STK X MATLAB GUI – Surveillance UAV

Requirements:

- **STKX License** (Should be included with all standard STK licenses but due to distributing issues at AGI you may have to contact AGI for the free STKX license)
- **MATLAB 32-bit** (AGI support recommends the 2013a 32 bit as newer versions are often unstable with STKX)
- It is possible run the application with graphics in the full desktop STK application instead of the MATLAB GUI with any version of MATLAB and without an STKX license. Edit the code as shown below to make the change. All GUI handles should work normally.

```
91
92      % Create New Scenario - GUI
93      %root = actxserver('AgStkObjects10.AgStkObjectRoot');
94      %try
95      %    scenario = root.Children.New('eScenario','UAVMission');
96      %catch
97      %    root.CloseScenario();
98      %    scenario = root.Children.New('eScenario','UAVMission');
99      %end
100
101     % NO GUI
102 -   app = actxserver('STK10.application');
103 -   root = app.Personality2;
104 -   scenario = root.Children.New('eScenario','UAVMission');
105
```

Desktop Visuals (No STKX license)

```
91
92      % Create New Scenario - GUI
93 -    root = actxserver('AgStkObjects10.AgStkObjectRoot');
94 -    try
95 -        scenario = root.Children.New('eScenario','UAVMission');
96 -    catch
97 -        root.CloseScenario();
98 -        scenario = root.Children.New('eScenario','UAVMission');
99      end
00
01      % NO GUI
02 -    %app = actxserver('STK10.application');
03 -    %root = app.Personality2;
04 -    %scenario = root.Children.New('eScenario','UAVMission');
```

MATLAB GUI (STK X license + 32bit MATLAB)

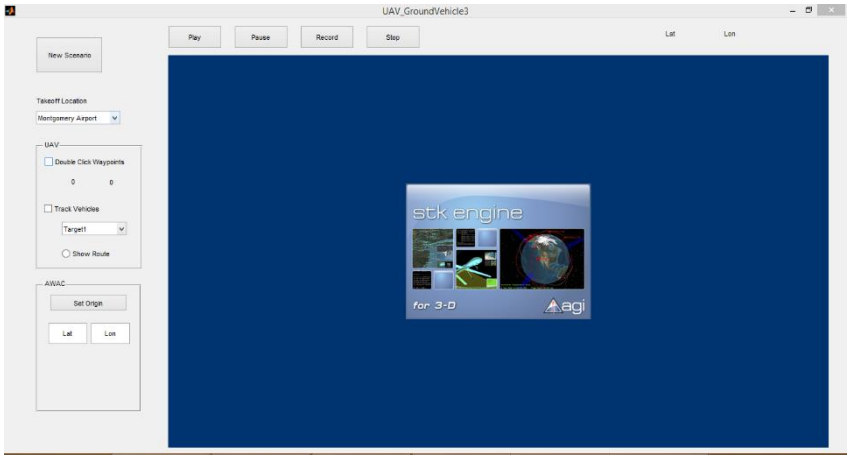
Files:

- SurveillanceUAV.m
- SurveillanceUAV.fig

Both files are required to run the application. Open and run the .m file to start the application. Running the .fig file alone will result in MATLAB crashing.

Running the Application

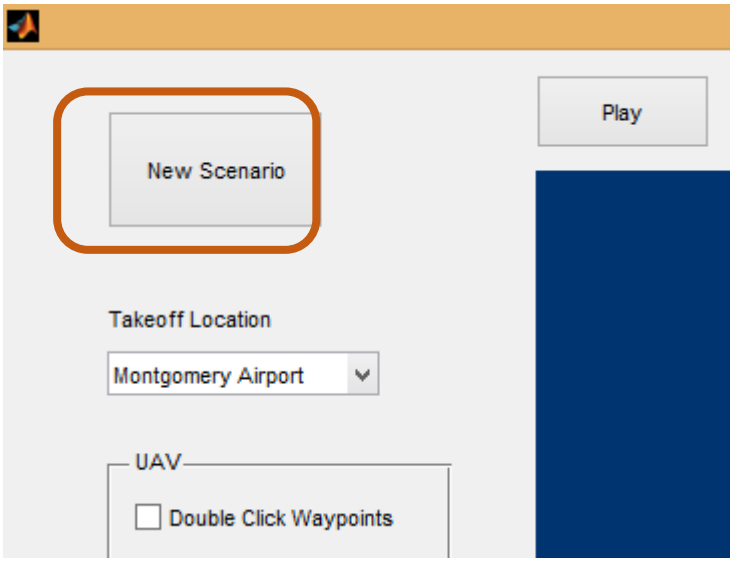
1) Open and run the .m file, this will show up:



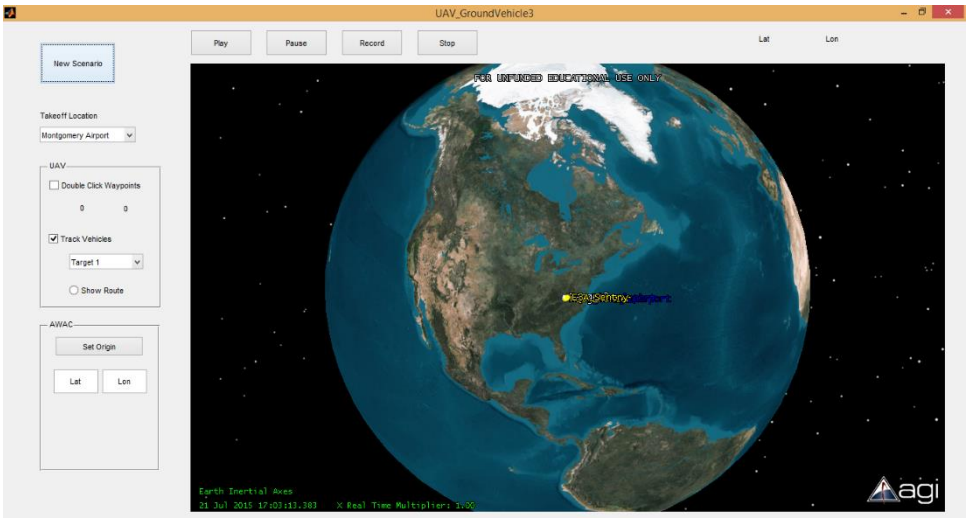
   a. If the STK Engine splash window say "NO LICENSE," an STKX license needs to be acquired from AGI.

2) Creating a new scenario

   a. Choose a takeoff location from the menu and press the new scenario button:



b. You will see a loading bar and then the 3D graphics globe, wait for the animation time in the bottom left corner of the 3D graphics to run and all objects to be placed:



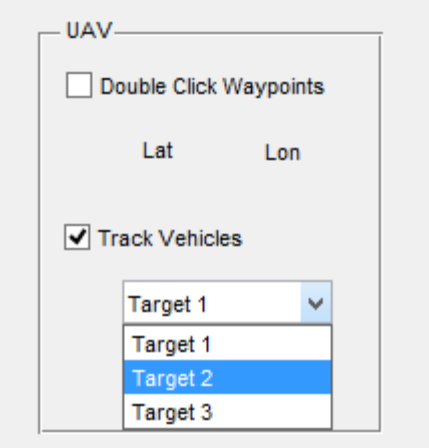
c. Once the objects are placed and the time running, the UAV will takeoff automatically.

3) Zooming in on objects

a. Use the mouse scroll wheel to zoom in on the objects and Blacksburg
b. Once closer, press shift + double click on any vehicle or facility to zoom to it:

4) Changing UAV target and recalculating route

a. The UAV has a basic tracking algorithm and will make an estimate of where its target is headed, take into account the current bearing of the aircraft, then recalculate a new path approximately every 15 seconds or whenever the target is changed. The UAV should automatically start tracking Target 1.
b. You can see what object the UAV is tracking from the dropdown menu in the panel on left hand side.
c. To change the UAV's target, choose which target the UAV should follow from the dropdown menu:



d. (The double click feature has been disabled while running on a laptop) To manually click waypoints, check the "Double Click Waypoints" box, then double click on the globe where you want the UAV to go.

5) Controlling the AWACS

a. The AWACS location can be controlled in the AWACS panel. Simply type in the latitude and longitude of the point you wish the aircraft to fly over. The aircraft will then alter its course to fly above the coordinate and begin a figure-8 holding pattern.