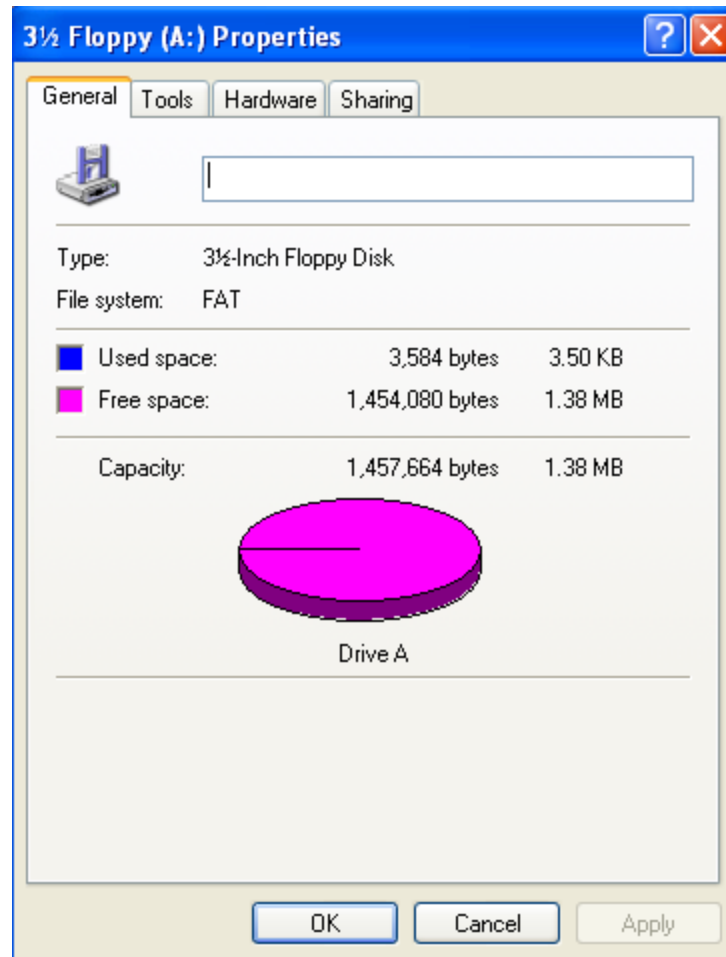# Introduction to Computer Forensics and Security
6G7Z1009
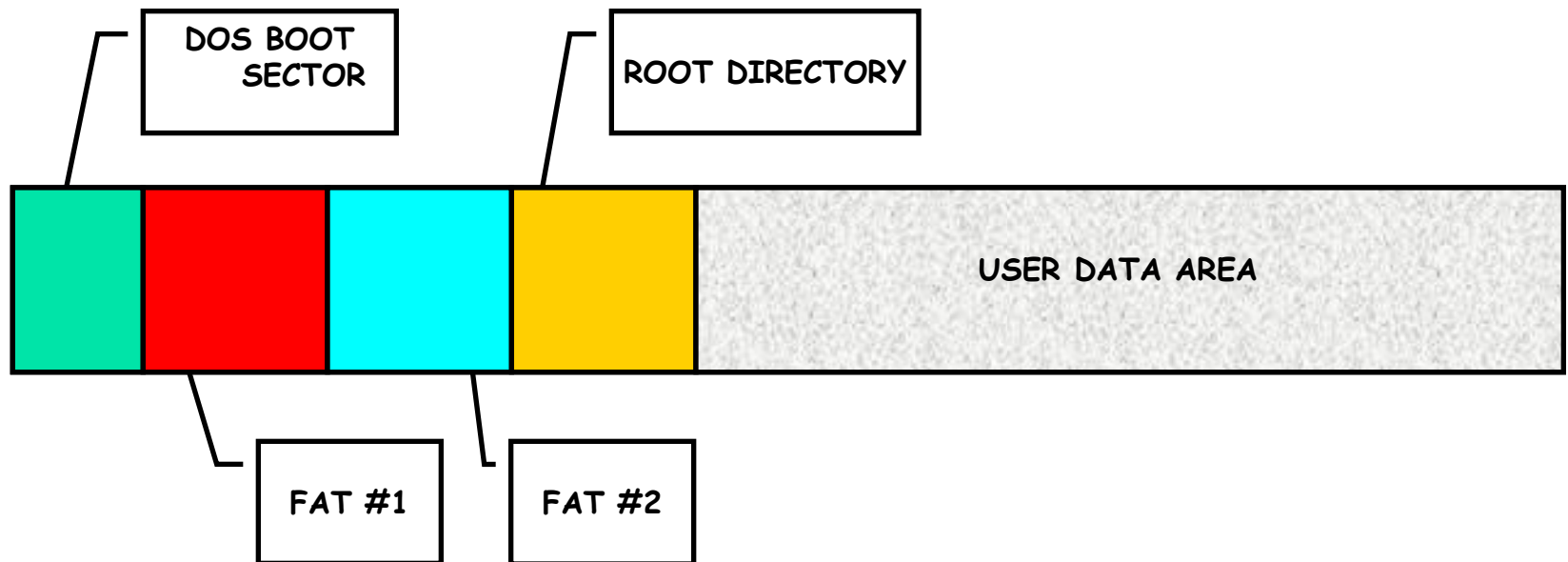
FAT

FAT File System

- **Four parts**
  - Volume boot record
  - File allocation tables
  - Root directory
  - User data area
- **Types**
  - FAT 12, 16, 32 bits; cluster address size
  - FAT1 and FAT2; first and second copy of FAT
  - Floppy: FAT12

FAT12/16 Structure

DOS BOOT SECTOR

ROOT DIRECTORY

USER DATA AREA

FAT #1

FAT #2

DOS Boot Sector

- Usually 512 Bytes in Size.
- Contains:
  - Volume Name
  - Serial Number
  - Volume Type
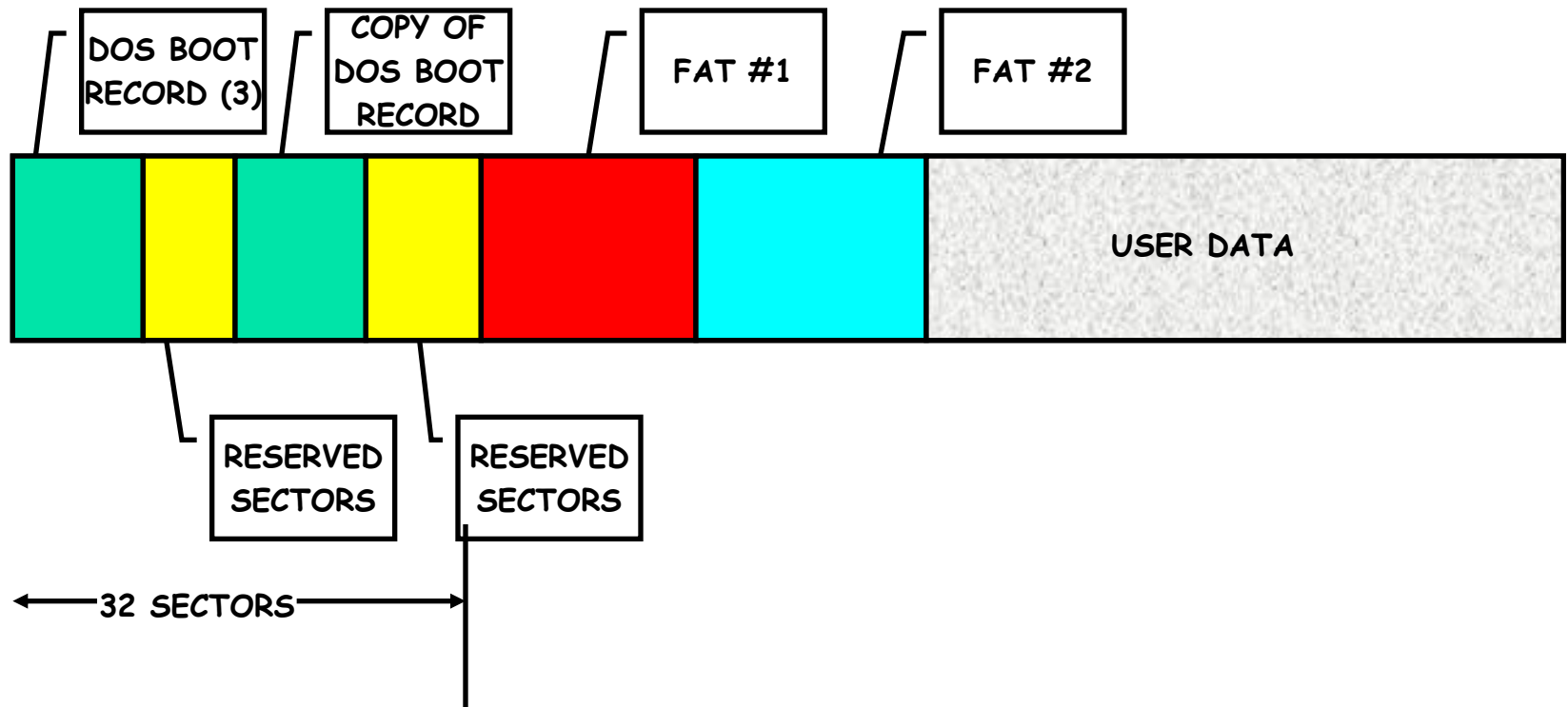 - Boot Code
  - Signature
  - ETC…

FAT 1 and FAT 2

- Tracking allocated and unallocated block/clusters on the disk.
- FAT 1 is the primarly table and FAT 2 is a copy of FAT 1.

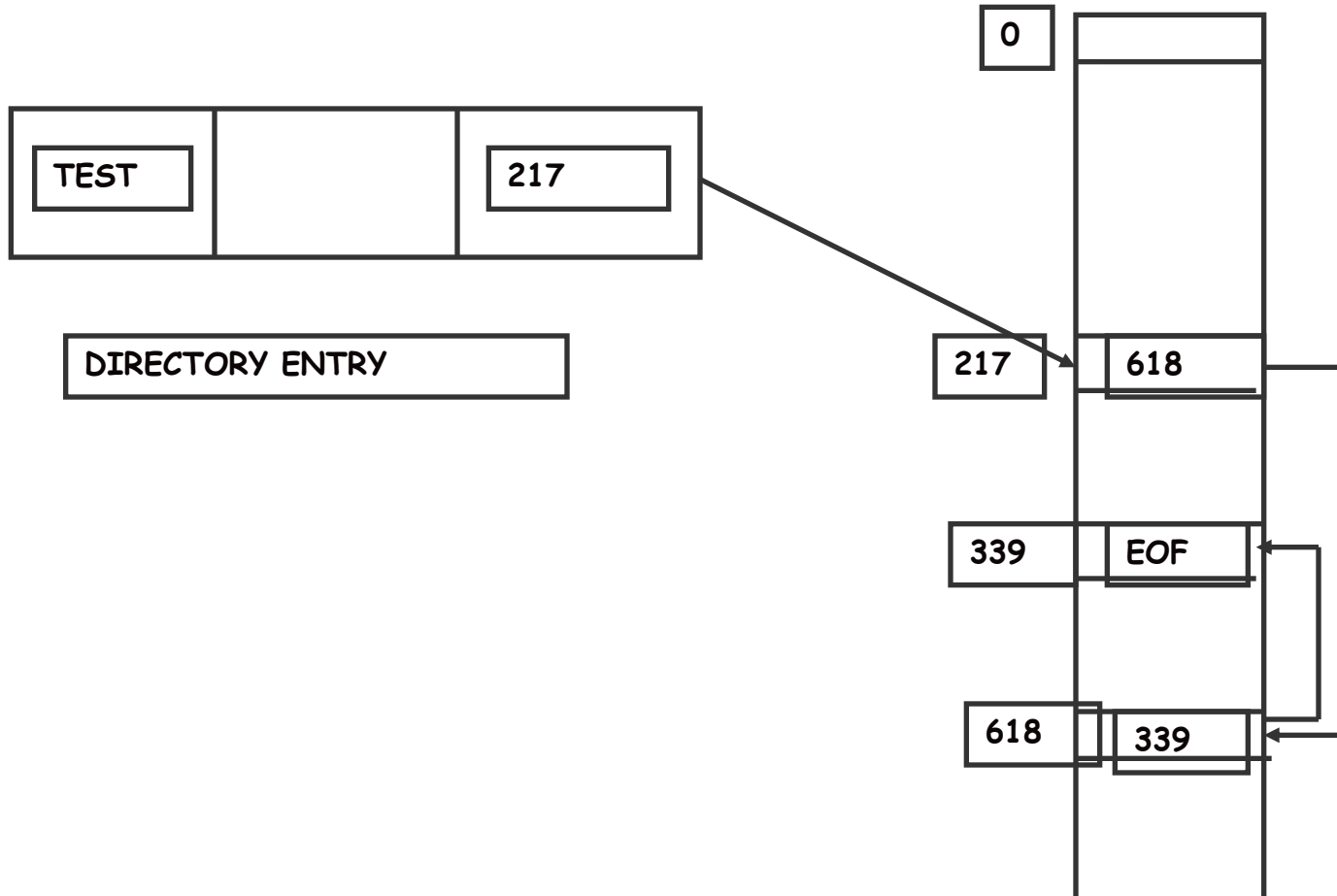# Root Directory

- Its main purpose in FAT12 and FAT 16 is holding the directory entries information for the Root folder on the disk.

FAT32 Structure

DOS BOOT RECORD (3)

COPY OF DOS BOOT RECORD

FAT #1

FAT #2

RESERVED SECTORS

RESERVED SECTORS

USER DATA

32 SECTORS

File Allocation Table

TEST

217

DIRECTORY ENTRY

0

217   618

339   EOF

618   339
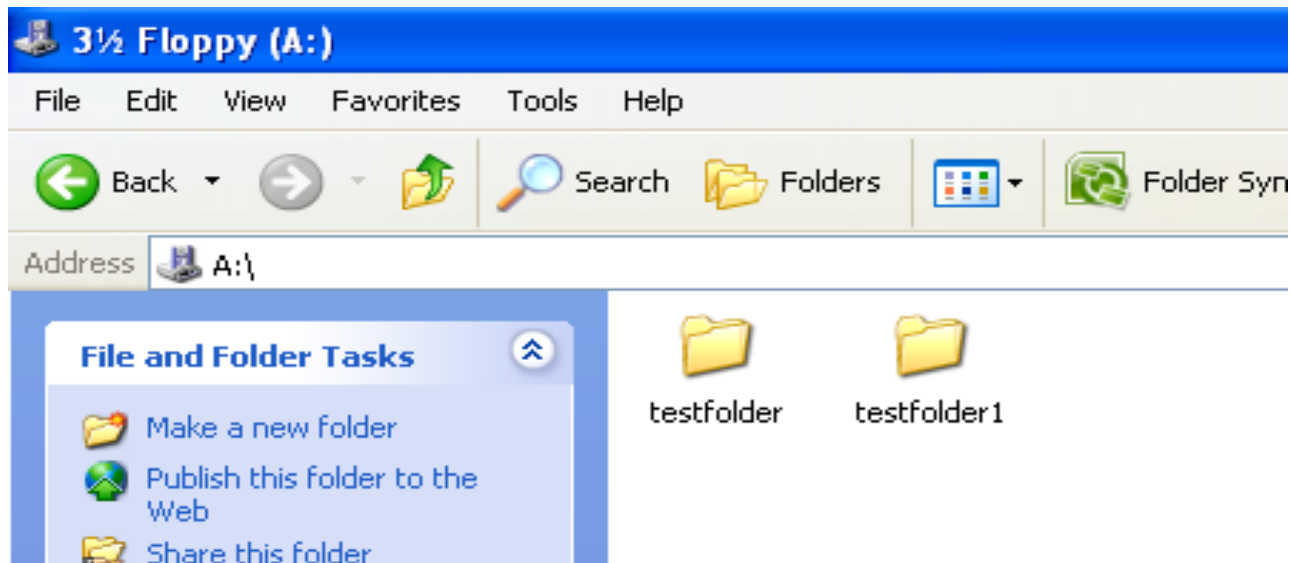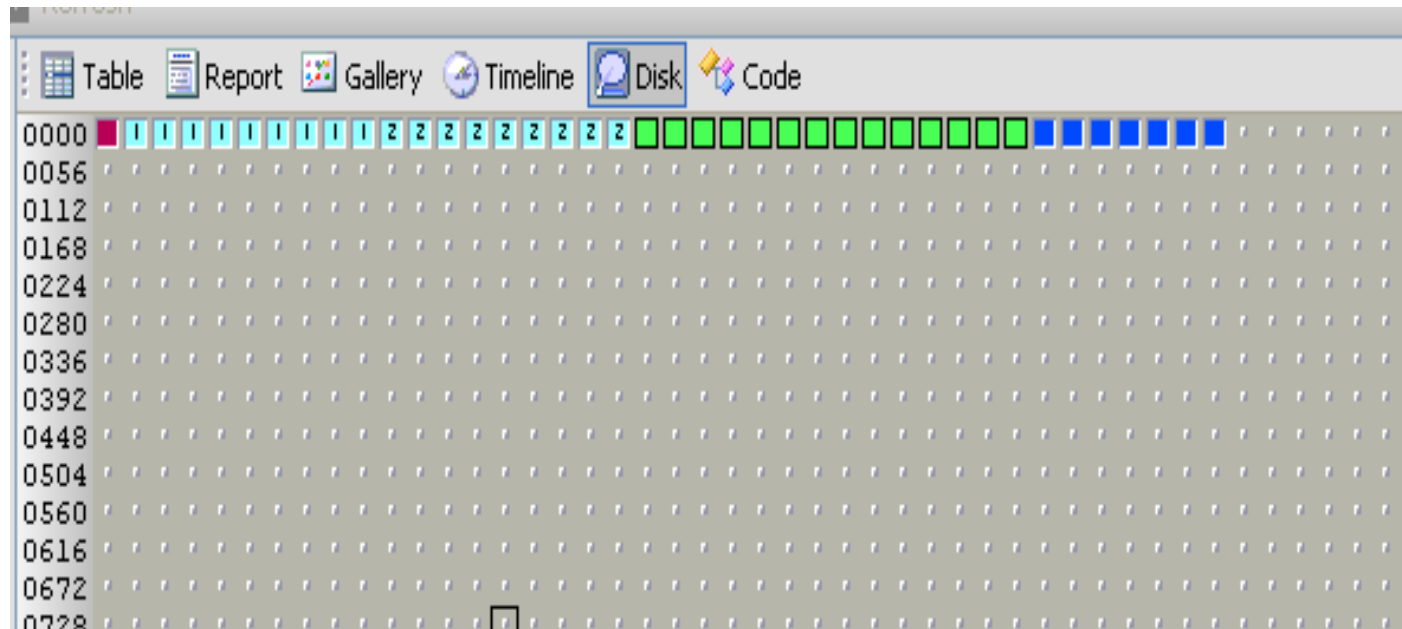
Sample FAT12/16 Disk Used

A Typical Floppy

- 1 sector per cluster
- 1 sector reserved as boot sector
- 18 sectors for FATs (**9 each**)
- 14 sectors for root directory
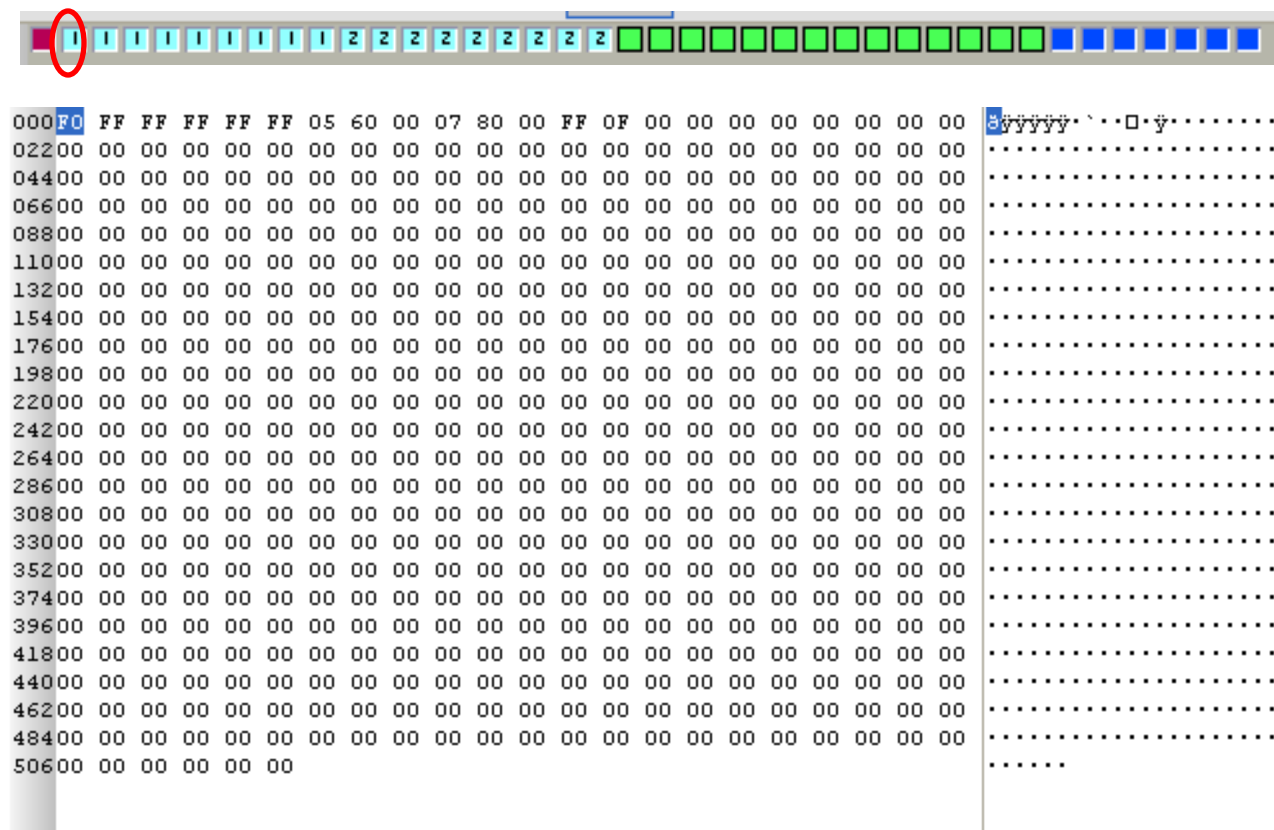
Graph Represents Sectors

MBR first 512 bytes

- Master Boot Record

FAT 1 first 512 bytes

FAT 2 first 512 bytes

- Notice it is a duplicate

FAT 12 Root Directory

Sub directory with one file inside


```
0000 2E 20 20 20 20 20 20 20 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00  .        ··@+|9;9;··
0222 2C 96 39 3B 03 00 00 00 00 00 2E 2E 20 20 20 20 20 20 20 20 20 10  ,□9;·······..         ·
0440 00 40 2B 96 39 3B 39 3B 00 00 2C 96 39 3B 00 00 00 00 00 00 41 45  ·@+|9;9;··,□9;······AE
0660 6E 00 43 00 61 00 73 00 0F 00 7B 65 00 2E 00 4A 00 50 00 47 00  ·n·C·a·s···{e·.·J·P·G·
0880 00 00 00 FF FF FF FF 45 4E 43 41 53 45 20 20 4A 50 47 20 00 B8  ····ÿÿÿÿENCASE  JPG ·,
1104 E 96 39 3B 39 3B 00 00 49 96 39 3B 04 00 16 09 00 00 00 00 00 00  N□9;9;··I□9;··· ······
1320 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
1540 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
1760 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
1980 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
2200 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
2420 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
2640 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
2860 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
3080 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
3300 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
3520 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
3740 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
3960 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
4180 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
4400 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
4620 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
4840 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ····················
5060 00 00 00 00 00 00                                                ·····.·
```

JPG Image first 512 bytes

- First sector for JPG image data

FAT 12/16 Structure

. FAT file system layout and data from the boot sector that is used to calculate the locations and sizes.

FAT12/16

Reserved Area / FAT Area / Root Directory / Data Area

Reserved Sectors / Num of FATS * Size of each FAT / Num of Root Directory Entries / Num of Sectors in File System
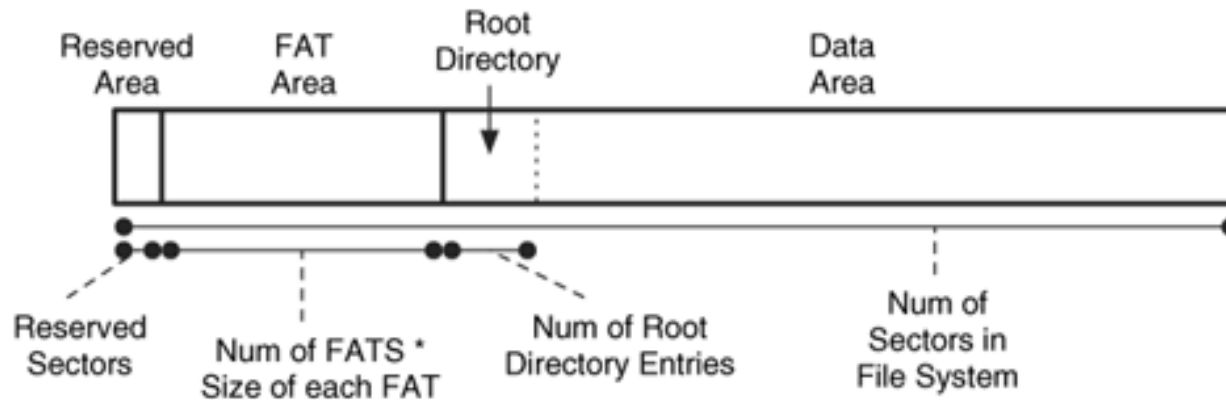
MBR first 512 bytes

Table 10.2. Data structure for the remainder of the FAT12/16 boot sector.

Byte Range	Description	Essential
0–35	See Table 10.1.	Yes
36–36	BIOS INT13h drive number.	No
37–37	Not used.	No
38–38	Extended boot signature to identify if the next three values are valid. The signature is 0x29.	No
39–42	Volume serial number, which some versions of Windows will calculate based on the creation date and time.	No
43–53	Volume label in ASCII. The user chooses this value when creating the file system.	No
54–61	File system type label in ASCII. Standard values include "FAT," "FAT12," and "FAT16," but nothing is required.	No
62–509	Not used.	No
510–511	Signature value (0xAA55).	No

MBR first 512 bytes

Table 10.1. Data structure for the first 36 bytes of the FAT boot sector.

Byte Range	Description	Essential
0—2	Assembly instruction to jump to boot code.	No (unless it is a bootable file system)
3—10	OEM Name in ASCII.	No
11—12	Bytes per sector. Allowed values include 512, 1024, 2048, and 4096.	Yes
13—13	Sectors per cluster (data unit). Allowed values are powers of 2, but the cluster size must be 32KB or smaller.	Yes
14—15	Size in sectors of the reserved area.	Yes
16—16	Number of FATs. Typically two for redundancy, but according to Microsoft it can be one for some small storage devices.	Yes
17—18	Maximum number of files in the root directory for FAT12 and FAT16. This is 0 for FAT32 and typically 512 for FAT16.	Yes
19—20	16-bit value of number of sectors in file system. If the number of sectors is larger than can be represented in this 2-byte value, a 4-byte value exists later in the data structure and this should be 0.	Yes
21—21	Media type. According to the Microsoft documentation, 0xf8 should be used for fixed disks and 0xf0 for removable.	No
22—23	16-bit size in sectors of each FAT for FAT12 and FAT16. For FAT32, this field is 0.	Yes
24—25	Sectors per track of storage device.	No
26—27	Number of heads in storage device.	No
28—31	Number of sectors before the start of partition.[1]	No
32—35	32-bit value of number of sectors in file system. Either this value or the 16-bit value above must be 0.	Yes

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0······`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ·············)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME    FAT12    z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····|  · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u  □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh··rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   6O|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 20 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS  S
506 59 53 00 00 55 AA                                                    YS··U*
```

Assembly instruction to jump to boot code.

MBR first 512 bytes


```
000EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0·······`·@·p
02209 00 12 00 02 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ·····································)]··$N
0444F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME    FAT12   z3@·
066D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~·····|·My G·G·>
1107C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····| · |
132A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 ·w&·|·
1761E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
19852 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u □ 9··s&t·>·}h_
24200 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
26448 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
28603 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh:·rX0·hT·YZXr;··
30800 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
3523B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
37488 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|1·Rf
39636 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   6O|·J·i ·$| 6%|M·C  No
4186E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
44065 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
46273 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
4840A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
50659 53 00 00 55 AA                                                   YS··U*
```

Bytes 3-10 : OEM Name in ASCII
(OEM) Original Equipment Manufacturer

MBR first 512 bytes

```
000EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0  k<·MSDOS5.0······`·@·p
02209 00 12 00 02 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E  ···········)··$N
0444F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E  O NAME    FAT12   z3@·
066D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00  P<·|··;x·6E7·V·S·>|9··
088FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E  |s$··FE~·····|·My G·G·>
1107C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C  |{M·ry3@9··|t····| · |
132A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00  ·|w&·|···|···|···|·R·
154A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B  #P| ·R|#I| ·K|8 ·w&·|·
1761E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16  ··|·CHws··I|··K|·;····
19852 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00  R|!P|h··r·0·h,·r··{9··
220BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F  >f}s&u □ 9··s&t·>·}h_
24200 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A  ·3@M·^····D·M·XXXkh·G·
26448 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9  HH · |2|wc··I|··K|;··9
28603 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01  ··PRQh:·rX0·hT·YZXr;··
30800 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C  ··R····|bb .·| ·$|··I|
330A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2  !K|j··p·, @t)4·;··M·kr
3523B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C  ;··|s·w6·|~B··0|3Rw6·|
37488 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A  ··%|#M|xCyC4···M|1·Rf
39636 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F  60|·J·i ·$| 6%|M·C  No
4186E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20  n-System disk or disk
44065 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65  error  Replace and pre
46273 73 20 61 6E 79 20 6B 65 79 20 77 68 65 20 72 65 61 64 79 0D  ss any key when ready
4840A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53  ·IO      SYSMSDOS   S
50659 53 00 00 55 AA                                                   YS··U*
```

Bytes 11-12
Bytes per sector. Allowed values include 512, 1024, 2048, and 4096
00 02 = little endian (02 00) = 512

MBR first 512 bytes

```
000EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0  k<·MSDOS5.0·· ···`·@·p
02209 00 12 00 02 00 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ···············)]··$N
0444F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E  O NAME    FAT12   z3@·
066D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00  P<·|··;x·6E7·V·S·>|9··
088FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E  |s$··FE~·····|·My G·G·>
1107C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C  |{M·ry3@9··|t····| · |
132A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B  #P| ·R|#I| ·K|8 ·w&·|·
1761E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16  ··|·CHws··I|··K|·;····
19852 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00  R|!P|h··r·0·h,·r··{9··
220BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F  >f}s&u  □ 9··s&t·>·}h_
24200 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A  ·3@M·^····D·M·XXXkh·G·
26448 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9  HH · |2|wc··I|··K|;··9
28603 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01  ··PRQh··rX0·hT·YZXr;··
30800 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C  ··R····|bb .·| ·$|··I|
330A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2  !K|j··p·, @t)4·;··M·kr
3523B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C  ;··|s·w6·|~B··0|3Rw6·|
37488 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A  ··%|#M|xCyC4···M|l·Rf
39636 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F  6O|·J·i ·$| 6%|M·C  No
4186E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20  n-System disk or disk
44065 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65  error  Replace and pre
46273 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D  ss any key when ready
4840A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53  ·IO      SYSMSDOS  S
50659 53 00 00 55 AA                                                  YS··U*
```

Byte 13
Sectors per cluster (data unit). Allowed values are powers of 2
01 = 1

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 [01] 00 02 E0 00 40 0B F0    k<·MSDOS5.0··[ ]··`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E    ·············· ··)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E    O NAME     FAT12    z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00    P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E    |s$··FE~····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C    |{M·ry3@9··|t····| · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00    ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B    #P|·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16    ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00    R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F    >f}s&u  9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A    ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9    HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01    ··PRQh··rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C    ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2    !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C    ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A    ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F    6O|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20    n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65    error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D    ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53    ·IO       SYSMSDOS   S
506 59 53 00 00 55 AA                                                    YS··U*
```

Byte 14
Size in sectors of the reserved area.
01 = 1

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0··· · ·`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E    ··············· ·)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME      FAT12    z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~···· |·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t···· |  · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00    ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P|·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u  □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh··rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|1·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   60|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                   YS··U*
```

Bytes 14 -15
Size in sectors of the reserved area.
01 00 = little endian (00 01) = 1

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0··· ··`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E    ···············)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME     FAT12    z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~·····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····| · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P|·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u  □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh:·rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   60|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                   YS··U*
```

Byte 16
Number of FATs. Typically two for redundancy.
02 = 2

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0·····  ··@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ················]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME     FAT12    z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~··  ·|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····|  ·  |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u  □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh:·rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|1·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   60|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                   YS··U*
```

<div style="border: red">
Bytes 17 - 18

Maximum number of files in the root directory for FAT12 and FAT16.

This is 0 for FAT32 and typically 512 for FAT16.

E0 00= little endian (00 E0) =224
</div>

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0······`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ···············)]·$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME    FAT12   z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9·|t····| · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh··rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   60|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA   YS··U*
```

Bytes 19 - 20
number of sectors in file system
40 0B= Little endian (0B 40) =2880

30

MBR first 512 bytes

Byte 21
Media type. According to the Microsoft documentation, 0xf8 should
be used for fixed disks and 0xf0 for removable.

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0·······`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ·················)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME     FAT12    z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~·····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····| · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|·P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u  □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh··rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   60|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                   YS··U*
```

Bytes 22–23
16-bit size in sectors of each FAT for FAT12 and FAT16. For FAT32, this field is 0.
09 00 = little endian (00 09) = 9

32

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0·······`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ··············)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME    FAT12   z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~·····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····|  · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u  □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh··rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   60|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                    YS··U*
```

Bytes 24–25
Sectors per track of storage device.
12 00 = little endian (00 12) = 18

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0·······`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ··········)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME    FAT12   z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~·····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····| · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u  □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh··rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   60|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                    YS··U*
```

Bytes 26–27
Number of heads in storage device.
02 00 = little endian (00 02) = 2

34

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0·······`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E    ···············)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME    FAT12    z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|·';x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~·····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····|  ·  |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00    ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u  □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh··rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   60|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 72 20 64 69 73 6B   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                   YS··U*
```

Bytes 28–31
Number of sectors before the start of partition.

0

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5_0·······`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ·············)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME     FAT12    z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~·····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····| · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh··rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   60|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                   YS··U*
```

Bytes 32 - 35

32-bit value of number of sectors in file system. Either this value or the 16-bit value above must be 0.

0

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0······`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ···············)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME      FAT12   ·3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~·····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····| · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|·P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u  □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh:·rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|1·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   60|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                    YS··U*
```

Bytes 39 - 42
Volume serial number, which some versions of Windows will calculate based on the creation date and time.

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B E0   k<·MSDOS5.0·······`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ···············)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME    FAT12    z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>·9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~·····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····| · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|··|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u  □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh··rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   6O|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                   YS··U*
```

Bytes 43 - 53
Volume label in ASCII. The user chooses this value when creating
the file system.
NO NAME

38

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0·······`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ················)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME     FAT12   z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~··|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····| · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P|·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh··rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   6O|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                     YS··U*
```

Bytes 54 - 61

File system type label in ASCII. Standard values include "FAT,"
"FAT12," and "FAT16," but nothing is required.

FAT12

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0······`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E   ···············}·‹$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME     FAT12    z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~·····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····|· · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|·|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u  □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh:·rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   60|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                   YS··U
```

Bytes 62 - 509
Not used

40

MBR first 512 bytes

```
000 EB 3C 90 4D 53 44 4F 53 35 2E 30 00 02 01 01 00 02 E0 00 40 0B F0   k<·MSDOS5.0······`·@·p
022 09 00 12 00 02 00 00 00 00 00 00 00 00 00 00 29 DD 16 15 24 4E     ················)]··$N
044 4F 20 4E 41 4D 45 20 20 20 20 46 41 54 31 32 20 20 20 FA 33 C0 8E   O NAME     FAT12    z3@·
066 D0 BC 00 7C 16 07 BB 78 00 36 C5 37 1E 56 16 53 BF 3E 7C B9 0B 00   P<·|··;x·6E7·V·S·>|9··
088 FC F3 A4 06 1F C6 45 FE 0F 8B 0E 18 7C 88 4D F9 89 47 02 C7 07 3E   |s$··FE~·····|·My G·G·>
110 7C FB CD 13 72 79 33 C0 39 06 13 7C 74 08 8B 0E 13 7C 89 0E 20 7C   |{M·ry3@9··|t····| · |
132 A0 10 7C F7 26 16 7C 03 06 1C 7C 13 16 1E 7C 03 06 0E 7C 83 D2 00   ·|w&·|···|···|···|·R·
154 A3 50 7C 89 16 52 7C A3 49 7C 89 16 4B 7C B8 20 00 F7 26 11 7C 8B   #P| ·R|#I| ·K|8 ·w&·|·
176 1E 0B 7C 03 C3 48 F7 F3 01 06 49 7C 83 16 4B 7C 00 BB 00 05 8B 16   ··|·CHws··I|··K|·;····
198 52 7C A1 50 7C E8 92 00 72 1D B0 01 E8 AC 00 72 16 8B FB B9 0B 00   R|!P|h··r·0·h,·r··{9··
220 BE E6 7D F3 A6 75 0A 8D 7F 20 B9 0B 00 F3 A6 74 18 BE 9E 7D E8 5F   >f}s&u □ 9··s&t·>·}h_
242 00 33 C0 CD 16 5E 1F 8F 04 8F 44 02 CD 19 58 58 58 EB E8 8B 47 1A   ·3@M·^····D·M·XXXkh·G·
264 48 48 8A 1E 0D 7C 32 FF F7 E3 03 06 49 7C 13 16 4B 7C BB 00 07 B9   HH · |2|wc··I|··K|;··9
286 03 00 50 52 51 E8 3A 00 72 D8 B0 01 E8 54 00 59 5A 58 72 BB 05 01   ··PRQh··rX0·hT·YZXr;··
308 00 83 D2 00 03 1E 0B 7C E2 E2 8A 2E 15 7C 8A 16 24 7C 8B 1E 49 7C   ··R····|bb .·| ·$|··I|
330 A1 4B 7C EA 00 00 70 00 AC 0A C0 74 29 B4 0E BB 07 00 CD 10 EB F2   !K|j··p·, @t)4·;··M·kr
352 3B 16 18 7C 73 19 F7 36 18 7C FE C2 88 16 4F 7C 33 D2 F7 36 1A 7C   ;··|s·w6·|~B··0|3Rw6·|
374 88 16 25 7C A3 4D 7C F8 C3 F9 C3 B4 02 8B 16 4D 7C B1 06 D2 E6 0A   ··%|#M|xCyC4···M|l·Rf
396 36 4F 7C 8B CA 86 E9 8A 16 24 7C 8A 36 25 7C CD 13 C3 0D 0A 4E 6F   60|·J·i ·$| 6%|M·C  No
418 6E 2D 53 79 73 74 65 6D 20 64 69 73 6B 20 6F 72 20 64 69 73 6B 20   n-System disk or disk
440 65 72 72 6F 72 0D 0A 52 65 70 6C 61 63 65 20 61 6E 64 20 70 72 65   error  Replace and pre
462 73 73 20 61 6E 79 20 6B 65 79 20 77 68 65 6E 20 72 65 61 64 79 0D   ss any key when ready
484 0A 00 49 4F 20 20 20 20 20 20 53 59 53 4D 53 44 4F 53 20 20 20 53   ·IO      SYSMSDOS   S
506 59 53 00 00 55 AA                                                   YS··U*
```

Bytes 510 - 511
Signature value (0xAA55).

Directory Entry Structure

Directory Entry Structure

- Each file will have at least one directory entry called (basic directory entry).
  - File name in ASCII.
  - MAC Times/Dates.
  - File Size.

- If the file is longer than 8 characters in name or in different language than English it will have another one or more entries called long file name entry written in UNICODE.

Directory Entry Structure (Basic Entry)

Table 10.5. Data structure for a basic FAT directory entry.

Byte Range	Description	Essential
0–0	First character of file name in ASCII and allocation status (0xe5 or 0x00 if unallocated)	Yes
1–10	Characters 2 to 11 of file name in ASCII	Yes
11–11	File Attributes (see Table 10.6)	Yes
12–12	Reserved	No
13–13	Created time (tenths of second)	No
14–15	Created time (hours, minutes, seconds)	No
16–17	Created day	No
18–19	Accessed day	No
20–21	High 2 bytes of first cluster address (0 for FAT12 and FAT16)	Yes
22–23	Written time (hours, minutes, seconds)	No
24–25	Written day	No
26–27	Low 2 bytes of first cluster address	Yes
28–31	Size of file (0 for directories)	Yes

Directory Entry Structure


```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00   At·e·s·t·f··□o·l·d·e·r·
0024 00 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96   ····ÿÿÿÿTESTFO~1   ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74   9;9;··$·9;······At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF   ·f···,o·l·d·e·r·1·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96   TESTFO~2    ··@+|9;9;··,□
1200 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   9;··/···················
1440 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
1680 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
1920 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
2160 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
2400 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
2640 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
2880 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
3120 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
3360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
3600 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
3840 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
4080 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
4320 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
4560 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
4800 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
5040 00 00 00 00 00 00 00 00                                                   ········
```

DemoCD\0002 (PS 19 LS 19 SO 032 FO 32 LE 1)

Byte 0
First character of file name in ASCII or (0xe5 or 0x00 if unallocated)

Directory Entry Structure

Bytes 1-10
Characters 2 to 11 of file name in ASCII or short name

Directory Entry Structure – Entry Attribute

Table 10.6. Flag values for the directory entry attributes field.

Flag Value (in bits)	Description	Essential
0000 0001 (0x01)	Read only	No
0000 0010 (0x02)	Hidden file	No
0000 0100 (0x04)	System file	No
0000 1000 (0x08)	Volume label	Yes
0000 1111 (0x0f)	Long file name	Yes
0001 0000 (0x10)	Directory	Yes
0010 0000 (0x20)	Archive	No

Directory Entry Structure

Byte 11
File Attributes

Directory Entry Structure

Byte 12
Reserved

Directory Entry Structure

```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00  At·e·s·t·f···□o·l·d·e·r·
0024 00 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96  ····ÿÿÿÿTESTFO~1    ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74  9;9;··$|9;······At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF  ·f···,o·l·d·e·r·1·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96  TESTFO~2    ··@+|9;9;··,□
1200 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  9;······················
1440 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
1680 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
1920 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
2160 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
2400 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
2640 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
2880 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
3120 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
3360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
3600 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
3840 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
4080 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
4320 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
4560 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
4800 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
5040 00 00 00 00 00 00 00 00                                                  ········
```

Byte 13
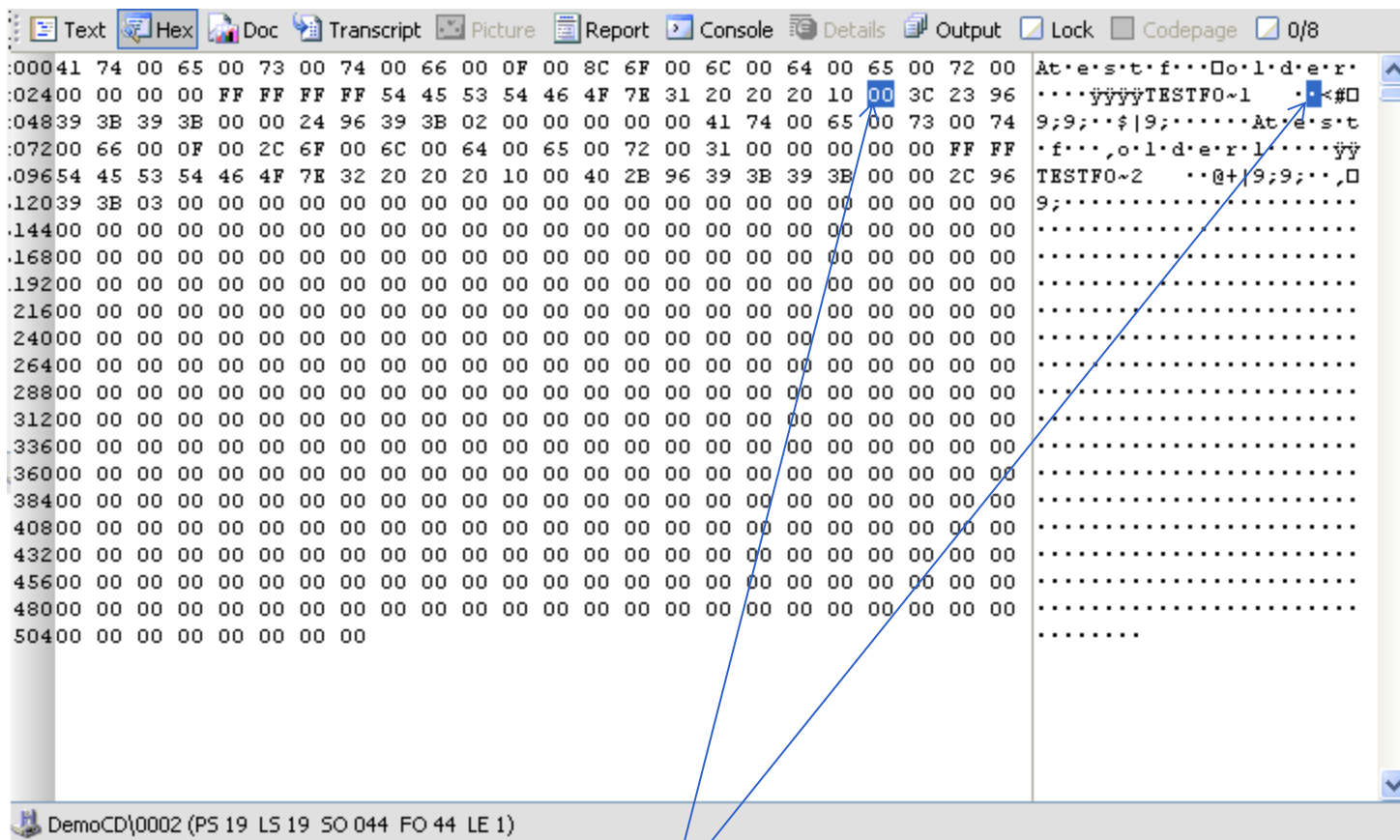Created time (tenths of seconds)

50

Directory Entry Structure


```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00  At·e·s·t·f···□o·l·d·e·r·
0024 00 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96  ····ÿÿÿÿTESTFO~1   ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74  9;9;··$|9;······At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF  ·f···,o·l·d·e·r·1·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96  TESTFO~2   ··@+|9;9;··,□
0120 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  9;······················
0144 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0168 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0192 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0216 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0264 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0288 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0312 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0336 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0384 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0408 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0432 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0456 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0480 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0504 00 00 00 00 00 00 00 00                                                  ········
```

Bytes 14-15
Created time (hours, minutes, seconds)

51

Directory Entry Structure

```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00  At·e·s·t·f···□o·l·d·e·r·
0024 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96  ·····ÿÿÿÿTESTFO~1   ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 00 41 74 00 65 00 73 00 74  9;9;··$|9;······At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF  ·f···,o·l·d·e·r·1·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96  TESTFO~2   ··@+|9;9;··,□
0120 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  9;······················
0144 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0168 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0192 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0216 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0264 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0288 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0312 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0336 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0384 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0408 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0432 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0456 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0480 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ························
0504 00 00 00 00 00 00 00 00                                                  ········
```

Bytes 16-17
Created day

Directory Entry Structure

```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00   At·e·s·t·f···□o·l·d·e·r·
0024 00 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96   ····ÿÿÿÿTESTFO~1   ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74   9;9;··$|9;······At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF   ·f···,o·l·d·e·r·1·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96   TESTFO~2   ··@+|9;9;··,□
0120 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   9;····················
0144 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0168 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0192 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0216 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0264 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0288 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0312 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0336 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0384 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0408 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0432 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0456 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0480 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0504 00 00 00 00 00 00 00 00                                                   ········
```

Bytes 18-19
Accessed day

Directory Entry Structure

```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00   At·e·s·t·f···□o·l·d·e·r·
0024 00 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96   ·····ÿÿÿÿTESTFO~1   ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74   9;9;··$|9;·····At·e·s·t
0072 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF   ·f·♦·□o·l·d·e·r·l····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96   TESTFO~2   ··@+|9;9;··,□
0120 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   9;····················
0144 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0168 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0192 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0216 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0264 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0288 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0312 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0336 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0384 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0408 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0432 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0456 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0480 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0504 00 00 00 00 00 00 00 00                                                   ········
```

Bytes 20-21
High two bytes of the first cluster address (0 FAT12 and FAT16)

Directory Entry Structure


```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00   At·e·s·t·f···□o·l·d·e·r·
0024 00 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96   ····ÿÿÿÿTESTFO~1    ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74   9;9;··$□9;······At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF   ·f···,o·l·d·e·r·1·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96   TESTFO~2   ··@+|9;9;··,□
0120 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   9;·····················
0144 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0168 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0192 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0216 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0264 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0288 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0312 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0336 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0384 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0408 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0432 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0456 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0480 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0504 00 00 00 00 00 00 00 00                                                   ········
```

Bytes 22-23
Written time (hours, minutes, seconds)

Directory Entry Structure

```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00   At·e·s·t·f···□o·l·d·e·r·
0024 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96   ····ÿÿÿÿTESTFO~1   ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74   9;9;··$·9;······At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF   ·f···,o·l·d·e·r·1·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96   TESTFO~2   ··@+|9;9;··,□
0120 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   9;··················
0144 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0168 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0192 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0216 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0264 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0288 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0312 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0336 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0384 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0408 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0432 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0456 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0480 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0504 00 00 00 00 00 00 00 00                                                   ········
```

Bytes 24-25
Written day

Directory Entry Structure

```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00    At·e·s·t·f···□o·l·d·e·r·
0024 00 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96    ····ÿÿÿÿTESTFO~1   ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74    9;9;··$|9;······At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF    ·f···,o·l·d·e·r·l·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96    TESTFO~2   ··@+|9;9;··,□
0120 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    9;····················
0144 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0168 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0192 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0216 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0264 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0288 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0312 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0336 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0384 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0408 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0432 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0456 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0480 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0504 00 00 00 00 00 00 00 00                                                    ········
```

Bytes 26-27
Low 2 bytes of first cluster address

Directory Entry Structure


```
0000  41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00   At·e·s·t·f···□o·l·d·e·r·
0024  00 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96   ····ÿÿÿÿTESTFO~1   ··<#□
0048  39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74   9;9;··$|9;······At·e·s·t
0072  00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF   ·f···,o·l·d·e·r·l·····ÿÿ
0096  54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96   TESTFO~2   ··@+|9;9;··,□
0120  39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   9;··············
0144  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0168  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0192  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0216  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0240  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0264  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0288  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0312  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0336  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0360  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0384  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0408  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0432  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0456  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0480  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ················
0504  00 00 00 00 00 00 00 00                                                   ········
```

Bytes 28-31
Size of file (0 for directories)

Directory Entry Structure – Long File Name

Table 10.7. Data structure for an LFN FAT directory entry.

Byte Range	Description	Essential
0–0	Sequence number (ORed with 0x40) and allocation status (0xe5 if unallocated)	Yes
1–10	File name characters 1–5 (Unicode)	Yes
11–11	File attributes (0x0f)	Yes
12–12	Reserved	No
13–13	Checksum	Yes
14–25	File name characters 6–11 (Unicode)	Yes
26–27	Reserved	No
28–31	File name characters 12–13 (Unicode)	Yes

Directory Entry Structure – Long File Name

Bytes 0-31
Long file name

Directory Entry Structure – Long File Name

```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00   A·t·e·s·t·f···□o·l·d·e·r·
0024 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96   ····ÿÿÿÿTESTFO~1   ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74   9;9;··$|9;·····At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF   ·f···,o·l·d·e·r·1·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96   TESTFO~2   ··@+|9;9;··,□
0120 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   9;······················
0144 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0168 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0192 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0216 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0264 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0288 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0312 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0336 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0384 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0408 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0432 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0456 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0480 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0504 00 00 00 00 00 00 00 00                                                   ········
```

Byte 0
Sequence Number and allocation status (0xe5 if unallocated)

Directory Entry Structure – Long File Name

Bytes 1-10
File name characters 1-5 (Unicode)

Directory Entry Structure – Long File Name


```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00   At·e·s·t·f··Do·l·d·e·r·
0024 00 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96   ····ÿÿÿÿTESTFO~1   ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74   9;9;··$|9;······At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF   ·f···,o·l·d·e·r·l·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96   TESTFO~2   ··@+|9;9;··,□
0120 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   9;···················
0144 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0168 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0192 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0216 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0264 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0288 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0312 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0336 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0384 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0408 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0432 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0456 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0480 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0504 00 00 00 00 00 00 00 00                                                    ········
```

Byte 11
File attributes

Directory Entry Structure – Long File Name


```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00   At·e·s·t·f··.·Do·l·d·e·r·
0024 00 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96   ····ÿÿÿÿTESTFO~1   ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74   9;9;··$|9;······At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF   ·f···,o·l·d·e·r·l·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96   TESTFO~2   ··@+|9;9;··,□
0120 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   9;··················
0144 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0168 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0192 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0216 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0264 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0288 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0312 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0336 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0384 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0408 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0432 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0456 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0480 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ························
0504 00 00 00 00 00 00 00 00                                                   ········
```

DemoCD\0002 (PS 19 LS 19 SO 012 FO 12 LE 1)

the rest of the FAT12 Lecture

Byte 12
Reserved

Directory Entry Structure – Long File Name


```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00   At·e·s·t·f··□o·l·d·e·r·
0024 00 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96   ····ÿÿÿÿTESTFO~1   ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74   9;9;··$|9;······At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF   ·f···,o·l·d·e·r·l·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96   TESTFO~2   ··@+|9;9;··,□
0120 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   9;···/··············
0144 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0168 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0192 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ···/················
0216 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0264 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0288 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0312 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0336 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0384 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0408 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0432 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0456 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0480 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ····················
0504 00 00 00 00 00 00 00 00                                                   ········
```

DemoCD\0002 (PS 19 LS 19 SO 013 FO 13 LE 1)

Byte 13
Checksum

Directory Entry Structure – Long File Name

Bytes 14-25
File name characters 6-11 (Unicode)

Directory Entry Structure – Long File Name


```
0000 41 74 00 65 00 73 00 74 00 66 00 0F 00 8C 6F 00 6C 00 64 00 65 00 72 00    At·e·s·t·f···□o·l·d·e·r·
0024 00 00 00 00 FF FF FF FF 54 45 53 54 46 4F 7E 31 20 20 20 10 00 3C 23 96    ·····ÿÿÿÿTESTFO~1   ··<#□
0048 39 3B 39 3B 00 00 24 96 39 3B 02 00 00 00 00 00 41 74 00 65 00 73 00 74    9;9;··$·9;······At·e·s·t
0072 00 66 00 0F 00 2C 6F 00 6C 00 64 00 65 00 72 00 31 00 00 00 00 00 FF FF    ·f···,o·l·d·e·r·1·····ÿÿ
0096 54 45 53 54 46 4F 7E 32 20 20 20 10 00 40 2B 96 39 3B 39 3B 00 00 2C 96    TESTFO~2   ··@+|9;9;··,□
0120 39 3B 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    9;······················
0144 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0168 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0192 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0216 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0264 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0288 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0312 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0336 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0384 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0408 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0432 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0456 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0480 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ························
0504 00 00 00 00 00 00 00 00                                                    ········
```

DemoCD\0002 (PS 19 LS 19 SO 026 FO 26 LE 2)

Bytes 26-27
Reserved

Directory Entry Structure – Long File Name

Bytes 28-31
File name characters 12-13 (Unicode)

Questions?

m.owda@mmu.ac.uk