Import of image files was introduced in **TECHBASE** version 2.70.1 for the *POLYEDIT, POSTER, INSIGHT3D* and *MFWIN* programs. **TECHBASE** users can now import TIFF (.tif) images and combine them with **TECHBASE** metafiles, and/or to use these images as a base for on-screen digitizing. This Technote will describe how to effectively use .tif images in **TECHBASE**.

Georeferenced Bitmaps

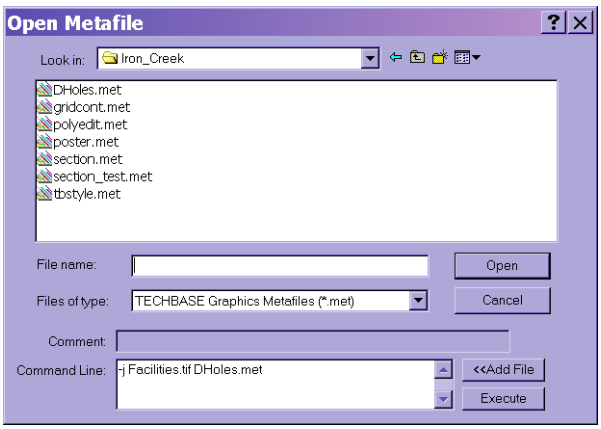
Images imported into **TECHBASE** are at this time restricted to geo-referenced TIFF images or GeoTIFF's. GeoTIFF is a means for tying a raster image to a known model space or map projection and for describing those projections. DRG and DOQ images distributed by the USGS include GeoTIFF information and can be imported into **TECHBASE**. Alternately, a separate "world file" which references the .tif may accompany the image. A world file is an ASCII text file containing coordinate information. The extensions of world files are .twf for a .tif image, .tiffw for a .tiff image. Following is an example world file including a description of each record:

```
2.438400000000      x dimension of a pixel (m)
0.000000000000      rotation term
0.000000000000      rotation term
-2.438400000000     y dimension of a pixel (m)
448959.468839188746  X coordinate of center of upper-left pixel (UTM zone 13)
4886658.238593537360  Y coordinate of center of upper-left pixel (UTM zone 13)
```

If you have a .tif image that does not have embedded GeoTIFF information, or an associated world file, you can create your own ASCII file, name it the same as your .tif file only with the .tfw extension and make sure it contains the information outlined above. As well, other image formats can be saved as .tif images, and a world file written to georeference these images. *Note* that if the GeoTIFF has both embedded georeference information and an associated world file, the world file overrides GeoTIFF information. Using this relationship, world files can be written for GeoTIFFs to superimpose local coordinate information onto your images.

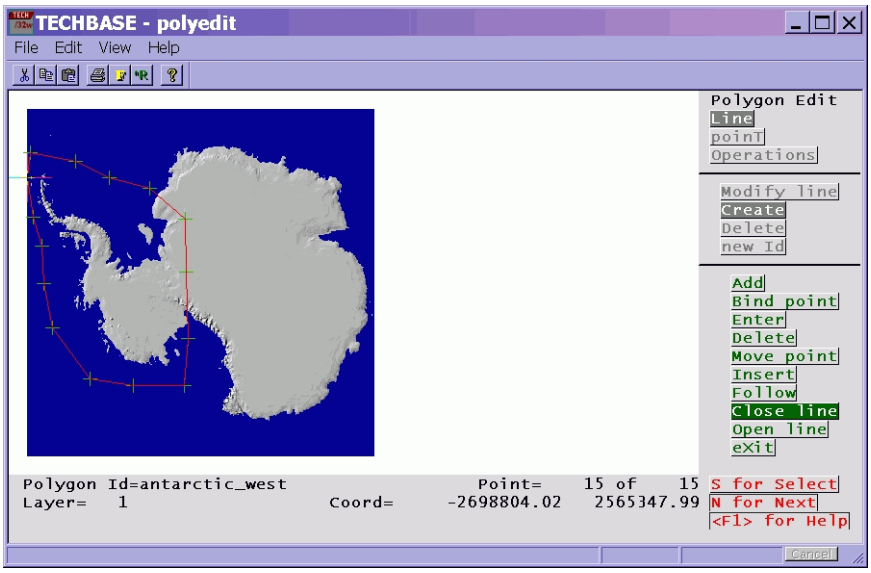
MFWIN

Perhaps the most straightforward way to use .tif import is to combine bitmapped images with **TECHBASE** metafiles in the MFWIN program. In MFWIN, there are now two choices in the File/Open option. The first file type in the drop down list is of course **TECHBASE** graphic metafiles, and now added are TIFF image files. Commonly you would open an image file, then open the **TECHBASE** metafile you would like to superimpose on the image. This combined file, or series of combined files, can be saved as a new metafile, or printed. Make sure to use the -j option when combining images with metafiles so that the files will be joined by coordinates. The -j option is entered on the command line in the MFWIN main menu. An example of the syntax used to join a metafile with a .tif image is shown below:



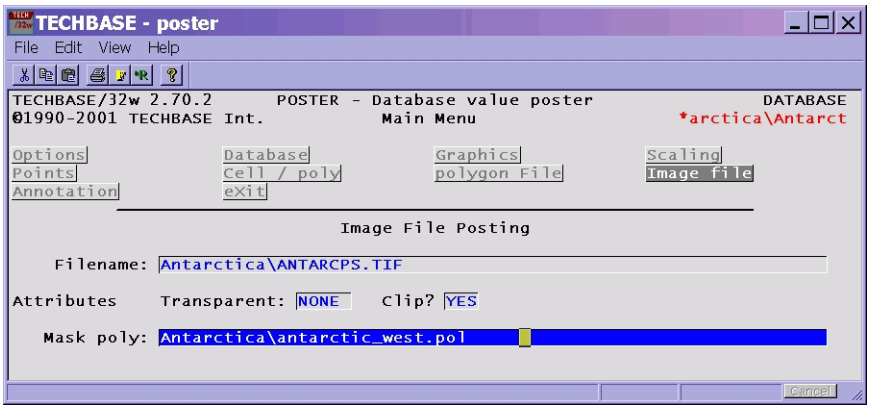
Polyedit

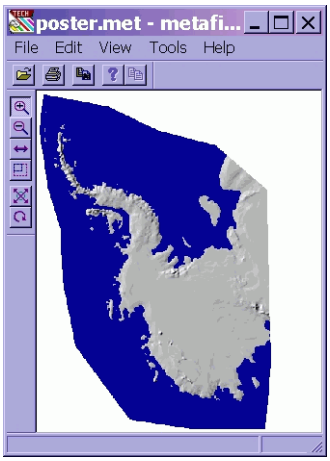
In POLYEDIT, you can load GeoTIFF images then create polygons, points or lines over them. In Polyedit/ Load/Background Image you can choose to turn either all the white or black pixels transparent, and to add georeference information if you do not have a world file associated with your .tiff (NOTE: this option is not yet enabled in v. 2.70.1). In the example below, an image was loaded into POLYEDIT, then a polygon was digitized over the western portion of the image area. On screen digitizing can be extremely useful if you do not have access to a digitizing tablet, or if you prefer to digitize on screen.



Poster

GeoTIFF files can also be imported into the Poster program. Options are available in *POSTER* for restricting what image data is imported into **TECHBASE**. The Image File/Attributes choice allows you to turn either white, black or no pixels transparent upon import - default being none. The clip option truncates the image at the edges of your coordinate range. You may also enter a polygon outside of which no data will be imported. The examples below show the effect of importing only the portion of the image that is within the polygon we drew in *POLYEDIT*.





Finally, images can be draped over surfaces in the *INSIGHT3D* program, but we will leave that for the next image Technote!

