

RAND/USGS Planetary Geodesy (RUPG) Software

RANDLSQ Program Parameter Input format

File: RUPG-FMT5031.doc

Version: 2004.08.11

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Description: Primary input of RANDLSQ program flow parameters.

File input:

Group 1 (1 record, note 2):

Name	Columns	Format	Description (units)
npic	1-5	I5	Number of images (unitless).
npoi	6-10	I5	Number of control points (unitless).
nmea	11-15	I5	Number of measurements (unitless).
nit	16-20	I5	Number of iterations of solution (unitless).
iout	21-25	I5	If iout=0, then an output pole, points, and picture file is not produced. If iout=1, then an output pole, points, and picture file is produced.
ntot	26-30	I5	Number of types of variables for which a solution is required. The variable types are given below under group 3 input.
nsw	31-35	I5	Number of single variables to be weighted (unitless).
isol	36-40	I5	If isol=1 then individual radii are used at control points. If isol=2, then a single body-wide radius is used. If isol=3, then a tri-axial ellipsoid is being used (and the "pole, points, and picture" file must have apriori values for these).
iew	41-45	I5	If iew=0, then east longitudes are used. If iew=1, then west longitudes are used.
list	46-50	I5	If list=0, then output is directed to the terminal. If list=1, then output is direct to a user-specified file.
nfirst	51-55	I5	Number of conjugate gradient solution iterations (unitless).
k100	56-60	I5	If DATFMT parameter equals "RANDCLEM", then this is multiplied by 100000 and added to "nmea". (The reason for this is currently not clear, but is perhaps to increase the size of buffer space for Clementine solutions) (unitless).

iawt 61-65 I5 Angle weighting type. If 0, use RAND (power of 10) style weighting. If 1, actual uncertainty is given.

Sample (from Mars solution, par0014-030606.dat):

=> 6371 37652 90130 4 1 6 2 1 1 1 99998<=

Group 2 (1 record):

Body 1-10 A10 Name of the target planetary body (all uppercase and left justified). Allowable names are:

ADRASTEIA
AMALTHEA
ARIEL
CALLISTO
DIONE
ENCELADUS
EUROPA
GANYMEDE
GASPRA
IAPETUS
IDA
IO
MARS
MERCURY
METIS
MIMAS
MIRANDA
MOON
PHOEBE
RHEA
TETHYS
THEBE
TITAN [Currently being added.]
TRITON

Sample (from Mars solution, par0014-030606.dat):

=>MARS<=

Group 3 ("ntot" records):

Idtot 1-6 I6 Variable type for which a solution is required. Possible types are:

- 1: latitude of point (degrees)
- 2: longitude of point (degrees)
- 3: radius of point (km)
- 4: alpha angle of C matrix (degrees)
- 5: delta angle of C matrix (degrees)
- 6: kappa angle of C matrix (degrees)
- 7: right ascension of pole (degrees)
- 8: declination of pole (degrees)
- 9: rotation rate of pole (degrees/day)

10: a-axis of ellipsoid (km)
11: b-axis of ellipsoid (km)
12: c-axis of ellipsoid (km)
13: ellipsoidal longitude offset (degrees)

gweight 7-11 I5 If "iawt"=0, weight to apply to the above variable (power of ten, units as described above). Use e.g. "-38" to allow a variable to freely adjust and "20" to fix it to the a priori value. E.g. use "20" for Mars radii known from MOLA.

gunc 12-35 D24.16 If "iawt"=1, actual weight to apply to the above variable (units as described above).

Sample (from Mars solution, par0014-030606.dat, fixing radii of all points, as input from MOLA interpolation):

```
=> 1 -38<=  
=> 2 -38<=  
=> 3 20<=  
=> 4 -38<=  
=> 5 -38<=  
=> 6 -38<=
```

Group 4 ("nsw" records):

iswt 1-6 I6 Single variable for which a weight is required.

sweight 7-11 I5 Weight to apply to the above variable (power of ten, units as described above). Use e.g. "-38" to allow a variable to freely adjust and "20" to fix it to the a priori value. E.g. use "20" for the latitude, longitude, and radii of a landing site whose coordinates are known by radio tracking.

Sample (from Mars solution, par0014-030606.dat, fixing latitude and longitude of first point, the Pathfinder landing site):

```
=> 1 20<=  
=> 2 20<=
```

Notes:

1. Currently read from RANDLSQ program unit 11.
2. This record was read with a "(I6,11I5)" format by the weighter2.f (Mars control network) program, which has been superseded by the randlsq.F program.
2. Lines beginning with a "#" will eventually be treated as comments.

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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 2004.08.11 by B. Archinal

Modifications:

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(end of document)