

Laboratory Notes (FAT Filesystem Data Recovery)

Laboratory Number: IST602 Lab2

Examiner Name: Akshay Chaurasia

Date & Time	Activity
10:00 AM	<div></div> <p>Attach the floppy drive</p> <div></div> <p>Format the drive in a</p>

Laboratory Notes (FAT Filesystem Data Recovery)

Laboratory Number: IST602 Lab2

Examiner Name: Akshay Chaurasia

10:04 AM

```
C:\>format a:/s/u
Insert new diskette for drive A:
and press ENTER when ready...

Formatting 1.44M
Format complete.
System transferred

Volume label (11 characters, ENTER for none)? Lab 2

    1,457,664 bytes total disk space
    200,704 bytes used by system
    1,256,960 bytes available on disk

    512 bytes in each allocation unit.
    2,455 allocation units available on disk.

Volume Serial Number is 260A-11E6

Format another (Y/N)?N

C:\>
```

Exercise 1

directory listing: dir a: -> 1 file

dir a:/a -> 4 files

```
C:\>dir a:

Volume in drive A is LAB 2
Volume Serial Number is 260A-11E6
Directory of A:\

COMMAND  COM           54,645 05-31-94   6:22a
          1 file(s)           54,645 bytes
                           1,256,960 bytes free

C:\>dir a:/a

Volume in drive A is LAB 2
Volume Serial Number is 260A-11E6
Directory of A:\

IO        SYS           40,774 05-31-94   6:22a
MSDOS     SYS           38,138 05-31-94   6:22a
COMMAND   COM           54,645 05-31-94   6:22a
DRUSPACE  BIN           66,294 05-31-94   6:22a
          4 file(s)           199,851 bytes
                           1,256,960 bytes free

C:\>
```

We can see the system files now.

Laboratory Notes (FAT Filesystem Data Recovery)

Laboratory Number: IST602 Lab2

Examiner Name: Akshay Chaurasia

10:08 AM

E1.3: diskedit a:

```
Disk Editor
Object Edit Link View Info Tools Help More>
Name .Ext ID Size Date Time Cluster 76 A R S H D U
Sector 19
10 SYS File 40774 5-31-94 6:22 am 2 A R S H - -
MSDOS SYS File 38138 5-31-94 6:22 am 82 A R S H - -
COMMAND COM File 54645 5-31-94 6:22 am 157 A - - - - -
DRUSPACE BIN File 66294 5-31-94 6:22 am 264 A R S H - -
LAB 2 Vol 0 9-08-19 10:03 am 0 A - - - - U
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Sector 20
Unused directory entry
Unused directory entry
Root Directory
A:\
Offset 0, hex 0
```

Object -> Boot Record

```
Disk Editor
Object Edit Link View Info Tools Help
Description Boot Record Data DOS Reports
Sector 0
OEM ID: MSDOS5.0
Bytes per sector: 512 512
Sectors per cluster: 1 1
Reserved sectors at beginning: 1 1
FAT Copies: 2 2
Root directory entries: 224 224
Total sectors on disk: 2880 2880
Media descriptor byte: F0 Hex
Sectors per FAT: 9 9
Sectors per track: 18
Sides: 2
Special hidden sectors: 0
Big total number of sectors: (Unused)
Physical drive number: 0
Extended Boot Record Signature: 29 Hex
Volume Serial Number: 260A11E6 Hex
Volume Label: LAB 2
File System ID: FAT12
Boot Record
Drive A:
Offset 3, hex 3
```

View -> as Hex

```
Disk Editor
Object Edit Link View Info Tools Help
Sector 0
00000000: EB 3C 90 4D 53 44 4F 53 - 35 2E 30 00 02 01 01 00 8<E MSDOS5.0....
00000010: 02 E0 00 40 0B F0 09 00 - 12 00 02 00 00 00 00 00 .0.E=.....
00000020: 00 00 00 00 00 00 29 E6 - 11 0A 26 4C 41 42 20 32 .....JP..LAB 2
00000030: 20 20 20 20 20 20 46 41 - 54 31 32 20 20 20 FA 33 ..... FAT12...
00000040: C0 8E D0 BC 00 7C 16 07 - BB 78 00 36 C5 37 1E 56 .A...l...px.6.7&U
00000050: 16 53 BF 3E 7C B9 0B 00 - FC F3 A4 06 1F C6 45 FE .S.>I...<B.v.E#
00000060: 0F 8B 0E 18 7C 8B 4D F9 - 89 47 02 C7 07 3E 7C FB .Y..l&M-gg...>IJ
00000070: CD 13 72 79 33 C0 39 06 - 13 7C 74 08 8B 0E 13 7C .ry3.9..lt.Y..I
00000080: 89 0E 20 7C A0 10 7C F7 - 26 16 7C 03 06 1C 7C 13 e..l&l=A..l...I
00000090: 16 1E 7C 03 06 0E 7C 83 - D2 00 A3 50 7C 89 16 52 .A...l&l..GPI&.R
000000A0: 7C A3 49 7C 89 16 4B 7C - B8 20 00 F7 26 11 7C 8B l&l&l&.Kl...=8.IY
000000B0: 1E 0B 7C 03 C3 48 F7 F3 - 01 06 49 7C 83 16 4B 7C .I...H=<..lI&.Kl
000000C0: 00 BB 00 05 8B 16 52 7C - A1 50 7C E8 92 00 72 1D .Y..I.RlIPl&f.r.
000000D0: B0 01 E8 AC 00 72 16 BB - FB B9 0B 00 BE E6 7D F3 .&%.r..iJ...p}S
000000E0: A6 75 0A 8D 7F 20 B9 0B - 00 F3 A6 74 18 BE 9E 7D .u..l&...<^t..R}
000000F0: E8 5F 00 33 C0 CD 16 5E - 1F 8F 04 8F 44 02 CD 19 8...3...^v&.AD...
00000100: 5B 5B 5B EB EB 8B 47 1A - 48 48 8A 1E 0D 7C 32 FF XXX&81G>HH&A..I2
00000110: F7 E3 03 06 49 7C 13 16 - 4B 7C BB 00 07 B9 03 00 =...lI..KlY...+...
00000120: 50 52 51 EB 3A 00 72 DB - B0 01 E8 54 00 59 5A 5B PRQ&:r...8T.YZX
00000130: 72 BB 05 01 00 83 D2 00 - 03 1E 0B 7C E2 E2 8A 2E rY...&...<.lP&e.
Boot Record
Drive A:
Offset 3, hex 3
```

FLOPPY, therefore volume boot record

Laboratory Notes (FAT Filesystem Data Recovery)

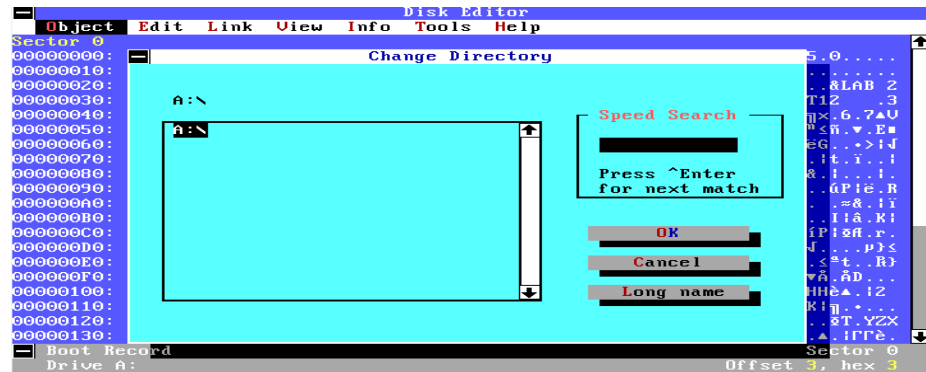
Laboratory Number: IST602 Lab2

Examiner Name: Akshay Chaurasia

10:20 AM

Object -> Directory

Press enter on Directory A, it will take you to the main screen



The screenshot shows the Disk Editor main screen with a menu bar (Object, Edit, Link, View, Info, Tools, Help, More>) and a table of directory entries. The table has columns: Name, .Ext ID, Size, Date, Time, Cluster, and a set of flags (76 A R S H D U). The entries are for Sector 19, including IO, MSDOS, COMMAND, and DRUSPACE files, and LAB 2 volume.

Name	.Ext ID	Size	Date	Time	Cluster	76 A R S H D U
Sector 19						
IO	SYS	File	40774	5-31-94	6:22 am	2 A R S H - -
MSDOS	SYS	File	38138	5-31-94	6:22 am	82 A R S H - -
COMMAND	COM	File	54645	5-31-94	6:22 am	157 A - - - -
DRUSPACE	BIN	File	66294	5-31-94	6:22 am	264 A R S H - -
LAB 2	Vol	0	9-08-19	10:03 am	0	A - - - - U

Object -> 1st FAT

The screenshot shows the Disk Editor main screen with a menu bar (Object, Edit, Link, View, Info, Tools, Help) and a table of the 1st FAT. The table has columns for sector numbers and their corresponding cluster values. The entries are for Sector 1, showing a sequence of sectors and their cluster values, including an EOF entry.

Sector	Cluster
Sector 1	
0	1
1	2
2	3
3	4
4	5
5	6
6	7
7	8
8	9
9	10
10	11
11	12
12	13
13	14
14	15
15	16
16	17
17	18
18	19
19	20
20	21
21	22
22	23
23	24
24	25
25	26
26	27
27	28
28	29
29	30
30	31
31	32
32	33
33	34
34	35
35	36
36	37
37	38
38	39
39	40
40	41
41	42
42	43
43	44
44	45
45	46
46	47
47	48
48	49
49	50
50	51
51	52
52	53
53	54
54	55
55	56
56	57
57	58
58	59
59	60
60	61
61	62
62	63
63	64
64	65
65	66
66	67
67	68
68	69
69	70
70	71
71	72
72	73
73	74
74	75
75	76
76	77
77	78
78	79
79	80
80	81
81	82
82	83
83	84
84	85
85	86
86	87
87	88
88	89
89	90
90	91
91	92
92	93
93	94
94	95
95	96
96	97
97	98
98	99
99	100
100	101
101	102
102	103
103	104
104	105
105	106
106	107
107	108
108	109
109	110
110	111
111	112
112	113
113	114
114	115
115	116
116	117
117	118
118	119
119	120
120	121
121	122
122	123
123	124
124	125
125	126
126	127
127	128
128	129
129	130
130	131
131	132
132	133
133	134
134	135
135	136
136	137
137	138
138	139
139	140
140	141
141	142
142	143
143	144
144	145
145	146
146	147
147	148
148	149
149	150
150	151
151	152
152	153
153	154
154	155
155	156
156	157
157	158
158	159
159	160

Alt+X to get out of the editor.

Laboratory Notes (FAT Filesystem Data Recovery)

Laboratory Number: IST602 Lab2

Examiner Name: Akshay Chaurasia

Exercise 2

10:40 AM

At the C:\ prompt in MS-DOS, type: copy con a:\file1.txt This is file 1 +Z

At the C:\ prompt in MS-DOS, type: dir a:\ a. A file named file1.txt should appear

```
C:\>copy con a:\file1.txt
This is file 1^Z

      1 file(s) copied

C:\>dir a:\

Volume in drive A is LAB 2
Volume Serial Number is 260A-11E6
Directory of A:\

COMMAND  COM           54,645 05-31-94   6:22a
FILE1    TXT           14 09-08-19   10:41a
          2 file(s)           54,659 bytes
                               1,256,448 bytes free

C:\>
```

At the C:\ prompt in MS-DOS, type: md a:\DIR1

At the C:\ prompt in MS-DOS, type: dir a:\ a.

A new directory named DIR1 should appear

```
C:\>md a:\DIR1

C:\>DIR A:\

Volume in drive A is LAB 2
Volume Serial Number is 260A-11E6
Directory of A:\

COMMAND  COM           54,645 05-31-94   6:22a
FILE1    TXT           14 09-08-19   10:41a
DIR1     <DIR>          09-08-19   10:43a
          3 file(s)           54,659 bytes
                               1,255,936 bytes free

C:\>
```

Examiner Name: Akshay Chaurasia

In the **Disk Edit** program, press the F4 key

Laboratory Notes (FAT Filesystem Data Recovery)

Laboratory Number: IST602 Lab2

Examiner Name: Akshay Chaurasia

In the **Disk Edit program**, press the <ALT>+O keys **at the same time**

Highlight the 1st FAT entry and press ENTER

Scroll down to the **offset of 394 to 396**

Object	Edit	Link	View	Info	Tools	Help
249	250	251	252	253	254	255
257	258	259	260	261	262	<EOF>
265	266	267	268	269	270	271
273	274	275	276	277	278	279
281	282	283	284	285	286	287
289	290	291	292	293	294	295
297	298	299	300	301	302	303
305	306	307	308	309	310	311
313	314	315	316	317	318	319
321	322	323	324	325	326	327
329	330	331	332	333	334	335
337	338	339	340	341		
Sector 2						
342	343	344	345	346	347	348
350	351	352	353	354	355	356
358	359	360	361	362	363	364
366	367	368	369	370	371	372
374	375	376	377	378	379	380
382	383	384	385	386	387	388
390	391	392	393	<EOF>	<EOF>	<EOF>
0	0	0	0	0	0	0

FAT (1st Copy) Sector 2
A:\FILE1.TXT Cluster 394, hex 18A

Cluster number: 394

File Name: File1.TXT

Exit the **Disk Edit program**, press the <ALT>+X keys **at the same time**

Exercise 3

11:04 AM

Name	Ext	ID	Size	Date	Time	Cluster	76	A	R	S	H	D	U
Cluster 395, Sector 426													
.	Dir	0	9-08-19	10:43 am	395	-	-	-	-	D	-		
..	Dir	0	9-08-19	10:43 am	0	-	-	-	-	D	-		
FILE2	TXT	Erased	14	9-08-19	10:45 am	396	A	-	-	-	-		
Unused directory entry													
Unused directory entry													
Unused directory entry													
Unused directory entry													
Unused directory entry													
Unused directory entry													
Unused directory entry													
Unused directory entry													
Unused directory entry													
Unused directory entry													
Unused directory entry													
Unused directory entry													

Sub-Directory Cluster 395
A:\DIR1 Offset 64, hex 40

Alt+O – CLUSTER NUMBER

Laboratory Notes (FAT Filesystem Data Recovery)

Laboratory Number: IST602 Lab2

Examiner Name: Akshay Chaurasia

11:10 AM

Alt+O – FAT THAT CLUSTER

Alt+O – dir – select dir

Change the sigma with !

Alt+O – write

Alt+O – first fat – scroll down to cluster 396 – u will see “0”

CHANGE IT TO <EOF>

Alt+O

CHECK – WRITE – RESCAN

WILL REDIRRCT U TO THE DIRECTORY, SELECT IT

```
Disk Editor
Object Edit Link View Info Tools Help More>
Name .Ext ID Size Date Time Cluster 76 A R S H D U
Cluster 395, Sector 426
. Dir 0 9-08-19 10:43 am 395 - - - - D -
.. Dir 0 9-08-19 10:43 am 0 - - - - D -
!ILEZ TXT File 14 9-08-19 10:45 am 396 A - - - -
Unused directory entry
```

```
Disk Editor
Object Edit Link View Info Tools Help More>
Name .Ext ID Size Date Time Cluster 76 A R S H D U
Cluster 395, Sector 426
. Dir 0 9-08-19 10:43 am 395 - - - - D -
.. Dir 0 9-08-19 10:43 am 0 - - - - D -
!ILEZ TXT File 14 9-08-19 10:45 am 396 A - - - -
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Unused directory entry
Sub-Directory Cluster 395
A:\DIR1 Offset 0, hex 0
```

YOU GOT YOUR FILE BACK

```
C:\>dir a:/s
Volume in drive A is LAB 2
Volume Serial Number is 260A-11E6
Directory of A:\DIR1
. <DIR> 09-08-19 10:43a
.. <DIR> 09-08-19 10:43a
!ILEZ TXT 14 09-08-19 10:45a
3 file(s) 14 bytes
Total files listed:
3 file(s) 14 bytes
1,255,424 bytes free
C:\>
```

Don't change the number of characters in the file name

Laboratory Notes (FAT Filesystem Data Recovery)

Laboratory Number: IST602 Lab2

Examiner Name: Akshay Chaurasia

you can only replace the first character(sigma)

To delete a directory:

C:

Del a:\DIR1\!ile2.txt

Rmdir a:\DIR1

DIR A:

Delete Object “diskedit hlp”

Alt+O -Drive – c drive – root directory - (diskedit hlp) - check size

96117

$96117/512=187$

Alt 0 – alt b – see how many sectors/cluster

8 sector/cluster

Disk Editor													
Object Edit Link View Info Tools Help More>													
Name	.Ext	ID	Size	Date	Time	Cluster	76	A	R	S	H	D	U
Sector 13													
IO	SYS	File	40774	5-31-94	6:22 am	2		A	R	S	H	-	-
MSDOS	SYS	File	38138	5-31-94	6:22 am	12		A	R	S	H	-	-
COMMAND	COM	File	54645	5-31-94	6:22 am	22		A	-	-	-	-	-
DRUSPACE	BIN	File	66294	5-31-94	6:22 am	36		A	R	S	H	-	-
DOS	Vol		0	5-30-10	10:45 am	0		A	-	-	-	-	U
FDISK	EXE	File	29336	5-31-94	6:22 am	53		A	-	-	-	-	-
FORMAT	COM	File	22974	5-31-94	6:22 am	266		A	-	-	-	-	-
DISKEDIT	ICO	File	766	8-14-02	1:03 am	67		A	-	-	-	-	-
DISKEDIT	PID	File	967	8-14-02	1:03 am	68		A	-	-	-	-	-
DISKEDIT	EXE	File	677872	8-14-02	1:03 am	61		A	-	-	-	-	-
DISKEDIT	HLP	Erased	96117	8-14-02	1:03 am	235		A	-	-	-	-	-
CONFIG	SYS	File	88	6-24-09	9:45 am	264		A	-	-	-	-	-
RAMDRIVE	SYS	File	5873	3-10-93	6:00 am	230		A	-	-	-	-	-
HIMEM	SYS	File	29136	9-04-94	8:07 am	232		A	-	-	-	-	-
CONFIG	OLD	File	77	3-26-04	5:03 pm	229		A	-	-	-	-	-
AUTOEXEC	OLD	File	785	8-07-95	12:43 pm	271		A	-	-	-	-	-
Sector 14													
CONFIG	XXX	File	77	3-26-04	5:03 pm	265		A	-	-	-	-	-
AUTOEXEC	BAT	File	25	6-24-09	9:51 am	273		A	-	-	-	-	-
Root Directory													
C:\													
												Sector 13	
												Offset 0, hex 0	

Laboratory Notes (FAT Filesystem Data Recovery)

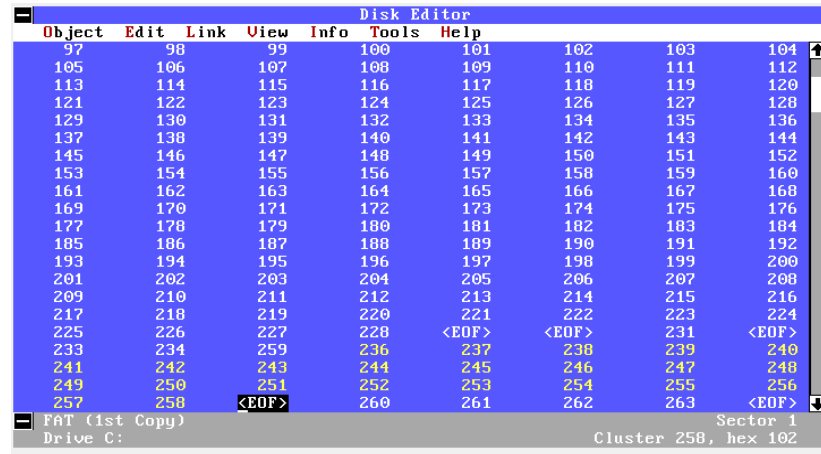
Laboratory Number: IST602 Lab2

Examiner Name: Akshay Chaurasia

Replace with sigma with D

Alt+O - 1st fat

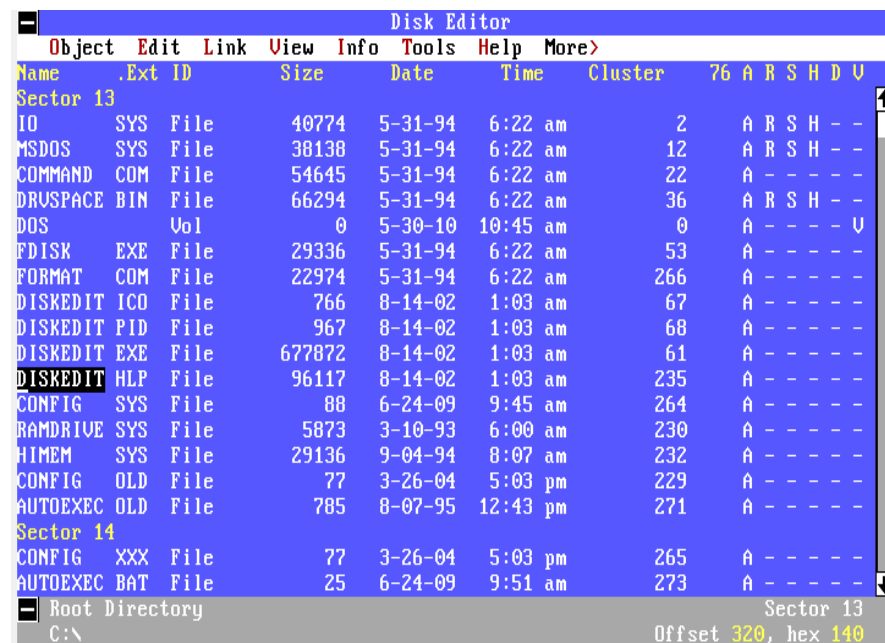
Scroll down to 235 and Replace 0 with the consicutive numbers and list cluster with eof



Object	Edit	Link	View	Info	Tools	Help
97	98	99	100	101	102	103
105	106	107	108	109	110	111
113	114	115	116	117	118	119
121	122	123	124	125	126	127
129	130	131	132	133	134	135
137	138	139	140	141	142	143
145	146	147	148	149	150	151
153	154	155	156	157	158	159
161	162	163	164	165	166	167
169	170	171	172	173	174	175
177	178	179	180	181	182	183
185	186	187	188	189	190	191
193	194	195	196	197	198	199
201	202	203	204	205	206	207
209	210	211	212	213	214	215
217	218	219	220	221	222	223
225	226	227	228	<EOF>	<EOF>	231
233	234	235	236	237	238	239
241	242	243	244	245	246	247
249	250	251	252	253	254	255
257	258	<EOF>	260	261	262	263

FAT (1st Copy) Sector 1
Drive C: Cluster 258, hex 102

Alt+O – directory – write – rescan – Object is recovered



Name	.Ext	ID	Size	Date	Time	Cluster	76	A	R	S	H	D	U
Sector 13													
IO	SYS	File	40774	5-31-94	6:22 am	2	A	R	S	H	-	-	
MSDOS	SYS	File	38138	5-31-94	6:22 am	12	A	R	S	H	-	-	
COMMAND	COM	File	54645	5-31-94	6:22 am	22	A	-	-	-	-	-	
DRUSPACE	BIN	File	66294	5-31-94	6:22 am	36	A	R	S	H	-	-	
DOS		Vol	0	5-30-10	10:45 am	0	A	-	-	-	-	U	
FDISK	EXE	File	29336	5-31-94	6:22 am	53	A	-	-	-	-	-	
FORMAT	COM	File	22974	5-31-94	6:22 am	266	A	-	-	-	-	-	
DISKEDIT	ICO	File	766	8-14-02	1:03 am	67	A	-	-	-	-	-	
DISKEDIT	PID	File	967	8-14-02	1:03 am	68	A	-	-	-	-	-	
DISKEDIT	EXE	File	677872	8-14-02	1:03 am	61	A	-	-	-	-	-	
DISKEDIT	HLP	File	96117	8-14-02	1:03 am	235	A	-	-	-	-	-	
CONFIG	SYS	File	88	6-24-09	9:45 am	264	A	-	-	-	-	-	
RAMDRIVE	SYS	File	5873	3-10-93	6:00 am	230	A	-	-	-	-	-	
HIMEM	SYS	File	29136	9-04-94	8:07 am	232	A	-	-	-	-	-	
CONFIG	OLD	File	77	3-26-04	5:03 pm	229	A	-	-	-	-	-	
AUTOEXEC	OLD	File	785	8-07-95	12:43 pm	271	A	-	-	-	-	-	
Sector 14													
CONFIG	XXX	File	77	3-26-04	5:03 pm	265	A	-	-	-	-	-	
AUTOEXEC	BAT	File	25	6-24-09	9:51 am	273	A	-	-	-	-	-	

Root Directory Sector 13
C:\ Offset 320, hex 140