Lecture 1

EE 422 (DSP for Comm)
Spr 04, CSU-FtC
Jan 20, 2004 (96th Birthday of Louis, Sr.)

B105 T, R 2:10 pm

Rules of Engagement

1. This is essentially a lab course — but at the end you would like to be able to say you can program DSP hardware to run SP & Comm algorithms ... for instrumentation, software radio, wireless, etc.

2. This means there will be some theory — basically review of EE 311 / EE 312 / EE 421. Only multi-rate theory will be new (I think).

3. Typically, I or we (LS & Mike Buehrer) will give two lecture. Mike will give three lab demos to get you started. Always meet in B105 — then repair to B109.

4. Three labs are open (B109), where several DCs run CCS (a TI product).

5. You will work in 2-person teams, with joint lab reports signed to indicate what load-sharing was.

6. 70% labs + 30% project (new lab)

7. We will either ck out hardware, or lock it into cornet in B109.

8. The WWW-site is extensive, and you should refer to it for

lab-notes

.h & .c programs

etc.

a. www.engr.colostate.edu/EE427
b. .ti.com {keyword search re C6711}
c. tutorials within CCS

9. Pair up & email pairings to mbuchner@engr. w/ cc to scherf@engr.

10. Assume all have card access to B109

11. Ea station has or will have

a. PC + Windows + MATLAB + CCS + ENS Software Suite

b. Signal Gen + Oscill.

c. DSK 6711 C Development Board

d. Cables : stereo headphone to dbl BNC rf
: headphone to headphone

e. BYO headphones, speakers, MP3, MiniDisc, etc.

12. By Thurs : Read Lab 1 Notes
: Roam around TI WWW

On Thurs : Mike will help you set up your file structure for DSP & charge it with support files required to build a project, which can be compiled, downloaded, and executed on DSP.

File Structure

0. You have an ENS Acct w/ disk space on U:\ drive

1. Your file structure will be

U:\ DSP \ Support
\ Lab_01_ \ project ~~file~~ folder _1kHz {.pjt, .c}
\ Lab 02 folder

DSP

Support : header (.h) & c- (.c)
: linker command (.cmd)
: vector file for interr or poll

Lab_01_ { sine-gen project file (created by student) ~~support~~ files
{ source code files }

2. Some of these files are to be downloaded from EE422 Webpage and some are to be created in CCS... namely the project file, which you build in CCS.

3. Once you have established your file structure, and used projectbuild in CCS to charge Lab_01 folder with projectfile. Nit, you are ready to run your first DSP program: Generate a 1kHz sinewave.

Mike: We should have an experiment like,

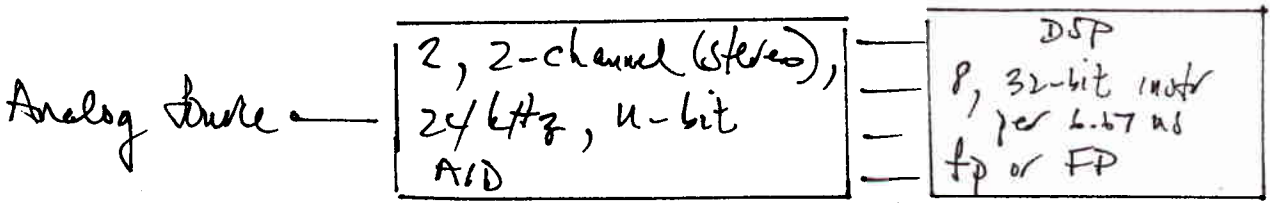
$$x[n] = k^2 x[n-2] \quad ; \quad x[0] = A$$

or

$$x[n] + a\,x[n-1] + b\,x[n-2] = 0, \quad x[0] = A$$

to synthesize sine or damped sine.

4. Rudiments of Hardware



$$\frac{P}{6.67 \times 10^{-9}} \simeq 10^9 \text{ instr/sec} \quad (1 \text{ GHz})$$