3.1 Baseline test (T000)

Description:
To get a baseline of all the sensors we perform 4 tests where the drone is not activated. Hence, no rotation of any propeller. The drone will be placed in the Vicon motion capture lab on a wheeled table. At a specific time during these tests the table will be physically moved to test the responsiveness of the sensors. Furthermore, input will also be given to the system through the remote controller to test the systems ability to log these signals as well.
Goal:
To acquire data to assess the performance of the test setup and the calibration of the sensors.
Preparations:
See first part of setup procedure in Section 4.1.

T000 - General Information		
Aircraft: M600 Payload: SafeEYE + Accelerometer Pilot: Michael Juul Nielsen (MJN) Test Manager: MJN ETF: 2 min/flight Frequency of recordings: 10Hz Frequency of Razor IMUs: 10Hz	Recordings: SafeEYE IMU Accelerometer A3 IMU Vicon	Camera: Onboard: N/A SafeEYE Lab: N/A Still: MJN Videotape: N/A

Flight Program		
#0	• Place drone in start location • Follow the setup procedure (see Section 4.1)	
#1	• Start recording script • Start logging of data - save to appropriate .csv file • Start stop watch - synchronize with beginning of data logging	
#2	• From time 15-30 seconds • Use the remote control to transmit input to the system in random patterns	
#3	• From time 60-90 seconds • Move the wheeled table upon which the drone is placed. • Perform large movements (more visible for the Vicon system) • Perform small jerk-like movements (more visible for the IMUs)	
	Additional comments: At 90 seconds in test 2 and 4 the arm upon which the external IMU was mounted was lowered and raised again. Furthermore, between test 2 and 3 the Vicon system was rebooted and the logging script was restarted.	

Table 3: Test plan *T000*.

5 Results

Here the results of the tests will be presented and briefly discussed. Most of the results are contained in separate csv files and Matlab scripts. The location of these will be defined in the results of each test.

5.1 Baseline test (T000)

The results of the Baseline test are found here: (Link to dropbox or github - for now the data is just attached to the email.) and can be analyzed using the Matlab script data_plotter.m (will also be made online accessible - but for now also attached to email).

Looking at the data, most of it corresponds to what is expected to be seen given the test performed. However, one sensor does stand out. The magnetometer of the external IMU has a few spikes in all iterations of the test as seen in Figure 7. What causes these spikes are unknown as of now. However, since they only appear for the duration of one data entry each, it may be likely that it is caused by an error in the transmission of data over the serial connection.

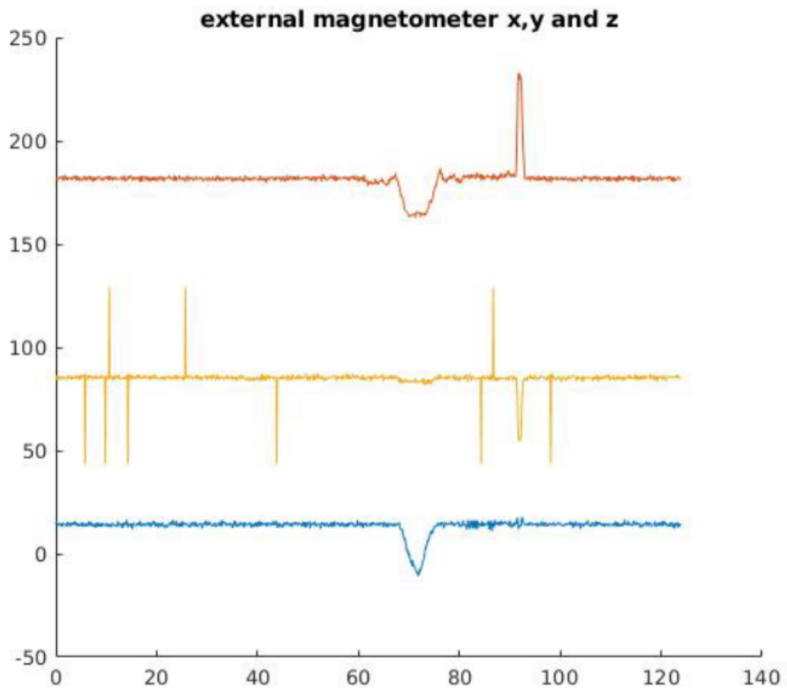

Figure 7: Data recorded from the magnetometer of the external Razor IMU during test T000-4