

Exception to this rule:

You can install the following files into the memory card, if you do NOT intend to add data to them:

- PlanetariumDB.pdb - Location list
- UserObjsDB.pdb - Deep Sky Objects
- PlnCometsDB.pdb - Comets and Asteroids

If these files reside on the card only but not in main memory they will be copied to main memory together with planet20.prc each time you start the application and will be discarded when you stop the application. So if you add new entries, they are discarded as well. The files will be copied again from the card at the next start. (Please note, you need the files from the latest release (v2.2). Files from older versions do not get copied along with the application).

This copying takes place only if you don't have the files installed in main memory. If you have them installed in main memory and on the card, they won't be copied.

If you wish to enter a new location, a new comet or a new object, you need to move the files to the main memory. If you just want to read from them, you can move them to the card and remove them from main memory.

Download Planetarium

You can download Planetarium from the following web site:

<http://www.aho.ch/pilotplanets/release.htm>

You will also find information about the latest release there and you can join a mailing list to get notified when new versions are available. Current data is also posted on this site.

Unzip the archive

If you are familiar with zip files, you might want to [skip](#) this paragraph.

A zip file contains several other files in compressed format. Storing files this way has advantages: a) They are all grouped together. You just download one file and have everything you need. b) They are stored in compressed form and therefore need less download time. c) The zip file contains a checksum. Should there be an error during transmission, you would get notified about it.

The zip format is widely used. If you plan to download other software from the internet in the future, you will need to know how to "unzip" a file. However, if you haven't ever unzipped a file and don't want to go through this, you can ask the author of Planetarium to send you the files in uncompressed form as an e-mail attachment: planets@aho.ch

To extract the contents of a zip file you need a special program.

On Windows you could use WinAce from <http://www.winace.com> or alternatively WinZip from <http://www.winzip.com>.

If you have a Macintosh you could use "ZipIt" from <http://www.maczipit.com>.

Please read the instructions that come with these programs on how to use them.

Which files to install

planet20.zip contains the following files:

- Planet20.prc - The main executable application file.
- PlnStars1600.prc - The small star data base.
- PlnStars9096.prc - The big star data base.
- PlanetariumDB.pdb - A list of 600 Major cities.
- UserObjsDB.pdb - A list of about 200 deep sky objects.

- PInCometsDB.pdb - A list of some comets and asteroids.

You need to install at least the file Planet20.prc and either PInStars1600.prc or PInStars9096.prc. All the other files are optional.

- PInStars1600.prc contains data of about 1600 stars down to magnitude 5. Choose this file if you don't have very much free memory or don't need faint stars in the program.
- PInStars9096.prc contains data of the complete Yale Bright Star Catalogue with 9096 stars down to magnitude 6.5. Choose this file if you have enough free memory and would like to have fainter stars in the program.

You can switch the star data base later by just installing the other one of them.

The data base files correspond with the following lists in the program:

- PlanetariumDB.pdb - The Location Pick list (Menu item "Options / Set Location", then tap the "Pick" button)
- UserObjsDB.pdb - The Objects list (Menu item "Options / Objects")
- PInCometsDB.pdb - The Comets and Asteroids list (Menu Item "Options / Comets and Asteroids")

The data in these lists is backed up during HotSync every time you have made changes or entered new data. To fill some or all of these lists with initial data you can install the corresponding .pdb files from planet20.zip. They contain:

- PlanetariumDB.pdb - About 600 major cities from all over the world.
- UserObjsDB.pdb - 110 [Messier](#) objects and 110 [Caldwell](#) objects.
- PInCometsDB.pdb - Some comets and asteroids.

If you have a GPS and a cable to connect it to your Palm, Planetarium can get the current location directly from the GPS. To enable this feature, you'll need to download and install the file GPSNMEA.prc. You can read more about this on the page "[Connecting a GPS](#)"

If you have a computer controlled telescope and a cable to connect it to your Palm, Planetarium can show you the sky section where the telescope is pointing at or steer the telescope to a given object. To enable this feature, you'll need to download and install the appropriate plug-in file. You can read more about this on the page "[Connecting a Telescope](#)".

Installing the files on the PDA

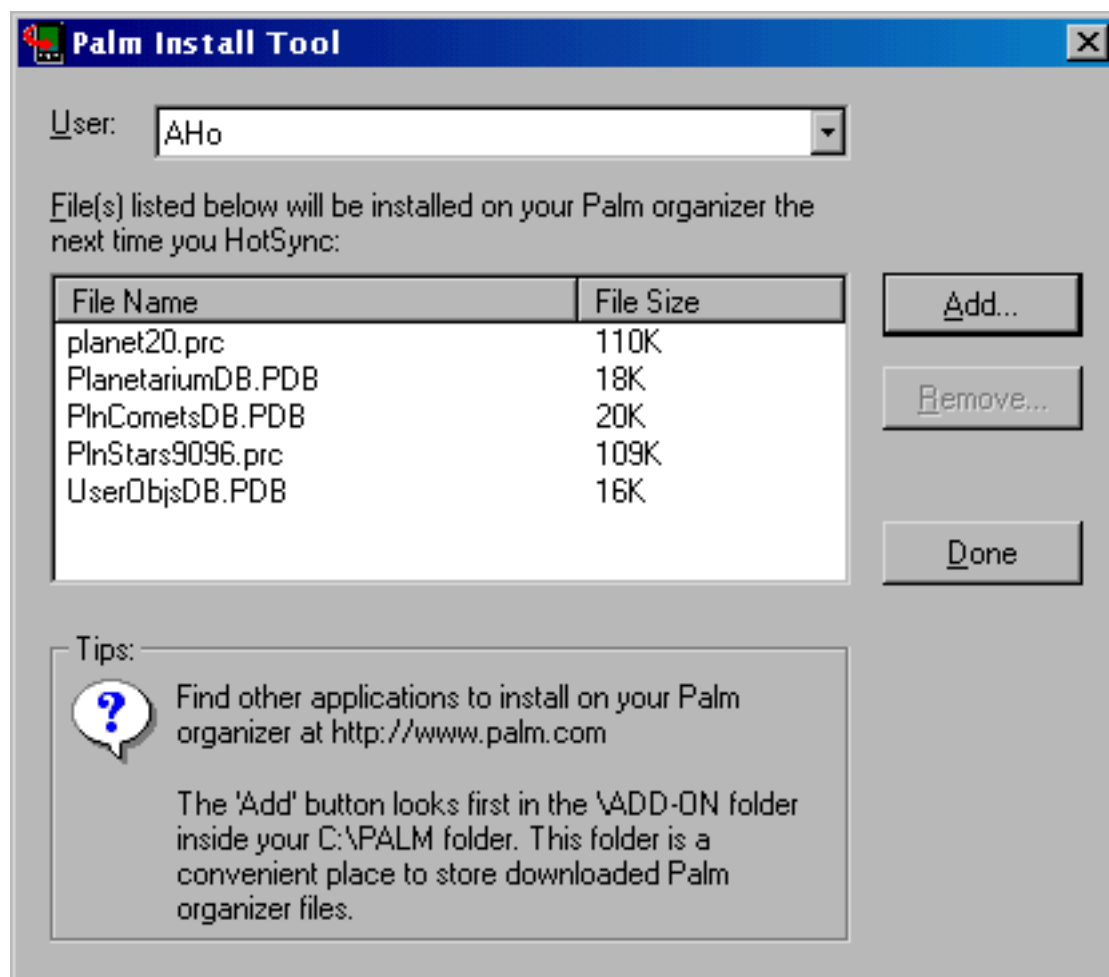
If you are familiar with installing files, you might want to [skip](#) this paragraph.

To install these files onto your PDA, please have a look at your documentation that came with your device. There should be a chapter explaining how applications are installed.

For very novice users, this is a little bit more detailed (I cannot give you completely detailed instructions on this here because it depends on the device and brand, but in general it works like this):

1. Start the Palm Desktop Application on the PC or Mac.
2. Select the "Install" function.
3. Select one or more .prc and .pdb files and prepare them for installation.
4. During the next HotSync they get transferred to your Device.





Entering the registration code

If you have purchased Planetarium you should have received a registration code. If you don't have this registration code, Planetarium just runs as demo version. When you enter the registration code, Planetarium will get converted into the full version.

To enter the registration code you got, select the menu item "Info / Register" or press the "Enter Key" button on the startup screen.

Enter the registration code without any blanks or quotes.



Tap on the "OK" button. If you have entered the key correctly, you will get a confirmation.



Planetarium runs as full version which you can convince yourself of in the About screen (menu item "Info / About")



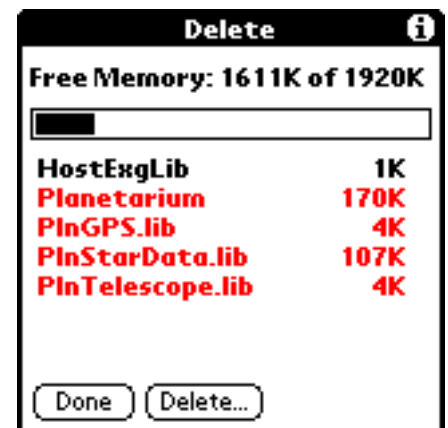
For very novice users: To select a menu item you tap on the lower left silk screen button just at the left of the graffiti area. Then you should see the menu bar at the top of the display. You now select with the pen one of the items from this menu.



Deinstallation

If you wish to deinstall Planetarium, please delete the following items from your Palm:

- Planetarium - The Planetarium main executable and the data bases
- PlnStarDataLib.lib - The star database
- PlnGPS.lib - If you have installed the GPS connection feature
- PlnTelescope.lib - If you have installed the Telescope connection feature



Introduction / First steps

This chapter helps you getting started after you have successfully installed Planetarium on your Palm. It shows you how to enter your location and gives you a short explanation of the two main views.

- [Entering the location](#)
- [Compass view](#)
- [Sky view](#)
- [Twilight](#)

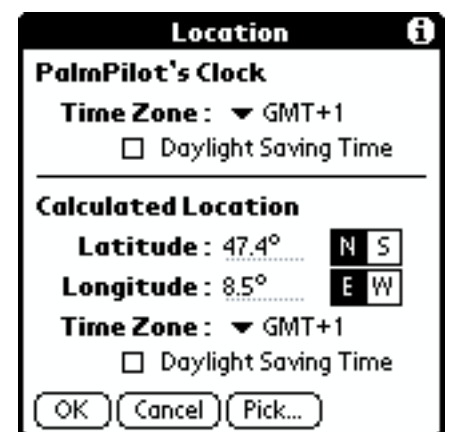
Entering the location

In order to calculate the sky for your place, you first need to enter the coordinates of your location. Select the menu item "Options / Set Location" or tap on the location text at the lower left to get to the Location screen.

The Location screen is divided in an upper and a lower part.

In **the upper part** you enter the time zone your Palm's clock is currently set to. Planetarium uses this entry to calculate UTC (Universal Time Coordinated, the time in Greenwich) which is the base for calculating astronomical events. Example: If you live in San Francisco and your Palm is set to Pacific Time, set this entry to GMT-8. If you travel to New York and adjust your Palm's clock to Eastern Time, change this entry to GMT-5, always keep it according to the time zone your Palm's clock is set to.

The Daylight Saving Time (DST) switch adds one hour to the time zone. Check this box during summer when you observe daylight saving time and uncheck it during winter. Please note: Planetarium can not automatically calculate the transition dates for DST, so you need check and uncheck this switch manually every time you adjust your Palm's clock to summer or winter time.




In **the lower half** you set the location you want Planetarium to calculate the sky for. Look up the coordinates in an atlas or on the [web](#) or tap on the "Pick" button to choose a location from the list. You also enter the time zone of that location. Planetarium uses this value to calculate events like sun rise for example in local time for that location. The DST switch works the same as above, check it if the specified location currently has daylight saving time in effect, uncheck it otherwise.

Are you confused with the two time zone settings? Don't worry. If you use Planetarium to calculate the sky for the place you currently are and you have set the Palm clock to the time zone of your current location, these two entries are the same. Example: If you live in San Francisco and have set your Palm's

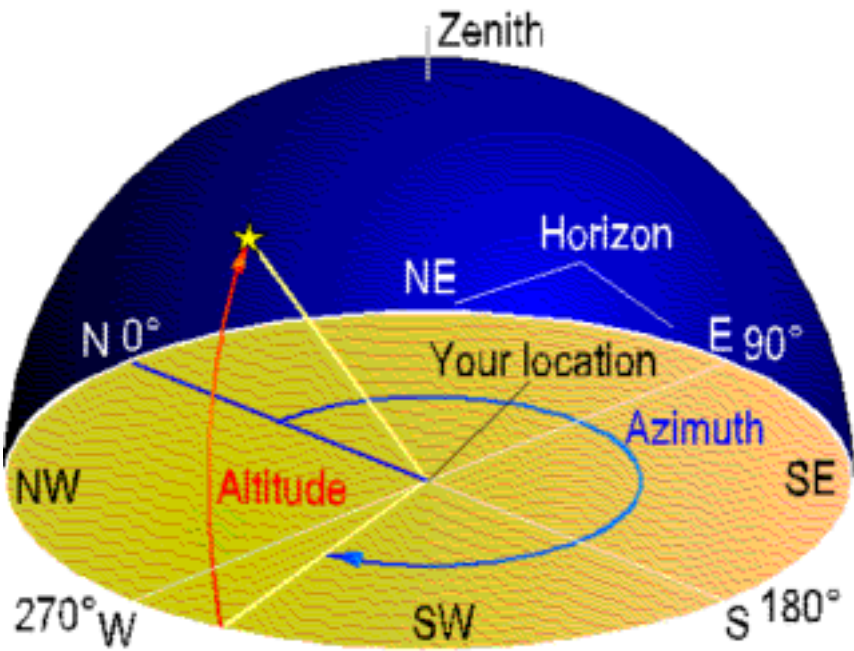
clock to Pacific Time, set both entries to GMT-8. Check or uncheck both DST switched according to the season. Then you need to enter latitude and longitude of San Francisco and you're set.

Compass view

Now select the menu item "Options / Compass view" to get to compass view.

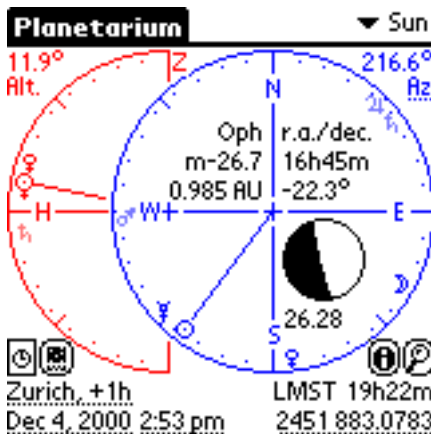
Make sure the "Now" button  is active (white clock on dark background). When the "Now" button is active, Planetarium uses the current time from the Palm's clock.

In Compass view, the information for celestial objects is given in **azimuth** (the horizontal angle between north and the direction of the object, counted eastwards) and **altitude** (the vertical angle between the horizon and the height of the object). Azimuth is measured in degrees, counted eastwards. Altitude is also measured in degrees, 0° is at the horizon, 90° is at the zenith. Negative values are below horizon.



These two values are shown graphically. The circle at the right of the display shows the azimuth of the objects on a compass scale. To use this dial, turn the Palm Organizer so that 'N' points to the north. (If you don't know where north is, try to turn the Palm so that the Sun or the Moon icon points to the Sun or to the Moon. During the night you could also try to find Polaris if you are in the northern hemisphere).

The semicircle on the left shows the altitude. Hold your Palm Organizer upright so that 'Z' points to the zenith. Objects below the horizon line 'H' are not visible at the specified time and location.



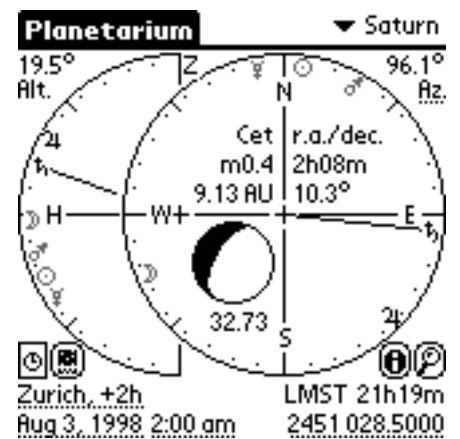
With the selector at the upper right you can choose the Sun, the Moon or a planet as the current object. The current object has lines drawn from the center and the various numbers are data for the current object. You can also select any other object as the current object by tapping the button with the magnifying glass icon.

Many people find it difficult to estimate the altitude of an object on the sky. This is a simple trick to improve these estimates.




Example:

In this example you can see in the left semicircle that Jupiter and Saturn are well above the horizon. In the right circle you find their direction: Jupiter is southeast and Saturn is in eastern direction. The Moon is in western direction and therefore about to set. In the left display we find that it has just crossed the horizon.



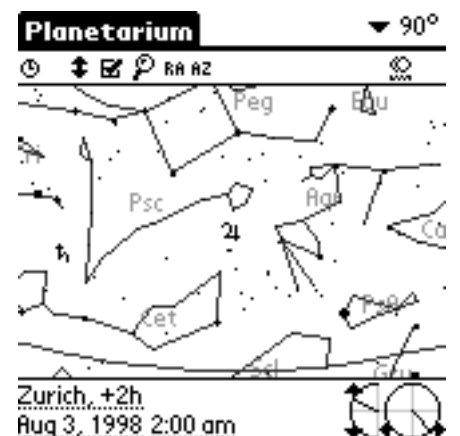
Sky view

Now change to Sky view by tapping the  button or selecting "Options / Sky View" from the menu. The sky view shows a camera-like image of the sky with the stars and planets as it can be seen at the specified location and time.


This picture shows the sky for the same place and the same time as above when looking in southeastern direction. The line marks the horizon. The display covers a field of view of about 90°.


The two dials at the lower right indicate the view direction. The principle behind them is the same as in Compass view: The left semicircle shows the altitude of the center of the sky map, the right circle shows the azimuth. You can tap on them to quickly set the view direction.

You can use the pen to tap on any object to select it and show its name. The selected object will be marked with a crosshair and information about it will be displayed on the bottom lines.





If you drag the pen to move the sky map: Place the pen somewhere on the display and move it a little. The crosshair will change to a four arrows symbol. Then drag the pen where you want to move your starting point to and lift it.

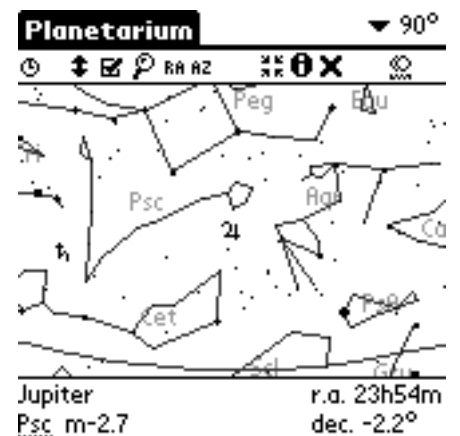
Sky view also has a "Now" button: The leftmost button  on the tool bar just below the title bar.

The Info button  only appears when an object is selected. It will show an information page about the object.

To search for an object tap on the Find button .

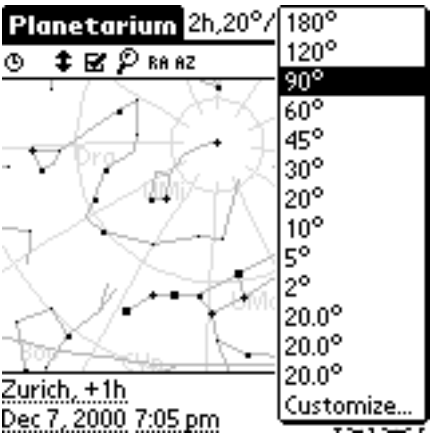
The Settings button  leads you to the [Sky View Settings screen](#) where you can specify what you want to see in the sky map.

The  button brings you back to compass view.



You can zoom in and out with the pull down list at the upper right. The number indicates the size of the field of vision.

You can use graffiti strokes to set the view direction quickly: Write "N", "E", "S" or "W" to select north, east, south or west. Write "0", "1", ..., "9" to select an altitude of 0°, 10°, ..., 90°.



Twilight

Select the menu item "Options / Twilight" to get to the twilight screen.

The twilight screen shows:

- Sun rise and set
- Moon rise and set
- Twilight times

Civil, Nautical and Astronomical twilight are defined as the times when the Sun is 6°, 12° and 18° below the horizon respectively. Roughly speaking,

- Civil twilight is when it's getting dark somewhat and you should switch on the lights of your car.
- Nautical twilight is when it gets dark enough for the brightest stars to be visible in the sky, which was important for nautical purposes, hence the name.
- Astronomical twilight is when it gets dark enough to observe even the faintest objects.

Planetarium			
Zurich, +2h		Dec 4, 2000	
	Rise	Trans	Set
Sun	8:56a	1:16p	5:36p
Moon	2:32p	7:59p	*1:36a
		*following day	
Day/Night Length	8h40m	15h20m	
Twilight	Morning	Evening	
Civil	8:21a	6:11p	
Nautical	7:42a	6:50p	
Astronomical	7:05a	7:27p	
Compass view		Sky view	

Now you have completed your first steps with Planetarium. To learn more about the capabilities of the program, please read the other chapters of the manual.

Registration

About shareware

Shareware is a marketing method, not a type of software or even strictly just a distribution method. When software is marketed through normal retail channels, you are forced to pay for the product before you've even seen it. The Shareware marketing method lets you **try a program before you buy it**. Since you've tried the program, you know whether it will meet your needs before you pay for it. A Shareware program is just like a program you find in major stores, catalogs, and other places where software is purchased; except you get to use it, on your own computer, before paying for it.

The Planetarium demo version

The Planetarium software you find on the internet is fully functional. If you install it on your Palm it will run as demo version and will give you plenty of time to try it out and check if you like it. After a while it will begin to show a remainder screen at program start to convince you either to register it or to remove it again from the Palm. If you decide to register, you will receive a registration code which you enter into the program. This will convert the program into the registered version and disable all remainder screens.

Why register?

When you register you will get a registraion code you can enter into Planetarium that disables the reminder screens, so you can fully enjoy the program. The shareware fee is not very high compared to the amount of functionality you get. We are not a big company with high administrative overhead. This allows us to give you the software for a very competitive price (\$24). However, we need some revenue to be able to continue developing software and supporting our users.

Where to buy

Please visit <http://www.aho.ch/pilotplanets/register.htm> for a list of sales points.

Join the mailing list

If you would like to be notified about new releases you can join the [Planetarium mailing list](#).

Setting the location

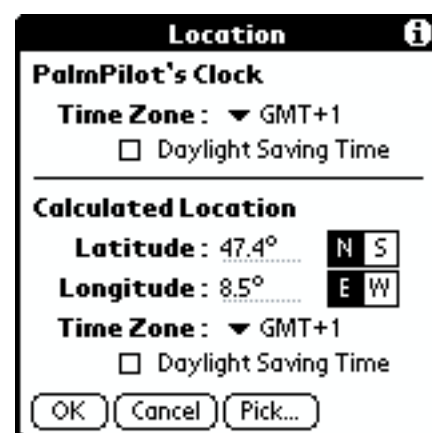
The Location Screen

In order to calculate the sky for your place, you first need to enter the coordinates of your location. Select the menu item "Options / Set Location" or tap on the location text at the lower left to get to the Location screen.

The Location screen is divided in an upper and a lower part.

In **the upper part** you enter the time zone your Palm's clock is currently set to. Planetarium uses this entry to calculate UTC (Universal Time Coordinated, the time in Greenwich) which is the base for calculating astronomical events. Example: If you live in San Francisco and your Palm is set to Pacific Time, set this entry to GMT-8. If you travel to New York and adjust your Palm's clock to Eastern Time, change this entry to GMT-5, always keep it according to the time zone your Palm's clock is set to.

The Daylight Saving Time (DST) switch adds one hour to the time zone. Check this box during summer when you observe daylight saving time and uncheck it during winter. Please note: Planetarium can not automatically calculate the transition dates for DST, so you need check and uncheck this switch manually every time you adjust your Palm's clock to summer or winter time.



In **the lower half** you set the location you want Planetarium to calculate the sky for. Look up the coordinates in an atlas or on the web (see below) or tap on the "Pick" button to choose a location from the list. You also enter the time zone of that location. Planetarium uses this value to calculate events like sun rise for example in local time for that location. The DST switch works the same as above, check it if the specified location currently has daylight saving time in effect, uncheck it otherwise.

Are you confused with the two time zone settings? Let's make a few examples:

- If you live in San Francisco and have set your Palm's clock to Pacific Time, set both time zone entries to GMT-8 and enter the coordinates of San Francisco.
- If you want to know when the sun rises in Berlin, set the lower time zone to GMT+1 and enter the coordinates of Berlin, leave the upper time zone.
- If you make a short trip to Denver and leave your Palm's clock setting, leave the upper time zone. Just enter the coordinates of Denver and set the lower time zone setting to GMT-7.
- If you make a business trip to New York and change your Palm's clock to Eastern time so that the Palm shows local time there, adjust the upper time zone to GMT-5. Then enter the coordinates of New York and set the lower time zone to GMT-5

There are several ways to set the coordinates

- Look them up in an atlas or on the web and enter them manually.
These are a few web sites where you can look up the coordinates for your town:

(Please report broken links to planets@aho.ch)

- <http://www.astro.com/cgi-bin/atlw3/aq.cgi?&lang=e>
- <http://www.heavens-above.com/countries.asp>
- <http://www.mapblast.com/myblast/index.mb>
- <http://fat-albert.alexandria.ucsb.edu:8827/gazetteer/>
- http://shiva.pub.getty.edu/tgn_browser/
- (USA only) <http://www.zipinfo.com/search/zipcode.htm>
- Tap on the "Pick" button to choose a location from the list. This brings you to the Location Pick List. Choose a category at the upper right, select a location and tap the "OK" button.
If the location pick list is empty, either install the file PlanetariumDB.pdb which came with the program and contains about 600 major cities, or enter data yourself, or import data from a text file. Please find more details with the description of the [Location Pick List](#).
- If you have installed the [GPS connection](#) plug-in, switch on your GPS and connect it to the Palm, press the "GPS" button and wait until the data is transferred.

Location Pick List		▼ Europe
Florence	43.8°N, 11.3°E	↑ ↓
Frankfurt	50.1°N, 8.7°E	
Geneva	46.2°N, 6.2°E	
Genoa	44.4°N, 9.0°E	
Gibraltar	36.1°N, 5.4°W	
Glasgow, Scot	55.9°N, 4.3°W	
Gomel	52.4°N, 31.0°E	
Göthenburg	57.7°N, 12.0°E	
Graz	47.1°N, 15.5°E	
Grenoble	45.2°N, 5.7°E	
Hamburg	53.5°N, 10.0°E	
<input type="button" value="OK"/> <input type="button" value="Cancel"/> <input type="button" value="New"/> <input type="button" value="Details..."/>		

Location i

PalmPilot's Clock


Time Zone : ▼ GMT+1
☐ Daylight Saving Time

Calculated Location

Latitude : 47.4° N S
Longitude : 8.5° E W
Time Zone : ▼ GMT+1
☐ Daylight Saving Time

Setting the time

There are three ways to change the time the sky map or compass info is calculated for:

- The "Now" button .
If the now button is active (white clock on dark background) Planetarium uses the current time from the Palm clock and updates the display every minute.
- Set the date or time manually. Choose the menu items Options/Set Date and Options/Set Time or just tap on the date and time text at the lower left to open the date and time entry screens. You can set the date and time to any value in the range of the Palm calendar (years 1904 to 2031).
- Use the Page up/down scroll buttons. Each press of these buttons adds or subtracts a given value to the current time. This way you can step through the time and observe the sky interactively. Use the menu 'Time Increment' to select the appropriate time step. The odd numbers are multiples of 23h56m (one sidereal day) and are useful for studying planetary motions in Sky view because the stars stay at their positions after each step.



The Menu

The **Options** menu has the following items:

- Set Location - Set your current location
- Set Date - Set the date
- Set Time - Set the time
- Preferences - Opens the [Preferences screen](#).
- Magn. Declination - Shows the [magnetic declination](#) or variation for the current location and lets you select true or magnetic azimuth.
- Objects - Edit the [objects list](#)
- Comets and Asteroids - Edit the [comets and asteroids list](#)
- Compass View - Select [Compass view](#)
- Sky View - Select [Sky view](#)
- Twilight - Show Sunrise and -set and the [Twilight times](#)
- Meteor Showers - Shows a list of annual [meteor showers](#)
- Observation Log - Lets you take [notes about your observations](#)

The **Time Incr** menu lets you select a time step which is used with the two page up/down [scroll buttons](#) to step through the time. The last item "Custom..." lets you select an arbitrary time step.

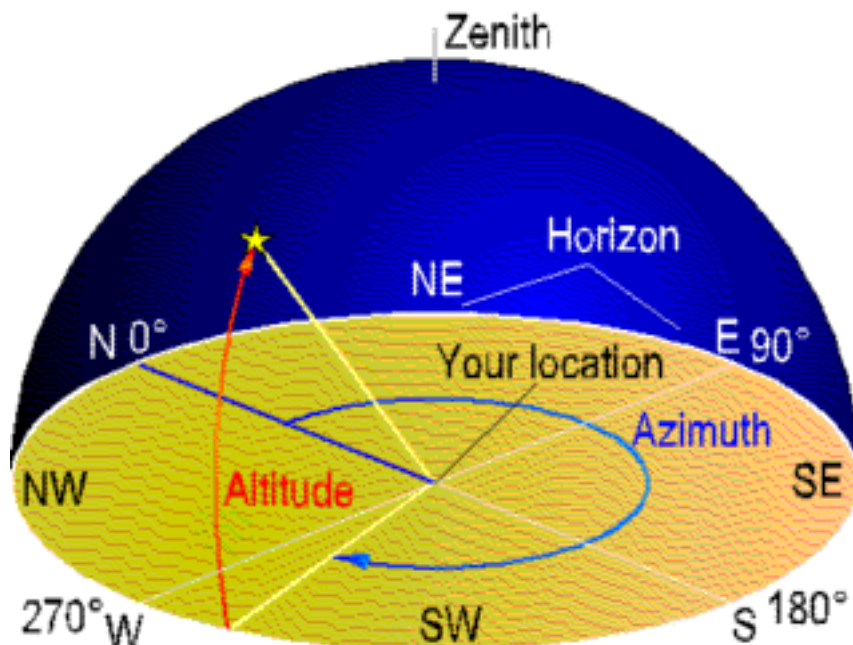
The **Info** menu has the following items:

- Help - Displays a help text for the currently selected view.
 - About - Shows the program version, the copyright, the web site and the support address.
 - Register - To enter the [registration key](#).
-

Compass view

General

In Compass view the information for celestial objects is given in **azimuth** (the horizontal angle between north and the direction of the object, counted eastwards) and **altitude** (the vertical angle between the horizon and the height of the object). Azimuth is measured in degrees, counted eastwards. Altitude is also measured in degrees, 0° is at the horizon, 90° is at the zenith. Negative values are below horizon.

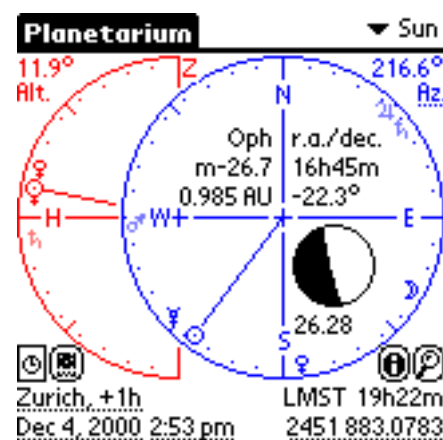


These two values are shown graphically. The circle at the right of the display shows the azimuth of the objects on a compass scale. To use this dial, turn the Palm Organizer so that 'N' points to the north. (If you don't know where north is, try to turn the Palm so that the Sun or the Moon icon points to the Sun or to the Moon. During the night you could also try to find Polaris if you are in the northern hemisphere).

The semicircle on the left shows the altitude. Hold your Palm Organizer upright so that 'Z' points to the zenith. Objects below the horizon line 'H' are not visible at the specified time and location.

You use compass view to do the following:

- Find a Planet or an object in the sky
- Use your Palm as a compass. [Here](#) is how this is done.
- Determine at a glance which planets or other objects of interest are above and below horizon
- Follow the path of the sun during the day to find the best time for taking a photo



Displayed information


In the upper left and right corners you can see Altitude and Azimuth for the current object. Altitude is positive above horizon, negative below. Objects in the circles are drawn in grey if they are below the horizon (PalmOS 3.0 or higher only). Azimuth is counted eastwards, starting with 0° at North. If you prefer Azimuth to start with zero at South, you can select this in the [Preferences](#) screen. In the [Magnetic Declination](#) screen you can select if the azimuth numbers should be corrected for magnetic declination so that they correspond to bearings on a magnetic compass.

Inside the right circle there are the equatorial coordinates of the current object shown below the text "r.a. / dec.". In the other quarter, the constellation, magnitude and distance of the current object are shown.

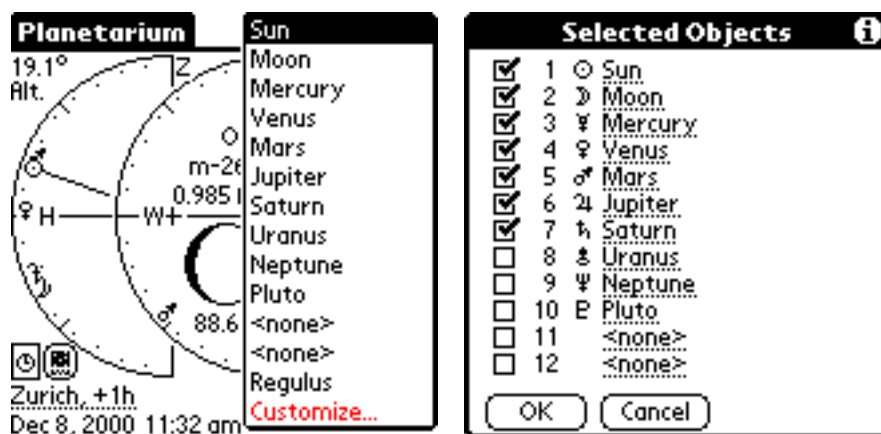
At the bottom there are the location and the time shown on the left side and on the right side there is the Local Mean Sidereal Time (LMST) and the Julian Date

Selecting the current object

With the pull down list at the upper right you can choose the Sun, the Moon or a planet as the current object. The current object has lines drawn from the center and the various numbers are data for the current object. You can also tap on any symbol in the circles to make that object the current one.

To make a object not in the list the current object, tap on the find button . This leads you to the Select screen where you can select any planet, star, deep sky object, constellation, comet or asteroid.

The pull down list can be customized by selecting the item "Customize...". This brings you to the Selected Objects screen.








For each of the 12 entries you can:

- Assign another object by tapping on the object name
- Select if it should be shown in the circles by checking or unchecking the checkbox.

There are 12 entries you can freely assign. The 13th entry in the pull down list is always the last search made with the find button.

The controls

There are several pen-sensitive regions in Compass view:

- The Now button  uses the Palm's current time when activated.
- The  button brings you to [Sky view](#).
- The Find button  lets you select any object as the current one.
- The Info button  shows detailed information about the current object.
- The rise/set table button  shows a table of rise and set time of all the objects in the pull down list.

- If you tap on the time, date or location texts you can change set another time or location.
 - The Julian Date number is also sensitive. If you tap on it, you can set the time by entering the Julian Date.
 - Tapping on the "Az." text at the upper right brings you to the [Magnetic Declination](#) page.
 - Tapping on the moon phase picture displays information about the Moon.
-

Sky View

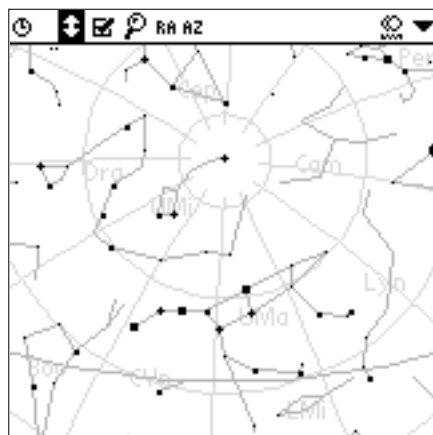
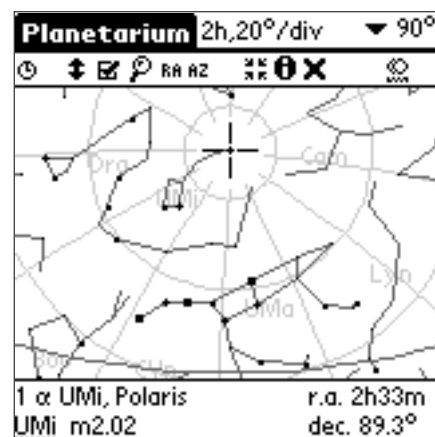
Sky view draws a camera like map of a part of the sky. You can use this display to get familiar with the constellations or to see where a planet moves in relation to the stars.

Screen layout

The screen is divided vertically into several sections.

- At the top there is the title bar. Besides that, the grid spacing is shown and at the right there is the zoom pulldown.
- Just above the map there is the tool bar with various buttons.
- The sky map
- Below the map at the bottom there is the info area. It shows the location, the time and the view direction or – if an object is selected – the name, the constellation, the magnitude and the position of the object.

In full screen mode the title bar and the info area are removed to make more space for the sky map.





Setting the view direction

There are several methods how you can set the view direction or the part of the sky that is shown:

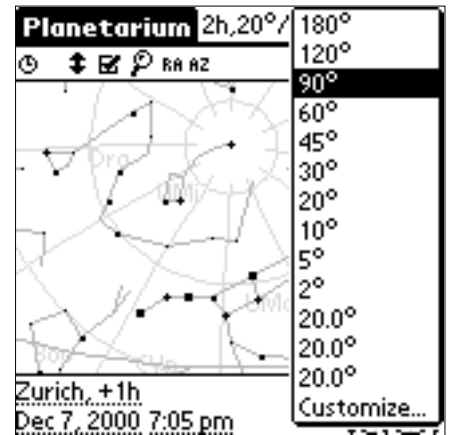
- Drag the sky: Place the pen somewhere into the sky map and keep it down. Move it a little and a four arrows symbol will be shown. Hold the pen down and drag it where you want to move your starting point to, then lift it again.
- View direction dials: If no object is selected, the view direction dials appear at the lower right. They two circles have the same meaning as in compass view. The left semicircle shows the view altitude and the right circle shows the view azimuth. You can tap on the circles to open a popup list with a few general directions to choose from. You can also tap on the small arrows next to the circles to move the view direction stepwise horizontally or vertically.
- Alt/Az and RA/Dec buttons. On the tool bar there are two buttons **RA** and **AZ**. The RA button opens a screen where you can enter the right ascension and the declination where you want the screen centered to. The AZ button lets you enter the azimuth and altitude of the screen center.



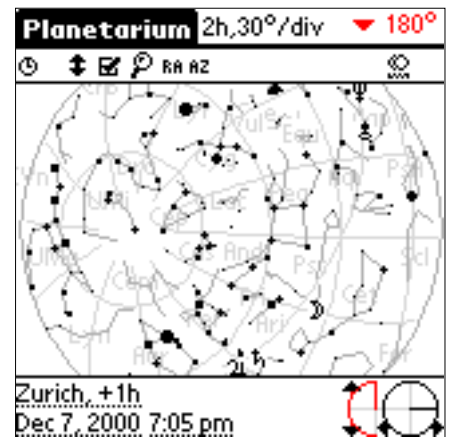
- Center the selected object. If an object is selected the center button  appears on the tool bar. This button moves the selected object to the centre of the screen.
- Search an object: With the find button  you can search for any object. If the object is not visible on the current map, the view direction is changed so that the object gets to the centre of the screen.
- Graffiti strokes: Write the letters "N", "E", "S" or "W" to set the view direction to north, east, south or west respectively. Write the numbers "0", "1", ..., "9" to set the view altitude to 0°, 10°, ..., 90°.

Zooming in and out

The popup list on the right can be used to set the zoom factor. The number indicates the field of view from the left to the right border of the screen. There are three customizable zoom factors at the end of the list.



If you select 180° as zoom factor and change the view direction to "straight up" you get an overhead view of the full sky with the zenith in the middle of the screen.



The controls

There are several pen-sensitive regions in sky view. Let's start with the buttons on the tool bar:



Uses the Palm's current time when activated.



Toggles full screen mode on and off.



Select what will be drawn on the sky map.



Switches the constellation lines on and off.



Search for a star or an object.



Set the center of the map to a given right ascension and declination.



Set the center of the map to a given azimuth and altitude.



Mirrors left/right and up/down. This allows to simulate the view through some telescopes.



Open the telescope commands popup list (only available if you have installed a telescope driver. Read more about this on the page "[Connecting a Telescope](#)".



Go to [compass view](#)



Go to the [Observation Log](#)

The following three buttons are only available when an object is selected:



Center the selected object.



Show information about the selected object



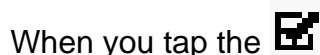
Unselect the selected object


The Zoom selector at the upper right is used to select the size of the field of view. The last three entries of the list can be customized by selecting the entry "Customize...".

The location, date and time texts can be tapped to set another time or location.

The view direction dials at the lower right open a popup list with a few general directions to choose from. You can also tap on the small arrows next to the circles to move the view direction stepwise horizontally or vertically. Please note that the view direction dials are only visible when no object is selected.

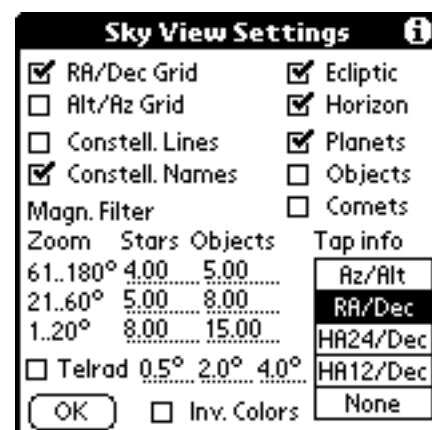
Sky View Settings



When you tap the  button on the tool bar, you get to the Sky View Settings screen.

Here you can select what should be drawn on the sky map:

- Grids: You can choose whether an RA/dec grid or an Alt/Az grid or no grid at all should be drawn.
- Constellation lines and names
- Ecliptic and Horizon
- Planets: this also includes the Sun and the Moon
- Objects: Whatever is selected in the [objects list](#)
- Comets: Whatever is selected in the [comets and asteroids list](#). Please note that comets and asteroids use a lot of computational power. If you don't need them, turn them off to make the screen redraw faster.
- Telrad circles. A Telrad finder is an optical device that superimposes three circles on your field of view. You can use these circles to measure distances between objects. Enter the diameters of the three circles of your Telrad finder into the three entry fields to display circles of that size in the sky view.



Zoom	Stars	Objects
61..180°	4.00	5.00
21..60°	5.00	8.00
1..20°	8.00	15.00

The Magnitude Filter lets you specify how many stars and objects are drawn in the sky map. This is depending on the zoom level. For view fields above 60 degrees, the uppermost line applies, for view fields from 20 to 60 degrees the middle line applies and for high zoom views the lower line applies. You

enter the limiting magnitude. Only stars and objects that are brighter than this limit will be drawn.

The Tap info determines what kind of coordinates should be drawn on the two bottom lines in sky view when you tap on the map with the pen. You can select from RA/Dec, Az/Alt, and HA/Dec (HA = Hour Angle) or no info at all. Choose the one that fits your telescope mount. You can select HA to be either from 0h to 24h or ascending to 12h on both sides of 0h with indication of E or W.

Twilight Screen

Select the menu item "Options / Twilight" to get to the Twilight screen.

Planetarium			
Zurich, +2h		Dec 4, 2000	
	Rise	Trans	Set
Sun	8:56a	1:16p	5:36p
Moon	2:32p	7:59p	*1:36a
		*following day	
Day/Night Length		8h40m	15h20m
Twilight		Morning	Evening
Civil		8:21a	6:11p
Nautical		7:42a	6:50p
Astronomical		7:05a	7:27p
Compass view		Sky view	

This screen shows the rise, transit and set times of the sun and the moon and the twilight times for the current date. When the moon rises in the evening it will set in the morning of the following day. This case is indicated with an asterisk *.

Transit time is the time when the object is at the highest point. Civil, Nautical and Astronomical twilight are defined as the times when the Sun is 6°, 12° and 18° below the horizon respectively. Roughly speaking,

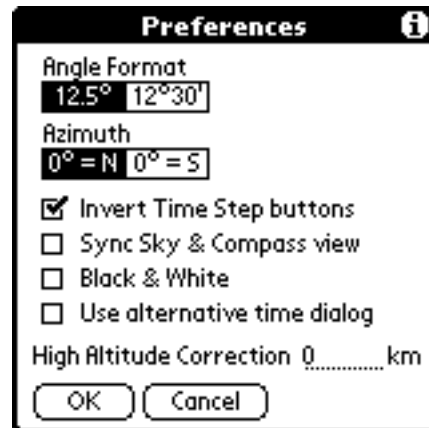
- Civil twilight is when it's getting dark somewhat and you should switch on the lights of your car.
- Nautical twilight is when it gets dark enough for the brightest stars to be visible in the sky, which was important for nautical purposes, hence the name.
- Astronomical twilight is when it gets dark enough to observe even the faintest objects.

At the upper left of the screen the location is displayed. This text is sensitive, tapping on it brings you to the [Location screen](#). The date text at the upper right is sensitive, too. Tapping on it lets you choose another date.

The rise and set times of the sun and the moon are defined as the time when the upper border crosses the horizon. The rise and set time calculations take an atmospheric refraction of about 0.5° into account.

Preferences

The Preferences screen can be reached by selecting "Preferences" from the main menu.



The 'Angle format' setting determines how Planetarium prints numbers, wither as degrees with decimal fraction or as degrees with minutes of arc. Please note that you can always enter numbers in both formats (see below).

The 'Azimuth' setting lets you choose whether azimuth should be counted starting with 0° at North or at South. Azimuth is always counted clockwise.

The 'Invert Time Step buttons' switch lets you choose if the page up/down scroll buttons step forwards and backwards in time when pressing up or down or vice versa.

The switch 'Sync Sky & Compass view' determines if objects selected in one view should also be selected in the other one.

If you have a color device you will see an additional checkbox labelled "Night mode". Checking this switch causes Planetarium to use only red and black for all drawings on the screen. The red color is said not to affect the pupils once they got used to the darkness. On non color devices with PalmOS 3.0 or higher there is a checkbox 'Black & White' that prevents Planetarium from using gray scale if you have difficulties with gray scale on your device.

On devices with PalmOS 3.5 you can select if the new style time dialog or the old one should be used when setting the time.

The entry field labelled 'High Altitude Correction' can be used in an aeroplane. You enter the current flight altitude and this will affect the horizon line in the sky view and the rise and set times. Conversion: 1 kilometer (km) = 3300 feet or 10000 feet = 3 km.

Entering numbers in Planetarium


You can enter angles into Planetarium either as degrees with decimal fraction or as degrees with minutes of arc. In order to allow Planetarium distinguish between these two variants, there are some rules:

- Degrees with decimal fraction need to be entered like an ordinary floating point number (e.g. 12.3 or -87.65) with an optional degree sign at the end (e.g. 12.3°). Even though Planetarium only displays a certain number of decimal digits, you can always enter more digits and they will be stored internally and used for the calculations.
- Degrees with minutes of arc need to be entered with a degree symbol as separator (e.g. 12°18'). The minutes tick at the end is optional (e.g. 12°18). As the degree symbol can cause troubles

either when entering as graffiti stroke or when editing a memo, the colon character can be used instead (e.g. 12:18' or 12:18). The minutes part can have a decimal fraction (e.g. 12:18.75' or 12:18.75). Even though Planetarium does never display this fraction, if you enter it it will be stored internally and used for the calculations.

These rules also apply for numbers read from a memo when importing data bases. We recommend using the colon when editing data memos on the PC because the degree character will be converted into something else on some systems when transferring it to the Palm.

Info screen

The Info screen is shown when the Info button  is tapped. It displays various data about an astronomical object. It is divided into several pages which can be selected with the pushbuttons at the bottom. There are five pages:


Pos: Shows position related values of the object

Object Information				i
» Moon				
Location	Zurich, +1h			
Local Time	Dec 7, 2000	7:05p		
Constellation	Pisces (Fish)			
RA./dec.	1h53m	5.4°		
Hour Angle	2h07m			
Ecl. Lon/Lat	28.2°	-5.8°		
Az/Alt	137.0°	40.0°		
Magnitude	-11.5			
Dist./Light t.	376e3 km	1.25s		
<div><div>OK</div><div>Pos</div><div>Stats</div><div>R/S</div><div>Time</div><div>Phases</div></div>				

Stats: Shows various values depending on the object. This page is only available for the Planets. Special information is displayed for the Sun (the solstices), Jupiter (the moons), Saturn (the angular size of the rings) and the Moon, Mercury and Venus (the phase).

Object Information			i
24 Jupiter			
Location	Zurich, +1h		
Local Time	Dec 7, 2000	10:05p	
Magnitude	-2.8		
Distance	4.07 AU		
Dist. to Sun	5.04 AU		
Elongation	168.8°		
Angular Size	48.4" × 45.3"		
By Jove!			
			
G C E I			
OK	Pos	Stats	R/S Time

R/S: Shows the next few rise, transit and set events of the object. Next to the rise and set times there is also the azimuth where the object rises or sets. Next to the transit times there is the maximum altitude the object reaches, marked with a caret ^. If only a dash "-" is displayed for rise and set times, the object won't rise or set like the sun in polar summer for example or Polaris, the northern star. The small little line between the lines shows which event comes next.

Object Information 				
☾ Moon		-> Twilight		
Location		Zurich, +1h		
Rise	Dec 6, 2000	2:17p	90.1°	
Trans	Dec 6, 2000	8:28p	43.9°A	
Set	Dec 7, 2000	2:50a	273.7°	
Rise	Dec 7, 2000	2:41p	82.6°	
Trans	Dec 7, 2000	9:15p	49.1°A	
Set	Dec 8, 2000	4:02a	281.5°	
Rise	Dec 8, 2000	3:06p	75.2°	
Trans	Dec 8, 2000	10:04p	54.1°A	
Set	Dec 9, 2000	5:16a	289.0°	
<div><div>OK</div><div>Pos</div><div>Stats</div><div>R/S</div><div>Time</div><div>Phases</div></div>				

Time: Shows values regarding the current location and time.

Object Information			i
☾ Moon			
Location	Zurich, +1h		
Local Time	Dec 7, 2000	7:05p	
UTC	Dec 7, 2000	6:05p	
JD	2451 886.2535		
LMST	23h46m		
<div><div>OK</div><div>Pos</div><div>Stats</div><div>R/S</div><div>Time</div><div>Phases</div></div>			

Phases: Shows the dates for the next few moon phases. This page is only available for the Moon. The small little line between the lines shows which phase event will be next


Object Information			i
Last quarter	Nov 18, 2000	4:26p	
New Moon	Nov 26, 2000	12:13a	
First quarter	Dec 4, 2000	4:57a	
Full Moon	Dec 11, 2000	10:04a	
Last quarter	Dec 18, 2000	1:43a	
New Moon	Dec 25, 2000	6:23p	
First quarter	Jan 2, 2001	11:33p	
Full Moon	Jan 9, 2001	9:25p	
Last quarter	Jan 16, 2001	1:36p	
New Moon	Jan 24, 2001	2:08p	
First quarter	Feb 1, 2001	3:03p	
Full Moon	Feb 8, 2001	8:13a	
OK	Pos	Stats	R/S Time Phases

Meteor Showers


The Meteor Showers screen can be reached by selecting "Meteor Showers" from the main menu.


Meteor Showers		Aug 8, 2002
Pegasids	Jul 10	3
July Phoenicids	Jul 14	var.
Pisces Austrinids	Jul 28	5
Southern delta-...	Jul 28	20
Alpha-Capricorni...	Jul 30	4
Southern iota-A...	Aug 5	2
Northern delta-...	Aug 9	4
Perseids	Aug 13	110
Kappa-Cygnids	Aug 18	3
Northern iota-Aquari...	Aug 20	3
Alpha-Aurigids	Sep 1	10
<input type="checkbox"/> Show in Sky View		


This screen shows a list of annual meteor showers. The columns show the name, the date of the maximum and the zenith hourly rate. The currently active showers are written in bold font. The current date is displayed at the upper right and can be changed by tapping on it.

You can select a meteor shower and then tap on the  button to get more information about that particular meteor shower or

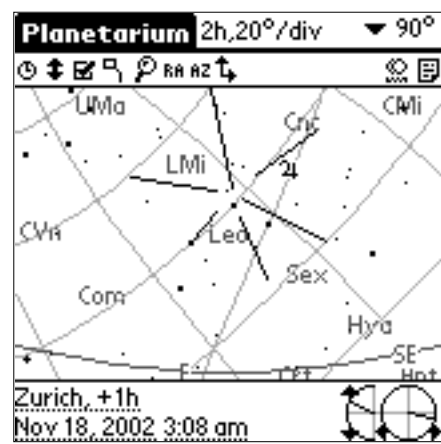
Meteor Shower		
Perseids		
IMO Code	PER	
Activity Period	Jul 17 - Aug 24	
Maximum	Aug 13, 2002	
RA/Dec	3h04m 58.0°	
Zenith Hourly Rate	110	
<input type="button" value="OK"/>		

tap on the sky view button  to go to the sky view. If the shower is currently active, the radiant is shown in sky view, otherwise the center of the sky view shows where the position of the radiant will be during the activity period.

The  button sets the time to the shower maximum time. This allows you to go quickly to the season when the shower will be active and check whether it is above the horizon during the night at your location.

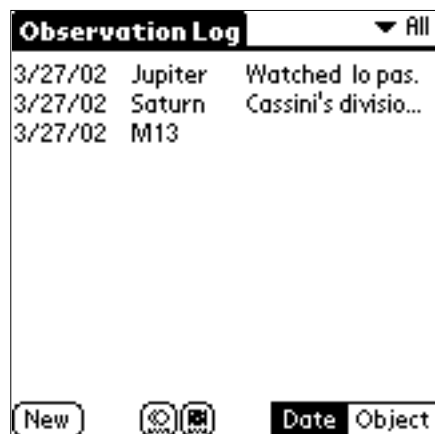
The  button brings you to compass view.

If the checkbox 'Show in Sky View' is checked, all currently active meteor showers radiants will be drawn in the sky view.




Observation Log

The Observatino Log screen can be reached by selecting "Observation Log" from the main menu.



The Observation log lets you take notes of the observations you make. You can sort the list either by date or by object name.



The two buttons  and  bring you back to compass or sky view.

Tap on the "New" button to create a new entry or tap into the list to edit an existing entry.



This Log details page lets you enter the details of your observation. You can enter the name of the observed object by graffiti or tap on the "List" button if you want to pick it from the list of objects available in Planetarium. To change the date or time of the observation, just tap on it.

To simplify the entry of repeatedly used texts in the descrtiption/comments field (like "Atmosphere:", "Equipment:" or "Photo:", etc), please study the Palm shortcuts that can be defined in the Preferences application.

Databases

Planetarium uses three data bases for the [location pick list](#), the [objects list](#) and the [comets and asteroids list](#). These three data bases have some things in common.

Every time you make a HotSync they are backed up to your Palm backup directory on the PC. (To be precise: they are only transferred if changes have been made to the data base since the last HotSync.) The backed up files have the following filenames:

- the location pick list: PlanetariumDB.pdb
- the objects list: UserObjsDB.pdb
- the comets and asteroids list: PlnCometsDB.pdb

You might have noticed that files with the same name are also present in the zip file where you found the other Planetarium files. These files contain initial data for the data bases: For the location data base there are about 600 cities, the objects list contains over 200 deep sky objects and the comets and asteroids data base contains a few comets and asteroids. It is optional to install these initial data files. If they are not installed, Planetarium just creates a new empty data base and the corresponding list will be empty.

Planetarium allows to change entries or add new entries to these data bases. You might want to use the "Personal" category or create a new category for this. Please note that all the changes you make to existing entries or the new entries you add go into the data base files PlanetariumDB.pdb, UserObjsDB.pdb, PlnCometsDB.pdb. Your data gets merged with the initial data you installed. If you reinstall one of the files from the zip archive or a previous backup of yours, the complete data base is replaced and your changes will be erased. To provide a workaround for this problem the import and export feature has been made.

The Import and Export features

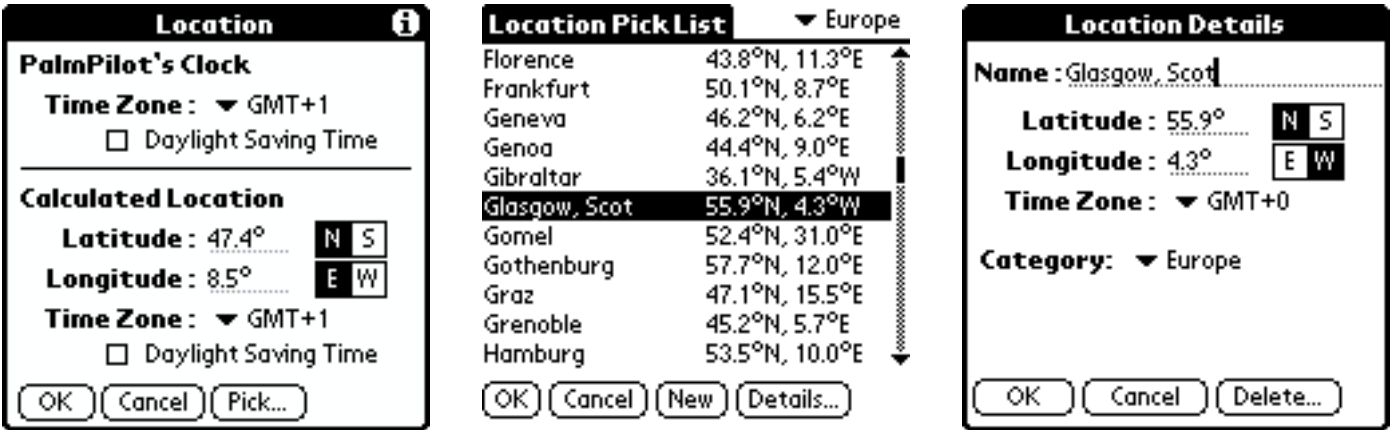
The export feature stores all items of a category in textual form into one or more memos. The memos are automatically created and have a title like: "Planetarium Locations Europe". The import feature is the counterpart. It reads a memo and adds all entries to the data base. With these features you can:

- Share Planetarium data with your friends. For example if you have added your favourite deep sky objects to the data base in your Personal category, you select the Personal category, select the menu item "Export" and beam the resulting memo to your friend. Your friend creates and selects a new category where he wants to place the items, then selects the menu item "Import", chooses the memo you beamed and presses the "Import" button.
 - Save your personal entries when you reinstall the data base. For example you might have installed the location data base and have deleted all categories outside America to save space. Now you plan a trip to Europe and wish to reinstall the initial file. However, if you do that, the complete data base will be replaced and that means the personal entries you added will have gone. So you export the personal category into a memo beforehand, reinstall the initial data base file and reimport your personal entries afterwards.
 - Get new data from the internet. For example there is a list of [Alignment stars for the LX200](#) telescope. To transfer this list into Planetarium you need to copy the list from your Internet browser to the clipboard and paste it into a new memo in your Palm Desktop application. Then make a HotSync to transfer the new memo to the Palm. On the Palm, create and select a new category or just select the category where you want the entries. Then select the menu item "Import", choose the memo with the data and tap the "Import" button.
-

Location Pick List

The location pick list stores the coordinates of locations. This is useful when you travel around.

To reach the location pick list, select "Options / Set Location" from the main menu, then tap on the "Pick" button.



The buttons:

- OK - To select a location, tap on the location and press "OK".
- Cancel - To leave the locaiton pick list.
- New - To add a new location.
- Details - To edit a location, tap on the location and press "Details".

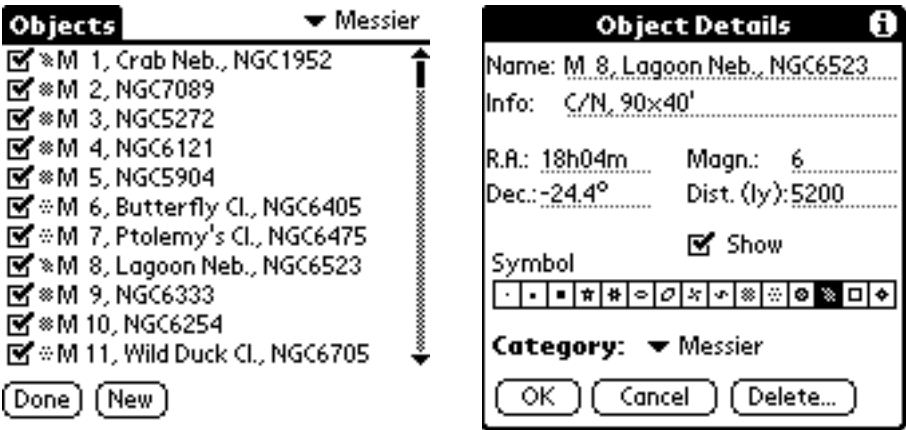
The menu items:

- Delete all - Deletes all items from the currently selected category.
- Import from memo - Reads a memo containing locations and adds them to the currently selected category.
- Export to memo - Creates a new memo and writes all entries of the currently selected category in textual form into it.
- Help - Displays a short help text.

Please note that the menu items operate on all items of the **currently selected category** only. To select a category use the pulldown list at the upper right. It is important that you select the category where you want to place the items before you execute the import menu command.

Objects

The objects list stores objects with fixed coordinates like galaxies, planetary nebulaes or just your favourite stars. To reach the objects list, select "Options / Objects" from the main menu.



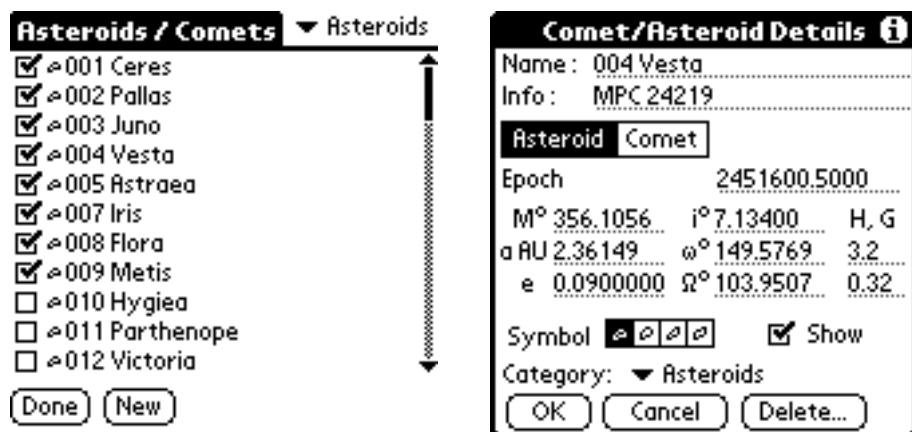
Each object can be turned on or off with the checkbox at the left of the line. Only checked objects are shown in the sky view. To edit an object just tap on it to get to the details screen.

Please note: The following menu items operate on all items of the **currently selected category** only. To select a category use the pulldown list at the upper right. It is important that you select the category where you want to place the items before you execute the import menu command.

- Show all - Checks all objects of the currently selected category.
- Hide all - Unchecks all objects of the currently selected category.
- Delete all - Deletes all items from the currently selected category.
- Import from memo - Reads a memo containing objects and adds them to the currently selected category.
- Export to memo - Creates a new memo and writes all entries of the currently selected category in textual form into it.
- Help - Displays a short help text

Comets and Asteroids

The comets and asteroids list stores the orbital elements of asteroids and comets. To reach the comets and asteroids list select "Objects / Comets and Asteroids" from the main menu.



Each entry can be turned on or off with the checkbox at the left of the line. Only checked entries are shown in the sky view. To edit an entry just tap on it to get to the details screen. Here is an [example how to enter the orbital elements](#).

Please note: The following menu items operate on all items of the **currently selected category** only. To select a category use the pulldown list at the upper right. It is important that you select the category where you want to place the items before you execute the import menu command.

- Show all - Checks all entries of the currently selected category.
- Hide all - Unchecks all entries of the currently selected category.
- Delete all - Deletes all items from the currently selected category.
- Import from memo - Reads a memo containing comet or asteroid data and adds them to the currently selected category.
- Export to memo - Creates a new memo and writes all entries of the currently selected category in textual form into it.
- Help - Displays a short help text.

In the "Comet / Asteroid Details" screen you enter the orbital elements for the object. Depending on whether it is a comet or an asteroid the data set differs slightly.

For Asteroids you need:

- the Epoch as Julian date

- the Mean anomaly M in degrees
- the semimajor axis a in AU
- the eccentricity e
- the orbit inclination i in degrees (J2000)
- the argument of perihelion ϖ in degrees (J2000)
- the longitude of the ascending node Ω in degrees (J2000)
- the magnitude parameters H and G

For Comets you need:

- the time of perihelion as Julian date
- the perihelion distance q in AU
- the eccentricity e
- the orbit inclination i in degrees (J2000)
- the argument of perihelion ϖ in degrees (J2000)
- the longitude of the ascending node Ω in degrees (J2000)
- the magnitude parameters H_0 and k

The data for comets and asteroids need to be updated once in a while. The data can be used for several months before the accuracy deteriorates. Check for [current data](#) once or twice a year.

Connecting a GPS

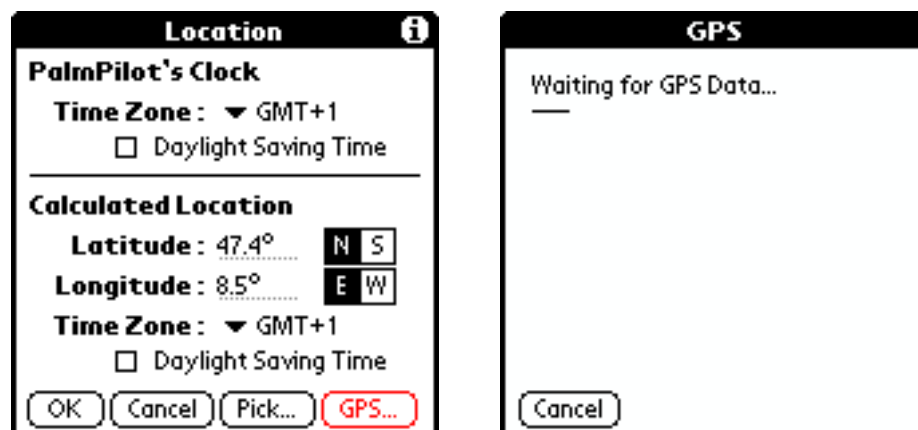
You can connect any GPS to the serial port that provides NMEA output (for profits: The GPGGA and GPRMC sentences are decoded). You will need a special cable to connect the GPS to the Palm. Please contact your GPS dealer for this.

Installation

In order to use the GPS feature you need to install the file GPSNMEA.prc on your Palm. Please download it from the [download page](#).

Usage

To get the coordinates from the GPS, enter the Location screen by selecting the menu item Options/Set Location or by tapping on the location text. If the file GPSNMEA.prc has been installed correctly, there will be a "GPS" button. When you tap on this button the Palm opens the serial port and waits for data from the GPS. You can tap the "Cancel" button to abort this operation. As soon as some valid data has been received, the coordinates are copied into the Location screen.



Connecting a Telescope

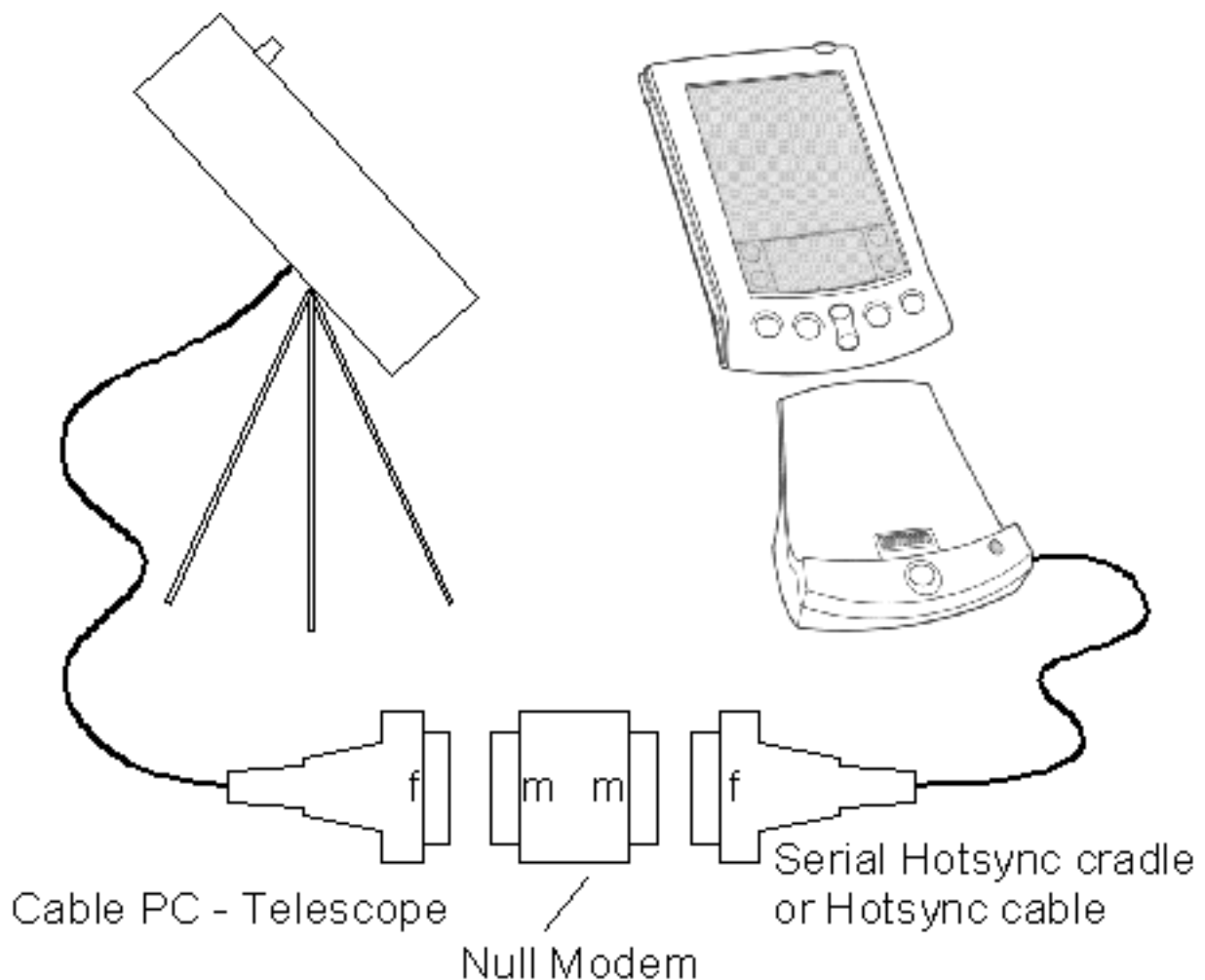
If you have a telescope which can be controlled by a computer you can connect it to Planetarium via the serial Port.

Installation

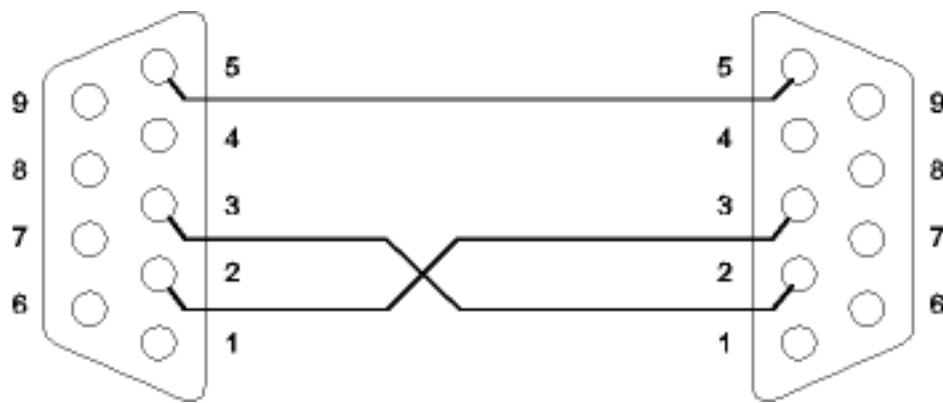
In order to use the telescope feature you'll need to install the appropriate Planetarium telescope driver first. Please download it from the [download page](#).

Cable

You will need a special cable. Unfortunately it is not very common to connect the Palm to the telescope so there is no good source for this kind of cable. The easiest solution is to buy a cable which connects the telescope to the PC and connect this cable to the hotsync cradle or a hotsync cable via a null modem.




The null modem crosses the Rx/Tx lines and allows to plug everything together (m = male, f = female). This is a wiring scheme of the null modem:



There are also serial cables for the Palm that have a male DB9 connector. They are also called "Modem Cable" as they allow to connect the Palm to an ordinary modem. If you have such a cable, you don't need the null modem. Instead you can connect the modem cable directly with the telescope cable.

Usage

If the telescope driver is installed properly, the telescope button  shows up in the sky view tool bar. Tapping this button opens a popup menu with the available functions.

- Query Position - Asks the telescope where it is pointing at and displays a symbol.
- Set position - Only available if you have selected an object. Moves the telescope to that object.
- Sync - Only available if you have selected an object. If you have manually centered the selected object in your telescope view this function commands the telescope to resynchrnonize with this object. Useful for star hopping.

Please note that not all of these commands are available for all telescopes. For example if your telescope does not allow to set the position the corresponding command will not be available.

Frequently Asked Questions

[General Questions](#)

[Problems with installation or registration](#)

General Questions

Q: Sun rise and set are off by one hour

A: Make sure the Daylight Savings Time checkbox is set correctly in the Location screen. Use the Menu item "Options / Set Location" to get to the Location screen. The Daylight Savings Time checkbox needs to be checked during summer (or winter if you live in the southern hemisphere) and unchecked during the winter because Planetarium can not calculate the transition dates for the daylight savings time. You need to switch it on and off manually every time you set

Q: The times for sun rise and sun set Planetarium calculates are completely off.

A: Perhaps you have confused latitude and longitude?

Q: I understand that the "Now" button should use the current time, but it doesn't.

A: Make sure you have correctly set the time zone settings in the Location screen. See [here](#) for a detailed description how the two time zone settings work. If you just want to use Planetarium for your home location, set both time zones to the same value.

Q: The screen is too bright when I'm out in the dark, it blinds me.

A: If you have a colour device, you can use the "Night mode" which uses only red and black. Red is said not to affect the pupils once they have got used to the dark. To switch the night mode on select the menu item "Options / Preferences". On non-colour devices you can set the background in sky view to black with the "Inv. Colors" checkbox in the "Sky View Settings" screen.

If this is still too bright for you, you can make yourself a screen filter. Print a gray rectangle on a transparency film for overhead projectors and cut it to the size of the Palm's display.

If you have a black&white device, another good option is switch off the backlight of the Palm and to use a red LED-flashlight to shed some light on the screen.

Q: The grey lines are too light and I can hardly see them.

A: Please try to use the contrast adjustment of your Palm device to change the darkness of the lines. There is either a wheel on the side of your Palm device or a button that pops up a window with a slider. (If you can't find the contrast adjustment, please consult your Palm manual.)

There have been a few reports that on some devices the grayscale is not working as well as expected. Either the display can hardly be seen at all or there are vertical streaks or the contrast has constantly to be adjusted when switching to and from Planetarium. If you experience these problems, you can either use the checkbox "Black & White" in the Preferences screen which will prevent Planetarium from using

grayscale to draw the map. Or you can try out the freeware application "NoStreak" by Till Harbaum <http://www.palmgear.com/software/showsoftware.cfm?prodID=3873>. It allows to change the display refresh frequency which in many cases can cure this problem.

Q: How can I make the screen redraws faster?

A: To make the redraws in sky view faster you need to take off load for the program. The comets and asteroids are very time consuming, only switch on a few of them or switch them off altogether in the Sky View Settings screen. Another time consuming factor are deep sky objects and stars when there are very many of them the program has to draw. Use the magnitude filters to reduce the number of shown stars and objects.

Q: How can I make the program use less memory?

A: There are several possibilities to reduce the memory needs:

- Planetarium comes with two star data bases. To reduce memory [install](#) the small one (PlnStars1600.prc).
- If you don't travel around, delete the locations list.
- Perhaps you don't need the double stars list or the Caldwell list, so delete them as well.
- If you don't need the Comets and Asteroids, they also use space.

How to delete whole categories from the data bases you can read [here](#). If you have made personal entries in the data bases, export them to the memo and keep a copy in case you want to reinstall the original data later.

Q: Where is "Big Dipper"?

A: Big Dipper is also called "Ursa Major", the Great Bear. Search for that constellation.

Q: Why aren't the Plejades not in the list of constellations?

A: The Plejades are not a constellation in the sense of the IAU. They are an asterism in the constellation Taurus. You can find them by searching for the Messier object M 45.

Q: Comet Ikeya-Zhang doesn't show up in the Sky chart

A: You have your settings set in a way that the comet is not usually drawn on the display. If you search for it, it will be drawn in order to show you the search result, but on the next screen refresh the main settings will be applied again and thus the comet left out again.

To change the settings so that a particular comet is normally shown make sure the following:

- In the comet list, the comet needs to be checked
 - In the Sky View Settings screen (tap little checkbox above sky map) the switch "Comets" needs to be checked
 - The Magnitude filter for the appropriate zoom range in the column "Objects" need to be high enough so that the comet's magnitude will not be filtered out.
-

Q: What are the numbers at the bottom right in compass view?

A: The number labelled LMST is the Local Mean Sidereal Time. The sidereal time indicates which part of the sky is currently visible. This depends on the time of day, the season and your location. To be precise, your sidereal time is equal to the right ascension of stars now crossing your meridian.

The other number is the Julian Date. This is the number of the days since noon on January 1, 4713 B.C. The fractional part of the number is used for the time of the day. Astronomers commonly calculate the interval between dates of events by subtracting Julian days, eliminating the necessity to keep track of

leap years and other calendar details.

Q: Is there a version for the PocketPC available?

A: No, I'm sorry. I will look into porting it to the PocketPC, but I cannot promise anything yet.

Q: Is there a German version available?

A: Yes, there is. Please check the [download page](#)

Q: How do I enter the orbital elements of a comet?

A: Please see this [example](#).

Q: How do I enter the International Space Station ISS?

A: I'm sorry, it is not possible to track man made satellites with Planetarium. Planetarium focuses on the natural universe around us, giving you the tools and data to interpret it.

However, there is a Palm program which does a good job in calculating earth satellites. It is called "PocketSat" by Jim Berry: <http://www.emmgraphics.com/pilot>

Problems with installation or registration

Q: I dropped my Palm and had to buy a new one. I could not find the e-mail with the registration code.

A: This is no problem. We keep a data base of registered users. Just send an e-mail to planets@aho.ch and tell us your name and your e-mail address. If you have changed the e-mail address since you registered, please also give us the previous one. We will immediately give you the code again.

Q: I just upgraded my Palm Vx to the latest OS, 4.1, and now Planetarium stopped working, comes back with a "Fatal Exception" error.

A: I have got a quite few reports of such strange crashes. It looks like something went wrong with restoring the data after the upgrade rather than a bug in Planetarium that would cause this problem. In all cases so far the problem could be cured by completely deinstalling Planetarium and reinstalling it again.

There is a vast number of combinations of different PalmOS versions with different Palm devices. In theory they all should work without any problems, but one never knows. If the problem persists, please let me know, so I can investigate it further.

Q: I purchased the program, my credit card has been billed but I just received some code instead of the registered version of the program!

A: If you purchased Planetarium without installing the demo version, you will have to [download](#) it from the web. If the demo version is already installed, all you need to do is to [enter](#) the code into the program to convert it from the demo version into the full version.

Q: I purchased the program, my credit card has been billed but I haven't received anything yet!

A: Sometimes this unfortunate situation arises when the e-mail address you provided doesn't work, for

example because of a typing error, so that the automatic system is unable to deliver you the code. If you contact me (planets@aho.ch) I will most probably find your record in my registration data base and immediately send you the code.

Q: After some troubles with the e-commerce system I tried it again and now my credit card is billed twice!

A: Please contact the dealer where you bought it (PalmGear.com or Handango.com). They will cancel the duplicate if you explain them your situation.

Q: Can Planetarium run in flash memory?

A: Yes, it can. But you need to keep the files PlanetariumDB.pdb, UserObjsDB.pdb and PlnCometsDB.pdb in RAM. The files planet20.prc and PlnStars1600.prc or PlnStars9096.prc can be installed in the flash.

Q: Can Planetarium be moved to the memory card?

A: Yes, partially. Please read the notes [here](#).

Q: The program uses so much space, how can I delete the large star data base to install the small one?

A: You don't need to delete the large star data base, just install the small one. This will replace the already installed star data base..

Usage Examples

On this page I describe some things that you can do with Planetarium. You are invited to do these step-by-step procedures with me and see if you get the same results.

- [Find or identify a planet](#)
- [Determine sunrise and sunset](#)
- [See the Moon's crescent lying horizontally near the equator](#)
- [Sun eclipse at Aug 11.1999 in southern Germany](#)
- [The sun never sets in polar summer](#)
- [Find the Big Dipper and Polaris](#)
- [Observe a retrograde loop of a planet](#)
- [Determine the next full moon](#)
- [Use Planetarium as a compass](#)
- [Moon eclipse on July 5, 2001](#)
- [Can we see the Perseids this year?](#)

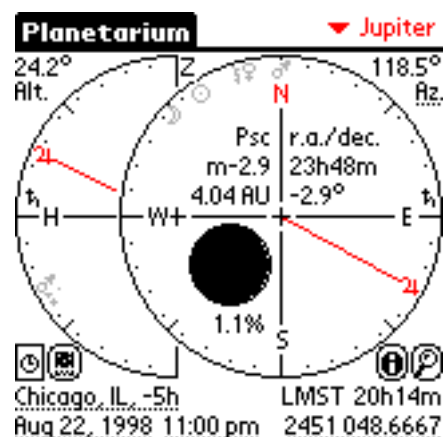
Find or identify a planet

Let's assume the time was Aug, 22. 1998, 11:00 pm and the night sky is clear and we want to know if we can see Jupiter on the sky. Let's further assume we are located at Chicago. So enter the following as Location and Timezone:

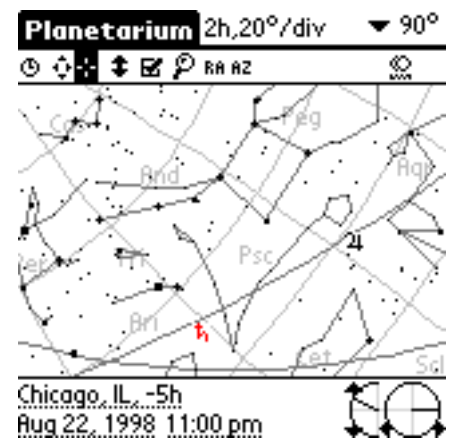
41.8°N, 87.7°W, GMT-6, DST on

Set the date to Aug, 22. 1998 and the time to 11:00 pm.

Select Compass view and from the pull down list at the upper right select Jupiter. Align the display so that "N" points to north. Try to find Jupiter in the direction indicated by the line. It should be visible about 24 degrees above the horizon in the south east.



Now we see that there is another bright object in the east just above the horizon. To identify it, switch to Sky view. From the zoom pull down list at the upper right select 90°. Use the view direction dials at the lower right to set the view direction to East and the view altitude to 30°. Try to match bright stars in the sky with bright stars on the display. If you are sure you have found the object of interest on the display, tap on it to get its name; in this example, it is Saturn.



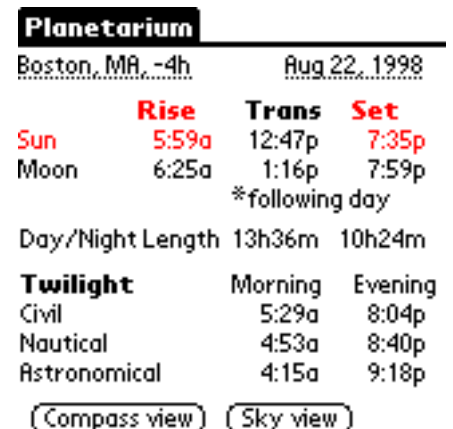
Determine sunrise and sunset

Let's find the time of sunrise and sunset on Aug. 22. 1998 in Boston. To do this, enter the following as Location and Timezone:

71.1°W, 42.3°N, GMT-5, DST on

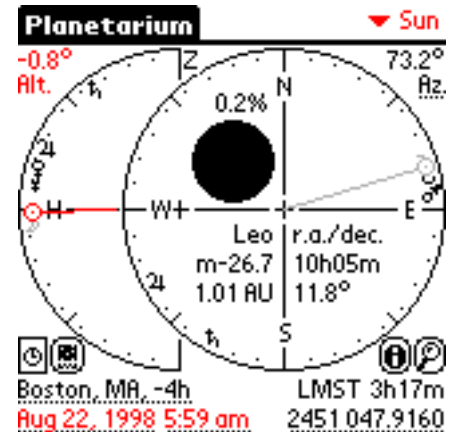
Set the date to Aug. 22. 1998.

Select the menu item "Options / Twilight". The display will show many data concerning the Sun and twilight. Sunrise is at 5:59 am and sunset is at 7:35 pm.



At the right there is a picture of Compass view at the time of sunset to verify it. Please note that sunrise and sunset are when the Sun has an altitude of -0.83° . One reason for this is that the Sun is not a point of light but a disk about 0.5° wide. The other reason is that the atmospheric refraction lets objects at the horizon appear slightly higher than they really are. Taking this into account, the top of the Sun's disk visually crosses the horizon line when it's center has an altitude of -0.83° .

Find a full [description](#) of all shown values in the manual.

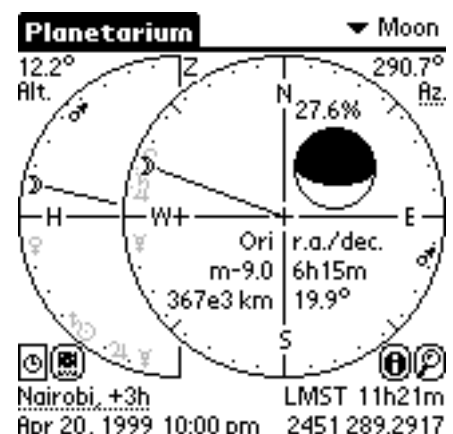


See the Moon's crescent lying horizontally near the equator.

If you live near the equator you can sometimes see the Moon lying horizontally like a smile. This is rather an unfamiliar view for people living in higher latitudes. Enter the following as Location and Timezone:

36.8°E, 1.3°S, GMT+3, DST off (Nairobi)

Set the date to Apr 20. 1999 and the time to 10.00 pm. Choose Compass view and have a look at the Moon phase diagram. You can also select Sky view and see the Moon setting perfectly vertically when stepping hours.



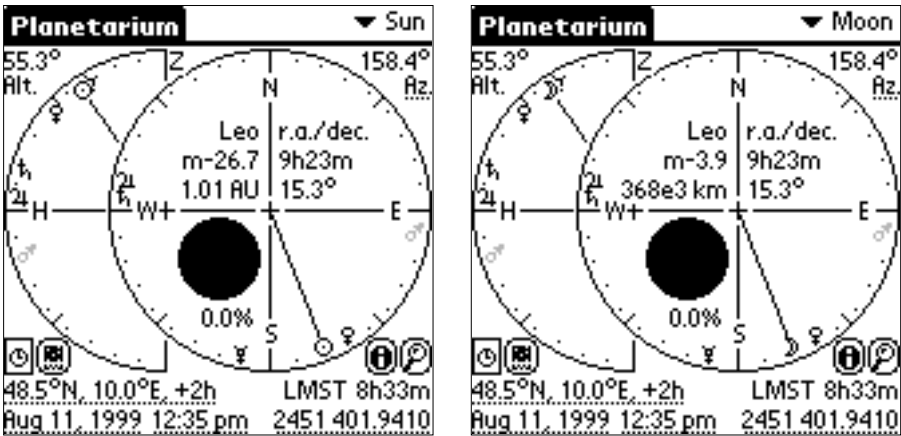
Get an idea of the Sun eclipse at Aug 11. 1999 in southern Germany

Let's go to southern Germany. Enter the following as Location and Timezone:

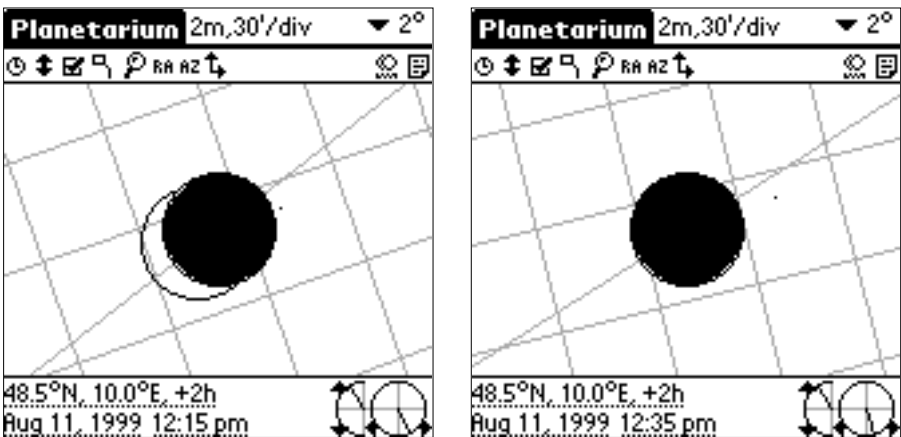
10.0°E, 48.5°N, GMT+1, DST on

Set the date to Aug 11. 1999 and the time to 12.35 pm.

Both the Sun and the Moon are small disks on the sky of about 0.5° in diameter and they have to get really close for an eclipse to occur. Most of the new moons are not eclipses because the Moon's orbit is inclined by about 5° in respect to the plane of Earth's orbit and it passes either above or below the Sun. But on this specific day look at the azimuth and the altitude of the Sun and compare it with the azimuth and the altitude of the Moon. They are both 158.4° and 55.3° respectively, so they are very close. Because the accuracy of Planetarium is only about 0.1°, we can not tell if this is a total or a partial eclipse, nor the exact contact times. But in fact it was a total eclipse. And a totally clouded one, too...

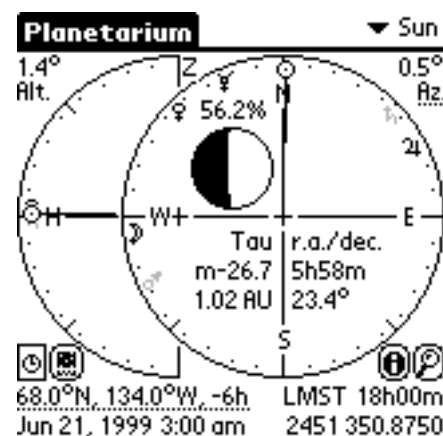


When switching to Sky view you can get a graphical representation of the moon moving in front of the sun.



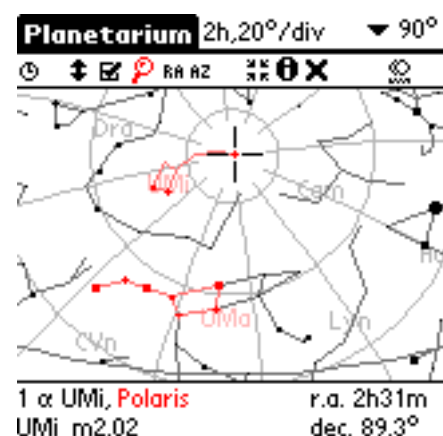
The Sun never sets in polar summer

Let's go to Inuvik (Canada): 68°N, 134°W, GMT-7, DST on
Set the date to June, 21. 1999. Now select Compass view and observe the altitude of the Sun as you step hour by hour through the day. It will not go below 1.4°.



Find the Big Dipper and Polaris

If you live in northern hemispheres, enter your location and try to find the Big Dipper and Polaris in Sky view. You might know that they are always in the north, so set your view direction to north using the view direction dial at the lower right. You can also use the search function for finding them, accessible by tapping the button with the magnifying glass. Please note that the official name for Big Dipper is "Ursa Major".



Observe a retrograde loop of a planet

Did you know that the early medieval astronomers had great difficulty in explaining the planetary motions? Let's see why.

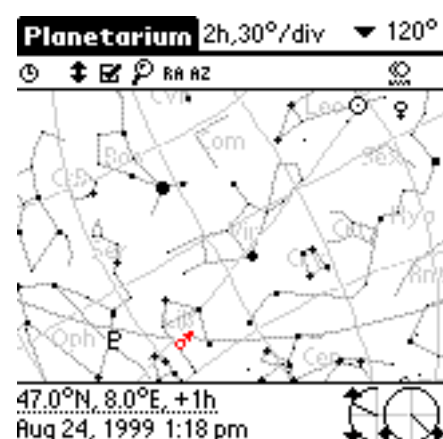
Set the location to 47°N, 8°E, GMT+1, DST off.

Select Nov 28. 1998, 7:00 am.

Select Sky view and make sure that the planets are switched on.

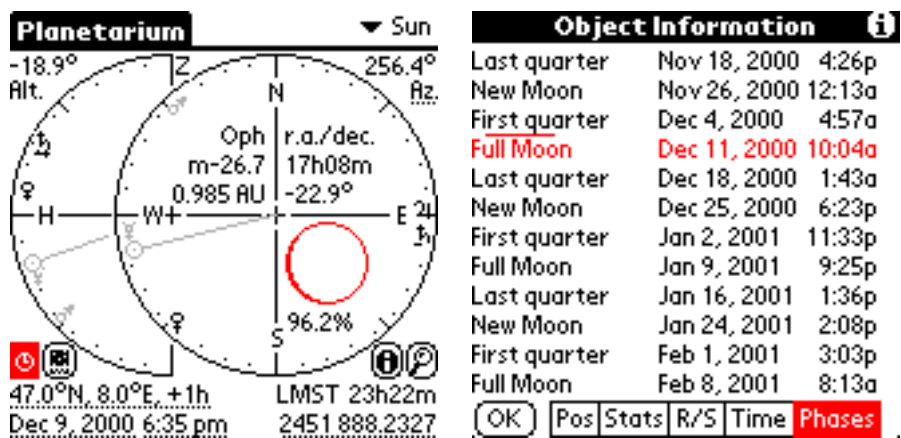
Set the view direction to SE, the view altitude to 30° and the zoom factor to 120°.

You should see the Sun a few degrees below the horizon and Mars about 45° above. Set the time increment to 6.981 days or to 29.918 days. Using one of these odd numbers has the advantage that the stars seem to stay at their place and we can watch the motion of the planet against them. Step now the time up and observe Mars wandering through the constellations. Perhaps you need to switch off Objects and Comets and set a magnitude limit for the stars to make the display drawing faster. In March 1999 Mars will slow down and in April it will move in the opposite direction! This retrograde loop will last until June and then Mars will continue in the usual direction. Unfortunately it becomes harder then to observe Mars in the real sky because it is also getting closer to the Sun and therefore the sky will be too bright to see it.



Determine the next full moon

If you are afraid of vampires and werewolves you need to know the date of the next full moon. The fastest way to get to this information is to select compass view, switch on the now button and tap on the moon phase display. Then in the Object Information screen select [Phases] at the bottom. The little horizontal line separates past and future events, so look for the next full moon below this line. Uuuh, it's coming soon...



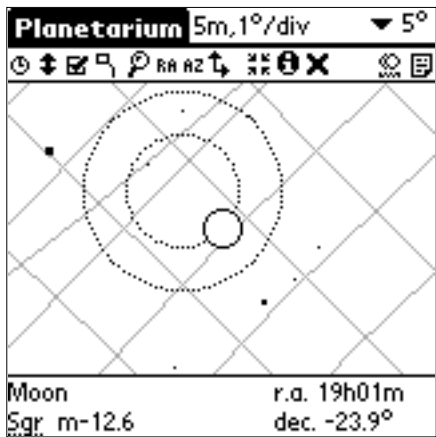
Use Planetary as a compass

Enter your location and switch the Now button on. If the Sun is visible on a clear sky turn your Palm organizer so that the Sun symbol in the azimuth diagram points to the Sun. The azimuth scale then shows the directions. Note that you do NOT need to correct for the declination between true and magnetic North pole! The azimuth scale points to the true North pole.

To get it more precisely get a string and tie an object on it so that you have a pendulum. Hold your Palm organizer as horizontally as possible in the sunlight. Wait until the string doesn't swing any more and let it cast a shadow onto the display. Select the Sun in compass so that you get a line from the center in the azimuth diagram to the Sun symbol. Now turn the Palm Organizer so that this line is exactly aligned with the shadow of one the string.

Moon eclipse on July 5, 2001

Set the Date to July 5, 2001 and the time to 20:21 UTC. (You can just go to compass view and enter the Julian Date 2452096.1215). Switch to Sky view and search for the Moon. You can see the moon and two dotted circles. These circles are the penumbra and the umbra of the earth. You can also see that this is only a partial moon eclipse as the moon does not completely enter the umbra.

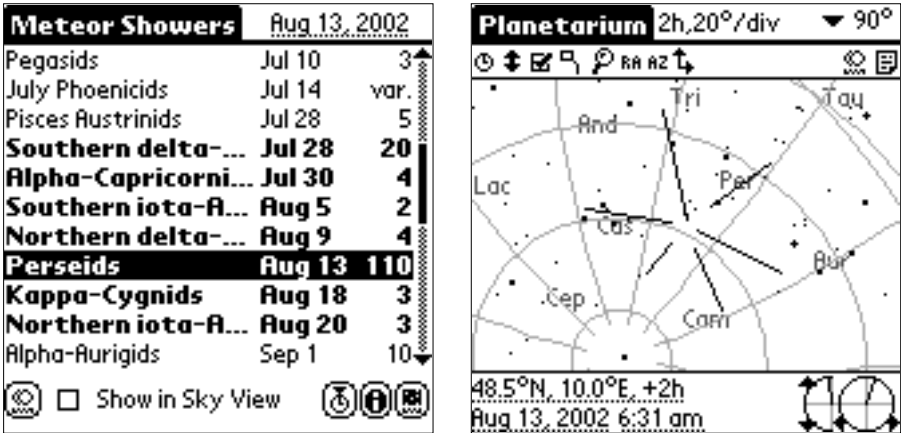



Use the time step buttons to advance forward and backward in time to see the moon move through the shadow of the earth..

Can we see the Perseids this year?

Select the menu item "Options / Meteor Showers" and scroll down in the list until you find the Perseids.

Tap the line with the Perseids and tap on the  button. This will set the time to the time of maximum of the Perseid shower.



Now tap on the  button to go to sky view and check where the shower is. From the two view direction dials at the lower right we can tell that the Perseids are nearly in the Zenith at 6:31 am (at least in Zurich). This is a very good position. By stepping backwards in time we can check where the Perseids are during the night.

Disclaimer:
The author of Planetarium can not be held responsible for star gazers falling asleep at their working place!

Disclaimer

Disclaimer

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Planetarium is shareware - this means you can try it for a while and see if you like it. If you find that you are frequently using Planetarium then you need to [register](#) it to be able to legally continue using it. If you decide not to register it after a reasonable evaluation period, you should stop using Planetarium and delete it from your Palm. You may give unregistered copies to others under the same terms - they may try it and then either register or remove it. Planetarium (together with this document) may be included on any disk or CDROM of shareware sold by non-profit organizations. If you wish to include it in a commercial software collection, please contact me at planets@aho.ch

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