Senior Project Final Proposal
Due: October 31, 2002
Instrumentation Panel for an older car

Introduction:

The instrumentation panel will be applied to an older vehicle without such a device in order to help the driver be aware of the condition of the car. Without such a device the driver will not know the temperature of the coolant, which might cause an overheating problem in a time and place where people won’t have access to a gas station. Everyone has seen people on the side of the road with their hoods open and waiting for the temperature to cool down. This could be avoided by placing this device in your car. Most cars know have these displays but overheating still happens, this is because the display is a tool and it’s up to the driver to use it. Problems always happen at the worst times and with this device one will knock out at least one problem, the car.

The instrumentation panel will display the RPM, temperature of the water, and oil pressure by using a liquid crystal display (LCD). This type of display is not the best one because the driver won’t be able to see the readings from the side or at night. A better display would be a VF display because the driver would be able to see the readings at night and from each side but due to costs I might have to stick with the one I have.

Description:

This device can be applied to many different vehicles, but since all new vehicles already have such instrumentation devices, it will apply to an older car. This particular panel will most likely be applied to an older, 82 Nissan Sentra. Figure one lays out the basics of how the sensors will get the inputs and transport them to the microcontroller.
The temperature sensor will measure the coolant temperature in order to know how hot the coolant is to prevent overheating. If the temperature is too high, the driver will have to pull over and let the engine cool down to prevent damage. The sensor will be placed on the radiator with some kind of adhesive. The way the temperature sensor will work is that it will have a certain voltage correspond to each one degree temperature increase.

The RPM sensor will be necessary for the driver to know when to shift without over revving the engine and causing damage. A wire will be wrapped around the spark plug wire and every time the spark plug fires, the peak will be counted.

The oil pressure sensor will provide the driver with information such that the gaskets won’t blow because the driver will know when the pressure is too high or too low. The way the pressure sensor will work is that a certain voltage will correspond to a certain pressure and that number will be displayed on the LCD. I think I might just tap in to the old oil pressure sensor if that’s possible so I won’t have to buy one.

The MCU will be powered by the battery of the car.

Comparison:

There is a device that uses an LCD display for an aerocar, it’s called the DigiFly instrument display system (Internet, www.aerocar.com). This car can be made into a plane by attaching wings to it so the display changes from a car display into a plane display. In the car mode, the device shows speedometer, engine RPM, fuel quantity, oil pressure, coolant temperature and system voltage. The price is not known, but judging from the sensors it displays, and how it does it, it must be very expensive. The LCD displays the readings in a graphical format which I will not be doing. My readings will all be in numbers and no actual analog type gauges with a needle will be shown.
Another device manufactured by Amptronic Systems is made for small aircraft but the display that they are using is very similar to what I’m going to be displaying except without the altitude, and couple of other things that are not essential to a car display (Internet, homepages.acenet.co.za/cheeky/skydat). The size of their LCD is quite close to the one I’m going to be using and same type of format too. Theirs’ just has more functions because it’s an aircraft. Mine will be upgradeable if one wants to add more sensors and display them digitally.

There is also another product out there that is quite similar to what I’m going to be doing. It’s called the TachPlus, and it has many features, more than I will be displaying. The primary display is for the engine RPM, oil pressure, engine coolant temperature and battery voltage. It also has a secondary display that is accessed by a mode button which I will not be having. The many features this device has would cost a lot of money and time to construct so the price of it must be high.

**Demonstration:**

This project will be demonstrated with a working car and it will have to be outside for obvious reasons such as the size, weight, noise, and pollution. Since the car can’t be brought in, pictures will be taken of the sensors and the working LCD display to show that everything works, and how it works. The display will be mounted somewhere on the dashboard and will stay in the car at all times since it has to take readings and display them. This device is great for older cars because they do have engines but without proper instruments to monitor them.

**Completion:**

I think I will be able to complete this project in due time and hopefully with good results. I’ve been looking for the RPM sensor, and have found one. I found a temperature sensor that I will be using but not to many pressure sensors for the right price yet. Once all the sensors are
acquired the actual setup can be done and the writing of the code will have to start. I’m still thinking on how to grab the inputs and convert them to digital inputs. The actual display readings shouldn’t be too hard once the inputs are gathered.

Figure 1

Block Diagram
Dashboard of the car

Steering wheel

LCD

Radio

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