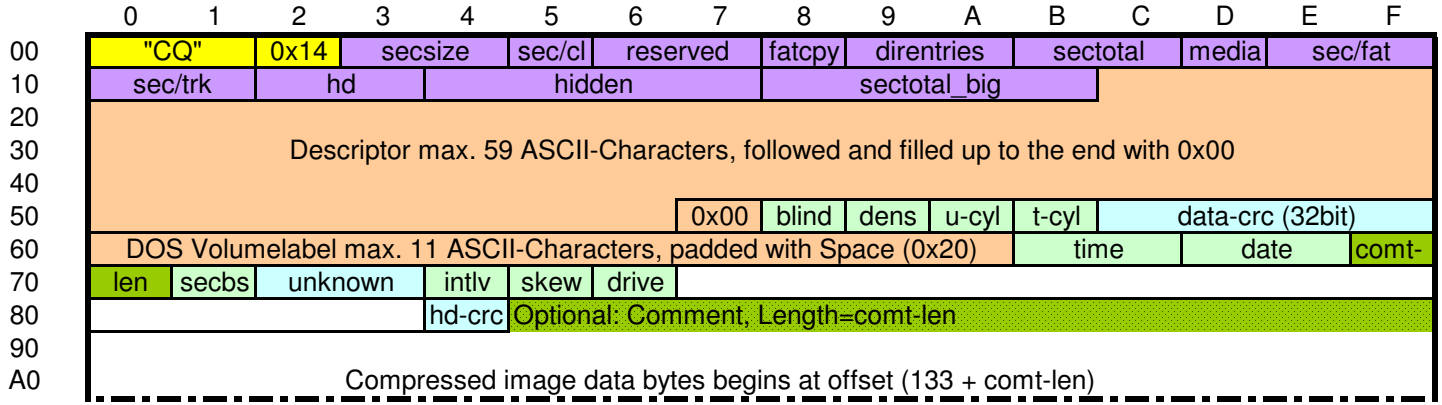
Disk image layout

Subject to change / Änderungen vorbehalten 05.04.2011

CopyQM Format (*.cqm)

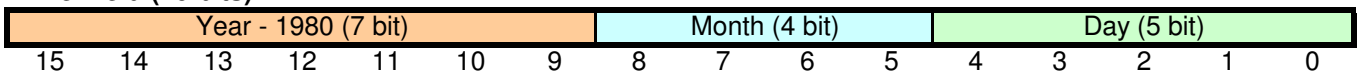
Latest known version: CopyQM v3.26 Plus (NTI)
Latest version I have: CopyQM v3.24 (Sydex)

Headersize = 133 Byte (0x85)

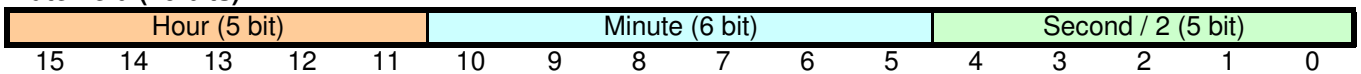


16/32bit values: Byteorder lowbyte...highbyte (little endian Byte ordering)
There is no (known) flag for write protection

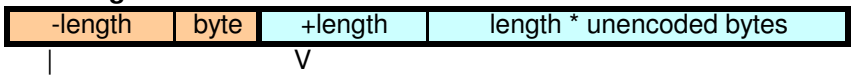
Time Field (16 bits)



Date field (16 bits)



Run length encoded data



16bit positive integer, followed by count=**length** bytes of unencoded data (Sequences of unequal bytes)
16bit negative integer, the byte after is repeated -(**-length**) times (Sequences of equal bytes)

Data-CRC Calculation
The CRC is calculated for the unencoded data over all used cylinders (header field **u-cyl**) in the image.
The CRC value is initialized with 0 and is updated using the CRC 32 polynomial 0x104C11DB7,
bit reverse algorithm (see source code of drvqm.c and crctable.c ind LibDsk).

```
unsigned long* crc;
*crc = crc32r_table[(byte ^ (unsigned char)*crc) & 0x3f] ^ (*crc >> 8);
```

Due to a feature in CopyQM (8 bit register as an index into a 1024 byte table)
all bytes must have their top two bits removed (&0x3f) before added to the CRC.

Header Checksum
The header checksum is calculated from the lowest 8 bit of the negative sum of all header bytes
except the checksum field itself.

```
header[132] = (-sum(header[0]...header[131])) & 0xff
```

When reading the header, the sum over the entire header must be zero.

```
sum(header[0]...header[132]) = 0
```

References
The LibDsk Library **http://www.seasip.demon.co.uk/Unix/LibDsk/**

The CopyQM image format in depth Subject to change / Änderungen vorbehalten 05.04.2011

CQM image Offset	DOS bootsect Offset	Len	blind=1/2	Content	Description
0x00-0x02		3			Image identifier (Constant "CQ\x14")
0x03,0x04	0x0b,0x0c	2		secsize	Sector length (Bytes per sector)
0x05	0x0d	1	unused	sec/cl	Sectors per cluster (Power of 2)
0x06,0x07	0x0e,0x0f	2	unused	reserved	Nr. of reserved sectors incl. the boot sector (min. 1)
0x08	0x10	1	unused	fatcpy	Nr. of FAT copies
0x09,0x0a	0x11,0x12	2	unused	direntries	Max. nr. of directory entries in root directory
0x0b,0x0c	0x13,0x14	2		sectotal	Nr. of total sectors if <= 65535, else 0
0x0d	0x15	1	unused	media	Media descriptor byte
0x0e,0x0f	0x16,0x17	2	unused	sec/fat	Nr. of sectors per FAT
0x10,0x11	0x18,0x19	2		sec/trk	Nr. of sectors per track
0x12,0x13	0x1a,0x1b	2		hd	Nr. of heads (1 or 2)
0x14-0x17	0x1c-0x1f	4	unused	hidden	Nr. of hidden sectors before the boot sector (zero on floppy disks)
0x18-0x1b	0x20-0x23	4	unused	sectotal_big	Nr. of total sectors if > 65535, else 0 (zero on floppy disks)
0x1c-0x57		60		descr	Description (ASCII Text, padded with \x00)
0x58		1		blind	Blind: 0=DOS, 1=blind, 2=HFS blind=0: => header contains additional filesystem (DOS) infos;
0x59		1		dens	Density: 0=DD, 1=HD, 2=ED
0x5a		1		u-cyl	Cylinders in image, set equal to t-cyl in blind (blind=1) images
0x5b		1		t-cyl	Cylinders on disk (total cylinders, physical cylinders)
0x5c-0x5f		4		data-crc	32bit data CRC
0x60-0x6a		11		label	DOS volume label (ASCII Text, padded with \x20 (Space))
0x6b,0x6c		2		time	Modification time (see diagram)
0x6d,0x6e		2		date	Modification date (see diagram)
0x6f,0x70		2		comt-len	Comment length (Length of optional comment field)
0x71		1		secbs	Sector base (Nr. of first sector - 1)
0x72,0x73		2	unused		Unknown, set by CopyQM v3.24 if blind=0, depends on disk contents
0x74		1		intlv	Interleave (1 if not interleaved)
0x75		1		skew	Skew (0 if not skewed)
0x76		1		drive	Source drive type: 1=5,25" 360KB, 2=5,25" 1,2MB, 3=3,5" 720KB, 4=3,5" 1,44MB, 6=3,5" 2,88MB, 8" is unknown (0 or 5?)
0x77-0x83		13			Unknown, always zero (\x00) in my tests
0x84		1		hd-crc	Header CRC
0x85-xxx		comt-len			If Comment, then comt-len bytes (incl. \x00 characters)
0x85-xxx					If no comment, then image starts here

Image starts at 0x85 (133) if no comment exists, or at 0x85 + "comt-len" if a comment exists

unused: Unused fields in blind mode (blind=1) or in HFS images (blind=2) filled with zeros (\x00)

The purple part in DOS images (blind=0) corresponds to the BIOS Parameter Block (BPB) of a DOS floppy disk.