

# How To Playback Dynamics Data

## **Background**

AVDS has the capability to animate vehicle dynamics data derived from sources such as AVDS's interactive simulation, other simulations, MATLAB and flight tests. The data must be saved in columns in a text file. The number of vehicles that can be animated at any one time is only limited by the computer hardware in use. The data for each vehicle must be supplied in separate files. AVDS reads the data from the file into memory and then uses the provided angular and linear positions to draw aircraft at each time instant. Between the given times steps AVDS interpolates the data to produce smooth playback even when large time steps are used. Data that can be included in playback includes linear and angular positions, articulated surface positions, HUD data such as Mach and velocity, craft type, and craft configuration mask. The user can also include data to be plotted in the charts during playback.

## **Files and Directories**

- By default AVDS is installed in the directory *C:\Program Files\AVDS*.
- The directory *AVDS\userfiles* contains a sample playback data file, *RecordData.save.txt*, and playback configuration file, *Sample.ply.ini*.
- By default, playback configuration file have the extension *\*.ply.txt*.

## **Playback Data File**

- Initial latitude and longitude are optional. If they are not defined the selected Airport is used, from the AVDS menu select *Initialize->Airport*.
- If latitude and longitude are used they are defined in degrees decimal as follows:  
% LAT 37.793625  
% LONG -122.32856
- Any lines, except those including latitude and longitude, that start with the characters #, % and \$ are ignored, i.e. these characters comment out the line.
- Dimensions used in playback files are as follows:
  - x, y, z positions are in **feet** relative to the initial latitude and longitude.
  - zrot, yrot, zrot rotations are in **degrees**.
  - alpha, beta are in **degrees**.
  - sfc01, sfc02, ... , sfc15 are in **radians**.
- The axes are defined as follows:

### **LINEAR MOTION**

#### **Body axes:**

x – positive forward (through the nose)

y – positive to the right (through the right wing)

z – positive down

#### **ANGULAR MOTION**

pitch - positive nose up

roll - positive left wing up

yaw - positive nose right (clockwise)

#### **Earth fixed axes:**

X – positive north

Y – positive east

Z – positive down

x - Positive rotation / positive pitch

y - Positive rotation / positive roll

z - Positive rotation / positive yaw

## **Configuring AVDS For Playback**

1. Open the Playback Configuration dialog window (from the AVDS menu select **Configure->Playback**).
2. Press the button labeled **Entity Data File Name** and choose the data file.
3. Select the **Entity Time Format** either **Delta** or **Elapsed**.
4. For each column in the data file drag the corresponding column number from the **File Column** tree to the appropriate item in either the **Dynamics Items** tree or **User Data Items** tree.
5. To add configurations for more vehicles press the up arrow in the **Entity Selected** block to increase the number of entities and then reaccomplish steps 1 through 5.

## **Playing Back A File**

1. Load the playback file, from the AVDS menu select **File->Playback->Open** and select the playback configuration file.
2. Select playback mode by selecting the **Play** button.
3. Press the **Start** button.
4. Use the playback toolbar to control the speed of playback.