

## UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE

## Department of Electrical Engineering

## Phase Locked Loops

INTRODUCTION

You have designed a low-pass filter which is to pass frequencies below 2000 Hz. All other frequencies are to be greatly attenuated. A computer analysis shows the response curve to be reasonably smooth with the specified values of components used in the design. This filter is to be used in a consumer product and the tolerances of the filter components are to  $\pm 10\%$ . To insure that the filter is still selective at the proper frequencies with the 10% tolerance on the components, you would like to build the filter and analyze it at frequencies of 1800-2200 Hz. Your problem is that while your signal generator was being calibrated, the lab technician spilled a cup of coffee in the chassis and consequently it will not be back for two weeks. You do however have another signal generator capable of frequencies of up to 1500 Hz.

ASSIGNMENT

The student is to design and breadboard a circuit using phase locked loop techniques that will enable the use of a 750 - 1500 Hz signal generator to test the filter.

REFERENCES

1. References on reserve in the library.
2. Textbooks on the subject of electronics and electronic devices.
3. Faculty with expertise in the area of electronics and digital systems.

EXPECTED RESULTS (as a minimum)

1. Verify that the design produces a signal in the desired range.
2. Experimentally determine both the lock and capture ranges of the design.
3. Demonstrate the circuit to a faculty member.