

Using ERDAS Ver. 7.X Files Within IMAGINE

You may use ERDAS Ver. 7.X files for many of the ERDAS IMAGINE functions without converting them into the IMAGINE file format. Dynamic Loadable Libraries (**DLLs**) allow changes to files which are not in the native .img format.

If you need to import or export ERDAS Ver. 7.X files with IMAGINE, use the Import/Export dialog.

Accompanying Files

The following Ver. 7.X file types accompany ERDAS Ver. 7.X GIS or LAN files, and will be used by IMAGINE along with the files they accompany:

- ◆ PRO files
- ◆ STA files (with LAN files)
- ◆ TRL files (with GIS files)

☞ When you use ERDAS Ver. 7.X files in IMAGINE, the processing time will be longer for most applications.

IMAGINE Functions and Ver. 7.X Files

Annotation

IMAGINE annotation layers can be created over a displayed ERDAS Ver. 7.X file. If the Ver. 7.X file is georeferenced, the annotation will be georeferenced.

Image Info

In the Image Info dialog, you can view file/layer information for any Ver. 7.X LAN or GIS file, and you can print the statistics and histogram information. However, you cannot modify the file.

Map Composer

You can use Ver. 7.X raster files in map frames.

The Legend Properties dialog will not read in the class names or histogram from the Ver. 7.X TRL file because Ver. 7.X attributes cannot be used with IMAGINE. However, the color patches do appear, and you can type legend text into the Legend Layout table.

Rectification

You may use an ERDAS Ver. 7.X image as an input image for rectification. You can digitize GCPs for use in the GCP Tool. To save these GCPs based on non-native DLLs, select **File | Save Input** from the Viewer menu bar or **File | Save Input As...** to save as an independent .gcc file.

Spatial Modeler

You can use Ver. 7.X files with models that require attributes. Using the **GeometricModels DLL Class**, Ver.8.3 can read attributes (descriptors) from Ver.7.X files.

Viewer

You may use all of the functions of the IMAGINE Viewer when you are viewing ERDAS Ver. 7.X files, including contrast adjustment and color selection. Ver. 8.3 can read attributes (descriptors) from 7.X files.

LAN and GIS Files - Image Data

LAN and GIS image files are stored in the same format. Each file contains a header record, followed by the image data. The image data are arranged in a Band Interleaved by Line (BIL) format. Each file is virtually unlimited in size - the file structure allows up to 274 billion bytes. The only size constraint is the capacity of the particular storage medium. The file consists of 512-byte records. The first 128 bytes of the first record contains the header information which consists of the following:

Name	Byte(s)	Description
HDWORD	1:6	A 6 byte array containing 'HEAD74'. (Pre-7.4 files say 'HEADER'.)
IPACK	7:8	An integer value which indicates the pack type of the data:
		0 = 8 bit
		1 = 4 bit
		2 = 16 bit
NBANDS	9:10	An integer that indicates number of bands/channels per line. (Always 1 for GIS.)
	11:16	Unused.
ICOLS	17:20	An integer*4 number specifying the width of the file in pixels.
IROWS	21:24	An integer*4 number specifying the length of the file in lines of pixels.
XSTART	25:28	An integer*4 number specifying the database x-coordinate of the first pixel (upper left) in the file.
YSTART	29:32	An integer*4 number specifying the database y-coordinate of the first pixel (upper left) in the file.
	33:88	Unused.
MAPTYP	89:90	An integer which indicates the type of map projection associated with the file. See PRO files for a complete list.
NCLASS	91:92	An integer which indicates the number of classes in the data set.
	93:106	Unused.
IAUTYP	107:108	An integer which indicates the unit of area associated with each pixel:
		0 = NONE

Name	Byte(s)	Description
		1 = ACRE
		2 = HECTARE
		3 = OTHER
ACRE	109:112	A real number which specifies the number of area units represented by each pixel, in the units given in IAUTYP.
XMAP	113:116	A real number which gives the map x-coordinate for the upper left corner pixel in the file.
YMAP	117:120	A real number which gives the map y-coordinate for the upper left corner pixel in the file.
XCELL	121:124	A real number which gives the x size of each pixel. Units depend upon the map type specified in MAPTYP:
		State Plane = feet
		Lat/Lon = degrees
		all others = meters
		XCELL is 0 if MAPTYP is "none".
YCELL	125:128	A real number which gives the y size of each pixel, in the same units as XCELL.

Data file values begin at byte 129, and cross over record boundaries as necessary. The data are arranged in the following order where:

- x = the number of columns
- y = the number of lines (rows), and
- n = the number of bands,
- Pixels 1 through x of line 1, band 1
- Pixels 1 through x of line 1, band 2
- Pixels 1 through x of line 1, band 3
- Pixels 1 through x of line 1, band n
- Pixels 1 through x of line 2, band 1
- Pixels 1 through x of line 2, band 2
- Pixels 1 through x of line 2, band 3

Pixels 1 through x of line 2, band n

Pixels 1 through x of line y, band 1

Pixels 1 through x of line y, band 2

Pixels 1 through x of line y, band 3

Pixels 1 through x of line y, band n

The pixel values may be packed in one of three ways: 4-bit, 8-bit, and 16-bit. The 4-bit packing places two pixels per byte, 8-bit packing places one pixel per byte and 16-bit packing places one pixel per two bytes.

STA Files- Statistical Trailers

STA files (statistical trailers for LAN files) consist of 128 byte records. There are 9 records for each band, as follows:

Record	Name	Byte(S)	Description
Record 1		1:7	TRAIL74. (Trailers under earlier versions read 'TRAILER'.)
	BAND	8	Band number.
	MAXVAL1	9	Maximum data file value in the band. (4-bit and 8-bit files only)
	MINVAL1	10	Minimum data file value in the band. (4-bit and 8-bit files only)
		11:12	Unused.
	RMEAN	13:16	Mean of the data file values in the band (real).
	RMODE	17:20	Mode (statistical) of the data file values of the band (real).
	RMED	21:24	Median of the data file values in the band (real).
	RSTDEV	25:28	Standard deviation of the data file values in the band (real).
	MAXVAL2	29:30	Maximum data file value in the band. (4-bit, 8-bit or 16-bit files)
	MINVAL2	31:32	Minimum data file value in the band. (4-bit, 8-bit or 16-bit files.
		33:128	Unused.
Record 2		1:128	Histogram of values 0-31 for the band. Each histogram value occupies 4 bytes.
Record 3		1:128	Histogram (values 32-63).
Record 4		1:128	Histogram (values 64-95).
Record 5		1:128	Histogram (values 96-127).
Record 6		1:128	Histogram (values 128-159).
Record 7		1:128	Histogram (values 160-191).
Record 8		1:128	Histogram (values 192-223).

Record	Name	Byte(S)	Description
Record 9		1:128	Histogram (values 224-255).

Record 10 begins the same sequence for the next band.

The presence of 'TRAIL74' in the first seven bytes of the statistical record for each band indicates that statistics have been calculated for the data in that band.

TRL Files - GIS Trailer

Record Number	Byte(s)	Description
1	1:7	TRAIL74. (Trailers under earlier versions read 'TRAILER'.)
	8:72	Unused.
	73:117	Variable name.
	118:128	Unused.
2	1:128	Color scheme - green classes 0 - 128.
3	1:128	Color scheme - green classes 129-255.
4	1:128	Color scheme - red classes 0 - 128.
5	1:128	Color scheme - red classes 129-255.
6	1:128	Color scheme - blue classes 0 - 128.
7	1:128	Color scheme - blue classes 129-255.
8	1:7	TRAIL74. (Trailers under earlier versions read 'TRAILER'.)
	8:128	Unused.
9	1:128	Histogram of classes 0-31. Each histogram value occupies 4 bytes.
10	1:128	Histogram (classes 32-63).
11	1:128	Histogram (classes 64-95).
12	1:128	Histogram (classes 96-127).
13	1:128	Histogram (classes 128-159).
14	1:128	Histogram (classes 160-191).
15	1:128	Histogram (classes 192-223).
16	1:128	Histogram (classes 224-255).
17	1:32	Class name, class 0.
	33:64	Class name, class 1.
	65:96	Class name, class 2.
	97:128	Class name, class 3.
18	1:128	Class names, classes 4 - 7 (stored as in Record 17).

Record Number	Byte(s)	Description
19	1:128	Class names, classes 8 -11....et cetera for all class names, up to the number of classes in the file.

TRAIL74 Records

'TRAIL74' in the first seven bytes of Record 1 means that the TRL file contains at least one of the following: histogram, color scheme, or class names. 'TRAIL74' in the first seven bytes of Record 8 means that the histogram is present. If TRAIL74 is not present in record 8, class names or color schemes may be found in the trailer file, but no histogram.

Variable Name

The variable name is a descriptive string for the GIS file. You may enter up to 43 characters. The string is stored in bytes 73-117 of Record 1, in a 44-byte character array which contains the character string plus a terminating tilde (-).

Class Names

Each class name record contains four class names. Each class name consists of a 32-byte string, which is 31 user-entered characters plus a terminating tilde.

PRO Files - Projections Parameters

The projections parameters file (PRO) is a sequential, formatted ASCII file. Below is a sample PRO file:

```

          4          0
T      1.0000000000000000
T      0.0000000000000000E-01
F      3.0000000000000000E+07
F      4.5000000000000000E+07
F     -9.0000000000000000E+07
F      0.0000000000000000E-01
F      0.0000000000000000E-01
F      0.0000000000000000E-01
T      0.0000000000000000E-01

```

The first line of the file contains the map projection type. Lines 2-16 contain data that is specific to the map projection type specified in line 1. These lines are all in the same format - one logical (Boolean) value followed by one double precision value.

Line 1

```

          4          0

```

The first number is the projection type. Valid values are numbers 1-20, which correspond to the supported map projection types, listed below:

Type	Projection
1	UTM
2	State Plane
3	Albers Conical Equal Area
4	Lambert Conformal Conic
5	Mercator
6	Polar Stereographic
7	Polyconic
8	Equidistant Conic
9	Transverse Mercator

Type	Projection
10	Stereographic
11	Lambert Azimuthal Equal Area
12	Azimuthal Equidistant
13	Gnomonic
14	Orthographic
15	General Vertical Near-Side Perspective
16	Sinusoidal
17	Equirectangular
18	Miller Cylindrical
19	Van der Grinten
20	Oblique Mercator

The second number on the first line is the zone number.

- ◆ If the projection type is 1 (UTM), then the valid zone numbers are 1-60.
- ◆ If the projection type is 2 (State Plane), the valid zone numbers are the 4-digit state plane zone codes specified by USGS (i.e. 3xxx, 4xxx, 5xxx, and 6xxx) or by NOS (-1xx through -5xxx).

For all other projection types, the zone number is 0.

Lines 2 and 3

```
T      1.00000000000000000000
T      0.00000000000000000000E-01
```

Line 2 contains the spheroid number to be used in the projection calculations.

The spheroid types are listed below:

Type	Spheroid
1	Clarke 1866
2	Clarke 1880
3	Bessel
4	New international 1967

Type	Spheroid
5	International 1909
6	WGS 72
7	Everest
8	WGS 66
9	GRS 1980
10	Airy
11	Modified Everest
12	Modified Airy
13	Walbeck
14	Southeast Asia
15	Australian National
16	Krasovsky
17	Hough
18	Mercury 1960
19	Modified Mercury 1968
20	Sphere of Radius 6370977m
21	WGS 84
22	Helmert

The Boolean values at the beginning of lines 2 and 3 are never used and are simply initialized to "T" along with the rest of the array, and the second value of line 3 is always 0.0.

Lines 4 through 16

```

F      3.0000000000000000E+07
F      4.5000000000000000E+07
F     -9.0000000000000000E+07
F      0.0000000000000000E-01
F      0.0000000000000000E-01
F      0.0000000000000000E-01
T      0.0000000000000000E-01

```

T 0.000000000000000000E-01
 T 0.000000000000000000E-01

Depending on the projection type selected, the programs that handle map projections require different types of inputs. These inputs include such values as Central Meridian, Standard Parallels, Scale Factors, etc., and are different for each map projection. Lines 4-16 in the PRO file contain these data. The actual lines that are used depend upon the map projection type (see chart below). When the Boolean value at the beginning of a line is "F," that indicates that its parameter value is used.

PRO file line number	Projection type (#) ^a --> ----- Parameter	3	4	5	6	7	8	9	0	1	1	1	1	1	1	1	1	1	2
Line 3	Spheroid Selection Menu	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Line 4	False Easting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Line 5	False Northing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Line 6	Longitude Of Central Meridian	X	X	X		X	X	X							X	X	X	X	
Line 7	Latitude Of Origin Of Projection	X	X			X	X	X											X
Line 8	Longitude Of Center Of Projection								X	X	X	X	X	X					
Line 9	Latitude Of Center Of Projection								X	X	X	X	X	X					
Line 10	Latitude Of First Standard Parallel	X	X			X													
Line 11	Latitude Of Second Standard Parallel	X	X			X													
Line 12	Latitude Of True Scale			X	X														
Line 13	Longitude Below Pole				X														
Line 14	Scale Factor At Central Meridian							X											
Line 15	Height Of Perspective Point Above Sphere												X						
Line 16	Scale Factor At Center Of Projection																		X

^aParameters for definition of map projection types 0-2 are not applicable.