Objectives  
The objective of this lab is to introduce the lab equipment, familiarize yourself with Metrowerks CodeWarrior for the 9S12, and to develop a set of useful fixed-point output routines.

Software Design  
Main calls uBinOutdec, uBinOutdec calls printf, printf calls TERMIO\_putchar, TERMIO\_putchar sends data to the hardware LCD.

Analysis and Discussion

1) In what way is it good design that there is no arrow directly from the fixed.c module to the LCD.c module in the call graph for your system?

The code is not easily reusable. As long as fixed.c uses printf, fixed.c can be reused for other pieces of hardware that can display strings.

2) Why is it important for the decimal point to be in the exact same physical position independent of the

number being displayed?

The output to the LCD looks nice.

3) When should you use fixed-point over floating point? When should you use floating-point over fixed-point?

Use fixed-point over floating point when speed is a factor. Floating point calculations, without hardware support, can cost many cycles. If precision is required, fixed-point is better.

4) When should you use binary fixed-point over decimal fixed-point? When should you use decimal fixed-point over binary fixed-point?

5) Give an example application (not mentioned in this lab assignment) for fixed-point. Describe the problem, and choose an appropriate fixed-point format. (no software implementation required).

6) Can we use floating point on the 9S12? If so, what is the cost?

Extra credit) Is fixed-point or floating-point arithmetic faster on the Pentium w/MMX?