MICROSOFT EXCEL FILE FORMAT
Microsoft Excel is a popular spreadsheet. It uses a file format called
BIFF (Binary
File Format). There are many types of BIFF records. Each has a 4 byte
header. The
first two bytes are an opcode that specifies the record type. The second
two bytes
specify record length. Header values are stored in byte-reversed form
(less significant
byte first). The rest of the record is the data itself (Figure 2-1).
Figure 2-1. BIFF record header.

```
              |    Record Header   |  Record Body
Byte Number   |  0    1    2    3  |  0    1    ...
              ----------------------------------
Record Contents | XX | XX | XX | XX | XX | XX | ...
              ----------------------------------
              | opcode    | length  | data
```

Each X represents a hexadecimal digit
Two X's form a byte. The least significant (low) byte of the opcode is
byte 0 and the
most significant (high) byte is byte 1. Similarly, the low byte of the
record length
field is byte 2 and the high byte is byte 3.

BOF (Beginning of File)
The first record in every spreadsheet is always of the BOF type (Figure
2-2).
Figure 2-2. BOF record.

```
          |   Record Header    |     Record Body    |
Byte      |  0    1    2    3  |  0    1    2    3  |
          -------------------------------------------
Contents  | 09 | 00 | 04 | 00 | 02 | 00 | 10 | 00 |
          -------------------------------------------
          | opcode   | length   | version | file   |
          |          |          | number  | type   |
```

The first two bytes, arranged with the low byte first, show that the opcode
for BOF is
09h. The second two bytes indicate that the record body is 4 bytes long.
The first two
bytes of the body are the version number (2 for the initial version of
Excel). The last
two bytes are the file type. Type 10h is a worksheet file.

Relating Spreadsheet Cells to Record Data Bytes
A spreadsheet appears on a screen or printout as a matrix of rectangular
cells. Each
column is identified by a letter at its top, and each row is identified by
a number.
Thus cell A1 is in the first column and the first row. Cell C240 is in the
third column
and the 240th row. This scheme identifies cells in a way easily understood

by people.
However, it is not particularly convenient for computers, as they do not handle letters
efficiently. They are best at dealing with binary numbers. Thus, Excel stores cell
identifiers as binary numbers, that people can read as hexadecimal. The first number in
the system is 0 rather than 1.
Figure 2-3, which shows the form of an INTEGER record, illustrates the storage of column
and row information.
Figure 2-3.   INTEGER record.

```
       | Record Header  |  Record Body
Byte   | 0    1    2    3 | 0    1    2    3    4    5    6    7    8 |
       ----------------------------------------------------------------
Value  | 02 | 00 | 09 | 00 | 00 | 00 | 02 | 00 | 00 | 00 | 00 | 39 | 00 |
       ----------------------------------------------------------------
       | opcode  | length  |  row   | column  |   rgbAttr   |   w    |
```

Opcode 2 indicates an integer record. The length bytes show that the record body is 9
bytes long. Row 0 in the body corresponds to spreadsheet row 1. Row 1 corresponds to
spreadsheet row 2, and so on. Column 2 corresponds to spreadsheet column C. Thus,
Figure 2-3 deals with cell C1. The next three bytes, labeled "rgbAttr," specify cell
attributes (Table 2-3). The final pair of bytes, (labeled "w") holds the integer's
value. Here it is 39H or 57 decimal. Thus the record specifies that cell C1 of the
spreadsheet contains an integer with the value 57.
Standard File Record Order
Excel worksheet files have each record type in a predetermined position. A file need
not have all types, but the ones that are present are always be in the same order.
Table 2-1 lists the record types for Excel document (spreadsheet) files, in the order
they would appear in a BIFF file. Table 2-2 lists the types in opcode order.
Several record types in a BIFF file, namely, ROW, BLANK, INTEGER, NUMBER, LABEL,
BOOLERR, FORMULA, and COLUMN DEFAULT, describe the contents of a cell. These records
contain a 3 byte attribute field labeled "rgbAttr". The following table describes how
the bits in the field correspond to cell attributes.
Table 2-1. Cell Attributes

Byte Offset	Bit	Description	Contents
0	7	Cell is not hidden	0b
		Cell is hidden	1b
	6	Cell is not locked	0b

```
                      Cell is locked                      1b
            5-0       Reserved, must be 0                  000000b
            7-6       Font number (4 possible)
            5-0       Cell format code
    2       7         Cell is not shaded                   0b
                      Cell is shaded                       1b
            6         Cell has no bottom border            0b
                      Cell has a bottom border             1b
            5         Cell has no top border               0b
                      Cell has a top border                1b
            4         Cell has no right border             0b
                      Cell has a right border              1b
            3         Cell has no left border              0b
                      Cell has a left border               1b
            2-0       Cell alignment code
                          general                          000b
                          left                             001b
                          center                           010b
                          right                            011b
                          fill                             100b
                          Multiplan default align.         111b
```

The font number field is a zero-based index into the document's table of fonts. the
cell format code is a zero-based index into the document's table of picture formats.
There are 21 different standard formats. Additional custom formats may be defined by
the user. See the FONT and FORMAT record descriptions form additonal details.

Table 2-2. Excel Record Type in Order of Appearance

Record Type	Opcode (Hexadecimal)
BOF	09
FILEPASS	2F
INDEX	0B
CALCCOUNT	0C
CALCMODE	0D
PRECISION	0E
REFMODE	0F
DELTA	10
ITERATION	11
1904	22
BACKUP	40
PRINT ROW HEADERS	2A
PRINT GRIDLINES	2B
HORIZONTAL PAGE BREAKS	1B
VERTICAL PAGE BREAKS	1A
DEFAULT ROW HEIGHT	25
FONT	31
FONT2	32
HEADER	14
FOOTER	15
LEFT MARGIN	26

```
RIGHT MARGIN                27
TOP MARGIN                  28
BOTTOM MARGIN               29
COLWIDTH                    24
EXTERNCOUNT                 16
EXTERNSHEET                 17
EXTERNNAME                  23
FORMATCOUNT                 1F
FORMAT                      1E
NAME                        18
DIMENSIONS                  00
COLUMN DEFAULT              20
ROW                         08
BLANK                       01
INTEGER                     02
NUMBER                      03
LABEL                       04
BOOLERR                     05
FORMULA                     06
ARRAY                       21
CONTINUE                    3C
STRING                      07
TABLE                       36
TABLE2                      37
PROTECT                     12
WINDOW PROTECT              19
PASSWORD                    13
NOTE                        1C
WINDOW1                     3D
WINDOW2                     3E
PANE                        41
SELECTION                   1D
EOF                         0A
```

Table 2–3. Excel Record Types in Opcode Order

Record Type	Opcode (hexadecimal)
DIMENSIONS	00
BLANK	01
INTEGER	02
NUMBER	03
LABEL	04
BOOLERR	05
FORMULA	06
STRING	07
ROW	08
BOF	09
EOF	0A
INDEX	0B
CALCCOUNT	0C
CALCMODE	0D
PRECISION	0E
REFMODE	0F
DELTA	10

```
ITERATION                 11
PROTECT                   12
PASSWORD                  13
HEADER                    14
FOOTER                    15
EXTERNCOUNT               16
EXTERNSHEET               17
NAME                      18
WINDOW PROTECT            19
VERTICAL PAGE BREAKS      1A
HORIZONTAL PAGE BREAKS    1B
NOTE                      1C
SELECTION                 1D
FORMAT                    1E
FORMATCOUNT               1F
COLUMN DEFAULT            20
ARRAY                     21
1904                      22
EXTERNNAME                23
COLWIDTH                  24
DEFAULT ROW HEIGHT        25
LEFT MARGIN               26
RIGHT MARGIN              27
TOP MARGIN                28
BOTTOM MARGIN             29
PRINT ROW HEADERS         2A
PRINT GRIDLINES           2B
FILEPASS                  2F
FONT                      31
FONT2                     32
TABLE                     36
TABLE2                    37
CONTINUE                  3C
WINDOW1                   3D
WINDOW2                   3E
BACKUP                    40
PANE                      41
```

Worksheet Record Types in Opcode Order
The following section lists all record types in opcode order. It gives a
specification
and byte-by-byte breakdown of each type. Note that Excel terminology
refers to
spreadsheets or worksheets as "documents."

```
DIMENSIONS                    00h                         0d
```

Record Type: DIMENSIONS
Description: Entire dimensions or range of a spreadsheet
Record Body Length: 8 bytes
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0-1	First row	

```
     2-3           Last row plus 1
     4-5           First column
     6-7           Last column plus 1
```
Note: The last row and column in the record are both one greater than the highest
numbered occupied ones.

```
BLANK                      01h                           1d
```

Record Type: BLANK
Description: Cell with no formula or value
Record Body Length: 7 bytes
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0-1	Row	
2-3	Column	
4-6	Cell attributes (rgbAttr) (Table 2-3)	

```
INTEGER                    02h                           2d
```

Record Type: INTEGER
Description: Constant unsigned integer
Record Body Length: 9 bytes
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0-1	Row	
2-3	Column	
4-6	Cell attributes (rgbAttr) (Table 2-3)	
7-8	Unsigned integer value (w)	

```
NUMBER                     03h                           3d
```

Record Type: NUMBER
Description: Constant floating point number
Record Body Length: 15 bytes
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0-1	Row	
2-3	Column	
4-6	Cell attributes (rgbAttr) (Table 2-3)	
7-14	Floating point number value (IEEE format, see Appendix A)	

```
LABEL                      04h                           4d
```

Record Type: LABEL
Description: Constant string
Record Body Length: 8 to 263 bytes
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0-1	Row	
2-3	Column	

```
          4-6            Cell attributes (rgbAttr) (Table 2-3)
          7              Length of string
          8-263          ASCII string, 0 to 255 bytes long


BOOLERR                        05h                            5d


Record Type: BOOLERR
Description: Boolean constant or error value
Record Body Length: 9 bytes
Record Body Byte Structure:
     Byte Number     Byte Description              Contents (hex)
          0-1            Row
          2-3            Column
          4-6            Cell attributes (rgbAttr) (Table 2-3)
          7              Boolean or error value
                              Boolean
                                    true            1
                                    false           0
                              Error
                                    #NULL!          0
                                    #DIV/0!         7
                                    #VALUE!         0Fh
                                    #REF!           17h
                                    #NAME?          1Dh
                                    #NUM!           24h
                                    #N/A            2Ah
          8              Specifies Boolean or error
                              Boolean                 0
                              Error                   1


FORMULA                        06h                            6d


Record Type: FORMULA
Description: Name, size, and contents of a formula cell
Record Body Length: 17-272 bytes
Record Body Byte Structure:
     Byte Number     Byte Description              Contents (hex)
          0-1            Row
          2-3            Column
          4-6            Cell attributes (rgbAttr) (see Table 2-3)
          7              Current value of formula (IEEE format, see Appendix
A)
          15             Recalc flag
          16             Length of parsed expression
          17             Parsed expression
If a formula must be recalculated whenever it is loaded, the recalc flag
(byte 15) must
be set.  Any nonzero value is a set recalc flag.  However, a flag value of
3 indicates
that the cell is a part of a matrix, and the entire matrix must be
recalculated. Bytes 7
through 14 may contain a number, a Boolean value, an error code, or a
```

string. The
following tables apply.
Case 1: Bytes 7 - 14 contain a Boolean value.

Byte Number	Byte Description	Contents (hex)
7	otBool	1
8	Reserved	0
9	Boolean value	
10-12	Reserved	0
13-14	fExprO	FFFFh

Case 2: Bytes 7 - 14 contain an error code.

Byte Number	Byte Description	Contents (hex)
7	otErr	2
8	Reserved	0
9	error code	
10-12	Reserved	0
13-14	fExprO	FFFFh

Case 3: Bytes 7 - 14 contain a string.

Byte Number	Byte Description	Contents (hex)
7	otString	0
8-12	Reserved	0
13-14	fExprO	FFFFh

The string value itself is not stored in the field, but rather in a separate record of
the STRING type.

STRING	07h	7d

Record Type: STRING
Description: Value of a string in a formula
Record Body Length: variable
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0	Length of the string	
1-256 (max)	The string itself	

The STRING record appears immediately after the FORMULA record that evaluates to the
string, unless the formula is in an array. In that case, the string record immediately
follows the ARRAY record.

ROW	08h	8d

Record Type: ROW
Description: Specifies a spreadsheet row
Record Body Length: 16 bytes
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0-1	Row number	
2-3	First defined column in the row	
4-5	Last defined column in the row plus 1	
6-7	Row height	
8-9	RESERVED	0
10	Default cell attributes byte	
	Default attributes	1

```
                   Not default attributes              0
          11-12      Offset to cell records for this row
          13-15      Cell attributes (rgbAttr) (see Table 2-3)


BOF                          09h                         9d


Record Type: BOF
Description: Beginning of file
Record Body Length: 4 bytes
Record Body Byte Structure:
     Byte Number      Byte Description              Contents (hex)
          0-1          Version number
                         Excel                         2
                         Multiplan                     3
          2-3          Document type
                         worksheet                     10h
                         chart                         20h
                         macro sheet                   40h
```

If bit 8 of the version number byte pair is high (mask with 0100h to find out), the BIFF
file is a Multiplan document.

```
EOF                          0Ah                        10d
```

Record Type: EOF
Description: End of file
Record Body Length: 0 bytes
The EOF record is the last one in a BIFF file. It always takes the form
0A000000h.

```
INDEX                        0Bh                        11d
```

Record Type: INDEX
Description: Contains pointers to other records in the BIFF file, and defines the range
of rows used by the document. It is used to simplify searching a file for a particular
cell or name.
Record Body Length: variable
Record Body Byte Structure:

```
     Byte Number      Byte Description              Contents (hex)
          0-3          Absolute file position of first NAME record
          4-5          First row that exists
          6-7          Last row that exists plus 1
          8-on         Array of absolute file positions of the
                       blocks of ROW records.
```

The INDEX record is optional. If present, it must immediately follow the FILEPASS
record. IF there is no FILEPASS record, it must follow the BOF record.

```
CALCCOUNT                    0Ch                        12d
```

Record Type: CALCCOUNT
Description: Specifies the iteration count
Record Body Length: 2

```
Record Body Byte Structure:
     Byte Number       Byte Description              Contents (hex)
        0-1            Iteration Count
CALCMODE                    0Dh                        13d


Record Type: CALCMODE
Description: Specifies the calculation mode
Record Body Length: 2
Record Body Byte Structure:
     Byte Number       Byte Description              Contents (hex)
        0-1            Calculation mode
                         Manual                         0
                         Automatic                      1
                         Automatic, no tables          -1
PRECISION                   0Eh                        14d


Record Type: PRECISION
Description: Specifies precision of calculations for document
Record Body Length: 2
Record Body Byte Structure:
     Byte Number       Byte Description              Contents (hex)
        0-1            Document precision
                         precision as displayed         0
                         full precision                 1
REFMODE                     0Fh                        15d


Record Type: REFMODE
Description: Specifies location reference mode
Record Body Length: 2
Record Body Byte Structure:
     Byte Number       Byte Description              Contents (hex)
        0-1            Reference mode
                         R1C1 mode                       0
                         A1 mode                         1
DELTA                       10h                        16d


Record Type: DELTA
Description: Maximum change for an iterative model
Record Body Length: 8
Record Body Byte Structure:
     Byte Number         Byte Description       Contents (hex)
        0-7              Maximum change (IEEE format, see Appendix A)
ITERATION                   11h                        17d


Record Type: ITERATION
Description: Specifies whether iteration is on
Record Body Length: 2
Record Body Byte Structure:
     Byte Number         Byte Description       Contents (hex)
        0-1              Iteration flag
                           Iteration off                0
                           Iteration on                 1
```

```
PROTECT                          12h                              18d


Record Type: PROTECT
Description: Specifies whether the document is protected with a document
password
Record Body Length: 2
Record Body Byte Structure:
     Byte Number         Byte Description        Contents (hex)
         0-1             Document protection
                           Not protected               0
                           Protected                   1
PASSWORD                         13h                              19d


Record Type: PASSWORD
Description: Contains encrypted document password
Record Body Length: 2
Record Body Byte Structure:
     Byte Number         Byte Description        Contents (hex)
         0-1             Encrypted password
HEADER                           14h                              20d


Record Type: HEADER
Description: Specifies header string that appears at the top of every page
when the
document is printed
Record Body Length: variable
Record Body Byte Structure:
     Byte Number         Byte Description        Contents (hex)
          0              Length of string (bytes)
         1-on            Header string (ASCII)
FOOTER                           15h                              21d


Record Type: FOOTER
Description: Specifies footer string that appears at the bottom of every
page when the
document is printed
Record Body Length: variable
Record Body Byte Structure:
     Byte Number         Byte Description        Contents (hex)
          0              Length of string (bytes)
         1-on            Footer string (ASCII)
EXTERNCOUNT                      16h                              22d


Record Type: EXTERNCOUNT
Description: Specifies the number of documents referenced externally by an
Excel
document
Record Body Length: 2
Record Body Byte Structure:
     Byte Number         Byte Description        Contents (hex)
         0-1             Number of externally referenced documents
EXTERNSHEET                      17h                              23d
```

Record Type: EXTERNSHEET
Description: Specifies a document that is referenced externally by the
Excel file.
There must be an EXTERNSHEET record for every external file counted by the
EXTERNCOUNT
record.
Record Body Length: variable
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0	Length of document name	
1-on	Document name	

The document name may be encoded. If so, its first character will be 0, 1
or 2.
0 indicates the document name is an external reference to an empty sheet.
1 indicates the document name has been translated to a less sys-tem-
dependent name.
This feature is valuable for documents intended for a non-DOS environment.
2 indicates that the externally referenced document is, in fact, the
current document.

NAME	18h	24d

Record Type: NAME
Description: User-defined name on the document
Record Body Length: variable
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0	Name attribute	

Only bits 1 and 2 are ever nonzero.

Bit 1 is 1 if the name is a function or
command name on a macro sheet.

Bit 2 is 1 if the name definition
includes:
* A function that returns an array, such
   as TREND or MINVERSE
* A ROW or COLUMN function
* A user-defined function

Name attribute
Meaningful only if bit 1 of
byte 0 is 1 (the name is a function or
command name). Only bits 0 and 1 are
ever nonzero.

Bit 0 is 1 if the name is a function.

Bit 1 is 1 if the name is a command.

| 2 | Keyboard shortcut. Meaningful only if the name is a command. | |

```
                              If no keyboard shortcut        0
                              If shortcut exists           ASCII value

         3                    Length of the name text
         4                    Length of the name's definition
         5-?                  Text of the name
         ?-?                  Name's definition (parsed) in internal
                              compressed format
         ?                    Length of the name's definition (duplicate)
All NAME records should appear together in a BIFF file.
WINDOW PROTECT                19h                           25d


Record Type: WINDOW PROTECT
Description: Specifies whether a document's windows are protected
Record Body Length: 2 bytes
Record Body Byte Structure:
     Byte Number             Byte Description          Contents (hex)
        0-1                  Window protect flag
                             Not protected                  0
                             Protected                      1
VERTICAL PAGE BREAKS         1Ah                           26d


Record Type: VERTICAL PAGE BREAKS
Description: Lists all column page breaks
Record Body Length: variable
Record Body Byte Structure:
     Byte Number             Byte Description          Contents (hex)
        0-1                  Number of page breaks
        2-on                 Array containing a 2-byte integer for each
                             column that immediately follows a column page
                             break.  Columns must be sorted in ascending
                             order.
HORIZONTAL PAGE BREAKS       1Bh                           27d


Record Type: HORIZONTAL PAGE BREAKS
Description: Lists all row page breaks
Record Body Length: variable
Record Body Byte Structure:
     Byte Number             Byte Description          Contents (hex)
        0-1                  Number of page breaks
        2-on                 Array containing a 2-byte integer for each
                             row that immediately follows a row page
                             break.  Rows must be sorted in ascending
                             order.
NOTE                         1Ch                           28d


Record Type: NOTE
Description: Note associated with a cell
Record Body Length: Variable, maximum of 254
Record Body Byte Structure:
     Byte Number             Byte Description          Contents (hex)
        0-1                  Row of the note
```

```
        2-3                      Column of the note
        4-5                      Length of the note part of the record
        6-on                      Text of the note
Notes longer than 2048 characters must be split among multiple records.
All except the
last one will contain 2048 text characters.  The last one will contain the
overflow.
SELECTION                        1Dh                          29d


Record Type: SELECTION
Description: Specifies which cells are selected in a pane of a split
window.  It can
also specify selected cells in a window that is not split.
Record Body Length: Variable
Record Body Byte Structure:
     Byte Number             Byte Description          Contents (hex)
          0                   Number of pane
                                bottom right                0
                                top right                   1
                                bottom left                 2
                                top left                    3
                                no splits                   3
         1-2                  Row number of the active cell
         3-4                  Column number of the active cell
         5-6                  Reference number of the active cell
         7-8                  Number of references in the selection
         9-on                 Array of references
Each reference in the array consists of 6 bytes arranged as follows:
     Byte Number             Byte Description
         0-1                  First row in the reference
         2-3                  Last row in the reference
          4                   First column in the reference
          5                   Last column in the reference
FORMAT                           1Eh                          30d


Record Type: FORMAT
Description: Describes a picture format in a document.  All FORMAT records
must appear
together in a BIFF file.
Record Body Length: Variable
Record Body Byte Structure:
     Byte Number             Byte Description          Contents (hex)
          0                   Length of format string
         1-on                 Picture format string
FORMATCOUNT                      1Fh                          31d


Record Type: FORMATCOUNT
Description: The number of standard FORMAT records in the file.  There are
21 different
format records.
Record Body Length: 2 bytes
Record Body Byte Structure:
```

```
        Byte Number           Byte Description        Contents (hex)
           0-1                 Number of built in format records.
COLUMN DEFAULT               20h                        32d


Record Type: COLUMN DEFAULT
Description: Specifies default cell attributes for cells in a particular
column.  The
default value is overriden for individual cells by a subsequent explicit
definition.
Record Body Length: Variable
Record Body Byte Structure:
        Byte Number           Byte Description        Contents (hex)
           0-1                 Column number of first column for which a
                                  default cell is being defined
           2-3                 Column number of last column for which a
                                  default cell is being defined, plus 1.
           4-on                Array of cell attributes
ARRAY                        21h                        33d


Record Type: ARRAY
Description: Describes a formula entered into a range of cells as an array.
Occurs
immediately after the FORMULA record for the upper left corner of the
array.
Record Body Length: variable
Record Body Byte Structure:
        Byte Number           Byte Description        Contents (hex)
           0-1                 First row of the array
           2-3                 Last row of the array
            4                  First column of the array
            5                  Last column of the array
            6                  Recalculation flag
                                 Array is calculated           0
                                 Needs to be calculated      nonzero
            7                  Length of parsed expression
           8-on                Parsed expression (array formula)
1904                         22h                        34d


Record Type: 1904
Description: Specifies date system used on this spreadsheet
Record Body Length: 2 bytes
Record Body Byte Structure:
        Byte Number           Byte Description          Contents (hex)
           0-1                 Specifies date system used
                                 1904 date system              1
                                 anything else                 0
EXTERNNAME                   23h                        35d


Record Type: EXTERNNAME
Description: An externally referenced name, referring to a work-sheet or
macro sheet or
to a DDE topic.  All EXTERNNAME records associated with a supporting
```

document must
directly follow its EXTERNSHEET record.
Record Body Length: Variable
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0	Length of the name	
1-on	The name	

When EXTERNNAME references a DDE topic, Excel may append its most recent values to the
EXTERNNAME record. If the record becomes too long to be contained in a single record,
it is split into multiple records, with CONTINUE records holding the excess.

COLWIDTH	24h	36d

Record Type: COLWIDTH
Description: Sets column width for a range of columns
Record Body Length: 3 bytes
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0	First column in the range	
1	Last column in the range	
2-3	Column width in units of 1/256th of a character	

DEFAULT ROW HEIGHT	25h	37d

Record Type: DEFAULT ROW HEIGHT
Description: Specifies the height of all rows that are not defined explicitly
Record Body Length: 2 bytes
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0-1	Default row height in units of 1/20th of a point	

LEFT MARGIN	26h	38d

Record Type: LEFT MARGIN
Description: Specifies the left margin in inches when the document is printed
Record Body Length: 8 bytes
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0-7	Left margin (IEEE format, see Appendix A)	

RIGHT MARGIN	27h	39d

Record Type: RIGHT MARGIN
Description: Specifies the right margin in inches when the document is printed
Record Body Length: 8 bytes
Record Body Byte Structure:

Byte Number	Byte Description	Contents (hex)
0-7	Right margin (IEEE format, see Appendix A)	

```
TOP MARGIN                      28h                         40d


Record Type: TOP MARGIN
Description: Specifies the top margin in inches when the document is
printed
Record Body Length: 8 bytes
Record Body Byte Structure:
     Byte Number          Byte Description         Contents (hex)
        0-7               Top margin (IEEE format, see Appendix A)
BOTTOM MARGIN               29h                         41d


Record Type: BOTTOM MARGIN
Description: Specifies the bottom margin in inches when the document is
printed
Record Body Length: 8 bytes
Record Body Byte Structure:
     Byte Number          Byte Description         Contents (hex)
        0-7               Bottom margin (IEEE format, see Appendix A)
PRINT ROW HEADERS           2Ah                         42d


Record Type: PRINT ROW HEADERS
Description: Flag determines whether to include row and column headers on
printout of
document
Record Body Length:
Record Body Byte Structure:
     Byte Number          Byte Description          Contents (hex)
        0-1               Row and Column Header Print Flag
                            Do not print headers             0
                            Print headers                    1
PRINT GRIDLINES             2Bh                         43d


Record Type: PRINT GRIDLINES
Description: Flag determines whether to print gridlines on print-out of
document
Record Body Length: 2
Record Body Byte Structure:
     Byte Number          Byte Description          Contents (hex)
        0-1               Gridline Print Flag
                            Do not print gridlines           0
                            Print gridlines                  1
FILEPASS                    2Fh                         47d


Record Type: FILEPASS
Description: Specifies a file password.  If this record is present, the
rest of the file
is encrypted.  The file password specified here is distinct from the
document password
specified by the PASSWORD record.  If present, the FILEPASS record must
immediately
follow the BOF record.
Record Body Length: ?
```

```
Record Body Byte Structure:
     Byte Number          Byte Description          Contents (hex)
         0-on             ?
FONT                      31h                          49d


Record Type: FONT
Description: Describes an entry in the document's font table.  A document
may have up to
4 different fonts, numbered 0 to 3.  Font records are written in the font
table in the
order in which they are encountered in the file.
Record Body Length: variable
Record Body Byte Structure:
     Byte Number          Byte Description          Contents (binary)
         0-1              Height of the font (in 1/20ths of a point)
         2-3              Font Attributes
                            First byte (reserved)          00000000b
                            Second byte
                              Bit 0 - bold                 1b
                              Bit 1 - italic               1b
                              Bit 2 - underline            1b
                              Bit 2 - strikeout            1b
                              Bits 4-7 (reserved)          0000b
         4               Length of font name
         5-?             Font name
FONT2                     32h                          50d


Record Type: FONT2
Description:  System specific information about the font defined in the
previous FONT
record.  The FONT2 record is option-al.
Record Body Length: Variable
Record Body Byte Structure:
     Byte Number          Byte Description          Contents (hex)
         0-on             ?
TABLE                     36h                          54d


Record Type: TABLE
Description: Describes a one-input row or column table created through the
Data Table
command
Record Body Length: 12 bytes
Record Body Byte Structure:
     Byte Number          Byte Description          Contents (hex)
         0-1              First row of the table
         2-3              Last row of the table
         4               First column of the table
         5               Last column of the table
         6               Recalculation flag
                            Table is recalculated          0
                            Not recalculated               nonzero
         7               Row or column input table flag
```

```
                                Column input table                0
                                Row input table                   1
            8-9                 Row of the input cell
            10-11               Column of the input cell
The area given by the first and last rows and columns does not include the
outer row or
column, which contains table formulas or input values.  If the input cell
is a deleted
reference, the row of the input cell, given by the bytes at offset 8 and 9,
is -1.
TABLE2                          37h                               55d
```

Record Type: TABLE2
Description: Describes a two-input table created by the Data Table command.
It is the
same as the TABLE record, except there is no distinction between a row
input table and a
column input table, there are two input cells rather than one, and either
may have a
value of -1, indicating a deleted reference.
Record Body Length: 16 bytes
Record Body Byte Structure:

```
    Byte Number           Byte Description              Contents (hex)
        0-1               First row of the table
        2-3               Last row of the table
         4                First column of the table
         5                Last column of the table
         6                Recalculation flag
                            Table is calculated              0
                            Needs recalculation           nonzero
         7                RESERVED - must be zero            0
        8-9               Row of the row input cell
        10-11             Column of the row input cell
        12-13             Row of the column input cell
        14-15             Column of the column input cell
CONTINUE                  3Ch                               60d
```

Record Type: CONTINUE
Description: Continuation of FORMULA, ARRAY, or EXTERNNAME records that are
too long to
fit in a single record.
Record Body Length: variable
Record Body Byte Structure:

```
    Byte Number           Byte Description           Contents (hex)
        0-on              Parsed expression
WINDOW1                   3Dh                            61d
```

Record Type: WINDOW1
Description: Basic window information. Locations are relative to the upper
left corner
of the Microsoft Windows desktop, and are measured in units of 1/20th of a
point.

```
Record Body Length: 9 bytes
Record Body Byte Structure:
     Byte Number            Byte Description              Contents (hex)
        0-1              Horizontal position of the window
        2-3              Vertical position of the window
        4-5              Width of the window
        6-7              Height of the window
         8               Hidden attribute
                           Window is not hidden           0
                           Window is hidden               1
If you do not include a WINDOW1 record in your BIFF file, Excel will create
a default
window in your document.
WINDOW2                   3Eh                             62d


Record Type: WINDOW2
Description: Advanced window information.  The WINDOW2 record is optional.
If present,
it must immediately follow the WINDOW1 record.
Record Body Length: 14 bytes
Record Body Byte Structure:
     Byte Number            Byte Description              Contents (hex)
         0               Display Formulas
                           Display values                 0
                           Display formulas               1
         1               Display Grid
                           Do not display gridlines       0
                           Display gridlines              1
         2               Display Row and Column Headers
                           Do not display headers         0
                           Display headers
         3               Freeze window panes
                           Do not freeze panes            0
                           Freeze panes                   1
         4               Display zero values
                           Suppress display               0
                           Display zero values            1
        5-6              Top row visible in the window
        7-8              Leftmost column visible in the window
         9               Row/column header and gridline color
                           Specified in next four bytes 0
                           Use window's default           1
                           foreground color.
        10-13            Row/column headers and gridline color (RGB)
BACKUP                    40h                             64d


Record Type: BACKUP
Description: Specifies whether a BIFF file should be backed up
Record Body Length: 2 bytes
Record Body Byte Structure:
     Byte Number            Byte Description              Contents (hex)
        0-1              Backup flag
```

```
                        Do not back up              0
                        Back up                     1
PANE                    41h                         65d

Record Type: PANE
Description:  Describes the number and position of unfrozen panes in a
window. Panes are
created by horizontal and vertical splits, which are measured in units of
1/20th of a
point.
Record Body Length: 9 bytes
Record Body Byte Structure:
      Byte Number          Byte Description          Contents (hex)
          0-1              Horizontal position of the split, zero if none
          2-3              Vertical position of the split, zero if none
          4-5              Top row visible in the bottom pane
          6-7              Leftmost column visible in the right pane
           8               Pane number of the active pane
```