

TO: T. W. Hamilton

FROM: E. Cutting

SUBJECT: Categorization of Trajectory Computer Program Development and Maintenance Effort

DISTRIBUTION: V. C. Clarke, J. Lorell, Trajectory and Performance Group, Section 312 Group Leaders and Project Engineers, J. F. Scott, R. White, R. Roth

REFERENCE: Hamilton, T. W., "Request for Categorization of Section 312 Computer Program Development and Maintenance Effort", ICM 312.0-99, July 22, 1964

4.1 Conic Trajectory Programs

1. NECON (1014070, 1098000)
Cognizant Engineer: W. E. Kirhofer
Description: Computes parking orbit Earth-Moon conics
Development Status: Completed
2. DACON (1103070)
Cognizant Engineer: W. O'Neil
Description: Computes direct ascent Earth-Moon conics
Development Status: Completed
3. HECON (1013000, 1097000)
Cognizant Engineer: R. Richard
Description: Computes parking orbit heliocentric transfers
Development Status: Completed
4. Direct Ascent HECON
Cognizant Engineer: R. Richard
Description: Computes direct ascent heliocentric transfers
Development Status: Uncompleted-Active
5. Multiple Impulse Conic (1040000)
Cognizant Engineer: W. E. Bollman
Description: Computes heliocentric transfers utilizing impulsive plane change
Development Status: Completed
6. Analytic Circumlunar
Cognizant Engineer: F. Sturms
Description: Uses patched conics for Earth-Moon-Earth transfer (from STL)
Development Status: Completed

7. Analytic Lunar Return (1049010)
Cognizant Engineer: P. Feitis
Description: Moon to Earth using patched conics (from STL)
Development Status: Completed
8. Minovich Multiple Planetary Conic (1106000)
Cognizant Engineer: M. Minovich
Description: Computes coasting multiple planetary encounter conics
Development Status: Completed
9. Clarke Multiple Planetary Conic (1072000)
Cognizant Engineer: V. C. Clarke
Description: Same purpose as 4.1.8, but details more similar to HECON
Development Status: Uncompleted-Active
10. Dallas Round Trip Conic (1136000)
Cognizant Engineer: S. S. Dallas
Description: Round trip to planets using parking orbit at Earth and target
Development Status: Uncompleted-Active
11. Conic Partials Program
Cognizant Engineer: W. E. Kirhofer
Description: Computes many useful partials using NECON
Development Status: Completed
12. Heliocentric Conic Partials Program
Cognizant Engineer: W. Haynes
Description: Computes useful partials from HECON
Development Status: Uncompleted-Active
13. Lunar Flyby Analysis
Cognizant Engineer: W. E. Kirhofer
Description: Used in analysis of trajectories highly perturbed by moon
Development Status: Completed
14. Heliocentric Conic Plotting (1025000)
Cognizant Engineer: R. Richard
Description: Generates SCH020 plot tapes from HECON save tapes
Development Status: Completed
15. Conic View Period (9017000, 1065000)
Cognizant Engineer: W. Kirhofer
Description: Computes station view periods for HECON and DACON
Development Status: Completed
16. Conic View Periods for HECON
Cognizant Engineer: D. Tito
Description: Computes station view periods for HECON
Development Status: Uncompleted-Active
17. Planetary View Period (1059000)
Cognizant Engineer: R. Wallace
Description: Computes view periods of the Moon and planets
Development Status: Completed

18. Lunar Orbiter Lifetime (1092000)
Cognizant Engineer: J. Lorell
Description: Integrates orbital parameter to obtain satellite lifetime
Development Status: Completed
19. Multiple Heliocentric Conic (1040000)
Cognizant Engineer: J. Lorell
Description: Similar to 4.1.5
Development Status: Completed

4.2 Single Precision Integrating Trajectory Programs

1. Probe Ephemeris Generator - SPACE (1081000)
Cognizant Engineer: E. Cutting
Description: Generates probe ephemeris for JPTRAJ monitor
Development Status: Uncompleted-Active
2. Trajectory Post Processor SPPRO (1082000)
Cognizant Engineer: E. Cutting
Description: Processes SPACE to obtain desired output quantities
Development Status: Uncompleted-Active
3. ITER
Cognizant Engineer:
Description: Iteration routine for JPTRAJ
Development Status: Completed
4. PLOT
Cognizant Engineer:
Description: Allows SC4020 plotting under JPTRAJ
Development Status: Completed
5. POWER
Cognizant Engineer:
Description: Powered flight routine for JPTRAJ
Development Status: Uncompleted-Active
6. TRACK
Cognizant Engineer: (D. Roek)
Description: Plots Earth tracks using SC4020
Development Status: Uncompleted-Active
7. ORTHO
Cognizant Engineer: (D. Roek)
Description: Plots orthographic projections of trajectory using SC4020
Development Status: Uncompleted-Active
8. Space Trajectory (1015000)
Cognizant Engineer: E. Cutting
Description: Latest version of Space Trajectories program DBH07
Development Status: Completed

9. Powered Flight POWER (1012000, 1077000)
Cognizant Engineer: E. Cutting
Description: Latest version of powered flight program GN607
Development: Completed
10. Forward-Backward Integration (1118000)
Cognizant Engineer: W. E. Kirhofer
Description: Integrates backwards in time from final conditions
Development: Completed
11. General Plotting Program (1027000, 1095000)
Cognizant Engineer: J. Brenke
Description: Generates SC4020 plot tapes from output of 4.2.8
Development Status: Completed
12. Space Trajectory Monitor (1011000)
Cognizant Engineer: E. Cutting
Description: Monitor program for 4.2.8, 4.2.9, 4.2.11
Development Status: Completed
13. Lunar Return Search (1061000)
Cognizant Engineer: S. S. Dallas
Description: Varies lunar initial conditions in 4.2.8 to obtain desired
earth entry
Development Status: Completed
14. JPL 6° of Freedom (1005000)
Cognizant Engineer: P. Feitis
Description: Computes 6° of freedom entry trajectories (modification of
Ares 6°)
Development Status: Completed
15. Restricted 3-Body (1052000)
Cognizant Engineer: J. Lorell
Description: Integrates path of probe under influence of 2 bodies in
circular orbits
Development Status: Completed

4.3 Double Precision Integrating Trajectory Programs

1. TRIC
Cognizant Engineer: F. Sturms
Description: Transforms input conditions to standard coordinates
Development Status: Uncompleted-Active
2. PATH
Cognizant Engineer: F. Sturms
Description: Integrates equation of motion to obtain probe ephemeris
Development Status: Uncompleted-Active

3. PCST
Cognizant Engineer: F. Sturms
Description: Processes output of PATH to obtain various quantities
Development Status: Uncompleted-Active
4. VARY
Cognizant Engineer: F. Sturms (trajectory group interests, only)
Description: Solves variational equations
Development Status: Uncompleted-Active

4.4 Target Geometry Programs

1. Lunar TV Constraint Evaluation (1094000, 1057000, 9019000)
Cognizant Engineer: W. E. Kirhofer
Description: Used to determine Ranger Block III camera coverage
Development Status: Completed
2. Target Aiming TAIM (1048000)
Cognizant Engineer: W. E. Bollman
Description: Computes various target constraints in B plane
Development Status: Completed
3. TIME TAIM
Cognizant Engineer: R. Richard
Description: Computes contours of equal time for enter and exit shadow
Development Status: Completed
4. Mars Camera MARGAM (2203000)
Cognizant Engineer: N. Haynes
Description: Used to determine Mariner C instrument coverage
Development Status: Completed
5. Satellite Aiming SAIM (1048003)
Cognizant Engineer: N. Haynes
Description: Computes Mars aiming zones for Phobos and Deimos in
Canopus sensor
Development Status: Completed
6. Planetary Orbiter Split Capsule (1073000)
Cognizant Engineer: C. E. Kohlhasse, P. Feitis
Description: Computes near target characteristics of capsules and orbiters
Development Status: Completed

4.5 Low Thrust

1. Low Thrust (1016000)
Cognizant Engineer: R. Richard
Description: Computes optimum low thrust trajectories
Development Status: Completed

4.6 Monitors

1. JPTRAJ Monitor

Cognizant Engineer: E. Cutting (trajectory group interests, only)

Description: Monitor controlling many of the above programs and also
O.D., M.C. etc.

Development Status: Uncompleted-Active

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