RELAMPAGO LMA Level 1 File Documentation

Level 1 data were created using the lma_analysis software package developed at New Mexico Tech and LMA Technologies. Useful contacts for LMA software and technology are Harald Edens (harald.edens@nmt.edu), Bill Rison (William.Rison@nmt.edu), and Dan Rodeheffer (rodeheffer@lmatechnologies.com).

A minimum of 6 detecting stations and a maximum chisqr goodness-of-fit value of 5 are required to locate a VHF source. Every station has an assumed GPS timing delay of 13 ns, based on GPS cable lengths (which are uniform across all RELAMPAGO LMA stations).

Each RELAMPAGO LMA Level 1 file is an ASCII architecture header information at the top, and then information about each detected source.

The header section of each file contains all information needed to understand how the data were processed and what stations were involved. This information is mostly self-descriptive.

The columns in the data portion of the file (below the '*** data ***' header line) are the following:

- Decimal second of day
- Decimal latitude
- Decimal longitude
- Altitude in m above the WGS84 ellipsoid
- Chi-squared goodness-of-fit
- VHF source power (dBW)
- Hexadecimal mask containing information on number of stations detecting source

In Python, you can use the lmatools package (https://github.com/deeplycloudy/lmatools) to ingest the data. The XLMA software, available from New Mexico Tech, is another option for reading these data.