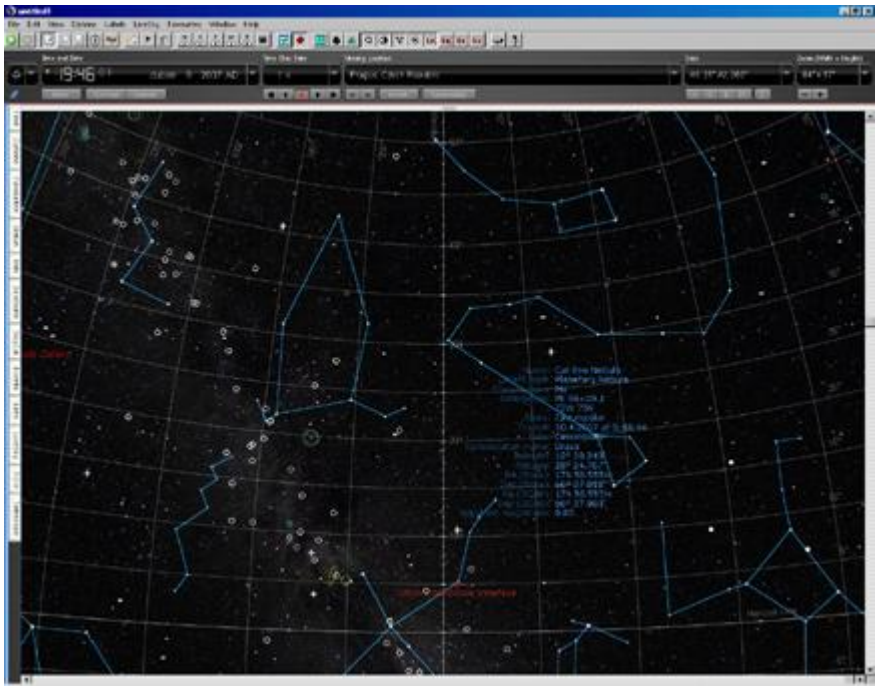
Program **StarryNight** <<= COMx =>> **NAVIGATOR** with **OURANOS** protocol

Detailed information on usage of **StarryNight software** with devices **NAVIGATOR-1** and **NAVIGATOR-2**



Planetarium StarryNight: Position of telescope in Delta Cygni indicate red mark **+**

Introduction

Some foreign astro-amateurs wanted to know whether the StarryNight planetarium software (abbr. SN) v 6.0.0 is compatible with the peripheral NAVIGATOR.

The question was:
Is it possible to use StarryNight Pro Plus (v.6 and higher) to communicate using OURANOS protocol via COMx with NAVIGATOR?

My first and optimistic opinion was that there should not be any problem. Communication protocol OURANOS is mentioned with the other hardware such as NGCMAX in the documentation SN.

Reality was a bit different:
In the first test SN did not communicate with NAVIGATOR, communication was blocked from the beginning. It was clear then that it is necessary to establish bidirectional communication via RS 232 using OURANOS protocol between **[StarryNight in PC]** and **[NAVIGATOR].**

My foreign colleagues say that SN is well known and often used by amateurs in the USA and Canada. In order to use Navigator in program SN it is important to solve the problem of their bidirectional communication.

The new version of SW StarryNight places a high demand on computer HW and SW.

Solution

After SN is installed you will find that in windows: **Telescope ->Configure->ASCOM Telescope Chooser**
There is no independent template for protocol OURANOS, so the Orion INTELLISCOPE protocol must be used for communication.

My appeal on forum ATM was answered by astro-amateur from New Mexico, USA: Peter Eschman. He offered to help me. He has been working IMAGINOVA to test and expand the capabilities of the **Orion Intelliscope** ASCOM driver.

With his help I was able to:
* analyze and compare communication protocols non-motorized mounts.
* I learned that OURANOS protocol does not contain the initialization command “P“, and consequently does not answer this command.
* The current ASCOM driver has been modified, command P was deleted and only command Q is functional.
* Command Q is shared with the INTELLISCOPE protocol, so OURANOS works properly.
* I extensively tested the modified ASCOM driver and communication is now fully working.

Peter Eschman gave us following statement:

Ouranos can use these 5 commands:
Q ….. Query encoders
R ….. Set resolution
I ….. Initialize encoder counts
A ….. Set init flag
a ….. get init flag

The ASCOM Orion Intelliscope driver only supports the Q command. The Q command is also supported by a wide variety of other devices that are based on the Tangent chip. When you use the ASCOM driver, you supply the encoder resolutions to the driver so that most Ouranos commands (R, I, A, and a) are not needed by the driver.

The Orion Intelliscope driver has been developed by Imaginova. It is based on an earlier ASCOM driver written by Dave Ek for his DSC interface. ASCOM is supported by a wide variety of planetarium software packages. For a current list of software using ASCOM, please check the Partners section of the ASCOM web site at http://ascom-standards.org/partners.html

We now have a version of the driver that will support virtually all Digital Setting Circle (DSC) units based on the Tangent chip. The latest driver should work with the following DSCs:
Celestron Advanced Astromaster, David Chandler Co. Deep Space Navigator, Discovery Digital Setting Circles, Jan Grecner Navigator1 and Navigator2, JMI NGCMAX, Lumicon Sky Vector, Mountain Instruments Star Pilot, Orion Sky Wizard 3, and TeleVue Sky Tour, as well as BBox, Ouranos, MicroGuider III and V, and other similar units.

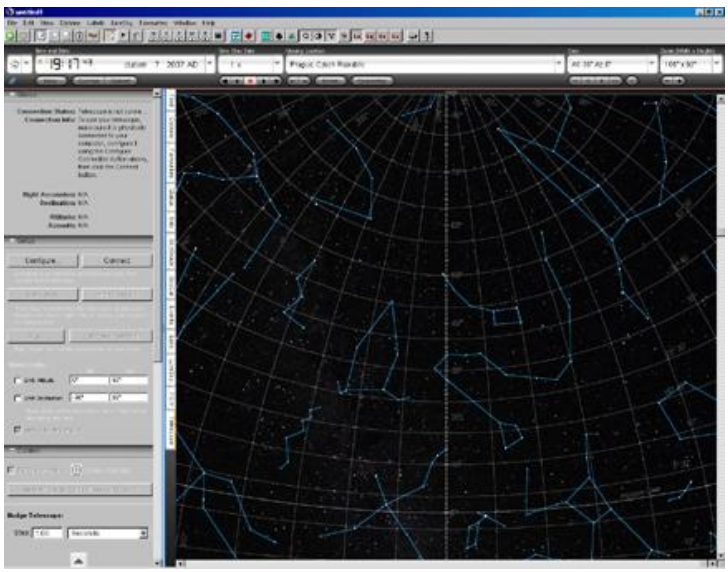
1) Start by installing the latest ASCOM 4.1 platform.
2) After installing the platform, rename your current copy of Intelliscope.dll, located in \Program Files\Common Files\ASCOM\Telescope
3) Copy the revised driver into the same directory

Be sure to enter your Comm port and encoder resolutions under driver properties setup screen. You do not need to perform any DSC stand-alone alignment steps with your DSC hardware, because the DSC only sends raw encoder values to your serial port. You can skip the alignment star process on the DSC, and just follow the steps from the ASCOM driver.

On some DSC, you may need to set the vertical or horizontal position of the telescope and use the enter key on your DSC so that encoder readings will be sent for both Alt/Dec and Az/RA. If your tracking is bad, check your encoder values and try the driver setup screen option to reverse RA/AZ axis.

Peter Eschman

The latest version of the Orion Intelliscope ASCOM driver will soon be available on the ASCOM web site listed above.
At this time the current driver is **IntelliScope.dll - 299.008 B - 09.04.2007- 17:09.**
If you are having problems finding the current driver, please contact Jan Grecner.
Be sure to follow steps 1) through 3) shown above, so that the revised driver is available for use.



The StarryNight program window before the initialization

The parameter setup window for INTELLISCOPE

The analysis of particular protocols leads to this conclusion:

Command set for classes of devices based on the Tangent chip

COMMANDS	Ouranos MicroGuider	NGC-Max JMI	Sky Vector Discovery AAM Celestron	Intelliscope
Q	O	O	#	O
P	X	O	O	O
R	O	O	X	
I	O *	X	X	
A	O	X	X	
a	O	X	X	

Comment

correspondence	O
another size /sense	#
unused	X

Q	Query encoders
P	Start-up of communication
R	Set resolution
I	Initialize encoder counts
A	Set init flag
a	get init flag

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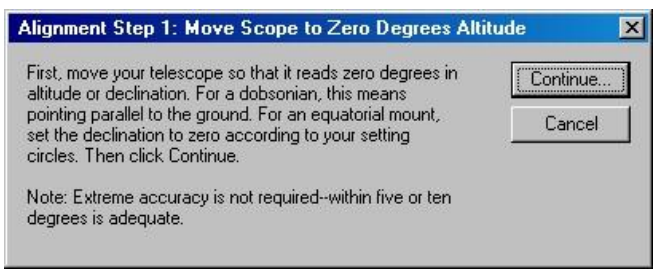
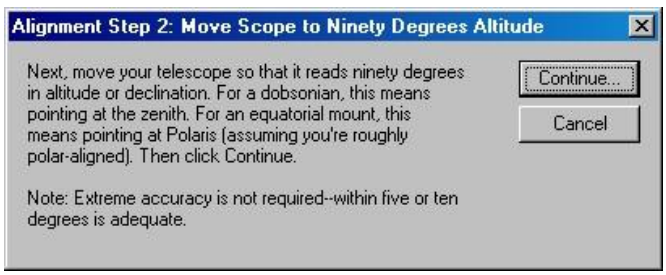
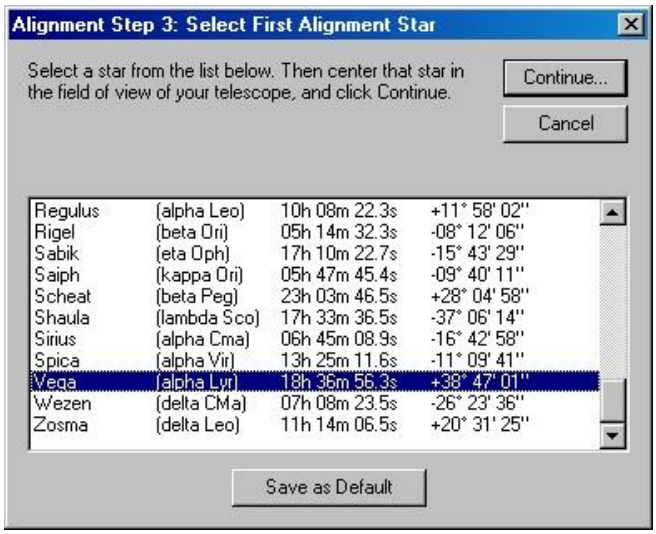
c: Jan Grecner, CZ

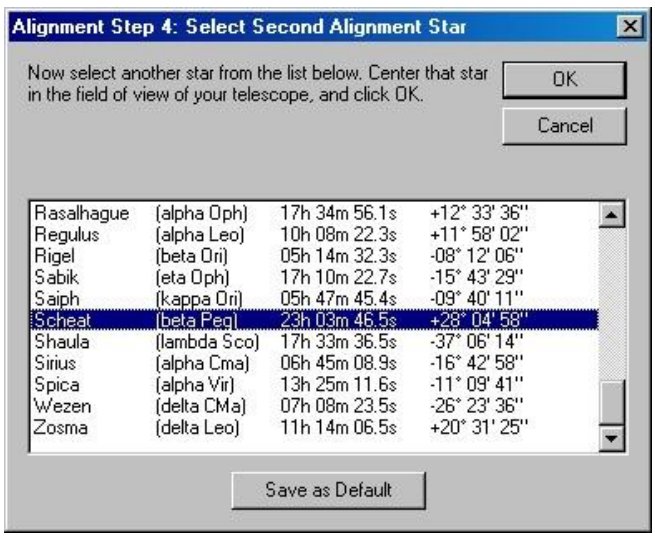
Remark : * **MicroGuider** does not support, plus **MicroGuider** has other commands not shared with Ouranos

Four steps for initialization of SN and at the same time for adjustment of telescope









It's necessary to pass initialization of mount otherwise the program SN does not allow you to continue

Navigation of mounts in SW environment StarryNight works in this way:

*** Driving program StarryNight (abbr. SN) as a planetarium is installed in PC**
*** SN communicates with our device NAVIGATOR via serial line COMX by protocol OURANOS**
*** Two rotary incremental sensors (encoders) DSC are connected to input of NAVIGATOR**
*** The DSC encoders scan the immediate position of two axes of the mounting, so**

The change of position of telescope (axis X, axis Y) is synchronously indicated on the map of sky in SW Starry Night by distinct red marker + .

I would like to point out that **SW STARRYNIGHT seems to me to be very complex** and almost "luxurious".
It provides extra ordinary services and so it demands modern equipment (ca 11,5 GB on HD)
It is possible to use it well also for purpose of education or publicity – it not only driving software but at the same user friendly.

System NAVIGATOR is functional in following application programs

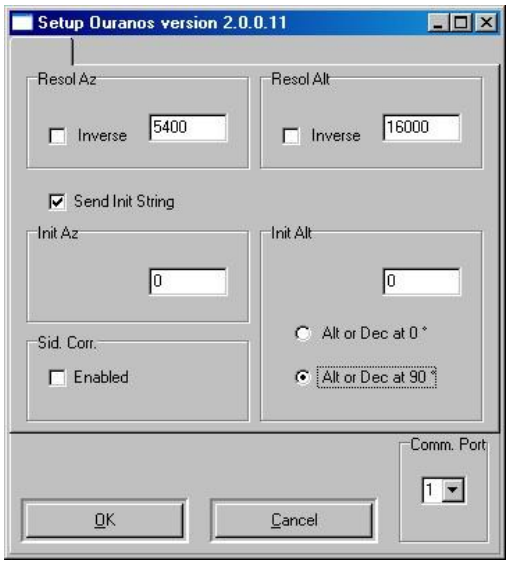
Functional programmes for peripheral equipment NAVIGATOR

#	Applications for OURANOS protocol	Win-XP	Win-98-SE	Win-ME
1	SkyCharts - Cartes du Ciel (CdC)	O	O	O
2	Starry Night	O	X	X
3	Ouranos Instrument - Surfing The Sky	O	O	O
4	Ouranos Utility	X	O	O
5	COMIT - Hyper Terminal	O	O	O

Comment :		
working order		O
malfunction		X

c: jan.grecner@iol.cz

Auxiliary SW for system NAVIGATOR communicating by protocol OURANOS



Three pictures in windows represent the program **SURFING THE SKY.** The program enables **navigation of scope** in coordinates without planetarium and also calibration of number of generated pulses in DSC.

Program **COMIT** is so-called TERMNAL and it can be used for testing particular statements in protocol OURANOS.

Conclusion

* **The good news is that we can use software STARRY NIGHT together with NAVIGATOR system**

* **The modified SW (which means new driver for INTELLISCOPE) is now available for astronomers (see the above-mentioned URL)**

* **If you use a fast PC, NAVIGATOR and 30.- EUR, program STARRYNIGHT is then a great solution.**

* **Peter Eschman helped us a lot with the communication protocol. We would like to thank him for his help.**

Prague, April 2007
Jan Grecner