FORMAT SPECIFICATION FOR LUND SIMULATED DATA INPUT TO DELFT RGC SOLUTION
(PROPOSAL)

by L Lindegren

1. Tape format

Magnetic tape, 1600 BPI, 9 tracks, phase encoded.
No label.

80 ASCII characters per logical record (no LF, CR), padded with
blanks when necessary.

A physical record (block) contains an integer number of logical
records. The maximum blocklength is 28800 characters = 360 logical
records. Normally the maximum blocklength is used except for the
last block in the file, which may be shorter (no blank records are
inserted to reach a fixed blocklength).

The first block of the first file is not preceded by any label or
EOF mark. The files are separated by a single EOF mark. Two EOF
marks follow the last file on the tape. There is no information
about the actual number of blocks and logical records in a file
other than the EOF mark.

A tape contains not more than ONE simulation run. This is identified
by a CHARACTER#8 variable called tapeid, tapeid = 'LOSIM3' for
the next simulation to be produced in Lund.

2. Files

For one simulation run (normally 5 consecutive spins = one RGC) the
tape will contain three files, viz.:

File #1: 'MCL' (Mission control local) - general data about the
        RGC; eclipses; and gas jets

File #2: 'FIS' (Fixed information on stars) - gives the assumed
        and true geometric positions of the stars in the
        RGC system; photometric data; etc

File #3: 'FRAME' (Frame data) - gives all data needed on a frame-by-
        frame basis: attitude (assumed and true); number of
        objects observed in the frame; and data for each
        observation (grid phase, correction to apparent
2.1. MCL - Mission control local

<table>
<thead>
<tr>
<th>record#</th>
<th>content</th>
<th>format</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>'MCL', tapeid</td>
<td>A5;X;A8;66X</td>
</tr>
<tr>
<td>2</td>
<td>IDRCGC;ECLON;ECLA;TIMBEG;TIMEND</td>
<td>I6;2F16.12;2F15.8;12X</td>
</tr>
<tr>
<td>3</td>
<td>NECLIP;NBGJET</td>
<td>2I6;68X</td>
</tr>
<tr>
<td>4</td>
<td>ECLIP1(I);I=1;4</td>
<td>4F15.8;20X</td>
</tr>
<tr>
<td>5</td>
<td>ECLIP2(I);I=1;4</td>
<td>4F15.8;20X</td>
</tr>
<tr>
<td>6</td>
<td>NUMFRA(1);TIME(1)</td>
<td>I6;F13.6;61X</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5+NBGJET</td>
<td>NUMFRA(NBGJET),TIME(NBGJET)</td>
<td>I6;F13.6;61X</td>
</tr>
</tbody>
</table>

Comments:
IDRCGC  = integer (1 to 3000) identifying the RGC
ECLON;ECLA = ecliptical longitude, latitude of RGC pole [rad]
TIMBEG;TIMEND = MJD for beginning of first, last frame
NECLIP  = number of eclipses (0 to 2)
ECLIP1(I):I=1;4 = timing information for first eclipse [decimal frame#]
ECLIP2(I):I=1;4 = timing information for second eclipse [decimal frame#]
NBGJET  = number of gas jets
NUMFRA(1:NBGJET) = integer frame# for each gas jet = INT(TIME(.))
TIME(1:NBGJET) = decimal frame# for each gas jet

2.2. FIS - Fixed information on stars

<table>
<thead>
<tr>
<th>record#</th>
<th>content</th>
<th>format</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>'FIS', tapeid</td>
<td>A5;X;A8;66X</td>
</tr>
<tr>
<td>2</td>
<td>IDRCGC;NOBJ</td>
<td>2I6;68X</td>
</tr>
<tr>
<td>3*k</td>
<td>IDOBJ, IDHIP, HMG, BMV, RMSHMG, RMSBMV</td>
<td>2I7;4F7.3;5I4.18X</td>
</tr>
<tr>
<td>3*k+1</td>
<td>IFP, IFS, IFV, IFM</td>
<td>F15.8;4F16.12;X</td>
</tr>
<tr>
<td>3*k+2</td>
<td>PSIT, QSIT</td>
<td>15X;4F16.12;X</td>
</tr>
</tbody>
</table>

(k = 1 to NOBJ)

Comments:
IDRCGC  = see 2.1
NOBJ    = number of objects (stars)
IDOBJ   = object identification within the RGC (21 to 20+NOBJ)
IDHIP   = Hipparcos object identification (1 to 120000 approx)
HMG     = magnitude H
BMV     = colour index B-V
RMSHMG, RMSBMV = standard errors for HMG, BMV
IFP     = 1 for primary star, 0 otherwise  [1]
IFS     = 1 for photometric standard, 0 otherwise  [1]
2.3. FRAME - Frame data

<table>
<thead>
<tr>
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<th>format</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>'FRAME', tapeid</td>
<td>A5;X;A8:66X</td>
</tr>
<tr>
<td>2</td>
<td>IDRCG,NFR</td>
<td>216:68X</td>
</tr>
<tr>
<td>+1</td>
<td>IDFR,NOBJ,NSTAR,NPLAN,TIME</td>
<td>416;F13.6,43X</td>
</tr>
<tr>
<td>+2</td>
<td>PSIE,TET,PHIE,PSID,RMSPSI</td>
<td>5F16.12</td>
</tr>
<tr>
<td>+3</td>
<td>PSIT,TET,PHIT</td>
<td>3F16.12:32X</td>
</tr>
<tr>
<td>+3+k</td>
<td>ID0BJ,ID0V,DPSI,DQSI,G,H,NGRID,IPHGRD,IPHRMS</td>
<td>I4,I3;2F16.12;2F10.6;317</td>
</tr>
</tbody>
</table>

(k = 1 to NOBJ)

(There are NFR groups of 3+NOBJ records following the first two records.)

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Comment:

IDRCG = see 2.1
NFR = number of frames (the three records +1, +2, +3 are given also for empty frames, e.g. during occultations)
IDFR = frame# (0 to NFR-1)
NOBJ = number of objects observed in the frame (0 to 10)
NSTAR = number of stars observed in the frame (0 to 10)
NPLAN = number of planets observed in the frame (0 to 10)
(NGR = NSTAR + NPLAN)
TIME = frame mid-time [decimal frame#] = IDFR + 0.5
PSIE,TETE,PHIE = Euler 3-2-1 angles for the assumed altitude w.r.t. RGC at time TIME, in radians
PSID = assumed time derivative of PSIE [rad/T4]
RMSPSI = standard error for PSIE [rad]
PSIT,TETT,PHIT = true attitude angles [rad]
ID0BJ = object identification within the RGC (1 to 3000)
ID0V = FOV identifier; -1 for following, +1 for preceding
DPSI,DQSI = corrections 'apparent minus geometric' in abscissa and ordinate [rad]
G,H = (approximate) field coordinates in [rad]
(N origin at grid center; images move along '+Gi +H towards QSI > 0)
NGR = site number = NINT(G/1.208")
IPHGRD = modulation phase at frame mid-time, expressed as an integer multiple of 1e-5 radians (0 to 628319)
IPHRMS = standard error for IPHGRD in units of 1e-5 rad