

Project Proposal for Muhua

SUPERB Summer 2000

Description:

Develop circuits and software to integrate Bluetooth radios into the PicoRadio Test Bed environment. At first order, integrate means to generate a bitstream at a Tx node and recover the same bitstream at an Rx node.

The work will require understanding of the Bluetooth radio interface, original design or adaptation of digital control circuits in the Xilinx FPGA, and basic 'C' coding for the ARM processor.

Task Outline:

1. Understand the basics of the PicoRadio Test Bed system.
2. Understand the basics of the Bluetooth radio and its interface.
3. Design a control interface based on the Proxim application programming interface (API) that will allow a user to control the radio from a console menu. This will require two components: 1) a control interface for the radio that will go in the Xilinx, and 2) 'C' code for the menu-driven API. Use Xilinx schematics/VHDL and 'C' code from the existing Proxim interface as a model.
4. Test the design on the bench using the PicoRadio Test Bed.
5. If time permits, adapt the existing TDMA support to the Bluetooth radios.

Goal:

This project should take a couple of months to complete. What "complete" means can vary because step 4 tends to be somewhat painful and full of nasty surprises for a variety of reasons. So, we should probably shoot for completion of step 3, and as much of step 4 as possible.

What You'll Be Learning:

- How a simple but complete communication system works.
- Hands-on experience with a cutting-edge radio technology.
- Issues of coding for embedded systems.
- Creating a low-level application programming interface (API)
- Structure and compilation of a simple operating system.
- Standard lab test procedures

What You Need To Do First:

To get started, you need to understand how the PicoRadio system works, particularly the PicoRadio Test Bed. There is currently no single document that gives an overview of PicoRadio, so you'll have to rely on a set of web pages, schematics, source code, and your own reasoning ability. We will sit down and go over the system to start, and we'll be available any time for help, but much of the time you'll be able to solve a problem on your own, with a little (or a lot) of digging.