

RAND/USGS Planetary Geodesy (RUPG) Software

RANDLSQ Program A Priori Input format, for Lunar image measurements (with 7 character control point names, and PLANET angles).

File: RUPG-FMT5012.doc

Version: 2004.08.13

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Description: Primary input of a priori information, such as approximate positions for the body pole position and rotation rate, control point positions, and camera position and orientation.

File input:

Groups 1, 2a, and 2b.

THESE RECORDS ARE NOT USED FOR LUNAR SOLUTIONS.

Group 3 - Control point locations ("npoi" records, note 2):

Phi	1-24	D24.16	Latitude of control point (degrees).
Lamda	35-48	D24.16	Longitude of control point (degrees). If iew=0, then east longitude. If iew=1, then west longitude.
Radius	49-72	D24.16	Radius of control point (meters or km?).
Pointid	73-79	A7	Point identification (unitless).

Sample (from Clementine lunar solution, zout.dat):

=> 0.2167900000000000D+02 0.2978699999999998D+02 0.1735230000000000D+04Clerke<=

Group 4 - Camera orientation and position (4 x "npic" records, note 3):

Record 4-1:

JulianDate	1-24	D24.16	Julian date when picture was taken (days).
Imageid	25-36	A12	Image identification. Usually flight data sequence (FSC) or similar image number (unitless).
-	65-79	A15	"JULIAN_DATE&FDS".

Record 4-2:

s(i,1)	1-24	D24.16	X component of spacecraft position vector in J2000.0 coordinates (km).
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s(i,2) 25-48 D24.16 Y component of spacecraft position vector in J2000.0 coordinates (km).
s(i,3) 49-72 D24.16 Z component of spacecraft position vector in J2000.0 coordinates (km).
- 74-79 A6 "SXSYSZ".

Record 4-3:

c(i,1) 1-24 D24.16 J2000.0 right ascension of optical axis of picture (degrees).
c(i,2) 25-48 D24.16 J2000.0 declination of optical axis of picture (degrees).
c(i,3) 49-72 D24.16 Twist angle of picture (degrees).
- 74-79 A6 "C1C2C3".

Record 4-4:

pa(i,1) 1-24 D24.16 Right ascension of target body north pole, e.g. alpha, at time "JulianDate" (degrees).
pa(i,2) 25-48 D24.16 Declination of target body north pole, e.g. delta, at time "JulianDate" (degrees).
pa(i,3) 49-72 D24.16 Rotation angle of target body, e.g. omega, at time "JulianDate" (degrees).
- 74-79 A6 "PLANET".

Sample (from Clementine lunar solution, zout.dat):

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=> 0.2449424473991000D+07 10010085 JULIAN_DATE&FDS<=
=>-0.5683284820000000D+02 0.1024576564900000D+04 -0.2289259262200000D+04 SXSYSZ<=
=>-0.8708766833846568D+02 0.6533837435742034D+02 -0.9010629153707471D+02 C1C2C3<=
=> 0.2731998259000000D+03 0.6567969309999999D+02 0.1746108997000000D+03 PLANET<=
```

Notes:

1. Currently read from RANDLSQ program unit 12.
2. "npoi" is the number of control points. See the "Solution Parameterization" file (format RUPG-FMT5031.doc") for input of this.
3. "npic" is the number of images. See the "Solution Parameterization" file (format RUPG-FMT5031.doc") for input of this.
4. Lines beginning with a "#" will eventually be treated as comments.
5. IMPORTANT: See format "RUPG-FMT5011.doc" for non-Lunar measurement files using 5 character Pointid.

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Reference: Model, program, and format generally follow that specified in:

Colvin, Tim R. (1992). "Photogrammetric Algorithms and Software for Spacecraft Optical Imaging Systems," _ A RAND NOTE _, N-3330-JPL.

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Document History:

Begun 2004.08.13 by B. Archinal

Modifications:

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