



How IHS AccuMap Interprets SEG P1 Files

For IHS Applications

IHS AccuMap®

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Interpreting SEG P1 Files IHS AccuMap IHS Inc.

Open Layers is a feature that enables you to display and inspect your proprietary data (such as seismic lines and shotpoints) on AccuMap's maps. Each Open Layers file has a single entry in the *Map Features* dialog box. AccuMap can import SEG P1 files into Open Layers files. The SEG P1 standard isn't precise, for example, units of measure aren't specified. The following is a description of how AccuMap's Open Layers import mechanisms interpret SEG P1 files.

Header Blocks

SEG P1 files are organised into records of 80 characters each. AccuMap can cope with records of any length, but only the first 80 characters of a record have any significance. Records are separated by end-of-line characters (and thus a SEG P1 file can be edited in a text editor, or a word processor in text only mode).

If the first character in a record is **H** the record is the first in a twenty-record header block. The contents of header blocks are otherwise entirely free-format and can contain any information. There can be any number of header blocks in a SEG P1 file, but there must be a header block at the very beginning of the file.

AccuMap tries to detect specific information in header blocks by scanning them for specific keywords (case is ignored). When a keyword is found, AccuMap searches for the first number that follows the keyword. If the number is valid for that keyword then AccuMap accepts the number as valid information.

This is what AccuMap tries to detect in header blocks:

Information	Keywords*	Valid Numbers
Ellipsoid	NAD	27, 83
	CLARKE	1866
	GRS	80
GRID	ATS	1.0, 1.1, 2.0, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2
	STS	1.0, 1.1, 2.0, 2.1, 2.2, 2.3, 2.4, 2.5
UTM Central Meridian	CM	87, 93, 99, 105, 111, 117, 123, 129, 135, 141
	MERIDIAN	87, 93, 99, 105, 111, 117, 123, 129, 135, 141
	ZONE	7, 8, 9, 10, 11, 12, 13, 14, 15, 16



AccuMap needs to know the ellipsoid in order to correctly import each data record's latitude and longitude (see below). If one isn't detected in the header block NAD27 (Clarke 1866) is assumed. AccuMap uses the ATS 2.6 grid and a hybrid surveyed Saskatchewan grid, so if any STS grid version or any ATS grid version other than 2.6 is detected, a warning is logged. The UTM central meridian is taken only as a reference for northings and eastings and no calculations are performed with it. See below for how location data is handled using latitudes and longitudes.

**Keywords are not required in the header block*

Data Records

If the first character in a record is a space it means the record is a data record (except when the record is part of a header block). This is what AccuMap expects to find in each record:

Column	Description	Expected Field Contents or Formats
1	Data record identifier	A space character
2-17	Line name	Left-justified ASCII text
18-25	Shotpoint No.	Integer
26	Reshoot code	A space character or a character from A to Z
27-35	Latitude	ddmmssssh where dd = degrees, mm = minutes, ssss = hundredths of seconds, and h = hemisphere (N or S)
36-45	Longitude	gg.gggggh where gg.ggggg = gradient and h = hemisphere (N or S) dddmmssssh where ddd = degrees, mm = minutes, ssss = hundredths of seconds, and h = hemisphere (E or W)
46-53	UTM Easting	ggg.gggggh where ggg.ggggg = gradient and h = hemisphere (N or S)
54-61	UTM Northing	Integer (decimeters)
62-66	Elevation	Integer (decimeters)
67-80	67-77 Time	yydddhhmmss where yy = year, ddd = day of year (1 = January 1), hh = hour, mm = minute, and ss = second (GMT)
67-80	78-80 Extra Information	ASCII text
	67-80 Extra Information	ASCII text



Latitude and longitude are critical fields – that is, they must contain valid values in order for the record to be imported. Degrees must be from 0 to 90/180, minutes must be from 0 to 59, hundredths-of-seconds must be from 0 to 5999, and the complete value must not be greater than 90^o/180^o. Gradients must be greater than or equal to 0.0 and less than 100.0/200.0.

The time field is specified in the SEG P1 standard but it doesn't seem to be used much in the Western Sedimentary Basin. Therefore, if the ASCII text in that field forms a valid time (hh from 0 to 23, ss from 0 to 59, etc.), it's taken as time information, otherwise it's taken as extra information. The year is resolved by applying a simple windowing algorithm where years 20 to 99 are 1920 to 1999 and years 0 to 19 are 2000 to 2019. This algorithm is consistent with other century-windowing algorithms in AccuMap.

Extra information can be any ASCII text. Its significance is usually dependent on how the SEG P1 file was created and who will be using it.

The shotpoint import process uses each data record to create a single Open Layers point entity. Most of the data in the data record is attached to the point entity and displayed by AccuMap when the entity is inspected.

The seismic lines import process uses a series of data records to create Open Layers line entities. All data records with the same consecutive line name are taken as vertices in a line entity. Co-linear vertices are discarded (a vertex is considered to be co-linear if it is less than 2^o out of line with its neighbours). The line name, starting shotpoint number, and ending shotpoint number are attached to each line entity and displayed by AccuMap when those entities are inspected.

Sizes of the Resulting Open Layer Files

When importing to make a layer of shotpoints, the size of the Open Layers file will be about 40% to 75% larger than the source SEG P1 file. A more accurate estimate can be obtained with the formula SEG P1 file size (in bytes) × 1.4 + 160 000.

When importing to make a layer of seismic lines, the size of the Open Layers file will be 90% to 99% smaller than the source SEG P1 file. A more accurate estimate can be obtained with the formula SEG P1 file size (in bytes) ÷ 100 + 30 000.

The amount of virtual memory required to display an Open Layers file in AccuMap is about the same as the file's size.



Importing Multiple SEG P1 Files into a Single Open Layers File

AccuMap's Import Manager can only cope with one SEG P1 file and one Open Layers file at a time. Ideally, all of the seismic lines for a single AccuMap map layer are in a single SEG P1 file. However, if that's not possible (or convenient), concatenate them all into a new SEG P1 file and import the new file instead.

An easy way to concatenate all your SEG P1 files into a single file is to use the *copy* command in a DOS command window. The **+** operator can be used with the *copy* command to concatenate files. For example, this command:

```
copy file1.seg+file2.seg file3.seg
```

will put the contents of *file1.seg* and *file2.seg* into a new file called *file3.seg*.

It's a little trickier to concatenate all *.seg files in a directory into one file. If a destination file (*file3.seg* in the previous example) is not specified, the *copy* command appends all files in the list to the first file. Therefore, here is the procedure for concatenating all *.seg files in a directory:

1. Create a blank text file entitled *all.seg* in the directory where your SEG P1 files are.
2. Open a DOS command window (*Start > Run*, then type *command* or from the *Start* menu, select *Programs > Accessories > MS DOS Prompt*), move to the directory with your SEG P1 files (type *CD XXX* where *XXX* is the directory name), and then type **copy all.seg+*.seg**.

All *.seg files are concatenated in the file *all.seg*.

Warning If the last record in a SEG P1 file doesn't end with a carriage return and linefeed (CR/LF) the first record in the next file will be appended to it without a CR/LF to separate the two and AccuMap will consider these two records a single record. You must edit the file with a text editor to manually separate these records with line breaks.

Verifying an Import was Successful

The import process generates a log file each time a SEG P1 file is imported. This log file appears in the same directory and has the same name as the Open Layers file, except the extension is *.log* instead of *.pts* or *.lms*.

For example, if you import *C:\TEMP\SHOTPOINTS.SEG* into *C:\TEMP\MYSEISMIC.LMS*, the log file will be *C:\TEMP\MYSEISMIC.LOG*.

If the log file exists at the start of the import process, it's emptied so any previously logged problems aren't mistakenly associated with the current import.



If a problem with the SEG P1 file is encountered, the problem, record number, and remedial action are recorded in the log file. If there are any entries in the log file at the end of the import process you are notified.

Entries in the log file may indicate a major problem with the data source and should always be reviewed. You can then decide whether the Open Layers file is suitable or whether the database that produced the SEG P1 file needs some maintenance.

Additional Information

The SEG P1 file format is defined in, "Positional Data Exchange Formats Standard," by Morgan, Spradley, Worthington and McClelland (1983) -- ISBN 0-931830-68-0, SEG catalog no. 348A.

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