ISIS Planetary Geodesy Software

(formerly RAND/USGS Planetary Geodesy (RUPG) Software)

ISIS *Qmatch* Program Measurement Input and Output File Format

File: ISIS-PG-FMT101.doc, .pdf, or .asc

Version: 2006.08.10

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File format:

Group 1 - Header records (2 records) (Note 1):

Record 1:

Name	Columns	Format	Description (units)
-	1-18	A	Text: "Matchpoint total ="
nmea	19-24	I6	Number of measurements in file

Record 2:

Name	Columns	Format	Description (units)
-	1-91	A	Text: "Point ID FSC LINE SAMP CLASS DIAMETER Comment"

Sample (from file generated from the RAND Lunar Clementine solution, "RAND-Clem.mat"):

```
=>Matchpoint total =543157<=
=>Point ID                              FSC    LINE    SAMP CLASS        DIAMETER  Comment<=
```

Group 2 - Image pixel measurements ("nmea" records) (Note 2):

Name	Columns	Format	Description (units)
Pointid	1-32	A32	Alphanumeric point identification (unitless). Note 3.
Imageid	34-43	I10	Integer image identification. Usually flight data sequence (FSC) or similar image number (unitless). Note 4.
Line	44-51	F8.2	Line measurement on image (pixels). Note 5.
Sample	52-59	F8.2	Sample measurement on image (pixels). Note 5.
Class	63	A1	Measurement class. Possible values are: A - Previous measures, not used currently.

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                              G - Measurement on a DIM (e.g. MOLA).
                              M - Manually measured.
                              T - Truth measure to which others are tied.
                              S - Automatic sub-pixel measurement.
                              U - Unmeasured (e.g. predicted/unverified).
                              Note 6.

     Diameter    65-82        F18.4         Feature size (e.g. crater diameter) (km).
     If blank or "-0.0000" no value is available.  Note 7.

     Comment     83-           A            User comment.  Must be quoted or not contain
     spaces (default is blank).  Note 8.


     Sample (first 10 measurements from file generated from the RAND Lunar Clementine
     solution, "RAND-Clem.mat"):

  Clerke                        15730757  188.00  135.00   M          -0.0000  File=../moon0005/mea040216a.dat
 Lemonni                        15730843   88.00  240.00   M          -0.0000  File=../moon0005/mea040216a.dat
   Borel                        15840852   92.00  238.00   M          -0.0000  File=../moon0005/mea040216a.dat
 Deseill                        29322612   36.00   10.00   M          -0.0000  File=../moon0005/mea040216a.dat
 Brewste                        15530789  257.00  233.00   M          -0.0000  File=../moon0005/mea040216a.dat
 Alfraga                        16140153  153.00  290.00   M          -0.0000  File=../moon0005/mea040216a.dat
 TaylorD                        16211943  191.00  210.00   M          -0.0000  File=../moon0005/mea040216a.dat
  Kant_P                        29421476  132.00  169.00   M          -0.0000  File=../moon0005/mea040216a.dat
 Dollond                        29521258  183.00  218.00   M          -0.0000  File=../moon0005/mea040216a.dat
 Archime                         3703918  176.00  139.00   M          -0.0000  File=../moon0005/mea040216a.dat
```

Notes:

1. In some non-standard versions of files in this format, the header records may
be missing, or the number of records may be missing or incorrect (or given as
"XXXXXX").
2. The ISIS *Qmatch* program reads and writes the Group 2 records in free format,
with blanks for field separation. However, the nominal format is given here,
and this was in fact required by some of the early RAND and USGS utility
programs which read this format, and is still used by some of the ISIS programs
that have not yet been switched to using free format.
3. The ISIS Planetary Geodesy software currently allows for 7 character point
identifications, in a right justified (A7) format. (Some early RAND and USGS
utility programs require the use of 5 character point identifications for non-
lunar data.)
4. ISIS 2.x currently requires that image identifications be integer*4 numbers.
Future versions of ISIS (e.g. 3.x) will allow for alphanumeric identifications,
probably up to at least 32 characters.
5. Line and sample coordinates are in the sense that coordinate (1,1) is defined
as at the upper-left pixel of an image. Integer coordinates define the center
of each pixel.
6. For each point, a reference (or "truth") image should preferably be
identified and the CLASS designator set to "T". (The other measures on the
point should have one of the other classes.) The reference image can be
selected arbitrarily, or perhaps selected as the image with the clearest (or
highest resolution) view of the point. The ISIS *Qmatch* program will not display
images for a point until one of the images is designated the "truth" image.
7. Some early non-standard versions of file in this format had the resolution
given in km/pixel, rather than feature size.

8. It is useful to put the actual filename of the image corresponding to the given imageid into the comment field, in order to document the physical connection between the measurements here and actual image files. Note that the user must also keep track of and document the use of multiple versions of images (and their corresponding measurement files if any) in the case where there may be a geometric change in the image.

Other notes:

A. In some non-standard versions of files in this format, lines beginning with "#" should be treated as comments.
B. The user must currently take care to keep measurement files separated as much as possible by mission (and/or camera), in cases where image numbers are not unique across missions. A future version (e.g. for ISIS 3.x) of this format will include a camera/mission identifier.
C. ".mat" (for matchpoint) is often used as the file name extension of files of this type. However, note that this is an unusual "reserved" special extension in Microsoft Windows for files of type "Microsoft Access Table Shortcut" and it might be preferable to simply use the ".dat" extension.

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References:

ISIS: See http://isis.astrogeology.usgs.gov/ for general information.

ISIS Planetary Geodesy: Under construction. But see:

http://isis.astrogeology.usgs.gov/Isis2/isis-bin//viking_geodesy.cgi for information on processing Viking images, and

http://isis.astrogeology.usgs.gov/Isis2/isis-bin//cassini_geodesy.cgi for information on processing Cassini images.   Also see:

http://astrogeology.usgs.gov/Projects/ControlNetworks/ for example input and output files.

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Document History:

Begun 2006.08.10 by B. Archinal, based on RUPG-FMT1001.doc.

Modifications:

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(End of document.)