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Chapter Overview

NCSA Reformat/XReformat, like many other programs that read foreign file formats, does not fully support many of them. Feedback from you is invaluable in helping developers determine what degree of support is necessary for each of the file formats. Some of the file formats are fully supported. This chapter describes the degree of support for each of the file formats.

Image and Data File Formats

NCSA Reformat/XReformat supports the following file formats: FITS, TIFF, GIF, Sun and raw raster and X Window Dump. A short description of the file format, in addition to the extent of their support is outlined below.

Flexible Image Transport System

Flexible Image Transport System (FITS) was designed for the interchange of astronomical images and other n-dimensional regularly spaced data arrays. FITS files may contain 16- or 32-bit data and information that

can be used to convert the data to floating point numbers. A data max and min and a scaling value may or may not be included in the file. NCSA Reformat/XReformat fully supports FITS, although 32-bit data may require large amounts of memory to convert.

Tagged Image File Format

Tagged Image File Format (TIFF) supports image data in a very flexible tagged format. This file format is most commonly used by scanners and other tools of the desktop publishing industry. The images may be pseudo color or true color images. The only files this program will be able to convert are 8 bit raster images. Five types of file compression are included with this file format specification, of which we support the two most common. Scheme 2, modified run length encoding, and scheme 5, LZW compression are supported. TIFF files may also contain a color table. We support this capability as well.

Graphics Interchange Format

Graphics Interchange Format (GIF) was developed for the exchange of files over CompuServe®. This file format uses a compression scheme to compact the data, and includes support for color tables. GIF format is fully supported.

Sun Raster File Format

Sun Raster Format was developed by Sun Microsystems for use on their machines. This format supports 8- and 24-bit colored images. Reformat only converts the 8-bit images.

Raw Raster File Format

A *raw binary file* is a stream of raw, 8 -bit binary data in row-major order. Each 8-bit byte corresponds to a pixel in the image. The image is represented in *row-major order*; that is, the first raster line appears first in the file, succeeded by the next raster line, and so forth. Though raw binary files are easy to create, the raw binary file format is not very flexible and therefore, not highly recommended.

If you choose to use raw binary files to store your image data, you must specify the dimensions of the dataset before the file can be read by NCSA Reformat/XReformat.

X Window Dump File Format

NCSA Reformat recognizes 8- and 24-bit color images stored in the *X Window Dump File Format.* However, NCSA XReformat only supports 8-bit X Window Dump files.

Palette File Formats

In some situations, you will have to select a color palette from a file other than the one that you are converting. For this reason we are including information on the palette file formats that are supported.

Raw Palette Files

A *raw palette file* is a stream of 768 bytes. Raw palette files can store 256 colors, which can be selected from a palette of over 16 million possible colors. Palette files are based on the red, green, and blue representation of color, the RGB color model. The files consist of, in order, 256 bytes of red, 256 bytes of green, and 256 bytes of blue. The 256 color palette entries are calculated by combining the *n*th element (red), the (*n*+256)th element (green), and the (*n*+512)th element (blue) to create the *n*th RGB component.

In other words, a *raw palette file* is a lookup table with 256 entries that tell which color to associate with each of the 256 possible *pixel* values. Each of the 256 palette entries in the palette is chosen from a master palette of 2^{24} RGB colors. Each palette entry consists of three bytes, one each for red, green, and blue; the first red component, the first green component, and the first blue component, for example, comprise the first palette entry.

When you load a palette file, the hardware color table entries are remapped according to the new palette; that is, each color in the palette file is assigned to its corresponding entry in the hardware color table.

HDF Palette Files

Besides storing raster images, scientific datasets, and annotations, HDF files can store palettes. To include palettes, a complete knowledge of HDF structure is helpful, but not necessary. Documentation on the HDF file format is available from NCSA, for those wishing to support it. See Appendix B, “Obtaining NCSA HDF and Other Software,” for more details.