AE4803A Introduction to Avionics Integration
Spring 2002 Homework #2
Due: Tuesday February 12, 2002 at 9:30am (beginning of class) or before

1. Problem 4.1 in Kayton & Fried.

2. You have become the Secretary of Transportation of a country that is just now building their first navigation infrastructure for aviation use. Due to corruption in the government, you are only allowed to build Doppler VORs (because the company that makes them knows the right people…). Your airspace is such that mid-air collisions are prevented if aircraft always remain within 4nm laterally (left/right) of their desired position en-route (they obviously need more accuracy than this near airports to land, but this is good enough elsewhere). Any particular aircraft can "tune-in" at least one VOR at a time. How far apart will you build your VOR transmitters? Provide a detailed justification of your answer for your testimony before Congress.

3. Find two references for each of the following techniques to compress/encrypt digital communications. For each technique, provide a concise (a paragraph or two) explanation of the principles involved.
   (a) JPEG compression
   (b) MPEG compression
   (c) Public key encryption

4. Problem 5.3 in Kayton & Fried (you may utilize the answer given for problem 5.1, use x=0, y=0, z=0 i.e. center of the Earth, as your initial guess for position, show all iterations in tabular form).