March 2016.

Technical guidelines for using R2CGGTTS V7.1

"R2CGGTTS.f.V71" code is supposed to be used and compiled on your own system with an appropriate Fortran 77 compiler ("gfortran" for example).

What's new in R2CGGTTS 7.1:

The reading is based on RINEX 3.02
GPS, GLONASS and Galileo are supported.
The output is aligned on the CGGTTS V2E standard (see *Metrologia* 2015 **52** G1).
In particular, if during the calibration, the antenna cable delay was included in the Receiver delay, "ANT CAB DELAY" can be either set to 0 or not reported in the paramCGGTTS.dat; a SYSDLY will be reported in the CGGTTS files. If furthermore the "CLOCK CAB DELAY XP+XO" is not mentioned or set to zero in the paramCGGTTS.dat, then a TOTDLY will be reported in the CGGTTS files.

Before starting:

Compile the Fortran 77 code on your own system with appropriate compiler (e.g. "gfortran").

Input files: (All the files have to be placed in the same directory)

In RINEX 3.02 format:

- rinex_obs : *rinex observation file*
- rinex_obs_p : *rinex observation file of the next day*
- rinex_nav_gps : *GPS navigation file*
- rinex_nav_p_gps : *GPS navigation file of the next day*
- rinex_nav_glo : *GLONASS navigation file*
- rinex_nav_p_glo : *GLONASS navigation file of the next day*
- rinex_nav_glo : *Galileo navigation file*
- rinex_nav_p_glo : *Galileo navigation file of the next day*

Others:

- biasC1P1.dat : *Needed if GPS P1 code is missing in Rinex observation file*
- paramCGGTTS.dat : *!! New format*
  Contains all parameters related to the receiver
  (created by user, see Annex 1)
- inputFile.dat (optional) : *To fit names of input files according to the need*
  (created by user, see Annex 2)

OUTPUT FILES:

- CGGTTS.GPS : *CGGTTS GPS only file*
- CGGTTS.GLO : *CGGTTS GLONASS only file*
- CGGTTS.GAL : *CGGTTS Galileo only file*
- CGGTTS.log : *Log of execution*

Execution:

Ensure that all required data are available in the same directory as the binary file.
Start the binary file.
If there is no inputFile.dat or no MJD specified in the inputFile.dat, you will be asked to enter it.
Then the SW will process the data and output files will be created.
If you encounter any trouble processing your data, please report to pascale.defraigne@oma.be

Annex 1: paramCGGTTS.dat

It contains all useful information that will appear in the header and parameters that will be used for CGGTTS file creation. The description of the file format is the following:

REV DATE YYYY-MM-DD	A 30	Date of last modification of the parameters
RCVR _____	A30	Type of receiver and serial number
CH _____	integer	Number of channels
LAB NAME _____	A30	Name of the laboratory
X COORDINATE _____._____	F16.4	X coordinate of antenna phase center (m)
Y COORDINATE _____._____	F16.4	Y coordinate of antenna phase center (m)
Z COORDINATE _____._____	F16.4	Z coordinate of antenna phase center (m)
COMMENTS _____	A30	All kind of comments
REF _____	A30	Laboratory reference
CALIBRATION REFERENCE _____	A9	Calibration ID provided by the BIPM
INT DELAY P1 GPS _____._____	F16.X	Receiver + antenna internal delay (GPS P1) (ns)
INT DELAY P1 GLO _____._____	F16.X	Receiver + antenna internal delay (GLONASS P1) (ns)
INT DELAY P2 GPS _____._____	F16.X	Receiver + antenna internal delay (GPS P2) (ns)
INT DELAY P2 GLO _____._____	F16.X	Receiver + antenna internal delay (GLONASS P2) (ns)
INT DELAY E1 **GAL** _____._____	F16.X	Receiver + antenna internal delay (Galileo E1) (ns)
INT DELAY E5a **GAL** _____._____	F16.X	Receiver + antenna internal delay (Galileo E5a) (ns)
ANT CAB DELAY _____._____	F16.X	Antenna cable delay (ns)
CLOCK CAB DELAY XP+XO _____._____	F16.X	Delay to receiver reference (ns)
LEAP SECOND _____	Integer	Number of leap seconds

An example of paramCGGTTS.dat file is given in parallel to the SW.

Annex 2: inputFile.dat (optional)

This file is useful for an automatic generation of filenames fitted to the required day, but is not mandatory. If it is absent, input files must be named as indicated in the section “Input/Output files” above and the MJD will be entered interactively.
The description of the file format is the following: (example taken for day of year 65 of year 2016, for “ssss” receiver). **MJD must be the last entry**.

```
FILE_RINEX_NAV_GPS
brdc0640.16N
FILE_RINEX_NAV_P _GPS
brdc0650.16N
FILE_RINEX_NAV_GLO
brdc0640.16G
FILE_RINEX_NAV_P_GLO
brdc0650.16G
FILE_RINEX_NAV_GAL
brdc0640.16L
FILE_RINEX_NAV_P_GAL
brdc0650.16L
FILE_RINEX_OBS
ssss0640.16O
FILE_RINEX_OBS_P
ssss0650.16O
FILE_CGGTTS_LOG
file_cggtts_log
FILE_CGGTTS_GPS
GZXX1Z57.452
FILE_CGGTTS_GLO
RZXX1Z57.452
FILE_CGGTTS_GAL
EZXX1Z57.452
MODIFIED_JULIAN_DAY
57452
```