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Solaris version

GSC New Pick File (NPF) Formats for ascii output files from the eq tables
=========================================================================

The first letter on each record is the record type indicator. The second
column is always a space ( for now, at least). The types of records are:

        S - solution record.
        E - (solution) error record.
        M - Magnitude record.
        C - English comment record.
        F - French comment record.
        I - internal record.
        H - There are two types of the header records,
            one for "S " - solution record, one for the "P " - phase information .
        P - phase arrival and association information record.
        Z - a dummy record to separate events. Not necessary if there is a solution record
            for next event in the file.

The nullable fields are marked by an "*" in front of the parameter names.
If a nullable field is blank, it means the value is not defined (unknown),
which is different from zero (0.0).

The order of the records is as following:
        [H ] - header for solution record
        [S ]
        [E ]
        [M ]
        .
        [C ]
        .
        [F ]
        .
        [I ]
        .
        [H ] - header for phase record
        [P ]
        .
        [Z ]
where "." means repeat of the previous record. [ ] means that this
record is optional. This is true for all records.

The npf files can contain multiple events.

In your npf file, you should start each of your solutions (i.e. events)
with the S and E records ( if they exist ), please ignore the H record.
Please note that there should be one S and one E records per solution,
and they should come in pairs, no other records should get inbetween.
Although the E record is not absolutely necessary.

There are two types of the header H records, one for "S " - solution record,
one for the "P " - phase information .  These records will help making the
S and P records more readable and edit-able. They have no other functions.
Any reader routines can discard these records.
The two type of H records can appear any where and as many time as you like.
Of course, the best places for them would be right in front of the records
that they try to quide.  Usually the extract and grl programs generate them.

The Z record can only appear (at most) once for this solution, and it has to be
the very last for this solution. If you have a S record for the next solution,
the Z record is not necessary. If it does exist, it is perfectly correct.

The "definition" column has the variable names we used in the database
and the definitions/explanations for them.


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***********************************
* solution record: ( 128 bytes ) *
***********************************


columns          format          definition                      data  source
=======          ======          ==========                      ============
1-2       a2          'S ' - code for solution record
3-10      a8          otime - origin time (yyyymmdd)        grl output
11        a1          space
12-15     a4          otime - origin time (hhmm)         grl output
16        a1          space
17-22     f6.3        otime - origin time (ss.mmm)       grl output
23-26     a4          eqtype - earthquake type                user input /default
                      L or " " - local earthquake
                      B - blast
                      R - rockburst
                      P - possible blast
                      U - un-confirmed rockburst
                      X - controlled explosions
                      Y - YKA event
                      I - Induced
                      S - Single/dual station
                      G - ghost event

27-34     f8.4        * lat - latitude                   grl output
35-43     f9.4        * lon - longitude                  grl output
44-49     f6.2        * depth - in KM                    grl output
50-51     a2          "km"
52-56     f5.2        * pmagnit - primary magnitude      grl output
57-60     a4          pmagtyp - primary magnitude type        user input/grl default
                      ML            RICHTER
                      MN            NUTTLI (DEFAULT)
                      MB            BODY-WAVE
                      MS            SURFACE WAVE
                      MC            CODA LENGTH
61        a1          space
62        a1          deptyp - depth type                     user input/grl default
                          F , G or ' ' - fixed depth
                      Z - free depth
                      X - no action for this event (solution)
                      N - assigned hypocenter and time.
                      H - assigned hypocenter, but calculated origin time.
63        a1          locator/hypoflg - hypo solution             user input/grl default
                      C - CANCESS  (?)
                      E - HYPOELLISE (?)
                      H - HYPOCENTE (?)
                      G - grid-search location program (grl)
64        a1          sol_final - flag to indicate solution is final  user input
                      A - prime solution
                      B - secondary solutions
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65          a1          ev_final - flag to indicate that evid is final   user input
66          a1          auto_manu - manual/automatic location flag(M/A) user input/grl output
67          a1          weight_flag                        user input/grl default
68          a1          space
69-70       a2          sol_qual - solution quality            grl output
71          a1          space
72          a1          sol_convg - solution convergence flag        grl output
73          a1          space
74          a1          felt - felt flag, e.g. F - felt event,.. user input
75-76       i2          maxint - max. intensity            user input
77          a1          int_scale- intensity scale (? e.g...)        user input
78          a1          space
79-80       i2          * n_assoc_evt - no. of associated events     user input
81-83       i3          model - model number    (mod __ ???)          user input/grl default
                        1 - canada standard model
                        2 - new brunswick model
                        3 - vancouver island model
                        4 - rocky mountain house model
                        5 - sudbury model ( modified from canada standard model, vs1= 3.65 )
                        6 - queen charlotte model
                        7 - vancouver island offshore single layer model
                        8 - adams model ( modified from canada standard model, vs1= 3.62 )
84-86       i3          nstns - number of stations              grl output
87-89       i3          nphs - number of phases              grl output
90          a1          space
91-92       i2          ndeps - number of depth phases           grl output
93-95       i3          gap - max. gap of az which has no non-zero
                        weighted phase ( arrival) station        grl output
96-102          f7.2        close_dst, dist. closest stn with non-zero
                        weighted phase                     grl output
103-107     a5          close_stn, closest station ( same as above )   grl output
108-113     a6          nation                        user input or calculated.
114-117     i4          region - Flinn-Engdahl region number           calculated
118-121     a4          can_reg - Canadian region number          calculated
                        1st letter:prov/seimic #,next 3:is sub-region # (TBD)
122         a1          focmec_flag - focal mechanism calculation flag  user input
123         a1          int_flag - intensity study flag            user input
124         a1          moment-flag - momentum flag           user input
125-126     i2          mag_flag - number of calculated magnitudes     user input or eq output
127         a1          explos_flag - explosion table exists       user input
128         a1          ref_flag - reference table flag            user input
129-130     a3          "< >", optional, useless, end of line indicator.



*****************************************
* solution error record: ( 128 bytes ) *
*****************************************

columns             format          definition                        data  source
=======             ======          ==========                        ============
1-2         a2          'E ' - code for solution errors
3-8         a6          agency (left hand justified, if short)   user input /grl default
                        USGS    United States Geological survey
                        GSC   Geological Survey of Canada
                        PGC     Pacific Geoscience Center
                        SEA     UNIVERSITY OF WASHINGTON
                        NEIS    NATIONAL EARTHQUAKE INFORMATION CENTER
                        ISC     INTERNATIONAL SEISMOLOGICAL CENTER
                        LDGO    LAMONT-DOHERTY GEOLOGICAL OBSERVATORY
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                    WES     WESTON GEOPHYSICAL OBSERVATORY
                    UAGI    UNIV. OF ALASKA, GEOPHYSICAL INSTITUTE
9            a1          space
10-15        f6.2        * solrms - solution rms                   grl output
16-21        f6.2        * timsd                                   grl output
22-26        a5          5 spaces
27-32        f6.2        * latsd                                   grl output
33-35        a3          3 spaces
36-41        f6.2        * lonsd                                   grl output
42-43        a2          2 spaces
44-49        f6.2        * depsd                                   grl output
50           a1          (
51-55        f5.2        ellip_major - error ellipsoid major horiztl axis grl output
56           a1          space
57-61        f5.2        ellip_minor - error ellipsoid minor horiztl axis grl output
62           a1          space
63-67        f5.2        ellip_vert - error ellipsoid vertical axis len. grl output
68           a1          space
69-73        f5.1        ellip_az - azimuth of major horizontal axis    grl output
74           a1          )
75-82        a8          source (left hand justified, if short)      user input /grl default
83-85        a3          author                              user input/grl default
86           a1          space
87-102          a16         solid - solution id                    eq database assigned
103          a1          space
104-119         a16         evid - event id                        eq database assigned
120          a1          space
121-128         a8          up_date - updated date                 eq database assigned




*****************************
* mag record: ( 102 bytes ) *
*****************************

columns            format        definition                      data  source
=======            ======        ==========                      ============
1-2          a2          'M ' - code for mag record
3            a1          "*" - primary mag.                  user input or grl default
                         " " - secondary mag.
4-7          a4          magtyp - magnitude type             user input or grl default
8-12         f5.2        * magnit - magnitude                grl output
13-14        a2          " ("
15-19        f5.2        * magsd - mag. std                  grl output
20-20        a1          ")"
21-23        i3          namp - no. of amp. used to calculate mag  grl output
24           a1          space
25           a1          magqual - quality                   user input or dan/loon/grl default
26-74        a49         49 spaces
75-80        a6          magagency -agency                   user input or default
81-82        a2          2 spaces
83-85        i3          magcnt - magnitude counter          eq database assigned
86           a1          space
87-102          a16         solid - solution id                    eq database assigned




***************************************************
* comment records ( three types ): ( 128 bytes ) *
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***************************************************

columns          format           definition                          data  source
=======          ======           ==========                          ============
1-2              a2               "C " - code for English comment
                                  "F " - French comment
                                  "I " - internal comment
3-82             a80              english/french/internal comment    (lower case ok)   user input
83-85            i3               cmcnt - comment counter.                eq database assigned
86               a1               space
87-102           a16              solid - solution id                     eq database assigned
103-120          a18              18 spaces
121-128          a8               up_date - updated date                  eq database assigned




*********************************************
* phase information record: ( 320 bytes ) *
*********************************************

columns          format           definition                          data  source
=======          ======           ==========                          ============
1-2              a2               'P '
3-7              a5               stn  - station code                     user input (dan/loon)
8-10             a3               component                         user input (dan/loon)
11-14            a4               rphase - raw ( entered, or picked ) phase     user input (dan/loon)
15               a1               wt_flag - weight flag
                                  e.g. 'X'-not to be used ( or not being used )   user input (dan/loon)
                                     'Y' - invalid phase id, not used for tt.   grl output
                                     'A','B' etc. defines the weight factor
16               a1               qual - quality                         user input (dan/loon)
                                  A    - sharp clear beginning  (+- 0.25 SEC.)
                                  B," " - good beginning          (+- 1.0 sec.)
                                  C    - weak poor beginning     (+- 4.0 sec. or more )
                                  X    - phase not used in solution, large  residual.
                                  Y    - not a real phase id, do not used for tt.
                                  0    - PHASE NOT READ

17-20            a4               arrtim - arrival time, HHMM            user input (dan/loon)
21               a1               space
22-27            f6.3             arrtim - arrival time, SS.SSS          user input (dan/loon)
28-30            a3               fm - first motion                 user input (dan/loon)
31               a1               ph_type - local (L), regional (R),
                                     or teleseismic(T)...            user input (dan/loon)
32-39            f8.3             * res - residual                  grl output
40-44            f5.2             * wt - weight                     grl output
45-52            f8.2             * dist - distance in KM           grl output
53-58          f6.1         * az - azimuth                       grl output
59-60            a2               octant                            grl output
61-65            f5.2             * mag1 - first magnitude            grl output
66               a1               av_mag1_flg - X - not used, ' '-used... etc.   grl output
67-70            a4               mag1type - first mag type ( see amp_qual )      user input /grl default
71-75            f5.2             mag1_res.- mag. residual.            grl output
76-80            f5.2             period in sec.
                                  If rphase='CODA', this will be coda length.   user input (dan/loon)
81-87            f7.1             magfact - ground displacement conversion factor user input (dan/loon)
                                  (combined with amp will define the ground displacement)
88-99            f12.1            amp - amplitude ( in mm , counts or microns, see notes below)
                                  ground displacement (in nm) = amp/magfact
                                  If magfact = 0, then ground displacement = amp
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                        If phase='CODA',it's cutoff amp.         user input (dan/loon)
100          a1         amp_qual- amp. quality
                        (mag. designator, if phase ='TRAC')      user input (dan/loon)
                        ' ' or '0' use the mag if error code = 0
                        'X', '1' or '3' - do not use mag.
                        'F', '2' or '8' - force to use mag regardless of error code
101-104      a4         amp_tim - amp. time, HHMM                user input (dan/loon)
105          a1         space
106-111      f6.3       amp_tim - amp. time, SS.SSS              user input (dan/loon)
112-118      f7.2       * tim_cor - clock correction             user input / data aquisition system
119-123      f5.2       * tra_cor - transmission correction (always -ve)     from station file
124-128      f5.2       * sit_cor - site correction             from station file
                   the real time correction = tim_cor + tra_cor + sit_cor
129-131      a3         ar_author - author picked this arrival      user input / dan/loon default
132-135      f4.1       snr - signal noise ratio                automatic detection process
136-140      f5.2       * slo - slowness                        automatic detection process
141-145      f5.2       * log_a_t - log of (A/T)                    automatic detection process
146-151      f6.1       * m_az - measured azimuth.              automatic detection process
152-157      f6.1       * m_emerang - measured angle of emergence     automatic detection process
158-160      a3         detqual - detection quality             automatic detection process
161-168      a8         cphase - calculated phase          grl output
169-170      a2         location
171-176      f6.1       * emerang - angle of emergence, calculated      grl output
177          a1         space
178-183      f6.2       * delta - distance in degrees          grl output
184          a1         space
185-190      a6         ar_agency - agency that picked this arrival     user input or dan/loon default
191-198      a8         ar_source - source of this arrival.      user input or dan/loon default
199-230      a32        tsf - time series waveforms file name.          user input or dan/loon defined
231          a1         space
232-235      a4         smodel - station model number           user input.
236-251      a16        arr_cmt - arrival comment               user input
252          a1         space
253-268      a16        groupid - group id                      eq database assigned
269          a1         space
270-285      a16        arrid - arrival id                      eq database assigned
286          a1         space
287-302      a16        solid - solution id                     eq database assigned
303          a1         space
304-311      a8         arrival_date                            user program assigned or eq database assigned
312          a1         space
313          i2         ph_tt - phase travel-time table number      user updates
                        ( code for tt model )
315          a1         space
316-323      a8         ar_update                               eq database assigned
324-325      a2         "<>", optional, useless, end of line indicator.
*********************************************************************
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