Formats CompeGPS 2006

Types of formats created by CompeGPS TEAM S.L.

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1 Introduction

This document mentions and explains all the formats created by CompeGPS TEAM S.L Formats of Maps, Tracks, Waypoints, Routes, Reliefs and Sets. Also other binary formats are mentioned that CompeGPS allows to open.

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2 Formats

Next is to a listing of the all formats created by CompeGPS TEAM S.L ordered by types of archives and within each file its different formats.

2.1   Maps

2.1.1   IMP (Text)

The following text explains the file format of maps imp. For its explanation the following format is followed; in black the different parts from the file, as well as the head, the body of the map are delimited... In blue brief explanations of some fields or the different parts from the file appear, for a greater understanding of the format. The remaining text is the fields that form the file.

```
MAP.IMP
CompeGPS MAP File
```

Head of the file. It contains the version of the format as well as the version of CompeGPS with which the file has been created. Also it includes the field projection, the type of coordinates that use and the datum. As far as the type of coordinates it is necessary to emphasize that for value 2 (co-ordinated of projection) a new datum point is defined user defined.

```
<Header>
Version=2
VerCompeGPS= Version of CompeGPS with which the file has been created.

Projection=
Coordinates= UTM=0/LatLon=1/ coordinating of projection =2
Datum= ...
</Header>
```

The part of file "Map" contains the Bitmap field that determines the names file, the BitmapWidth field contains the Bitmap width, the BitmapHeight field the height and finally the BitsPerPixel field contains I number of bits that form each píxel.

```
<Map>
Bitmap= bitmap.bmp
BitmapWidth  =
BitmapHeight =
BitsPerPixel =
</Map>
////// path of bitmap can be omitted if this in same path that the acghivo imp
```

In the calibration we found the points with which the map has been calibrated. The number of points is variable, depends on the amount of points that the user has used to calibrate the map. Each point contains five fields; the field bx and by are the coordinates that make reference to pixel of bitmap in which the map has been calibrated. The field zone contains zone UTM, but if the coordinates are in Latitud/Longitud or coordinates of projection, then the field zone must be empty.

```
<Calibration>
P1=bx,by,zone,x,y
P2=bx,by,zone,x,y
.........
```

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```
</Calibration>
```

In this part we found polygon in coordinates of bitmap, that is used to define marks in CompeGPS. It omits a part of bitmap, requesting itself to give the case for example of a legend in a map that is not wanted to consider at the time of calibrating. These coordinates keep based on pixels from bitmap. Y-down works in coordinate (the 0 this in the left superior part of the screen).

```
<MainPolygonBitmap>
M1=bx,by
M2=bx,by
.........
</MainPolygonBitmap>
```

2.1.2   RMAP (Binary)

The file format of maps "RMAP" is in binary format. So far, its internal format in this document is not included.

2.1.3   MPV (Binary)

The file format of maps "MPV" is in binary format. So far, its internal format in this document is not included.

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2.2 Tracks

Roster , and her corresponding explanation of the format , of the types of records created by around Impel TEAM S.L. in order to traction.

2.1.4   TRK

Next the file format of tracks is explained extension **trk**. CompeGPS Version 4.04. For its explanation the following format is followed; in black and initiate with a point the different parts from the file, as well as the head and the lines for each point are delimited of track. In blue brief explanations of some fields or the different parts from the file appear, for a greater understanding of the format. The remaining text is the fields that form the file.

Archives TRK are text files, formed by lines. Each line begins by a letter that identifies the type of line. The file with a head begins and follows with the lines that define the points of track.

- **Headboard ok**

We initiated the explanation of the head with an example for a easier explanation and greater understanding:

```
G  WGS 84
P  TOP Navigator TNCOM ver:42
Q  1669
N  Ivan
I  C:\ProyectosITV\CompeGPS\ICONS\Saber.ico
D  AGER_ROPER.0
C  249 63 14
L  -2:00:00
V  4.2 4.3 186 1280 0 0 0.0
E  0|1|00-NUL-00 00:00:00|00:00:00|0
```

Description of the fields of the head:

G: It identifies the datum.
P: It identifies the GPS from which the TRACK was obtained. (Model and version of the soft of the GPS).
Q: GPS Serial number of the GPS.
N: Name of the Pilot.
I: It identifies file ICO used for the animations.
D: Name of the place of beginning of track.
C: Used colour to show track in screen.
L: Hour difference respect UTC. All the hours of this file are in UTC, nevertheless, we indicated the difference with UTC here.
V: Auxiliary dates: minimum vertical speed, maximum vertical speed, track number, peak altitude.
E: Other auxiliary dates: valid_flight (= 1.0), no_date_flight (= 1.0), hour of the unloading of track, hour difference of the clock of the PC with the initial hour of track, empty track modifiable (= 1.0).
M: commentary.
F: End of file.
Z: Passenger name.
J: competition_id (These 4 lines are parameters of format IGC)

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K: competition class
G: glider_id
E: glider_type
F: id you go of the user who has created east file (Licence)

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- **Lines for each point of track ok**

 We initiate the explanation again with an example of to line of to point of track:

```
T  31T 400556 4658740 19-MAY-02 11:30:46 s 1120.0 4.2 0.0 0.0 0 0.5
290.5 -1 -1.0 320.0
```

In case that there is a section defined in track appears the following line by each section.

```
t      4294967295|coment|2|-1
```

Each field is in favour separated of the character space. This is the fields and their definition:

T   Indicative of the line of point of track.
31T   Zone if we used calibration UTM. If degrees are used we put one ` A ´ that will not consider but by reasons for east separation field cannot be left emptiness.

400556   X coordinate (UTM)/degrees length
4658740   Y coordinate (UTM)/ degrees latitude
19-MAY-02   Date of the point of track
11:30:46   Time of the point of track
s   s,n. s = point contiuous respect to the previous one.
                        n = point Discontiuous.
1120.0   Point Height.
4.2   Speed respect the ground (Km/h).
0.0   Speed respect the air (anemometer) .
0.0   Speed the wind.
0   Wind direction.
0.5   Speed Vertical (m/s) .
290.5   Temperature (K).
-1   Number of satellites. (If he is not available, -1)
-1.0   Height relief in this point. (If it is not calculated, -1)
320.0   Course

For the case in that there are sections:

t   Line Indicative section point.
4294967295   Colour of the section point.
| Separator.
Coment   Commentary.
| Separator.
2   Thickness of the section point.
| Separator.
-1   Type of line with which the section is defined.

In future versions, the extra fields of a point of track (like temperature, wind speed, etc. They will be configurable. At the beginning of the file the fields will be indicated to use. (IGC protocol does something similar in line I).

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2.1.5 IGC

Format specified in the Web of IGC. The connection is: http://www.fai.org/gliding/

Example of the file format IGC:

```
AXXXGarmin  id=138  GPS 12 SOFTWARE  4.57
HFDTE130302
HFPLTPilot:brauli
HFTZOTimezone:-6
HFSITSite:malgrat-turo de l'home
HPGTYGliderType:Trekking
HPGIDGliderID:
HFDTM100DATUM:WGS-1984
HFCIDCOMPETITIONID:
HFCCLCOMPETITIONCLASS:
LCOMPEGPSICON:C:\ARCHIVOS DE PROGRAMA\COMPEGPS\icons\parapente.ico
LCOMPEGPSCOLOR:037026179
LCOMPEGPSEMAIL:brauli@compegps.com
LCOMPEGPSUSERID:-14220&H-383F18F5&4.05&1&00-00-00
I00
B0525284139975N00238876EA0000000000
…………
B1715414146586N00226100EA0000000000
LCOMPEGPSVERSION:5.0.beta8
```

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2.2   Waypoints

2.2.1   WPT

The WAYPOINTS file format explanation, extension WPT CompeGPS Version 5.5. For its explanation the following format is followed; in black and initiate with a point the different parts from the file are delimited, like for example: The head, the lines of investment and of association. In blue brief explanations of some fields or the different parts from the file appear, for a greater understanding of the format. The remaining text is the fields that form the file.

Archives WPT are text files, formed by lines. Each line begins by a letter that identifies the type of line.

- **Headboard**

The head line must contain the information on the system of coordinates used, and the datum:

Line G: It identifies the datum of the map.
Line U: It identifies the system of coordinate:
         U 0 it indicates coordinates UTM.
         U 1 it indicates coordinates in Lat/Lot.

Example headboard:
```
G  WGS 84
U 0
```

- **W line for each waypoint ok**

For each waypoint, must have a line that begins by a capital W. The format of this line is identical that old program PCX5 of Garmin.

Example UTM:
```
W  ShortName 31T 318570 4657569 27-MAR-62 00:00:00 0  some Comments
```

Example Lat/Lon:
```
W  Short Name A  41.234234N 7.234424W  27-MAR-62 00:00:00 0  Comments
```

In this line, the fields are in favour separated of spaces. This is the list of all the fields of this line:

W   Identifier of beginning of line W.
ShortName   Waypoint name.
31T   Zone if we used calibration UTM. If degrees are used we put one ` A ' that will   not consider but by reasons for east separation field cannot be left emptiness.
318570   X coordinate (UTM)/degrees length.
4657569   Y coordinate (UTM)/degrees altitude.
27-MAR-62   Field no used, from old format PCX5.
00:00:00   Field no used, from old format PCX5.
0   Altitude.
"……."   Commentaries.

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- **w line for each waypoint**

The line **w** (letter very small w) is used to add more data for waypoint previous. In this line, the fields are in favour separated of commas.

Example:
`w airport,3,0,8421504,8388863,0,111,[URL],[RADIO],[DATABASE_ID]`

w
airport   Symbol name used for waypoint,
3   Text position,
0   Level of zoom lens,
8421504   Colour text,
8388863   Colour of the bottom (Background),
0   If the text is transparent: 0=transparent, 1=opaque,
111   (unsigned integer) Way of presentation,
[url]   url associated to waypoint,
[radio]   Radio of proximity,
[database_id]   Field to keep id's associate from data bases of GIS,

The text position can have the following values:

    0 Position by defect
    1 upstairs
    2 downstairs
    3 Left
    4 Right

- The radius is a real number in meters:

- The mood of presentation it's to numeral whole but which clears itself she reads AT binary, presentable the next values:

    Bit 0 = 1 whether we want show the short nominate of waypoint.
    Bit 1 = 1 if we want to show the description
    Bit 2 = 1 if we want to show the icon.
    Bit 3 = 1 if we want to show the altitude.

- **Line of association**

If there are archives associated to waypoint, must have a line that begins with the letter to after the line W or w.

This row associates a 3D cloud image.
`a C:\CompeGPS\symbols\3D\cloud.3di`

2.2.2 MRK (Marks)

MARKS file format explanation, extension MRK.

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- **Headboard**

The line of the head must contain the information on the system of coordinates used, and the datum:

Línea G: It identifies the datum of the map.
Línea U: It identifies the system of coordinate:
          U 0 it indicates coordinates UTM.
           U 1 it indicates coordinates in Lat/Lot.

Example:
```
G  WGS 84
U 0
```

- **Line for each mark:**

The line for each mark begins with letter m small letter and their fields are in favor separated of commas.

Example:

```
m, FAS, ,31T, 310720, 4658203, 0, marca006, 0 , 0.0, 12632256, 255,
1, 7
```

m	
FAS	Short name.
"……."	Long name.
31T	Zone if we used calibration UTM. If degrees are used we put one 'A' that will not consider but by reasons for east separation field cannot be left emptiness.
310720	X coordinate (UTM)/degrees length
4658203	Y coordinate (UTM)/degrees latitude
0	Altitude.
Marca006	Name bmp.
0	Text position.
0.0	Zoom lens level.
12632256	Colour text.
255	Bottom colour.
1	transparent.
7	Presentation way.

- **Position of the text**:

The position of the text can have the following values:

```
enum EPosicionTextoBaliza{
   PosText_Default=0,
   PosText_Arriba=1,
   PosText_Abajo=2,
   PosText_Izquierda=3,
   PosText_Derecha=4,
};
```

The presentation way presents/displays the following values:

bit 0 = 1 If we want that it appears the name of the mark.
bit 1 = 1 if we want description.
bit 2 = 1 if we want to see the icon (this does not even work).
bit 3 = 1 if we want to see the height (……………………)

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2.3   Routes

2.3.1   RTE

The initial line must contain the information on the datum. Next the file contains a line that identifies the colour and the name of the route. And later to this line we found the number of waypoints that they form the route:

Line G: It identifies the map datum.
Line R: It identifies the colour and the name of the file.
Line W: It identifies waypoint. Specified format in 2.3.1 section of this document.

Example:

```
G  WGS 84
 R   16711680 , aaaaa_ruta_COMPE_ARENYS
 W  r001 31T 461851 4604600 27-MAR-62 00:00:00 0.000000
 w  Waypoint , 0 , -1.0 , 12632256 , 255 , 1 , 7 ,
 W  r002 31T 461388 4606995 27-MAR-62 00:00:00 0.000000
 w  Waypoint , 0 , -1.0 , 12632256 , 255 , 1 , 7 ,
 W  r003 31T 464126 4604922 27-MAR-62 00:00:00 0.000000
 w  Waypoint , 0 , -1.0 , 12632256 , 255 , 1 , 7 ,
 W  r004 31T 461743 4602608 27-MAR-62 00:00:00 0.000000
 w  Waypoint , 0 , -1.0 , 12632256 , 255 , 1 , 7 ,
```

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2.4   Relief

2.4.1   HDR-DEM-PRJ

RELIEFS file format explanation. For its explanation the following format is followed; in black and initiate with a point the different parts from the file, as well as the head, the lines of investment and of association are delimited. In blue brief explanations of some fields or the different parts from the file appear, for a greater understanding of the format. The remaining text is the fields that form the file.

CompeGPS uses a standard format for the DEM. For each DEM, CompeGPS it needs 3 archives:

   HDR: Header.
   PRJ: Projection and datum of the DEM.
   DEM: Data of elevation.

- **Format of file HDR**:

This file has a text format:

Example:

```
BYTEORDER      M
NROWS          6000
NCOLS          4800
NBITS          16
BANDGAPBYTES   0
NODATA         -9999
ULXMAP         -19.99583333333333
ULYMAP         89.99583333333334
XDIM           0.00833333333333
YDIM           0.00833333333333
```

Definition of each line:

BYTEORDER: It indicates the form that data are stored in the altitude DEM matrix.
                 It can have the following values:
                    M: The less significant byte is first, and the most significant byte is the last one.
                    I: The most significant byte is first, and the less significant byte is the last one.

                    (A PC codifies the numbers using option M, but CompeGPS can read both)

NROWS: Number of rows in the matrix of altitudes DEM.
NCOLS: Number of columns in the matrix of altitudes DEM.
NBITS :   Number of bits by altitude in the matrix of altitudes DEM.
NODATA: Value in the matrix of altitude DEM for null data. (Normally it is used for the sea).
ULXMAP: Coordinate X of the superior left point in the matrix of altitudes DEM.
ULYMAP: Coordinate Y of the superior left point in the matrix of altitudes DEM.

XDIM: Increase of coordinate X between 2 columns in the matrix of altitudes DEM
YDIM: Increase of coordinate Y between 2 columns in the matrix of altitudes DEM

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- **PRJ files format**:

This file has a text format:

Example:

```
Proyección        GEOGRAPHIC
Datum             WGS84
UnidadesZ   METERS
Unidades          DD
(Zona        30 )
```

Definition of each line:

Projection: Name of the projection of the coordinates in file HDR.
                This it can be some of these:
                GEOGRAPHIC, UTM, France Lambert II étendu, or others.

Datum: Datum of the coordinates in the HDR cases out.

UnidadesZ: Units of elevation. (Normally meters)

Unidades: Units of coordinates: Normally DD for a projection GEOGRAPHIC, and meters
                for UTM and others.

Zone: It is used single in the case of projection UTM.

- Format of file DEM:

Here the matrix of altitudes DEM is stored. The total size of this file is NCOLS * NROWS * NBITS/16.

2.4.2   CDEM (Binary)

The "CDEM" relief file format is binary. So far, its internal format in this document is not included.

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2.5 Sets

2.5.1 CJT

Example:

```
VOID
1
C:\CompeGPS\Datos\vuelos\a_arenys\aavolarenys.TRK
1
C:\CompeGPS\Datos\relieves\dems\Catalunya30\malos\CATA30_EST_REV2.HDR
4
457559
4602447
31T
465958
4607164
31T
0
3
C:\CompeGPS\Datos\mapas\Catalunya\Fotos_ICC\orto5mv30f298117cor03.IMP
C:\CompeGPS\Datos\mapas\Catalunya\Fotos_ICC\orto5mv30f298116cor03.IMP
C:\CompeGPS\Datos\mapas\Catalunya\Fotos_ICC\orto5mv30f298115cor03.IMP
VOID
VOID
VOID
```

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2.6 Projections

Configurable TM projections file.

2.6.1 TM

PROJECTIONS file format explanation, extension METRIC TON (Cross-sectional Mercator).

This is a system to make projections, very used at world-wide level. It serves to create a centred system of reference to the point of the world that is of our interest. We can add to new projections, creating new archives in the CompeGPS\projections folder.

In here we can find archives of CompeTMProy_*.dat name. These archives contain the following series of data:

Version	=	**1**
Projection	=	**Transveral Mercator**
Name =		Bundesmeldenetz M28
Lon_Origin	=	10.333333333
Lat_Origin	=	0
scale_factor	=	1
FN	=	-5000000
FE	=	450000
Prefered_Datum=		Austrian

In black, they are the fixed fields, that cannot be changed.
Values Lon_Origen, Lat_Origen, scale_factor, FN, FE, are the parameters that define a new projection.
The data ' prefered_datum' is optional.