# EARTH EXPLORER MISSION CFI SOFTWARE

## Release Notes - Version 3.7.3

## 1 INTRODUCTION

This note describes the changes introduced in the new release of the Earth Explorer CFI software libraries.

## 2 NEW RELEASE DESCRIPTION

## 2.1 CFI Software and Documentation Delivery

The new versions of the CFI software libraries are the following:

- EXPLORER_FILE_HANDLING  -- Version 3.7.3 - 07/05/10
- EXPLORER_DATA_HANDLING  -- Version 3.7.3 - 07/05/10
- EXPLORER_LIB  -- Version 3.7.3 - 07/05/10
- EXPLORER_ORBIT  -- Version 3.7.3 - 07/05/10
- EXPLORER_POINTING  -- Version 3.7.3 - 07/05/10
- EXPLORER_VISIBILITY  -- Version 3.7.3 – 07/05/10

The CFI software libraries are available for download at the following URL (registration required):

http://eop-cfi.esa.int/CFI/eo_cfi_software.html

The following Software User Manuals have been updated accordingly:

- EXPLORER_FILE_HANDLING issue 3.7.3
- EXPLORER_DATA_HANDLING issue 3.7.3
- EXPLORER_LIB issue 3.7.3
- EXPLORER_ORBIT issue 3.7.3
- EXPLORER_POINTING issue 3.7.3
- EXPLORER_VISIBILITY issue 3.7.3
- GENERAL issue 3.7.3

The CFI software User Manuals are available for download at the following URL:

http://eop-cfi.esa.int/CFI/EO_CFI_DOCS/3.7.3/

## 2.2 Compilation software and platform

This release of the CFI libraries are provided for SOLARIS, LINUX, MACOS and WINDOWS platforms.

- SOLARIS (32-bits):
  - Solaris 5.7 (or later) Operating System
  - gcc compiler version 3.3.2 (for linking the software to a C application)
  - libxml2 version 2.6.22 or later
- SOLARIS (64-bits):
  - Solaris 5.9 (or later) Operating System
  - gcc compiler version 3.4.2 (for linking the software to a C application)
  - libxml2 version 2.6.22 or later
- LINUX (32-bits):
  - Linux 2.4.18 (RedHat 8.0) Operating System
  - gcc compiler version 3.3.1 (for linking the software to a C application)
  - libxml2 version 2.6.22 or later

Note that there is an incompatibility between gcc compiler version 3.3 and the RedHat 7.x Operating System. The standard C library (libc.a) is not fully compatible with gcc V3.x.

- LINUX (64-bits):
  - Linux 2.6.9 (RedHat Enterprise 4) Operating System
  - gcc compiler version 3.4.6 (for linking the software to a C application)
  - glibc 2.3.4
  - libxml2 version 2.6.22 or later
- PC WINDOWS:
  - Microsoft Windows 2000 or XP Operating Systems.
  - Microsoft Visual C++ 8.0 Compiler (for linking the software to a C application)
  - libxml2 version 2.6.20 or later (including iconv-1.9.1 and zlib-1.2.3)
- MACOSX (32-bits):
  - Mac OS X version 10.4.6
  - gcc compiler version 3.3 (for linking the software to a C application)
  - libxml2 version 2.6.22 or later

  The Earth Explorer CFI software is compatible with Mac OS X 10.4 Xcode release (using gcc 4.0)
- MACOSX (64-bits):
  - Mac OS X version 10.4.6
  - gcc compiler version 4.0.1 (for linking the software to a C application)

- libxml2 version 2.6.22 or later
- MACOSX on Intel (32-bits):
  - Mac OS X version 10.4.11
  - gcc compiler version 4.0.1 (for linking the software to a C application)
  - libxml2 version 2.6.22 or later
- MACOSX on Intel (64-bits):
  - Mac OS X version 10.4.11
  - gcc compiler version 4.0.1 (for linking the software to a C application)
  - libxml2 version 2.6.22 or later

Note that the distributed binaries have been generated with no debug.

## 2.3 Installation packages

The CFI libraries are provided in different packaging formats depending on the platform:

• Compressed (gzip) tar files are provided for SOLARIS, SOLARIS 64-bit, LINUX and LINUX 64-bit:

- EXPCFI_3_7_3_SOLARIS32.tar.gz
- EXPCFI_3_7_3_SOLARIS64.tar.gz
- EXPCFI_3_7_3_LINUX32.tar.gz
- EXPCFI_3_7_3_LINUX64.tar.gz

• WINDOWS installation program: EXPCFI_3_7_3_WINDOWS.exe

• MAC OS X PPC installation program: EXPCFI_3_7_3_MACOS32.dmg

• MAC OS X PPC 64-bit installation program: EXPCFI_3_7_3_MACOS64.dmg

• MAC OS X Intel installation program: EXPCFI_3_7_3_MACIN32.dmg

## 3   NEW FEATURES

The following new features have been implemented (see section "Known Problems" at the end of each of the SUMs to check limitations of the current release):

- EXPLORER_DATA_HANDLING:
  - GETASSEv2 DEM supported
  - IERS B Bulletin format 2010 reading supported
  - Ground Station DB 1.4 file reading supported

- EXPLORER_LIB:
    - Time initialization with list of files
    - Time initialization with OSF
- EXPLORER_POINTING:
    - Pointing functions support DEM GETASSEv2
    - Instrument offsets for attitude computations
- EXPLORER_VISIBILITY:
    - AOS/LOS mask mode from Ground Station DB 1.4 file

Note: The supported DEM files can be downloaded from the following URL:

GESTASSE v1: http://eop-cfi.esa.int/eo_cfi_distribution/DEM/GETASSE30_2004

GESTASSE v2: http://eop-cfi.esa.int/eo_cfi_distribution/DEM/GETASSE30_2008

# 4   CLOSED ANOMALIES

## 4.1 Software Problems

The following Software Problems have been fixed:

| Anomaly ID | Description |
|---|---|
| 351 | xl_time_ref_init_file: Although the interface of admits a list of files, the function only reads the first one. |
| 356 | xp_attitude_compute: Quaternion interpolation (SLERP): use the smallest angle |
| 357 | xp_attitude_compute: Quaternion interpolation (SLERP): perform linear interpolation when q0 is close to q1. |
| 358 | xp_attitude_compute: Quaternion interpolation (SLERP): the interpolated quaternion is not normalized |
| 360 | explorer_orbit: Initialisation of propagator ID in TLE mode fails if the TLE file is composed of more than one entry. |
| 361 | explorer_orbit: Initialisation of propagator ID in TLE mode + AUTO mode fails if the TLE file is composed of more than one entry. |
| 362 | explorer_orbit: Using xo_gen_tle: when the orbpre file contains more than one OSV per orbit |
| 363 | Error in Validating POF with schema version <Earth_Explorer_File xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" [^] xsi:schem... |
| 365 | The filename generated by the function xo_gen_oef is not correct |
| 366 | Combination Repeat cycle / cycle length: 4 days and 62 orbits should not be allowed |
| 367 | ASAR Geometry format incorrect in DATA_HANDLING SUM and SDF schema |

| 375 | Error message when calling xv_zone_vis_time(_no_file) with a three points swath over northern zones: EXPLORER_VISIBILITY... |
|---|---|
| 378 | xv_drsvistime problem coming from ENVCFI (AN 120) |
| 387 | It is not possible to generate an orbit file / swath file for sat_id Sentinel's, Seosat, Generic |
| 389 | Memory leak in xv_station_vis_time_no_file (Some memory is being allocated and never released) |
| 390 | The functions xv_zone_vis_time(_no_file) exit with segmentation fault under the following conditions: - orbit_id initial... |
| 391 | a) Increase the maximum allowed value for the the input cycle length b) The units are not correct in the MLST check: v... |
| 396 | xv_station_vis_time / xv_station_vis_time_no_file: The maximum number of [az, el] mask elements is 360. However Maximum number of points defining a station mask is XD_VER... |
| 397 | Problem in the propagation within stationvistime when using a small number of mask points (3) |
| 401 | The offsets for instrument frame are not taken into account in xp_attitude_compute. |
| 411 | the xo_time_to_orbit cfi function. In some special conditions, it returns a negative number of microseconds. |
| 412 | xp_target_inter: In same specific conditions, ADM E2S and L1BP fail to determine DEM intersections. |
| 421 | xd_read_att.c / xd_write_att.c: typo in string check |
| 426 | Error in initialization of orbit_id using a ROF and a non-EF reference frame |
| 431 | xv_gen_scf: Remove reference string and microseconds from <Date> field |

# 4.2 New Features

The following new features have been implemented:

| Anomaly ID | Description |
|---|---|
| 352 | new DEM dataset supported (GETASSE v2). |
| 354 | AOS/LOS and mask mode (satellite dependent) included in Ground Sation DB file |
| 373 | all applicable schema versions for a given EE CFI added in the DATA_HANDLING SUM |
| 377 | Ref_Frame from Variable Header POF/ROF removed |
| 381 | Leap second:  insertion checked after 4 dates during the year (end March, end June, end September and end December) |
| 386 | Section added in MCD to describe ray tracing and Edlen's law |
| 399 | consistency check between the time correlations in the time_id and the time correlations in the orbit_id |
| 400 | time correlation initialisation allowed with OSF |

| Anomaly ID | Description |
|---|---|
| 422 | New format of IERS B Bulletin now supported by EO CFI |