

LAS (Log ASCII Standard) Overview

This section briefly describes the LAS format. Also included is how to convert any columnar ASCII log format to LAS.

LAS Format

This section is a brief overview of the LAS format. For a detailed description of LAS, please get the LAS Version 2.0 document from:

Canadian Well Logging Society, Floppy Disk Committee
Suite 229, 640-5 Avenue, S.W.
Calgary, Alberta T2P 3G4
Canada

Valid Units for an LAS file

US/F - microseconds/feet
MS/F - milliseconds/feet
S/F - seconds/feet
F/S - feet/seconds
F/MS - feet/milliseconds
F/US - feet/microseconds
US/M - microseconds/meter
MS/M - milliseconds/meter
S/M - seconds/meter
M/S - meter/seconds
M/MS - meter/milliseconds
M/US - meter/microseconds

Note: F is an invalid unit for a sonic log.

Major Components of an LAS file

The sections that make up a LAS file are as follows:

- ~V - contains version and wrap mode information.
- ~W - contains well identification.
- ~C - contains curve information.
- ~P - contains parameters or constants.
- ~O - contains other information such as comments.
- ~A - contains ASCII log data.

In the ~V, ~W, ~C, and the ~P sections the dot, colon, and space are used to delimit the information within the line. A line must contain one dot and one colon and have their lines laid out as follows:

```
MNEM.UNITS          DATA :DESCRIPTION OF MNEMONIC
```

where

- MNEM is mnemonic. This mnemonic can be of any length but must not contain any internal spaces, dots, or colons.
- UNITS is units of the mnemonic (if applicable). The units if used, must be located directly after the dot. There must be not spaces between the units and the dot. The units can be of any length but must not contain any colons or internal spaces.
- DATA is the value of, or data relating to, the mnemonic. This value can be of any length and can contain spaces or dots as appropriate, but must not contain any colons. It must be preceded by at least one space to demarcate it from the units and must be to the left of the colon.
- DESCRIPTION is a description or definition of the mnemonic. It is always located to the right of the colon. Its length is limited by the total line length limit of 256 characters which includes a carriage return and a line feed.

The ~A (ASCII Log Data) field is always the last section in an LAS file.

- Each column of data must be separated by at least one space.
- A line of less than 256 characters (including the carriage return and line feed) will normally not be wrapped. Wrap

mode will be used if the data is longer than 256 characters.

- In wrap mode, depth will be on its own line, a line of data will be no longer than 80 characters. and the decimal points should be aligned for ease of reading.
- Exponents are not permitted.
- Insert the null-value, -999.25, in the LAS header instead of leaving a blank. For example, you have the following three logs:

Dept. (0 - 1000 ft.)

Son (0 - 1000 ft.)

RHOB (400 - 1000 ft.)

You will notice that the start and finish depth for the logs are different. If you leave any field blank, then the nearest log fills in the blank. In this case, the SON and RHOB datasets would have equal GR values from 0-399 ft. However, they do not have equal GR values from 0 - 399 ft., the RHOB log has no GR values from 0 - 399 ft.

the ProMAX® processing system requires the ~V, ~W, ~C, and ~A fields when reading an LAS file. An example LAS file follows:

~VERSION INFORMATION

VERS. 1.20: LAS LOG ASCII STANDARD VERSION 1.20

WRAP. NO: ONE LINE PER DEPTH STEP

~WELL INFORMATION

#MNEM.UNIT DATA TYPE INFORMATION

#-----

STRT.F 4099.866 :

STOP.F 4107.8657 :

STEP.F 1.000 :

NULL. -999.25 :

COMP. COMPANY :

WELL. WELL : Turtle

FLD. FIELD : Ninja

LOC. LOCATION : Sewer

PROV. PROVINCE : All Over

CNTY. COUNTY : Any

STAT. STATE : Where

CTRY. COUNTRY :

SRVC. SERVICE COMPANY :

DATE. DATE :

UWI. UNIQUE WELL ID :

API. API NUMBER :

~CURVE INFORMATION

#MNEM.UNIT API CODE CURVE DESCRIPTION

#-----

DEPT.F : 1 DEPTH

SON .US/F : 2 SONIC

~PARAMETER INFORMATION

#MNEM.UNIT VALUE DESCRIPTION

```
#-----  
~A DEPTH SONIC  
4099.8657 66.2656  
4100.8657 77.2188  
4101.8657 74.9531  
4102.8657 72.2969  
4103.8657 71.2656  
4104.8657 71.4063  
4105.8657 71.5938  
4106.8657 72.6719  
4107.8657 73.8750
```

Converting an ASCII file to LAS

To create an LAS file from any ASCII log format is simple.

- Copy the LAS file header above up to and including the ~A line.
- Add your columnar data to the end of the file making sure that a logs values are contained within one column. The DEPTH field must always be in the first column.
- Edit the header with your specific information.

The following header fields are required. From the ~W area:

```
STRT.F 4099.866 :  
STOP.F 4107.8657 :  
STEP.F 1.000 :  
NULL. -999.25 :
```

From the ~C area:

```
DEPT.F : 1 DEPTH  
SON .US/F : 2 SONIC
```

Below is an ASCII file to convert to LAS. The ASCII file:

Turtle.WELL

Depths and Velocities are English

Times reference seismic datum: 3111

Depths reference log datum : 3111

Times	Sonic	Depths	Impednce	Synthtic	RCs
93.00	6684.	324.	16847.	95.	0.000000
95.00	7133.	330.	17979.	83.	.032471
97.00	6789.	337.	17112.	3.	-.024597
99.00	7074.	344.	17830.	-114.	.020508
101.00	7676.	351.	19347.	-216.	.040710
103.00	7234.	358.	18235.	-210.	-.029541
105.00	7152.	366.	18028.	-93.	-.005676
107.00	7110.	373.	17920.	81.	-.002991
109.00	7254.	380.	18283.	225.	.010010
111.00	7012.	387.	17673.	289.	-.016907
113.00	7160.	394.	18047.	308.	.010498
115.00	7379.	401.	18598.	330.	.014954
117.00	7516.	409.	18943.	363.	.009155
119.00	7793.	416.	1964kj2.	336.	.018066
121.00	8012.	424.	20193.	152.	.013855

The log fields to export in this ASCII file to the new LAS file are the Depth and the Sonic logs. The edited LAS file:

~VERSION INFORMATION

VERS. 1.20: LAS LOG ASCII STANDARD VERSION 1.20

WRAP. NO: ONE LINE PER DEPTH STEP

~WELL INFORMATION

#MNEM.UNIT DATA TYPE INFORMATION

#-----

STRT.F 324.0 :

STOP.F 424.0 :

STEP.F 6.000 :

NULL. -999.25 :

COMP. COMPANY :

WELL. WELL : Turtle

FLD. FIELD : Ninja

LOC. LOCATION : Sewer

PROV. PROVINCE : All Over

CNTY. COUNTY : Any

STAT. STATE : Where

CTRY. COUNTRY :

SRVC. SERVICE COMPANY :

DATE. DATE :

UWI. UNIQUE WELL ID :

API. API NUMBER :

~CURVE INFORMATION

#MNEM.UNIT API CODE CURVE DESCRIPTION

#-----

DEPT.F : 1 DEPTH

SON .US/F : 2 SONIC

~PARAMETER INFORMATION

#MNEM.UNIT VALUE DESCRIPTION

#-----

~A DEPTH	SONIC
324.0	6684.0
330.0	7133.0
337.0	6789.0
344.0	7074.0
351.0	7676.0
358.0	7234.0
366.0	7152.0
373.0	7110.0
380.0	7254.0
387.0	7012.0
394.0	7160.0
401.0	7379.0
409.0	7516.0
416.0	7793.0
424.0	8012.0