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Sounding Better!

## TIFF Image Handling

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### ***TILED IMAGE SUPPORT***

The data in a TIFF file can be arranged in 2 styles: as strips of data or in tiles. Strips may contain any number of rows of image data, from 1 to the entire image. Tiling stores the image in blocks, such that all the blocks fit seamlessly together. We are noticing more of the tiled style TIFF in use and have added support to read this flavor.

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### ***LARGER IMAGES***

The trend in hydrographic data is always bigger and larger data sets as both hardware improvements lead to greater capture, and the quest for ever-increasing resolution has yet to abate. TIFF images, used as a well-supported storage mechanism, are growing in size along with this trend. The HYPACK® TIFF routines have been reworked to handle much larger images than previously supported. It should be noted that the size of a particular file on disk is a poor indicator of the actual image size in memory.

The main factors are compression and color depth. Most TIFF images are compressed to reduce transmission bandwidth and it is hard to predict uncompressed data size by casual observation.

Color depth refers to the required number of bytes per pixel of image data in the display and manipulation software. The image, for example, may be stored as a simple 1 byte per pixel, limited color range image, but the using software may unpack this into a common 3 byte range, tripling the memory requirement!

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### ***DRAWING SPEED IMPROVED WITH A SMALLER MEMORY FOOTPRINT***

Reading larger images is only half the battle. If a large enough memory pool isn't available, the image won't be displayed (aka Out of memory!). We came up with an interesting solution by using an intermediary file format. Using our improved reading algorithms, the TIFF image is uncompressed, parsed and reformatted into a format suitable for our display engine. The format allows for both random and quick access to the data required for display at any particular moment. This leads to a trifold improvement in usability:

- Drawing speed is increased as the data is already in the required format when read —no on-the-fly conversion required.
- Memory overhead is reduced as the entire image need not be loaded.

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- Lastly, TIFF images, once converted, stay in the project, so enabling and loading is extremely quick.

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## ***LONGITUDE LATITUDE GEO-REFERENCE SUPPORT***

Geo-referencing a TIFF image, that is positioning the image correctly in the world, is typically accomplished with either an external world file or with internal TIFF keys which contain transformation parameters. Until now, HYPACK® support has been limited to this reference data being in a projected XY system, but we have recently come across geo-referencing information based on Longitude and Latitude.

We have added initial support for such files using the assumption that the Lon, Lat values, as well as the scaling, are based on a local geodesy system. This works for the files we have seen, but if the reference system is based on another system, say WGS84, then we will need to add additional future improvements.