qwdirect data formats

This text is a very preliminary draft. The information in it is still incomplete, and will be gradually replenished.

Program QwDirect writes data from input files to a flash drive in a variety of formats. This document describes input file formats and flash drive write formats.

Input files are a chain of page images that are sequentially written to a flash drive. A page image consists of 2 fields—a data field and a ALE field. Data Field Size:

datasize = 512*spp

512 is the number of bytes per sector (other sector sizes do not seem to be found), spp is the number of sectors per page, depending on the type of flash drive. Usually, it is either 4 or 8 sectors per page, respectively, the page size is either 2048 or 4096 bytes.
The size of the OOB field also depends on the type of flash drive. Usually, for flash drives with 2K pages, oobsize=64, for flash drives with 4K pages, oobsize=224. This parameter is defined during the initialization phase of the nand controller as follows:

oobsize = (8 << ((devcfg >> 2) & 0x1)) * (pagesize >> 9);

The size of the OOB field of the input file must exactly match the auto-detected OOB size of the ALE. If this is not the case, you can force the size of the input file's ALE field to be set using the -z switch.
It is also possible to use input files that contain only page data fields (oobsize=0). In this case, the contents of the ALE field will be automatically calculated when it is written.

Data can be organized on a flash drive in 2 ways: standard and Linux. They differ in the layout of data on the page.
Standard format - Each sector is 512 bytes in size, followed immediately by a 16-byte ALE field. This format is defined by the flash drive manufacturer and is used for all partitions except file yaffs2.
Linux format - All sectors on a page except the last one are 516 bytes in size, followed by a 12-byte ALE. The last sector on the page has a size of 512-(4*(spp-1)), and the next ALE has a size of oobsize-12*(spp-1). The extra 4 bytes of each sector contain pieces of the yaffs2 tag. Thus, the yaffs2 tag falls entirely into the data field of the flash drive and is protected by the ECC in the same way as the data itself.

The key	Format At the entrance	OOB at the entrance	Fields to write	Format on a flash drive
-fs	Std	No	data	Std
-fl	linux	No	data	linux
-my	Std	eat	data+oob	linux
-be	Std	eat	data+oob	any
-Fo	Std	No	data	linux