TIM:

By implementing this new antenna design, the reach of the UCSC amateur radio repeater would be increased, but only locally. Therefore, we decided to take it a few steps further, and implement 2 separate RoIP nodes which would interface with the repeater, thus increasing the reaching capabilities of the UCSC repeater to a global scale.

RoIP, which stands for “Radio over IP” is similar to VoIP, and in fact uses many of the same protocols as services such as skype. By implementing 2 different nodes which use 2 different protocols this would allow the repeater to communicate with people on both networks, namely, Echolink, and Allstar Link.

In order to successfully design, and implement such a system, each RoIP node would require its own linux based single board computer, as well as a path for audio, and control signals, to and from the repeater. Since there would be multiple devices in a single system with a need to meet these requirements, we decided to design a linking interface, which would directly facilitate the interaction of the audio and control signals to and from the repeater.

The system, from a high level perspective functions such that a person in the field would have the ability to communicate with the repeater through their handheld radio. The user would then have the ability to choose which antenna they would like to use, by means of a DTMF sequence. Additionally, the user could then use another DTMF sequence to activate one of the RoIP nodes. All audio would go from the repeater through the linking interface, where it is then sent through audio codecs to the RoIP nodes, as well as to the DTMF decoder present in the antenna switching controller. All of these devices are constantly listening for their respective DTMF sequences before they can be activated.