

Date: 7/10/12
Location: ACRC
Aircraft: Thor
Pilot: Arion Mangio
Flights: 3 Thor

Weather
Sunny, light to no wind, temps around 80F.

METAR: KANE 101445Z 00000KT 10SM SKC 26/14 A3018

Andrei, Arion, Tim, and Will arrived at ACRC at 9:30am to fly on a calm morning. Three reporters from the Minneapolis Star Tribune accompanied them. The weather was calm and hot all morning. All flight ops ran smoothly. The main objective for this day was to test Will's heading tracking controller. First, a guidance algorithm commanding different heading patterns was tested. Second, a guidance algorithm that uses pilot input on the remote to command heading was tested.

The first flight (50) was for testing Will's heading tracker with Thor which consisted of 180 degree turns, and four 90 degree turns to make a rectangular pattern. This flight was completely closed-loop. Initially it seemed as though the controller was performing poorly. Upon inspection of the data, the signal seemed to be tracking the command fairly well. However, the plane was not given enough time to settle with each turn, so another flight was necessary which allowed more time for settling. The software used for this flight was

[branches/WayPointTrack/Software/FlightCode rev 856](#)

The second flight (51) was a follow up for the first flight that had increased allowable settling times. The data shows that the controller is responding in the correct manner, but it does not seem to be tracking very accurately. Future flight tests will be required to validate the inner loops of this controller. The software used for this flight was

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Flight 52 was conducted to test a guidance algorithm where the pilot commands a heading rate which is integrated and used as the heading angle command. The controller tracked the command, but was not as accurate as it was intended to be. Also, there is a small bias on the pilot input which is apparent when a heading rate of zero is commanded. This will have to be corrected for future tests. Once again, further tests must be conducted. The software used for this flight was

[branches/WayPointTrack/Software/FlightCode rev 858](#)

Flight 50 was dedicated to testing the performance of Will's heading tracking controller.

Thor Flight 50

Rx data: A018, L010, F000, H000

Flight 51 was conducted in the same manner of flight 50, but has longer allowable settling times for the tracker.

Thor Flight 51

Rx data: A024, L022, F000, H000

Flight 52 was dedicated to testing the heading tracker using pilot input generated heading angle commands.

Thor Flight 52

Rx data: A021, L002, F000, H000