Groundstation Tutorial

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- **Overview**

    This portion of the tutorial will run through the use of the Groundstation written for the MNAV autopilot. The latest version, version 1.1, uses a UDP connection rather then the older TCP/IP. Since there is a use of datagrams there isn't a need for a active socket connection between Stargate and Groundstation. Note that this version described in the tutorial is modified for the use for DASL lab members and has maps default for Philadelphia area maps.

- **Parts/Components**

    - DASL Groundstation
    - Laptop with 802.11b Wireless capabilities
    - Properly configured Stargate & MNAV
    - *Optional*: Google Earth (or other mapping software)
    - *Optional*: Visual Studio 6, 2003, or 2005.

- **Configure the Glass Cockpit**

    - To use the Open Glass Cockpit, the `opengc.ini` initialization file must be modified.
    - Open `opengc.ini` in your perferred text editor.
    - In the "Base Initialization" section:
        - Modify the NAV Database Path to the location where the `opengc.ini` is stored but also add `/Resources/NavData/` to the end of it.
        - The Font PATH is changed to the location path where the `opengc.ini` is located.

- **Using the Groundstation**

    - The DASL Groundstation has been pre-built. Just use the Groundstation self-executable. The program's main screen is seen below:
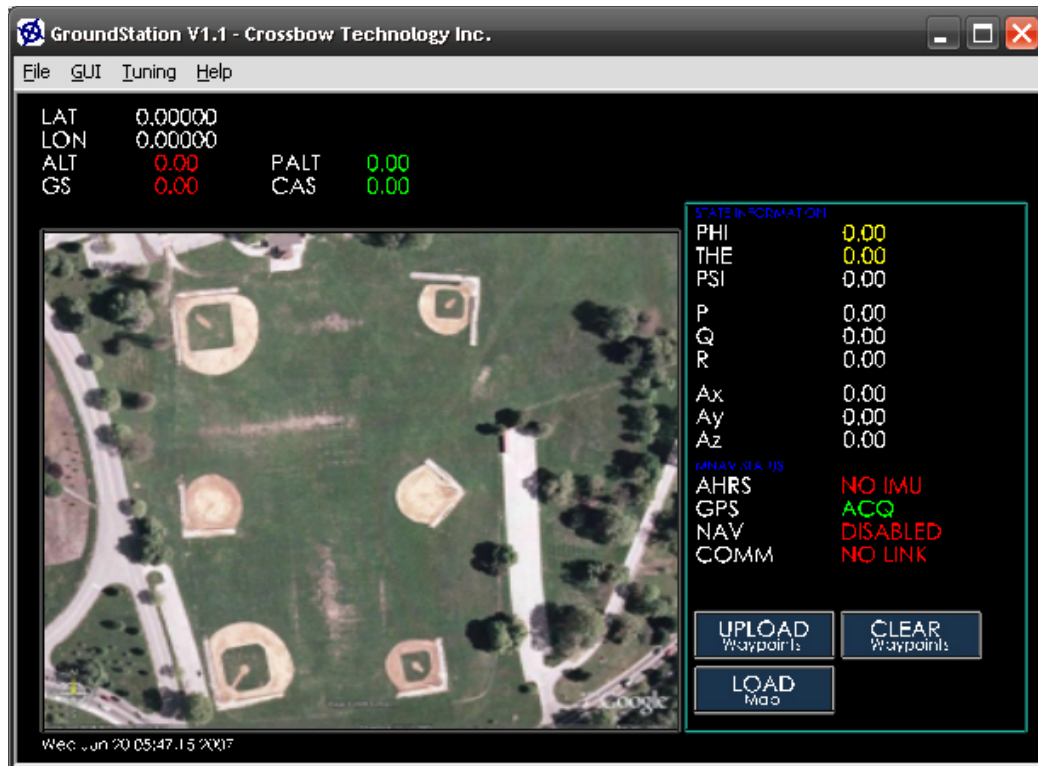
◦ Enclosed with version 1.0+, the Groundstation comes with a Open Glass Cockpit found under the "GUI" menu. The system must be configured before using it (see above). The cockpit looks like the following:


◦ To upload gain values to the MNAV auto-pilot use the the "Control Gain" menu item under the "Tuning" menu. The following dialog appears:
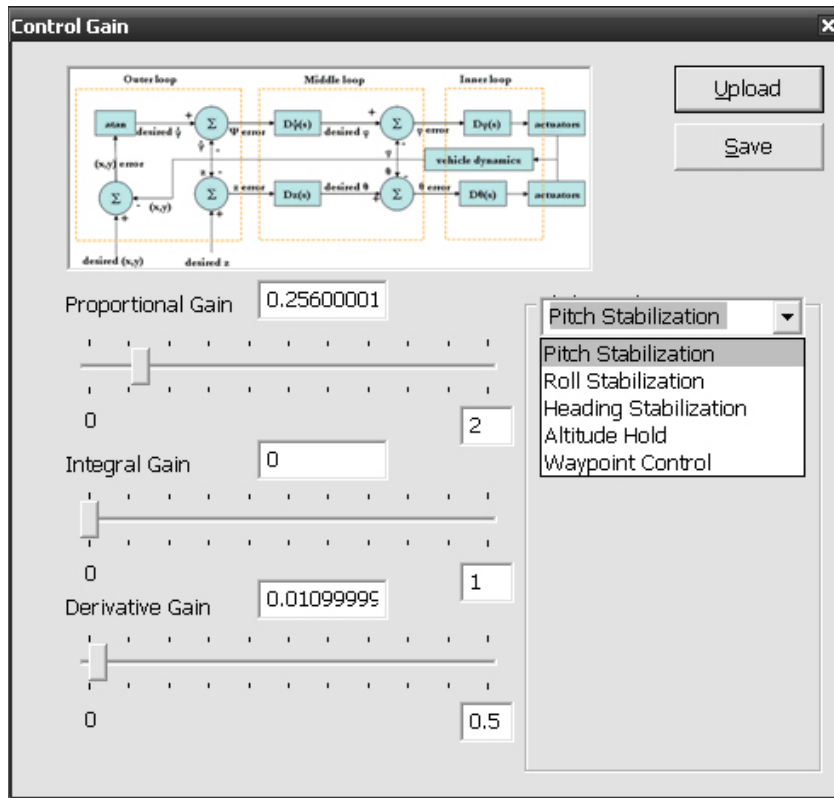
All the gain values are adjustable but the combo box on the right are pre-set gain values for different control problems. Click the "Upload" button to upload the new gain values to the MNAV. Also you can save your modified gain values to the `gainsetting.txt` files but using the "Save" button.

◦ Change or load new maps to the Groundstation by double-clicking the "Load Map" button on the main screen. The maps that are on the DASL groundstation are for the Philadelphia area. The original maps on the Groundstation are for the Xbow test site. You can input your own user maps by using the User Defined Map option. You will need the longitude and latitude values of the upper left and bottom right corners of the map in decimal form.
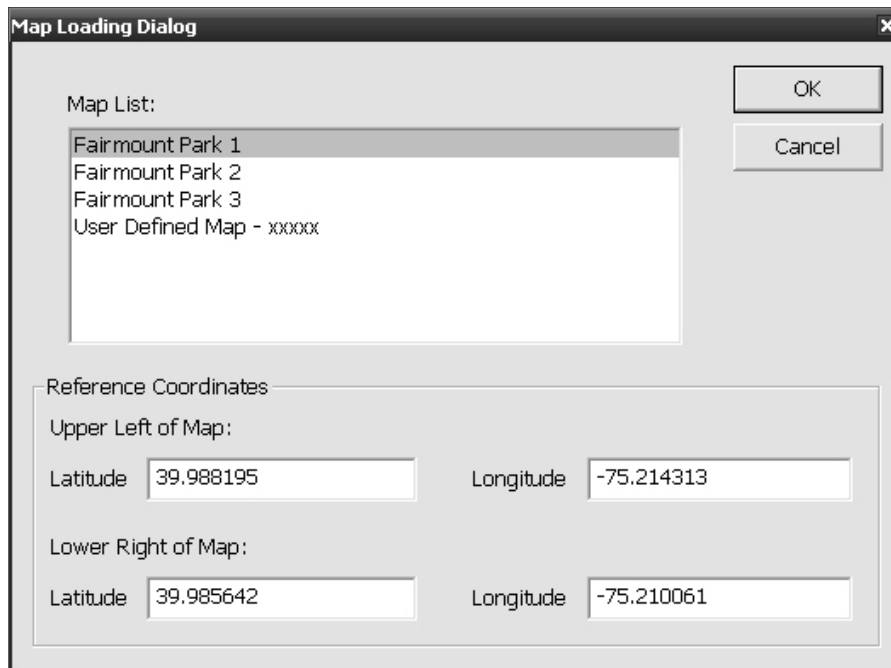
- **Final Thoughts & Useful Links**

The Groundstation as stated has two main versions. The biggest change is the TCP/IP socket connection in version 1.0 has been modified to be a UDP network connection in version 1.1. The DASL Groundstation has already been pre-compiled and built and can be downloaded here. The original sourcecode can be found on the MNAV Sourceforge website. Rebuilding the project is best done in a Microsoft IDE Visual Studio 6 on.

- Useful Links

  - DASL Groundstaion
  - Groundstation v.1.1 Source Code
  - Contact me