BMP files

BMP files contain four sections: a file header, a bitmap information header, a color palette, and the bitmap data. Of these four sections, only the palette information may be optional, depending on the bit depth of the bitmap data. The BMP file header is 14 bytes in length and is nearly identical to the 1.*x* DDB header. The file header is followed by a second header (called the bitmap header), a variable-sized palette, and the bitmap data.

File Header

Bitmap Header

Color Palette

Bitmap Data

All versions of BMP format files begin with the following 14-byte header:

typedef struct \_WinBMPFileHeader  
{  
 WORD FileType; /\* File type, always 4D42h ("BM") \*/  
 DWORD FileSize; /\* Size of the file in bytes \*/  
 WORD Reserved1; /\* Always 0 \*/  
 WORD Reserved2; /\* Always 0 \*/  
 DWORD BitmapOffset; /\* Starting position of image data in bytes \*/  
} WINBMPFILEHEADER;

**FileType** holds a 2-byte magic value used to identify the file type; it is always 4D42h or "BM" in ASCII. If your application reads Windows bitmap files, make sure to always check this field before attempting to use any of the data read from the file.

**FileSize** is the total size of the BMP file in bytes and should agree with the file size reported by the filesystem. This field only stores a useful value when the bitmap data is compressed, and this value is usually zero in uncompressed BMP files.

**Reserved1 and Reserved2** do not contain useful data and are usually set to zero in a BMP header written to disk. These fields are instead used by an application when the header is read into memory.

**BitmapOffset** is the starting offset of the bitmap data from the beginning of the file in bytes.

Following the file header in v2.*x* BMP files is a second header called the **bitmap header**. This header contains information specific to the bitmap data. This header is 12 bytes in length and has the following format:

typedef struct \_Win2xBitmapHeader  
{  
 DWORD Size; /\* Size of this header in bytes \*/  
 SHORT Width; /\* Image width in pixels \*/  
 SHORT Height; /\* Image height in pixels \*/  
 WORD Planes; /\* Number of color planes \*/  
 WORD BitsPerPixel; /\* Number of bits per pixel \*/  
} WIN2XBITMAPHEADER;

**Size** is the size of the header in bytes. For Windows 2.*x* BMP files, this value is always 12.

**Width and Height** are the width and height of the image in pixels, respectively. If Height is a positive number, then the image is a "bottom-up" bitmap with the origin in the lower-left corner. If Height is a negative number, then the image is a "top-down" bitmap with the origin in the upper-left corner. Width does not include any scan-line boundary padding.

**Planes** is the number of color planes used to represent the bitmap data. BMP files contain only one color plane, so this value is always 1.

**BitsPerPixel** is the number of bits per pixel in each plane. This value will be in the range 1 to 24; the values 1, 4, 8, and **24 (in the project)** are the only values considered legal by the Windows 2.*x* API.

The Windows 2.*x* bitmap header is identical to the OS/2 1.*x* bitmap header except that the Width and Height fields are signed values in Windows BMP files.

Following the header is the **color palette data**. A color palette is always present in a BMP file if the bitmap data contains 1-, 4-, or 8-bit data. **Twenty-four-bit bitmap data never uses a color palette (nor does it ever need to).** Each element of the palette is three bytes in length and has the following structure:

typedef struct \_Win2xPaletteElement  
{  
 BYTE Blue; /\* Blue component \*/  
 BYTE Green; /\* Green component \*/  
 BYTE Red; /\* Red component \*/  
} WIN2XPALETTEELEMENT;

Blue, Green, and Red hold the color component values for a pixel; each is in the range 0 to 255.