

COMMUNICATIONS FIELD TESTS

(A set of tests to gather data to support Ellipso System Engineering and detailed design.)

Task 1. Develop test cases for measurement of the signal conditions in a multi-path environment.

I. Test case # 1 – Determine CDMA Interference Conditions

Objective of Test Case #1:

The objective of this test case #1 under Task 1, is to measure, record and analyze the background interfering signal environment with a CDMA receiver in the Ellipso frequency bands in both urban, multi-path locations and in rural multi-path locations.

Plan for Accomplishment:

The approach to obtain this data for use within the system design and in later detailed hardware/software design first involves a survey of existing test data of this type. Any pertinent test data available will be used to reduce the specific data, which needs to be collected in the field. Then a permission to radiate request will be submitted to the FCC establishing the specific schedule, frequency bands, transmitted power and CDMA waveforms to be used for the tests. The frequency manager for the Anaheim area will be contacted to obtain the necessary FCC permits. During the time required to obtain the FCC permission, a transmit/receive site including an S-band transmitter and antenna and an L-band receiver and antenna will be established on the rooftop of B/250 on the Anaheim campus. Likewise, a communications van will be set up to contain an L-band transmitter and antenna and an S-band receiver and antenna with an electrical generator sufficient to power these and other general purpose test equipment items. The van mounted antennas may be stored inside the van and removed and mounted on the top at a remote site for test purposes, or they may be permanently affixed to the top of the van. This communication van will then be driven to multiple remote sites after obtaining necessary permissions and licenses, both in urban areas of Anaheim and into semi rural areas outside of Anaheim for signal transmission, reception and recording of data. A CDMA waveform generator will be used to provide signals to the transmitters, and Nextel-type cell/radio phones will be used to provide coordination between the test sites during the testing period.

The testing will consist of first receiving ambient background signals within the Ellipso bands both at the rooftop site and at various remote sites in an urban setting and in a semi-rural setting. Measurements will be made at various times of day and during different weather conditions as available. The data will be recorded for later use and analysis.

Then, after recording and analyzing this background environment, specific CDMA waveforms will be transmitted between the rooftop site and the communication van (S-band from the rooftop site and L-band from the communications van located at various remote sites). These transmitted and received signals will be recorded and analyzed to determine the magnitude of any interference in the communications path due to background ambient signals. Again, measurements will be made at various times of day and during different weather conditions as available.