ReadMe - Chinook Hill

1   KML File

The KML file is to be used with Google Earth. In the KML file each multipath event is labeled with the coordinates at which that event took place. Edwards Air Force Base is outlined, along with the location of the receivers.

The line of travel has the altitude of the plane associated with it. If you wish to see that line without the altitude then open the KML file in a text editor and delete the lines that read "<altitudeMode>absolute</altitudeMode>". Their will be the number of events + 1 lines that need to be deleted.

2   Transmitter and Receiver Locations

The receiver antenna location can be found in the KML file marked as Building 4795. The C-12 airplane transmit antenna positions can be found in the image file labeled "C-12 Antennas".

3   Animations

The animations are saved as .mov files. They will play fastest if you either let them load all the way, or download them by right clicking on the video and clicking on "Save As Quicktime Movie..."

4   Data Format

4.1   .MAT File Format

Each event is saved in a series of .mat files that are named as follows - impulse_index number_file number.mat

The .mat file contains a single variable called hout.
hout is a 2000 x 8 x N variable where
Number of rows = 2000 = length of the channel impulse response.
   The sample rate is 200 Msamples/s so the spacing between the samples is 5 ns.

number of columns = 8 = indexes the transmit and receive antenna combinations

number of pages = N is determined by the number of spatial samples (or "snap shots") stored in the file.

The spatial sampling rate is 1250 samples/s
(i.e., each transmit/receive antenna channel is probed once every 800 μs).

The transmit/receive antenna indexes are defined as follows:

Index (Column Number)	Description
1	Rx1, Tx1
2	Rx1, Tx2
3	Rx2, Tx1
4	Rx2, Tx2
5	Rx3, Tx1
6	Rx3, Tx2
7	Rx4, Tx1
8	Rx4, Tx2

The following is example MatLab code that can read an impulse response file (this works with February 3rd data files but can be modified to work with february 8th files): Download.

4.2   Determining Index

To determine the index of the impulse response from the timestamp found at the top center of the animation use the following equation:

$$\text{Index at Event} = \text{Start Index} + \frac{\text{Time of Event} - \text{Start Time}}{0.0004}$$

where *Time of Event* and *Start Time* are in seconds.

4.3   Example

Looking at Cords Road (W $\rightarrow$ E) on February 3rd we see that their are 14 events. While watching the animation for Event 7 we see something of interest starting at 08:51:36.16 (time stamp found at the top of the animation). To look at this particular spot more closely in the channel impulse response data we proceed as follows.

The Start Index (823000) and the Start Time (08:51:33.66) are listed in the table on the Cords Road (W $\rightarrow$ E) page, in the row labeled "Event 7." Convert the Start Time to seconds: 08:51:33.66 = 31893.66 seconds. Convert the Time of Event to seconds: 08:51:36.16 = 31896.16 seconds. The index of the event is:

$$823000 + \frac{31896.16 - 31893.66}{0.0008} = 826125$$