In seeking a practical solution for short range ultrasonic communications this work attempts to develop and produce an integrated array of acoustic transmitters on a flexible substrate. This is done using flexible thin film transistor (TFT) and micro electromechanical systems (MEMS). The goal is to develop a flexible system capable of communicating in the ultrasonic frequency range at a distance of 10 – 100 meters. This requires a great deal of innovation on the part of the FDC team developing the TFT driving circuitry and the MEMS team adapting the technology for fabrication on a flexible substrate.

The technologies required for this research are independently developed. The TFT development is driven primarily by research into flexible displays. The MEMS development is driving by research in biosensors and micro actuators. This project involves the integration of TFT flexible circuit capabilities with MEMS micro actuators in the novel area of flexible acoustic transmitter arrays. This thesis focuses on the design, testing and analysis of the circuit components required for this project.