

Kerbal Space Program - Bug #13508

Equatorial satellite contracts actually require correct LAN

01/02/2017 04:33 PM - root

Status:	Confirmed	Start date:	01/02/2017
Severity:	Low	% Done:	10%
Assignee:			
Category:	Gameplay		
Target version:			
Version:	1.2.2	Language:	English (US)
Platform:	Windows	Mod Related:	No
Expansion:			

Description

Equatorial satellite launches do not specify a longitude of ascending node, but the contract still checks this when evaluating the orbit. If you place a satellite into an orbit that is a rotation of the target orbit, the contract will not be fulfilled.

This can be fixed by one of the following:

1. contract evaluation looks only at the orbit's argument of periapsis, ignoring whether it actually matches the target orbit
2. contract window should show the longitude of ascending node value
3. equatorial contracts should only generate orbits with a longitude of ascending node of 0

given #2 or #3, i can fudge the correct orientation by offsetting by my parking orbit's AoN.

my vote would be for #3.

History

#1 - 07/01/2018 12:13 AM - Anonymous

- Category set to Gameplay
- Status changed from New to Confirmed
- % Done changed from 0 to 10

A confirming example came up recently on the forum

<https://forum.kerbalspaceprogram.com/index.php?topic/176209-matching-longitude-of-ascending-node-for-satellite-contract/>

In that context, I thought through how software could test the shape of orbit, even when the angular parameters are ill-defined. At some point the orbit is drawn using a 3D representation

$$\mathbf{r} = p (\mathbf{u} \cos\theta + \mathbf{v} \sin\theta) / (1 + \mathbf{e} \cdot \mathbf{u} \cos\theta + \mathbf{e} \cdot \mathbf{v} \sin\theta)$$

with unit vectors \mathbf{u} and \mathbf{v} in the plane of the orbit, latus rectum p , and eccentricity vector \mathbf{e} . The eccentricity vector and specific angular momentum $\mathbf{L} = \mathbf{u} \times \mathbf{v} \times \text{sqrt}(p/GM)$ are physically-meaningful vectors that do not depend on parameterization. The contract goal could be to get an orbit with vector \mathbf{L} to match the \mathbf{L} of the orbit within 5% the magnitude of the target \mathbf{L} , and \mathbf{e} within 0.05 the target-orbit's \mathbf{e} .

Files

screenshot276.png	1.03 MB	01/02/2017	root
-------------------	---------	------------	------