**­­EE 445S Real-Time Digital Signal Processing Laboratory – Prof. Brian L. Evans**

**Lab 2 Instructions – Part 2**

**2. Talkthrough using EDMA:**

* Please connect the DSP board to the PC using the USB cable, and connect the oscilloscope to the line out port, signal generator to the line in port.
* Overall, please follow the instructions in “C:\CD\docs\appendix\_a\ App\_CCS\_5\_1\_omapl138.pdf” for the detailed steps to create a project. But, instead of vectors.asm, please add vectors\_EDMA.asm file. Also, migrate to C:\CD\code\chapter\_06\ccs\Frame\_EDMA\_6748 to add all the files.
* Run the program. It shows the talk through application.
* Show your program to your TA.

**2. Sinusoidal Generation using EDMA:**

* Please connect the DSP board to the PC using the USB cable, and connect the oscilloscope to the line out port.
* Create another project folllowing the same instructions as above, but replace the following files with the ones you downloaded from the course website.

1. DSP\_Config.h
2. frame.h
3. ISRs.c
4. main.c

* Read the comments in the createtable() functions in ISRs.c. Generate a sine wave of frequency 1 KHz.
* Run the program to see the sinusoidal signal on the oscilloscope.
* Show your program to your TA.
* Repeat the program for 2 KHz.

***\*  All the necessary codes are provided to you in “C:\CD\code”.***

***\*  A mistake in the pdf instruction: at step A.7 (2), add both “OmapL138ZoomTargetConfiguration.ccxml” and “OMAPL138\_DSP.gel” into the project.***

***\* Note that the workspace of CCS can only be in the C: drive.***

***\* Please make sure all DIP switches(two packages of eight switches, each) on the board are in the “OFF” position.***

**3.  Other notices**

***\* The above pdf instructions only show how to create a new project. If you want to open an existing project, go to menu “project”  “importing existing CCS/CCE eclipse project”.***

***\*  Since the computer will erase any changing to the C drive after logging off. Please backup your project either in your personal directory or in flash disks. Losing files is not an acceptable excuse for not submitting assignments on time.***

**Assignments:**

* Explain (mathematically) what happened when 6 kHz & 7 kHz sine waves were generated for a sample rate of 8 kHz.
* Compare and contrast the three methods for sending the samples of the sinewave to the codec (polling, interrupt, DMA)
* Scaling factor: Why is the scaling factor necessary? What would happen if the scaling factor was left out?
* How many cycles does a single call to sin() take? Calculate the number of cycles that occur between samples. Assume the DSP runs at 375 MHz... (And feel free to comment on these two results)