Garmin Topographics Database (TDB) File Format

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Content

Garmin TDB File Format

Filename extension *.tdb

TDB File: The File that holds the information which *.img belong to the mapset

Mapset: An assortment of map tiles (*.img) that is joined together by .tdb, overview image (mapset00.img), and .mdx. (Taken from [3].)

This documentation is based on own research and the sources listed in the references section.

Basic data types

All values are serialized in little-endian byte order (least significant byte first).

Type	Length	Description
char	1	ASCII character, see [6]
byte	1	8 bit unsigned integer (range 0 .. 255)
ushort	2	16 bit unsigned integer (range 0 .. 65535)
uint	4	32 bit unsigned integer (range 0 .. 4294967295)

General file structure

The general format is the same as that of MPS file format within IMG files.

The file consists of a sequence of variable sized records. Each record looks like this:

Offset	Type	Content
0x00	char	Record type. Known values: ‘P’, ‘D’, ‘R’, ’S’, ‘B’, ‘L’ and ‘T’
0x01	ushort	Record length, excluding the record type and length
0x03	payload	

Usual record sequence: P D [R] [S] B L* [T]

Records R and S were introduced with TDB version 4.00. Both are optional.

Record ‘P’: Header record

TDB Version 3.00:

Offset	Type	Content
0x03	ushort	Product ID
0x05	ushort	Family ID
0x07	ushort	TDB version. Values seen 3.00, 4.03, 4.07, 4.11 (there is mention of 4.00, 4.02, 4.08, 4.09)
0x09	char[]	Map series name. String, terminated with 0x00.
	ushort	Product version
	char[]	Map family name. String, terminated with 0x00.

TDB Version 4.00:

Offset	Type	Content
	byte	Locked. 0=no, 1=yes
	byte	Lowest map level. Values seen 17, 18

Offset	Type	Content
	byte	= 1
	byte	= 1
	byte	= 1
	byte	Transparent. 0=no, 1=yes
	uint	? =0

TDB Version 4.02:

Offset	Type	Content
	byte	NOD bit size? Highest routable? = 0x10 or 0x18

TDB Version 4.03:

Offset	Type	Content
	byte	Fill type
	byte	Background color. 8 for marine, 0 otherwise.
	byte	Routing protect
	uint	North boundary
	uint	East boundary
	uint	South boundary
	uint	West boundary

TDB Version 4.07:

Offset	Type	Content
	uint	Codepage (see [4] and [5]). Value seen: 1252
	uint	? = 10000
	byte	Map is routable. 0=no, 1=yes
	byte	Map has profile information. 0=no, 1=yes
	byte	Map has DEM sub files. 0=no, 1=yes

TDB Version 4.11: (according to one source since 4.09)

Offset	Type	Content
	byte[20 or 21]	? =0

Record 'D': Copyright record

Offset	Type	Content
Sequence of the following sub-records until end of record:		
	byte	Copyright code 0: Source information. Describes, what data sources were used in generating the map data. 4: ?? (seen in BaseCamp_2.0.7\Maps\Global Application Basemap v2.gmap\Product1\Global_Application_Basemap_v2.tdb) 6: Copyright information from the map manufacturer. 7: Copyright bitmap reference. A file name that contains a BMP image to be printed along with the map.
	byte	Where code 1: Copyright text is printed in the "product information" screen in MapSource. No meaning for bitmap images. 2: Copyright text or bitmap image should be printed when a map is printed

Offset	Type	Content
		from MapSource. 3: Copyright text should be printed on both the “product information” screen and any printed maps.
	ushort	Extra properties If copyright code == 7: BMP scale factor Otherwise: Shall be 0
	char[]	Copyright string. String, terminated with 0x00. If copyright code == 7: BMP file name Otherwise: Message

Record ‘R’: DCA

Offset	Type	Content
Sequence of the following sub-records until end of record:		
	byte	Subfamily. Values seen 1, 195
	char[]	Name. Values seen: ‘Map’, ‘Preview Test Map’, ‘Test preview map’

Record ‘S’: ??

Offset	Type	Content
	ushort	ProductCode

Record ‘B’: Overview record

Offset	Type	Content
0x03	uint	Map number (“area code”)
0x07	uint	Parent map number =0
0x0B	uint	North boundary
0x0F	uint	East boundary
0x13	uint	South boundary
0x17	uint	West boundary
0x1B	char[]	Description. String, terminated with 0x00.

Record ‘L’: Detail map record

TDB Version 3.00:

Offset	Type	Content
0x03	uint	Map number (“IMG ID”)
0x07	uint	Parent map number (“area code”)
0x0B	uint	North boundary
0x0F	uint	East boundary
0x13	uint	South boundary
0x17	uint	West boundary
0x1B	char[l]	Description. String, terminated with 0x00.
	ushort	Image sections. Values seen 4, 6 (Usually one more than image sections real. The numbering is RGN=1, LBL=2, TRE=3, UNNAMED=4, NET=5. Image sections real leaves out UNNAMED.)
	ushort	Image sections real. Values seen 3, 5
	n x uint	Image sections real =3: RGN, TRE, LBL, =4: RGN, TRE, LBL, NET, =5: RGN, TRE, LBL, NET, NOD, =6: GMP, RGN, TRE, LBL, NET, NOD
	byte	Terminator? Values seen 1

TDB Version 4.03:

Offset	Type	Content
	ushort	Region ID. Value seen 1, 0xC3
	uint	MDR len. Value seen 255, 256
	n x char[]	Filenames of TRE, RGN, LBL, NET, NOD (note: not in the same order as the sizes!)

TDB Version 4.11: (in some files it is already present in 4.07?)

Offset	Type	Content
	ushort	=0

Record 'T': Signature

Offset	Type	Content
	byte[20]	filled with random data, then CRC result is strewn in: byte[2] = high byte byte[9] = mid-high byte byte[12] = mid-low byte byte[17] = low byte

32 bit CRC calculated over complete file up to the start of the T record.

Algorithm is standard CRC32, see [2].

References

Used sources of information

[1] http://wiki.openstreetmap.org/wiki/OSM_Map_On_Garmin/TDB_File_Format

[2] Catalogue of parametrised CRC algorithms http://reveng.sourceforge.net/crc-catalogue/all.htm

[3] https://www.velomap.org/velomaporg/archive/install_maps_with_gmaptool/

[4] Code Pages http://msdn.microsoft.com/en-us/goglobal/bb964653.aspx

[5] Code Pages http://en.wikipedia.org/wiki/Code_page

Standards and specifications

[6] ISO/IEC 646:1991, Information technology – ISO 7-bit coded character set for information interchange

Sources of sample files

- none -