**Project Overview**

Terrestrial Trunked Radio (TETRA), which is commonly used in Emergency Service Providers, is a special kind of radio waves. Maintaining well networks coverage of TETRA is essential for public safety.

The Objective of this project is to build up an application on the iOS platform and this application can connect a TETRA-based walkie-talkie through Bluetooth 4.0 technique, detecting signals and then storing into a database for analysis. We aim to find the holes in the network coverage and send the report to service providers for improvement.

This project is cooperated with the local company, Honoh Ltd. HONOH provide a variety of TETRA-based wireless and wired solutions to professionals. They combine a whole host of technically superior hardware components with complete resident software solutions.

**Methodology**

We have used a Bluetooth adaptor and a 2G-GSM modem in phase 1. The Bluetooth adaptor is used to connect between the 2G-GSM modem and iPad because the modem does not have Bluetooth embedded in the chip and we are required to have an external adaptor. In phase 2, we have used a real TETRA walkie-talkie which is connected to the in-use network.

Furthermore, we are required to have an iPad to run our application. We have used the iPad to control the walkie-talkie for collecting data of signal strengths, details and sending back to iPad. After that, the iPad will help to store and analyze the data it presents the data collection in a user-friendly presentation.

**Result**

At the end of the project, we used our product to test signals strength of TETRA around HKUST campus and we found the result as figures. Figure 1 shows the strength across the whole trip so that we can see there are some sudden drop of signals strength and also distance across time so we can check if the consistency of the records.

Figure 2 shows the map of HKUST and there are many dots showing the signals strength of such location. Green dots represent good signal, yellow dots represent fair signals, red dots represent bad signals and grey dots represents no signal.