University of Wisconsin-Madison
Department of Electrical and Computer Engineering
ECE 332 - Feedback Control Systems, Fall Semester 1998
Problem Set #3

Distributed: Friday, September 18

Due: Friday, September 25 (in class)

These problems will make use of remaining material in Chapter 2 of Dorf, and in Chapter 4 of Dorf, through section 4.3. We skip Chapter 3.

Dorf, Chapter 2, **Problems:**

P2.32 Mason's rule calculation.

P2.33 - After completing the Mason's rule calculation, you are to determine a relationship (one equality constraint) among the G's and H's that will force Y2/R1 to be zero. Note the interpretation: in a system with multiple inputs and outputs, and multiple paths, it is sometimes possible to zero out any effect on a given output from a given input.

Dorf, Chapter 2, **MATLAB Problems**

These are very simple problems, once you have familiarized yourself with the basic features of the MATLAB environment, and are really meant only to force you to become familiar with some control analysis tools available in MATLAB. As indicated in your course syllabus, access to MATLAB is available through CAE.

MP2.2 - Just direct application of built-in MATLAB functions.

MP2.6 - Note that this block diagram is configured to allow successive loop reduction. This approach lends itself to MATLAB assisted computation.

Dorf, Chapter 4, **Problems:**

P4.4 - Sensitivity calculation. Note that while you may use (4.16) as the book suggests, lecture (probably Monday 9/21) will provide a more convenient formula for computing this same sensitivity quantity.

P4.8 - (a) Another sensitivity calculation. (b) You need only compute the **steady state** output due to step input in D(s). Note that if Y(s) also had a contribution due to the desired input R(s), what you compute could be interpreted as the steady state error due to the disturbance.