ABSTRACT

TITLE:	GPS Time Integration in Support of VLF Lightning Research: A Project Focused on Time-Stamping a Live Data-Stream
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ABSTRACT: The origin of the formal study of lightning as an electrical phenomenon is attributed to Benjamin Franklin. While not his first design, or experiment, to test the electrical nature of lightning - it was Franklin's kite in the storm that would become the most famous of his experiments. The study of lightning is of long standing human interest, and the methods of this study have evolved with advances in modern technology. To further the local study of lightning, a Global Positioning System (GPS) time signal needs to be integrated with data collected by a Very-Low Frequency (VLF) receiver. The VLF device is used to detect electromagnetic emissions associated with lightning events. GPS time can provide accuracy in excess of the required 1ms resolution for VLF research needs. This level of timing accuracy is necessary to determine event coincidence with data from the National Lightning Data Network (NLDN) or the World Wide Lightning Location Network (WWLLN). LabView virtual-instruments can provide a convenient platform for signal integration in a PC environment. VLF and time-stamp data can be written to storage for later evaluation. Data file-size issues encourage live data-stream evaluations but come at a cost of potentially excessive CPU demands.