# HLA Module For Orbiter

By John Bland

Background

- Built on Orbiter 2010 v.100830
  - Release on 30 August 2010
- Used Visual Studio 2012 Professional Edition
  - Allows user to hook .dll for debug
- Used Chat Federate as a basis for HLA
- Used Orbiter Flight Data Recorder as API example
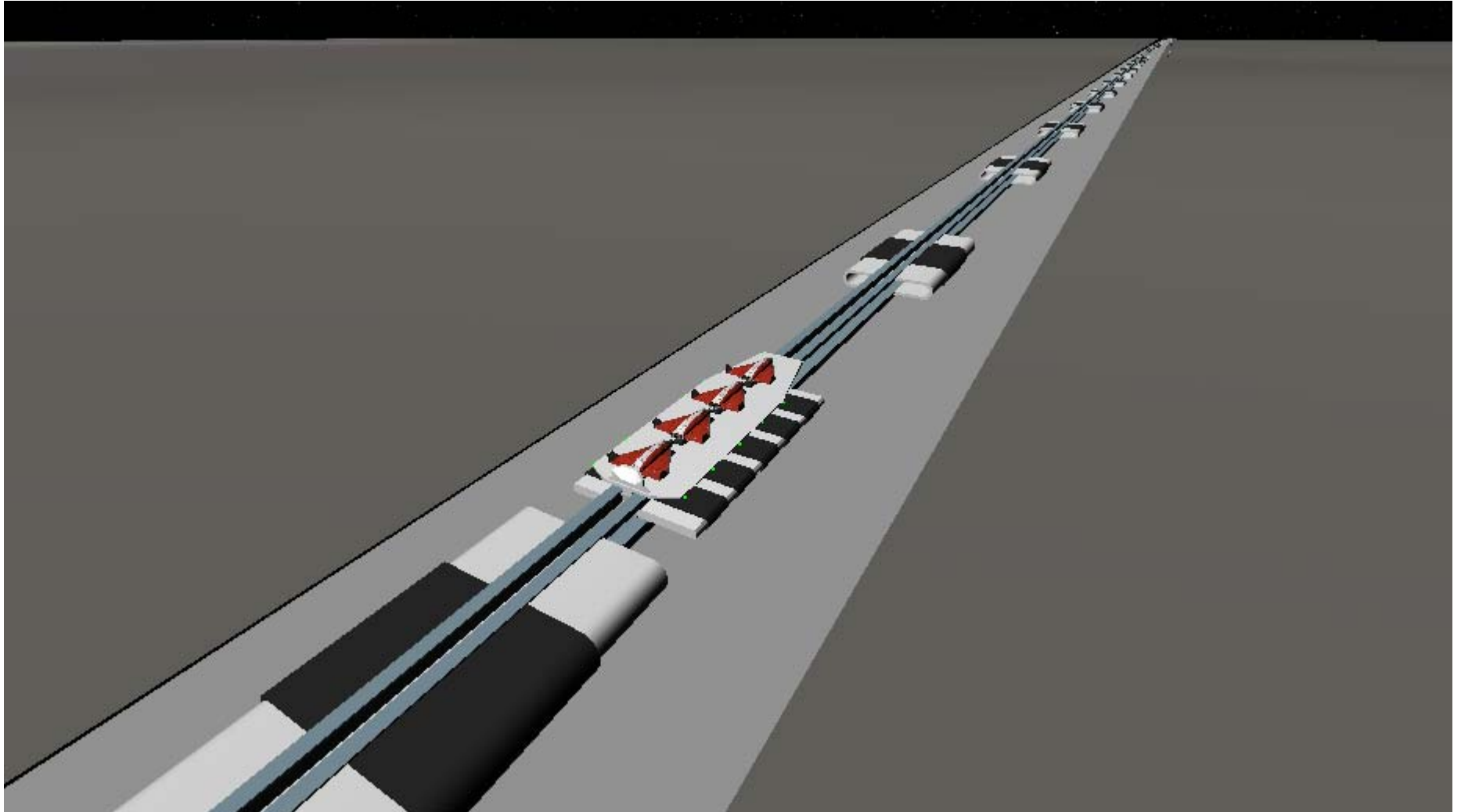
Extra Info

- DLL needs to be placed in C:\orbiter100830\Modules\Plugin

- FOMs need to be placed in C:\orbiter100830\Modules\2013_FOMS

- Mass Driver needs to be placed in C:\orbiter100830\Modules
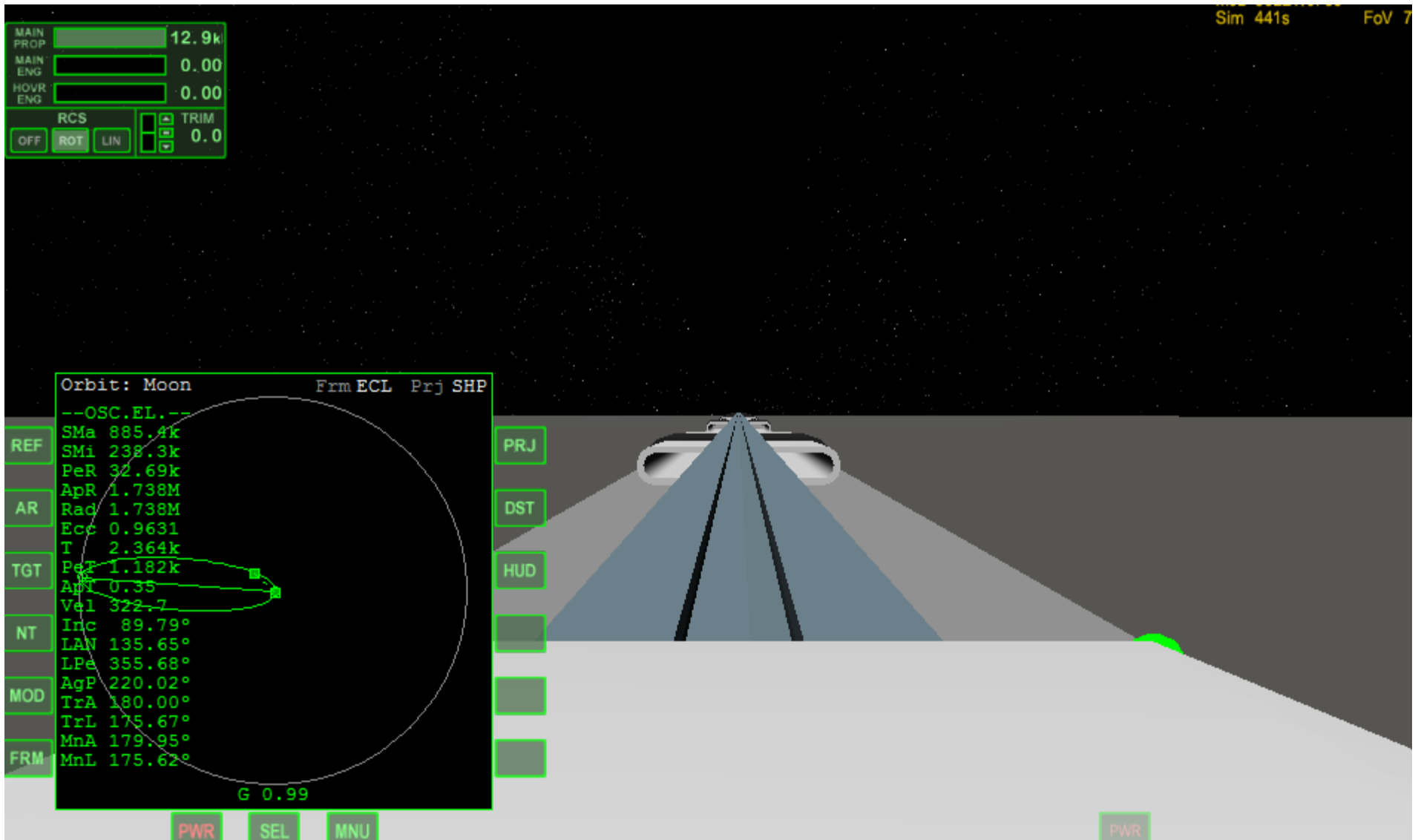 - Should be default install location

Mass Driver
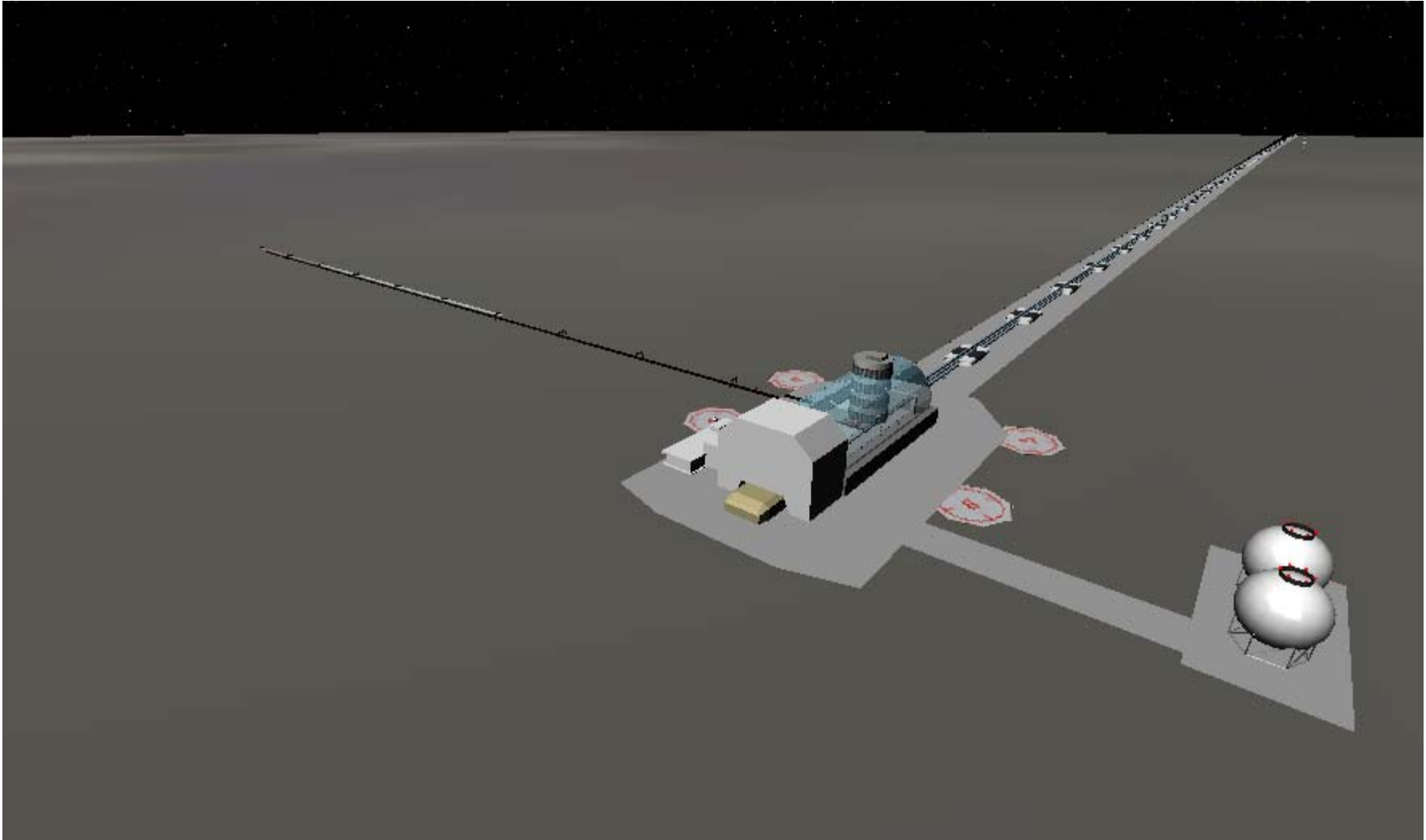
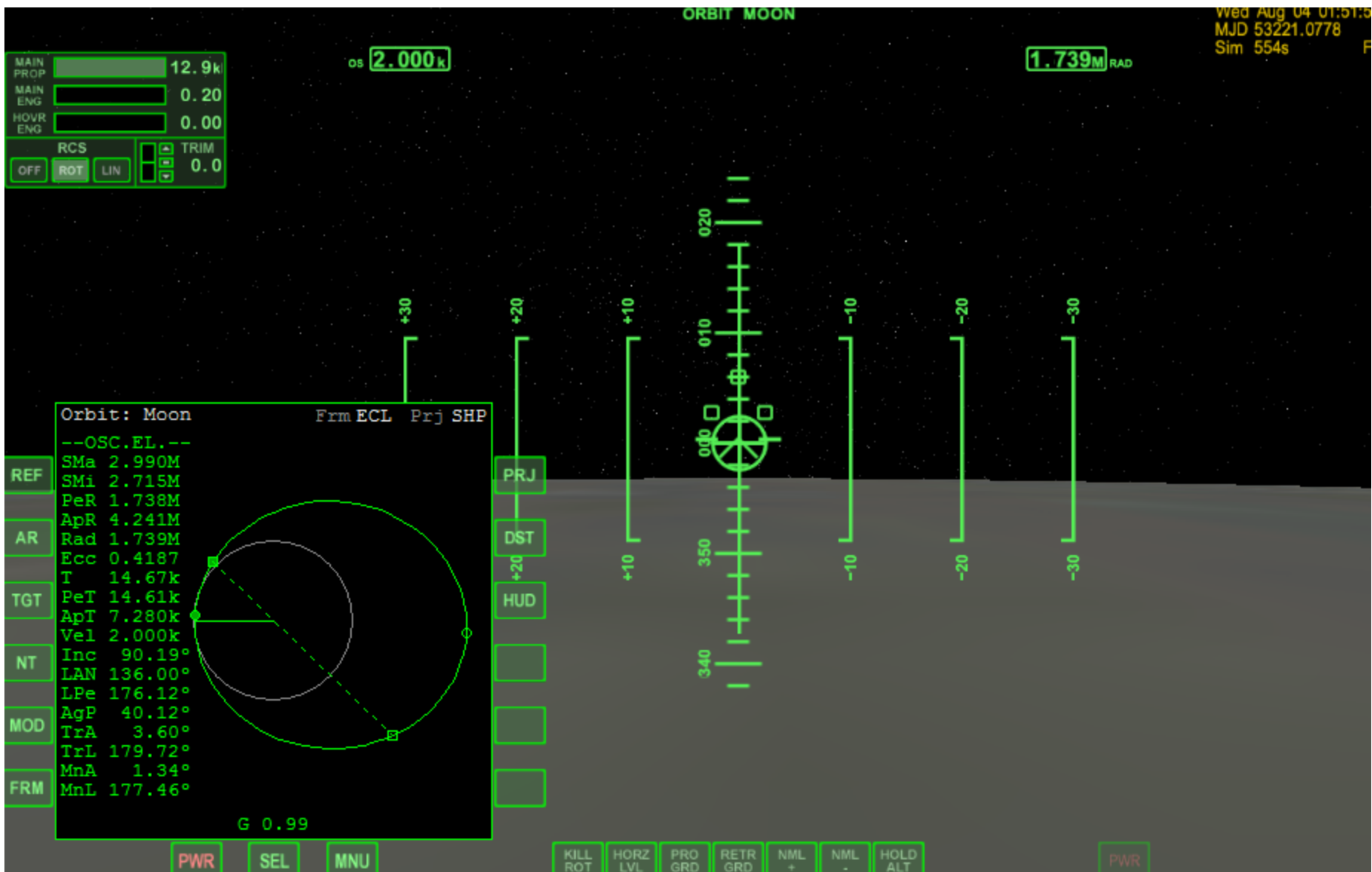108 KM long Rail

On the Rail

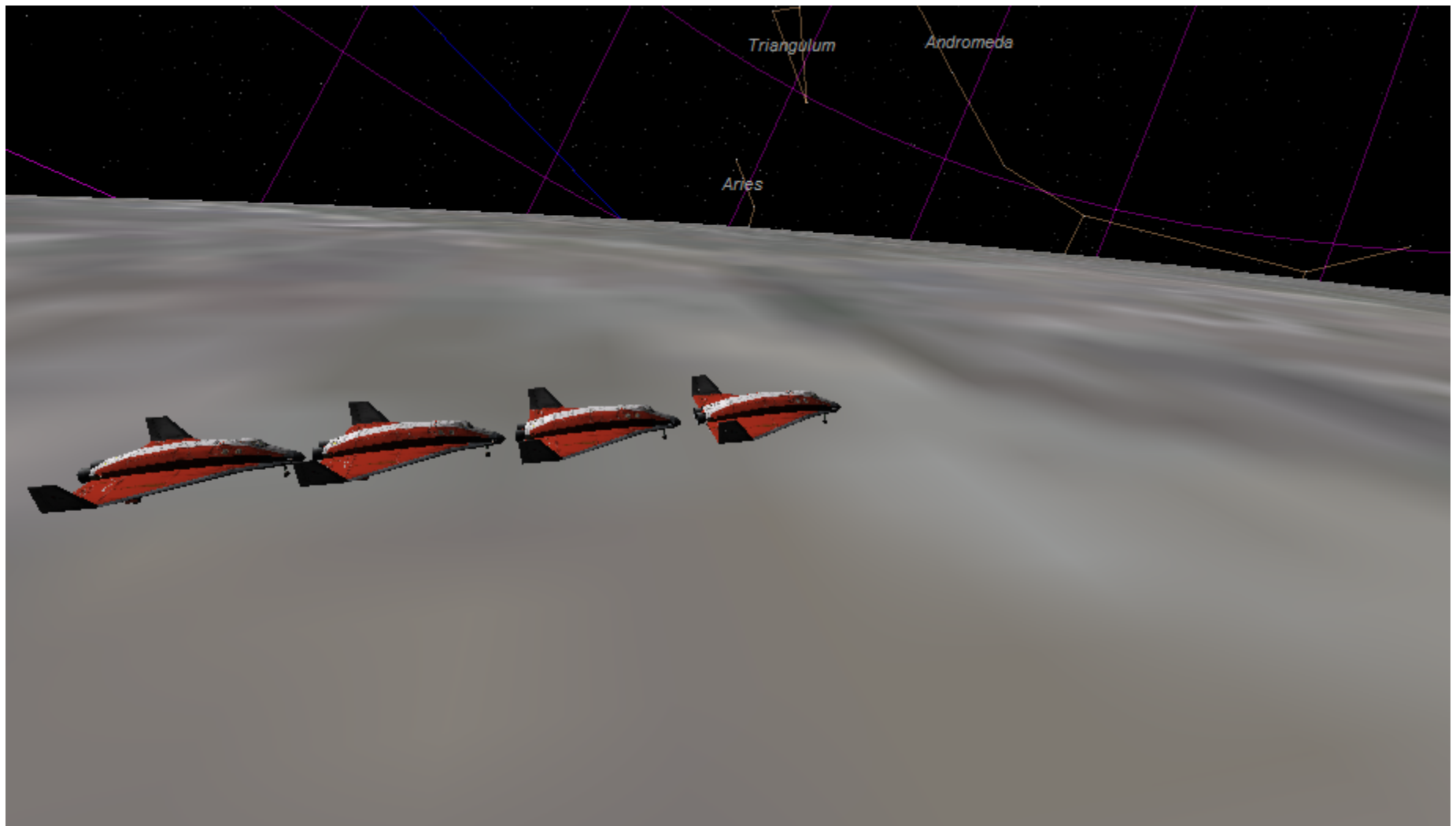Accelerates to 2000 m/s

Cockpit View

Another View

Another HUD View

Exterior Post Launch

More Extra Info

- Need to update moon config file for your location
  - C:\orbiter100830\Config\Moon\Base
- Edit your scenario file as needed
  - C:\orbiter100830\Scenarios\Catapulters

Code Info

- 2 HLA entities are created
  - LMD and LMD Payload
- Reference Frame is Moon Centric Fixed
  - Orbiter provides position data from multiple references
  - Sun, Barycenter, Planet XYZ, etc.
- Time issues never fully resolved
  - Querying the GALT did not work properly in c++

Code Info

- sendPosition() encodes the position and velocity information for both entities

- Multistep process to encode X,Y,Z position and velocity vectors

  – Another artifact of C++ versus Java

- syncTime() sets Orbiter's time to the SEE event time - previously set to 9 Apr 2013

Code Info

- MsgProc() creates the Dialog screen
- ResetVesselList() searches through all vessels and gets the Payload and Mass Driver
- UpdatePosition() updates the XYZ information on the Dialog screen
- OpenDlgClbk opens the Dialog screen

Code Info

- opcPreStep() occurs before each time step in Orbiter
  - All updates to position taken here
  - Time advances allow advancement
  - VesselStatus vector contains all information about each identified vessel
- oapiSetPause() pauses/resumes the Orbiter simulation
  - Can create choppy visuals if paused too long

HLA Functions

- receiveInteraction()
- reflectAttributeValues()
- objectInstanceNameReservationSucceeded()
- timeConstrainedEnabled()
- timeAdvanceGrant()
- objectInstanceNameReservationFailed()
- removeObjectInstance()
- provideAttributeValueUpdate()

Other Info

- Worked with both Pitch and MaK RTIs in the lab
  - Only worked with Pitch on site
  - Need further testing with MaK
- Most design decisions done on the fly
  - Little regard to readability/optimization
  - Plenty of room for improvement
- Pizza makes working late nights easier ☺

Questions?

- Please feel free to email me

- Will try to be available to help in class sessions

- Good Luck