

EET363 Introduction to Microcontrollers

OIT Portland West, Fall 2010

Lab Assignment #5 – Timer Module Due December 9

Objective: The student will use the timer module to create a tone in a speaker, and the PWM module to adjust the color of the RGB LED.

Project Description: You can't tell from the picture but might remember from the video, that every time Captain Pike's communication light flashed, it would also make a 'boop" sound. The Dragon12-Plus won't make any sound as sophisticated (after all, Star Trek is many centuries in the future) but it does have a small speaker connected to a timer module channel. You are to enable the speaker, and have it produce a middle C tone whenever the signaling LED is lit. Middle C is roughly 261.6 Hz.



We will actually do Star Trek Technology one better by changing the color of the light depending on the yes or no. For "Yes" the color should have the green LED on 75% and the red LED on 25%. For "No" the color should have the red LED on 75% and the green LED on 25%. If you have the older Dragon12+ board without the RGB LED you will have to pretend you have the RGB LED and use an oscilloscope to check the appropriate pins of the PWM module.

Equipment and Software needed:

- Everything you used in Lab Assignment 4
- While you can develop your program using the simulator, use the Dragon12-Plus for final testing.
- You may use the C compiler, if you wish (and know C).

General Instructions:

Other than you are to use the timer module "Output Compare" function to create the tone and the PWM module to adjust the duty cycle (and hence the illumination level of the RGB LED), you are on your own as to how you implement this assignment. Note that the RGB LED will work best if driven with a low frequency signal, but not so low you see the flashing.