FORTUNE EIGHT

Aerospace Industries, Inc.

International Technical Services

2002 Jan 27

MEMORANDUM

To: CMA Class

From: Chauncey Uphoff

Subject: Class Notes for Lecture 3

Lecture notes, from now on, will be short descriptions of what was covered in class because most of the material presented in class will be on the Bonus Handouts page. Occasionally, there will be a development that I haven't written up previously. For the most part, however, I will simply point you to previously published papers by me (most of which will be on the Bonus Handouts page) or give references to books and other papers. Because these lectures change almost everytime I give the course, it's better to do it this way; then I can make changes in the lecture notes and point the student to recent stuff or add it to the Bonus Handouts page. See the "…Restricted 4-Body" paper on the web-site.

Lecture 3 (2002/1/27) included my proof that the zero-sphere-of-influence patched conic satisfies Jacobi's integral in the circular restricted 3-body problem (note difference between Ehricke, Minovitch, and Bate/Mueller/White) approximation in which the heliocentric interplanetary transfer velocity is transformed to a launch- or target-centered inertial frame at a point where the spacecraft enters a finite sphere around the target. Surprisingly, the zero patched conic is more accurate than the SOI patched conic with regard to energy during close approach to the target planet. Not surprisingly, the zero patched conic gives no information about the target relative angular momentum during target periapsis. That's OK, we have to correct out the launch vehicle errors anyway and it's easy. The important part, in preliminary planning, is to make sure we get the launch and arrival energies right. Everything else is in the noise and the timing.

Homework was discussed and the "right-brain" puzzles were elucidated and it was pointed out that we're switching to the "left-brain" (analytical and languages) skills one will need to get the substance of this course. But we'll come back to the right-brain later.

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