

ZTC Transport – Ananke – Lunar Intercept Instructions

For Ananke v0.2 and ZTC_Phantom v0.1

Required addons:

Interplanetary MFD v5.1

Instructions for generating a lunar intercept scenario are:

1. In a text editor, open the scenario "ZTC_Phantom 485km Eq Circ Orbit.scn" and put in an approximate MJD date close to when you want a lunar transfer to occur, eg, 59247.0 (2008-Feb-02).
2. Scroll down to the vessel ZTC_Phantom and change the last number in the ELEMENTS line to the same MJD.
3. Save and close the scenario.
4. Open "ZTC_Tether_Orbital_Calculations.xls" spreadsheet.
5. Start Orbiter, make sure IMFD and Scenario Editor are activated in the Modules tab and load the scenario " ZTC_Phantom 485km Eq Circ Orbit".
6. Open IMFD to Target Intercept program in one MFD and OrbitMFD (Frm: ECL Prj: SHP) in the other.
7. In IMFD, make sure TOF-Locked is on then set TEj to 0 and TIn to 346k.
8. Adjust TEj until EIn = 0.00.
9. Change TOF-Locked to TOF-Unlocked.
10. Adjust TEj to minimise EjA (<0.5 should be achievable).
11. Use the Scenario Editor to bring the time within an hour or so of TEj.
12. Adjust TIn to get EIn = 0.00 then TEj to get settings as described in step 10.
13. In IMFD, switch to Burn Vector view and enter dVf and dVo into the spreadsheet.
14. Adjust Tip Velocity until Payload Velocity Error is close to zero (<0.1 m/s)
15. In IMFD, increase TEj until EjA is approx equal to Flight Path Angle in the spreadsheet.
16. Perform steps 13 to 15 until Payload Velocity Error is <0.1m/s and EjA Error <0.1deg.
17. Time accelerate until TEj is approx 100s.
18. Perform steps 13 to 16 again if necessary.
19. Pause time.

20. Enter Vel from OrbitMFD into spreadsheet under Phantom Vessel Velocity.
21. Enter IMFD TEj into the spreadsheet.
22. Open Scenario Editor. Copy and paste MJD into spreadsheet.
23. Unpause time and pause again as soon as TEj = 0.
24. From OrbitMFD enter TrL into spreadsheet.
25. Exit Orbiter.
26. In a text editor, open scenario "120km Ananke Lunar Intercept.scn".
27. Copy and paste MJD Catch from the spreadsheet in to the Date and Ananke ELEMENTS fields.
28. Copy and paste Ananke Orbit Elements SMA and Ecc into first two fields of Ananke ELEMENTS. Remember to move the SMA decimal place three places to the right.
29. Copy and paste LPe Catch into the fifth and sixth fields of Ananke ELEMENTS.
30. Calculate the second field of Ananke AROT by $-90 + \text{LPe}$ and enter into scenario.
31. Copy and paste Tether Parameters Angular Velocity * -1 into the first field of Ananke VROT.
32. Save and close scenario.