

AE4803A Introduction to Avionics Integration

Spring 2002 Homework #3

Due: Thursday February 28, 2002 at 9:30am (beginning of class) or before

1. Problem 7.1 in Kayton & Fried.
2. Problem 7.2 in Kayton & Fried, parts (a) and (b) only.
3. An ideal (unaided) inertial navigation system (no errors in accelerometer or gyro measurements) is placed on a table in French 101. Unfortunately, it is tilted 0.01 arc minutes compared to where we thought it was (that is, the initial condition given to the INS is tilted with respect to the actual value). Use the simplified 3-state (tilt error, velocity error, and position error) error analysis presented in class and in Kayton & Fried (p. 378), to predict how tilt error, velocity error, and position error will respond for the next 4 hours.
4. For the system in problem 3, discuss what will happen with altitude error (sketch out altitude error as function of time). Also discuss what might be done about this error in an airplane application.