

Test & Evaluation Project Summary

Using the resources of the Center and the University of Houston, the Southwest Public Safety Technology Center is establishing a broad-based facility for the development, testing and assessment of RF technology specifically applied to public safety concerns. As part of this effort the SWTC has established an agreement with Hewlett-Packard to provide facilities for comprehensive Electromagnetic Compatibility (EMC) and Electromagnetic Emissions testing and certification of high frequency devices.

The first project in this program is to test and evaluate a Russian-made "Non-Linear Junction Detector" purchased by the National Institute of Justice for use in US prisons to detect contraband cell phones. As widely reported recently in the press, contraband cell phones are becoming a serious problem in US prisons, where the prison authorities assume they can be used to plot escapes or conduct criminal business behind bars. Last year in the state of Texas, prison authorities seized 135 cell phones and similar numbers are being seized in other states.

The "Non-linear junction detector" (cell-phone detector) being evaluated interrogates a cell phone with a relatively high power RF signal that "drives" solid state junctions in the phone into a non-linear state where they will produce signals at harmonics of the interrogating frequency. These harmonic signals are radiated by phone and received by the cell-phone detector, thus indicating the presence of the phone. Importantly, the cell phone does not have to be turned on or even have a battery installed to detect its presence.

The objectives of the SWTC measurements are to evaluate the performance of the "Non-linear junction detector" and to determine the electromagnetic field levels radiated by the device. These field levels are used to determine compliance or noncompliance with FCC emissions regulations and to determine the near-field power levels around the device to ensure that the operator and surrounding personnel are not subjected to RF field levels that exceed established safety standards.

