Operation of the UiO/Alomar Allsky camera

Accounts and passwords
For routine operations the programs on the computer should be run as user *camops* – Camera Operators. In special cases, e.g. when it's necessary to recompile the AllSky Camera Deamon, *ascd*, or make other changes to the system, log in as root. The password for camops is uioand02, and for root it is hykeLisu.

Ordinary operations
The AllSky Camera Daemon, *ascd*, will be automatically started from the */etc/inittab* file each time the computer is rebooted (this line is commented out right now, start manually by typing *ascd*). The daemon will also run in the background even if you don't log onto the computer.

When ascd is running, there are four different conditions that have to be met for the imager to make exposures.

1. It must be dark. The imager has a protective photodiode which inhibits shutter opening, and switches off the image intensifier power if it's too bright.
2. To ensure it is dark enough, the sun must be at least 12 degrees under the horizon.
3. The moon must be under the horizon, or its phase must be less then 0.1.
4. The current time must be within a valid time interval specified in the time sequence file */home/camops/ascd/timeseq.txt*. This file is read by the daemon every minute, so it can be updated without stopping the camera operations.

The conditions under point 2 orand 3 can easily be changed in the source code under User Modifiable Section A, but to avoid degrading of the intensifier and CCD, it's not recommended to do so if you are not 100% sure what you are doing.

Changing run time parameters
In addition to changing the sun/moon criteria, it's three parameters which are likely to be changed in the source code. This is the F?_EXP, F?_IIGAIN and the filter sequence. F? refer to Filter no 1 to Filter no 5 which have individual settings and can be changed under User Modifiable Section A.

The filter sequence can be altered under User Modifiable Section B. The filter sequence is defined as a given filter for a given second in the minute. The default setting is red filter at second 00 and 30, and green filter at second 10, 20, 40 and 50. This is set equally for the imagers in Ny-Ålesund, Longyearbyen and at Andøya Rocket Range.

This imager has two different optical filters installed:

1. 6300 Å (red)
2. 5577 Å (green)
3. Open (currently no filter installed)
4. Open (currently no filter installed)
5. Open (currently no filter installed)

The filters are narrowband interference filters with FWHM bandwidth of about 2 nm.

To edit the ascd source code, go to the */usr/local/src/ascd/* directory . The source code is the file ascd.c. Before doing any changes to the code, it could be smart to make a copy of the original file!

To run the program with the changes, the ascd must be recompiled. Just type *make* in the same directory and the source code will be compiled. You will most probably receive a few warnings, one for each of the filters not used in the filter sequence. In the default filter sequence of filter 1 and 2 you will get three warnings (about filter 3, 4 and 5). Don't be concerned about this!

Finally the new built daemon, the ascd file, must be copied to the /usr/local/bin directory. Then the daemon can be restarted by simply typing ascd in a shell or by rebooting the computer.

Focusing the imager

The imager has a fairly good focus. But to get a perfect focus to see the stars, small adjustments has to be made. This involves two focus planes, one in front of the image intensifier (in the "middle" of the imager), and one in front of the CCD camera. Because there are telecentric units between those lenses, they will be focused independently. You should be able to focus through a "best" setting on both focus planes, and hence find the "perfect" setting. After focusing it will be smart to put a piece of duct tape or equivalent over the focusing mechanism to avoid defocusing by accident.

While focusing, you can use the *camtest* program. Run the program from the command line. You probably have to run the program as root because of a violation with libraries for Matlab (shared libraries).

If you use this program, you should also know some other commands. After starting camtest, you should apply these commands from the command prompt:

intensifier on
open_shutter
fw_pos 5 (selecting filter – for focusing it's recommended to use no filter)

If you can see a red light source, e.g from the top of an antenna, you can use fw_pos 1 instead (red filter) – at least for the first rough focusing.

Other useful commands are:
intensifier off
close_shutter
parked_mode (setting the imager in a "safe" stand-by mode)

From the Exposure(?) menu, you can choose single or continuous exposures. Selecting the Exposure->Setup menu, you can set exposure time. Settings between 100 and 1000 ms should work well.

In the View->Setup menu you can reed the minimum and maximum pixel value in the image. There is one hatch regarding continuous mode, the min and max values is updated only for the first image in a sequence. So if you want to use these values, you should use single exposures.

Have a close look at the monitor while adjusting the lens focus. While approaching a good focus, you will first see a week light source, probably with a diffuse ring around. The better you get the focus, the light source will appear stronger and stronger, and the ring will appear smaller and smaller, and finally melt together with the point source.

I'm quite sure this "user manual" still has many loose ends and is unclear, so don't hesitate to send me an e-mail or call me on 932 49035 if you have any questions!

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