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800K Macintosh Disk: Sector and Track Info

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TOPIC -----

I have three questions about 800K Macintosh disks:

- 1) How many sectors are there per side?
- 2) Is the top or the bottom of the disk used first for data storage?
- 3) What are the sync lengths of the tracks?

DISCUSSION -----

- 1) The table below states the formatted capacity of the 800K media:

800K Disk Specifications

Bytes per Sector	512
Tracks per Side	80
Sectors per Track	
Tracks 00-15	12
Tracks 16-31	11
Tracks 32-47	10
Tracks 48-63	9
Tracks 64-79	8
Sectors per Side	800
Sectors per Disk	1600
Bytes per Side	409600 (400K)
Bytes per Disk	819200 (800K)

- 2) The bottom of the disk is side 0; the top of the disk is side 1. The first sector, block 0, is on track 0 of side 0. The last sector, block 1599, is on track 79 of side 1.
- 3) A sector can be divided into four major sections. These are the header sync field, the header field, the data sync field, and the data field. These fields combined add up to 733.5 code bytes minimum.

Header Sync Field (6.25 bytes + sync overhead):

5 bit slip FF's minimum (FF,3F,CF,F3,FC,FF)

The header sync fields contain a pattern of ones and zeros that synchronizes the hardware state machine with the data on the disk. The header sync and headers field are written only when the disk is formatted. The formatter should make this field as large as possible, because this field buffers expansion of the previous sector's data field due to speed variation of the drive.

Header Fields (11 bytes):

The header field identifies the sector. The sub-fields are:

D5 AA 96	address marks: this identifies the fields as a header field
Track	encoded low 6 bits of track number
Sector	encoded sector number
Side	encoded high 2 bits of track number and side bit: decoded bit 5=0 for side 0, 1 for side 1 decoded bit 0 is the high-order bit of the track number decoded bits 1-4 are reserved and should be 0
Format	encoded format specifications: decoded bit 5=0 for single-sided formats decoded bits 0-4 define format interleave: standard 2:1 interleave formats have 2 in the field
Checksum	checksum formed by exclusive 'or' in the track, sector side, and format fields
DE AA	bit slip marks: this identifies the end of the field
Off	pad byte where the write electronics were turned off

Data Sync Field (6.25 bytes):

5 bit slip FF's (FF,3F,CF,F3,FC,FF)

The data sync field contains a pattern of ones and zeros that synchronizes the state machine with the data on the disk. This field is written whenever the data field is written.

Data Field (710 bytes):

The data field contains the actual data in the sector. The sub-fields are:

D5 AA AD	data marks: this identifies the field as a data field
Sector	encoded sector number
Encoded Data	524 bytes encoded into 699 code bytes; the first 12 data bytes are typically used as a sector tag by the operating system, and the remaining 512 bytes are used for actual data.
Checksum	a 24-bit checksum encoded into 4 code byte
DE AA	bit slip marks: this identifies the end of the field
Off	pad byte where the write electronics were turned off

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