ENGR 271 – Assignment 6

Due Date: July 16, 2000 (Sunday at 10:00 AM)
Material: Based on Experiments #2 and #6 in the *Earth Measurements* manual.

Key Programming Terms:
Read *Write* Data RAM EEPROM pointer
Count

Key Concepts:
Transistor Feedback

1. Wire the protoboard according to the schematic on page 128. You do not need to include the temperature sensors or the piezo speaker. You may wish to read pages 32-35 (top of page) and pages 125-140 and run the programs contained on those pages.
2. Pretend you are a hydroelectric engineer. Your job is to make sure that the reservoir contains enough water. Write a program so that the pump operates on a hysteresis cycle during the day (<20 lux) and on an automatic timing cycle at night (>=20 lux). A manual switch can also operate the pump. During the day, pump is turned on if the water level becomes too low (conductivity < 45 µS); if the pump is on, it remains on until the water level corresponds to a conductivity >= 60 µS.
3. The operation for #2 seems fine to you, but your boss wants to know the number of times in a week that the pump behavior is governed by a hysteresis cycle, timed operation, and a manual switch. You think that your boss is a pain in the neck, but you would like to continue receiving your paycheck. As a preliminary task, modify the above program to keep track of the pump operation for 10 cycles (i.e. use a *for-next* loop) by storing data using the *write* command and then retrieving data with the *read* command. Once the pump has run through 10 cycles, list something like the following in the debug window:

Hysteresis Cycles	Cycles of Timed Operation	Manual Cycles
5	3	2