

# ReadMe - Ramp

## 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>". There will be the number of events + 1 lines that need to be deleted.

## 2 Transmitter and Receiver Locations

The receive antenna locations can be found in the KML file marked as iNET and CAA. The transmit antenna positions on the UH-1H Helicopter are shown below in Fig. 1.

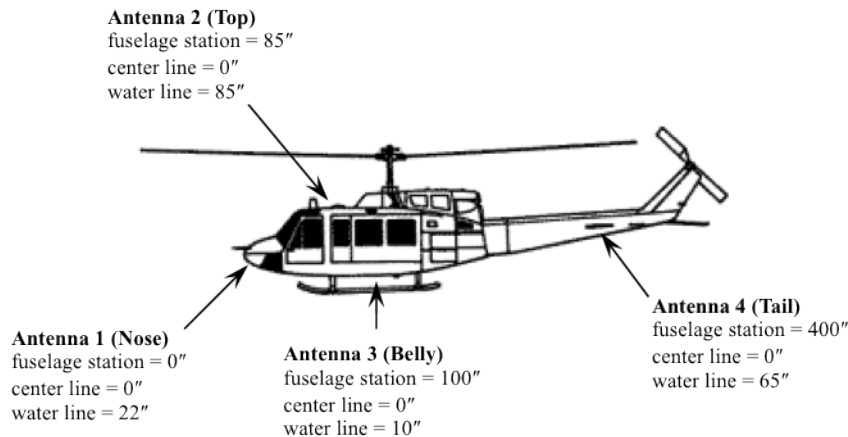


Figure 1: Transmit antenna positions on the UH-1H helicopter.

## 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  $2000 \times 6 \times N$  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 = 6 = 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 2000 samples/s

(i.e., each transmit/receive antenna channel is probed once every  $500 \mu\text{s}$ ).

The transmit/receive antenna indexes are defined as follows:

Index (Column Number)	Description
1	Rx1, Tx1
2	Rx1, Tx3
3	Rx1, Tx4
4	Rx2, Tx1
5	Rx2, Tx3
6	Rx2, Tx4

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:

$$\text{Event\_index} = \text{start\_index} + \frac{\text{event\_time} - \text{start\_time}}{0.0005}$$

where event\_time and start\_time are in seconds.

### 4.3 Example

The Ramp data comprises 6 events. Suppose while watching the animation for Event 1, we see something of interest at 16:58:06.12 (the time stamp found at the top of the animation). To look at this particular impulse response more closely, we proceed as follows:

1. The start time for Event 1 (16:58:05.82) and the start index for Event 1 (8901) are listed in the table in the row labeled Event 1.
2. Convert the start time to seconds:  $16:58:05.82 = 61085.82$  s.
3. Convert the event time to seconds:  $16:58:06.12 = 61086.12$  s.
4. The event index is

$$\text{event\_index} = 8901 + \frac{61086.12 - 61085.82}{0.0005} = 8961$$