Homework Assignment 2

To: CSci 5802, All students
CC: Teaching Assistant
From: Dr. Mats Heimdahl
Date: 2/8/00
Re: Homework Assignment 2

The problem
The problem we will work on is adopted from the civil avionics industry. It is a very small system (called the altitude switch—ASW) that is responsible for turning on the power to a device (we call it the Device Of Interest—DOI) when the aircraft drops below a certain altitude. The ASW is used to automatically start devices such as ground radar or a ground proximity warning system.

The ASW example is adopted from Steve Miller at Rockwell Collins.

The Altitude Switch
The Altitude Switch (ASW) is a re-useable component that turns power on to a Device Of Interest (DOI) when the aircraft descends below a threshold altitude (2,000 feet) above ground level (AGL). If the altitude cannot be determined for more than two seconds, the ASW indicates a fault. The detection of a fault turns on an indicator lamp within the cockpit.

The ASW receives a status indication from the DOI indicating whether the DOI is powered on. If the DOI does not indicate that it is powered on within two seconds after power is applied, a fault is indicated. The ASW does not apply power to the DOI if the DOI is already powered on. If the DOI is turned off after the aircraft descends below the threshold altitude, the ASW does not reapply power to the DOI unless the aircraft again descends below the threshold altitude.

The ASW also accepts an inhibit signal that prevents it from turning on power to the DOI or indicating a fault. All other ASW functions are unaffected by the inhibit signal.

The ASW also accepts a reset signal that returns it to its initial state.

Your Task
Develop a VDM SL model of the ASW to clarify the rules that govern the system.
Deliverables
I want you to turn in one solution per team. I expect you to make sure the specification is (1) liberally commented, (2) syntactically correct, and (3) type checked. Hand in the following

1. A printout of the specification.
2. A floppy with a soft copy of the specification.

Due Date
At the end of class on Tuesday, February 15.