rtim_Format_File_Scintillation

This section describes version 1.2 of this format.
General features of the format:

- ASCII text file.
- All fields are fixed width fields.
- The file contains one or more epochs. Each epoch contains zero or more data records.
- The file may contain other information, in lines that start with the characters '#' or '%'
  - '%' Marks a comment line. The rest of the line may contain anything.
  - '#' Marks an instruction line. The character is followed by a space, then a string (with no whitespaces) identifying the type of information, then another space. The defined types are listed in the table below.
  - From version 1.1 onwards, the first line of the file must be the “# VERSION” instruction line.
  - Instruction and comment lines may be placed before the first epoch line, between a completed epoch section and the next epoch section, or at the end of the file. They may NOT be placed in the middle of an epoch section.

Changes from 1.1 to 1.2:

- The field “Satellite id number” is replaced by two fields;
  “Satellite system id number” and “Satellite id number”
  Defined values for these fields are listed in tables 1 and 2.
- New data fields added for data from a third frequency.
- New data fields added, to specify tracking type.

List of instruction types	
Start of line	**Description**
“# VERSION ”	The line continues with the major version number, a dot, and the minor version number. The C format string for the entire line is: `“# VERSION %3i.%-3i\n”`
“# RECEIVER ”	The line continues with the 4-character id code of the receiver. The C format string for the entire line is: `“# RECEIVER %c%c%c%c\n”`
“# AGENCY ”	The line continues with the name of the agency that produced the file. The name may contain spaces and tabs, but not a new-line character. The entire contents of the line following “# AGENCY “ , excluding the newline character, is the agency name.
“# YEARDOY “	The line continues with the year and day-of-year of the first data record in the file. The C format string for the entire line is: `“# YEARDOY %04i %03i\n”`

An epoch section starts with the epoch line, which contains:

- Year (4 digits)
- Month (2 digits)
- Day (2 digits)
- Hour (2 digits)
- Minute (2 digits)
- Second (5 character field, minimum 1 digit after the decimal point)
- The number of records for this epoch (3 digits)

There is one space between each number.

The C format string for the epoch line is:

```
"%4i %02i %02i %02i %02i %5.1f %03i\n"
```

Within the epoch, there is a number of single-line records. This number was specified in the epoch line. Each single-line data record contains:

- Satellite system id number (2 character field)
- Satellite id number (2 character field)
- IPP Longitude [degrees] (7 character field, 2 digits after the decimal point)
- IPP Latitude [degrees] (7 character field, 2 digits after the decimal point)
- Elevation [degrees] (7 character field, 2 digits after the decimal point)
- Tracking type for 1st frequency (1 character)
- S4 for 1st frequency (7 character field, 3 digits after the decimal point)
- σ_φ for 1st frequency (7 character field, 3 digits after the decimal point)
- Spectrum slope for 1st frequency (7 character field, 3 digits after the decimal point)
- Tracking type for 2nd frequency (1 character)
- S4 for 2nd frequency (7 character field, 3 digits after the decimal point)
- σ_φ for 2nd frequency (7 character field, 3 digits after the decimal point)
- Spectrum slope for 2nd frequency (7 character field, 3 digits after the decimal point)
- Tracking type for 3rd frequency (1 character)
- S4 for 3rd frequency (7 character field, 3 digits after the decimal point)
- σ_φ for 3rd frequency (7 character field, 3 digits after the decimal point)
- Spectrum slope for 3rd frequency (7 character field, 3 digits after the decimal point)

There is one space between each number.

There is one space at the start of the line.

The C format string for a data record line is:

```
" %2i %2i %7.2f %7.2f %7.2f %1c %7.3f %7.3f %7.3f %1c %7.3f %7.3f %7.3f %1c
%7.3f %7.3f %7.3f\n"
```

Satellite system id codes	
Satellite System	**Satellite System Id code**
GPS	1
GLONASS	2
Galileo	3

Table 1: Satellite system id codes

Satellite id numbers	
Satellite System	**Satellite Id number range**
GPS	1 - 32
GLONASS	1 - 24
Galileo	1 - 32

Table 2: Satellite id numbers

Tracking types	
Type	**Description**
C	Tracking based on C/A - code
P	Tracking based on P - code
?	Tracking type unknown / not specified

Table 3: Tracking types

A small example of the format:

```
# VERSION   1.2
# RECEIVER hfs2
# AGENCY Norwegian Mapping Authority
# YEARDOY 2011 270
% This is an example file
% Note that comment lines may also contain no text:
%
% Now lets see some data:
2011 09 27 07 49  30.0 005
  1  1    3.46   79.51    1.78 C   0.150   0.068   0.000 P   0.109   0.078   0.000 ?   0.034   0.052   0.000
  1  4   29.01   58.18   17.43 C   0.125   0.033   0.000 P   0.000   0.027   0.000 ?   0.045   0.023   0.000
  1  9   12.74   58.26   59.49 C   0.000   0.010   0.000 C   0.000   0.008   0.000 ?   0.026   0.040   0.000
  1 12    7.69   59.12   67.02 P   0.022   0.013   0.000 P   0.014   0.017   0.000 ?   0.062   0.022   0.000
  1 14    1.87   61.99   39.87 C   0.055   0.016   0.000 C   0.000   0.013   0.000 ?   0.021   0.010   0.000
2011 09 27 07 50  30.0 006
  1  1    2.72   79.75    1.50 C   0.159   0.086   0.000 P   0.147   0.096   0.000 ?   0.023   0.012   0.000
  1  4   28.85   58.27   17.71 C   0.087   0.032   0.000 P   0.000   0.026   0.000 ?   0.035   0.042   0.000
  1  9   12.80   58.22   58.99 C   0.010   0.010   0.000 C   0.000   0.008   0.000 ?   0.035   0.064   0.000
  1 12    7.75   59.14   67.50 P   0.017   0.015   0.000 P   0.016   0.017   0.000 ?   0.034   0.055   0.000
  1 14    1.90   61.94   40.07 C   0.056   0.021   0.000 C   0.000   0.016   0.000 ?   0.054   0.034   0.000
  1 15   10.51   40.30    1.49 C   0.219   0.069   0.000 C   0.119   0.114   0.000 ?   0.044   0.019   0.000
% This comment serves only as an example
% of placing a comment between records
2011 09 27 07 51  30.0 005
  1  1    1.94   79.99    1.21 C   0.188   0.092   0.000 P   0.167   0.087   0.000 ?   0.021   0.034   0.000
  1  4   28.69   58.36   18.00 C   0.062   0.033   0.000 P   0.000   0.027   0.000 ?   0.034   0.024   0.000
  1 12    7.81   59.16   67.98 P   0.032   0.014   0.000 P   0.012   0.018   0.000 ?   0.033   0.043   0.000
  1 14    1.93   61.90   40.27 C   0.073   0.020   0.000 C   0.000   0.016   0.000 ?   0.009   0.054   0.000
  1 15   10.53   39.93    1.09 C   0.131   0.071   0.000 C   0.158   0.113   0.000 ?   0.045   0.030   0.000
% The end (of the file) is near
```