Kerbal Space Program - Bug #10138

Target-relative velocity display for landed target

07/20/2016 08:25 AM - Alchemist

Status:	Confirmed	**Start date:**	07/20/2016
Severity:	Low	**% Done:**	10%
Assignee:			
Category:	Controls and UI		
Target version:			
Version:	1.1.3	**Language:**	English (US)
Platform:	Windows	**Mod Related:**	No
Expansion:			

Description

Select a target that is on the surface of a planet. Then switch between navball modes and see how the velocity behaves.
If the target is in physics range, the target-relative velocity closely matches your surface-relative velocity, what is correct for a target practically doesn't move in relation to the surface.
However, if the target is outside the physics range, the displayed target-relative velocity matches your orbital velocity. That is, the unloaded target's orbital velocity is assumed 0, when it's surface velocity that should be so - the navigation forgets to account account for the planet rotating and the inertial-frame speed it gives to the target.

History

#1 - 12/16/2018 12:37 AM - Anonymous

- File TargetRelativeVelocity.jpg added

- Status changed from New to Confirmed

- % Done changed from 0 to 10

The added launch-sites of Making History expansion provide a quick way to demonstrate this.
1) Launch Bug-E-Buggy (stock) at the Island Runway
2) Launch Velociteze (stock) at the KSC Runway
3) Use map view to target Bug-E-Buggy 33km away
The NavBall indicates 175m/s eastward velocity relative to the target, which is the surface rotation speed of Kerbin.
In fact, the planet rotation moves both Velociteze and Bug-E-Buggy at nearly the same velocity, with Bug-E-Buggy moving just 174m/s × 33km/600km = 10m/s downward in the (non-rotating) reference frame of Velociteze.

There is a very nice video https://youtu.be/VU-_InTkc54?t=681 warning new players about this, for aircraft landing. It also affects targeting bases on other bodies, whenever the body has noticeable rotational velocity.

Interestingly, going within the 2.25-km physics-loading distance to the target corrects the indicated velocity, and then after moving beyond the unloading distance, the velocity remains correct... until the next quicksave/quickload.

Workaround by increasing the physics-loading distance:
@PHYSICSGLOBALS { @VesselRanges { @landed {
@load = 60000
@unload = 70000
} }

Files

TargetRelativeVelocity.jpg	218 KB	12/16/2018	Anonymous