

Over 20 years of experience in lightning location

The lightning network calculates the geographical coordinates (latitudes/longitudes) of individual lightning strokes and records data for further analysis and display.

The Global Positioning & Tracking Systems, Pty Ltd. (GPATS) has developed advanced proprietary Time-of-Arrival precision lightning network. This network takes full advantage of current state-of-the-art technology in signal processing, precision GPS timing techniques and consumer based servers to provide optimal performance at the lowest possible cost. GPATS is focused on bringing higher performance and lower cost lightning network solutions to the market in order to radically reduce life cycle costs by utilizing commercial-off-the-shelf technologies wherever possible. Integration of a planned series of modular sensing and processing enhancements will assure that the lightning network performance will define lightning location technology for years to come.

GPATS offers world class detection efficiency and accuracy

- Accuracy < 250m RMS within system geometry
- Detection Efficiency within the system geometry (baselines < 400km)
 - > 95% (cloud-ground strokes)
 - > 80% (cloud-cloud strokes)
- Continuous sensor calibration provides accurate stroke amplitudes
- Multiple on-board detection algorithms accurately discriminate stroke characterization (cloud, ground, polarity, etc.)
- High-speed processing/low bandwidth data requirements
- Detection and location of hundreds of strokes per second
- No “dead-time” between strokes

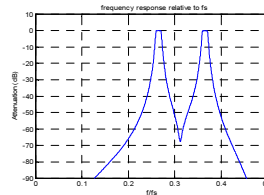
The GPATS DSP-DF200 Advanced Lightning Sensor with Digital Signal Processing is designed to bring the latest technology and precision to the market today. Offering Low Frequency/Very Low Frequency (LF/VHF) dual-band operation, the DSP-DF200 processes lightning strokes from both cloud-to-ground (CG) and cloud lightning (CL) simultaneously. Utilizing a high sensitivity, low noise wideband receiver, state-of-the-art digital filters and equalizers, along with precision GPS time reference, the sensor is able to characterize and categorize each lightning stroke. Once identified, the DSP-DF200 initiates a TCP/IP message to the GPATS Central Analyzer Processor (CAP) where the precise lightning location is calculated.



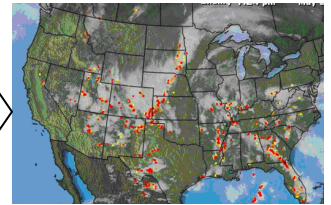
The electromagnetic signal produced by a lightning strike is detected by one of GPATS's high-powered sensors.



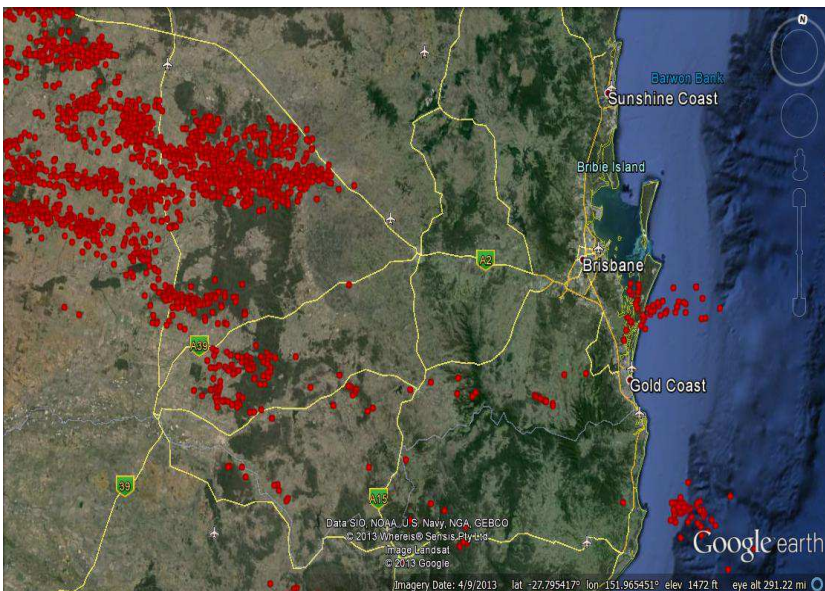
The precision lightning sensor sends raw data to the primary lightning processing hub.



The central analyzer processor takes the sensor information and calculates the strike position, time, polarity, and amplitude.



End users receive lightning data via GPATS software and custom applications.



GPATS is located in Ultimo, NSW, Australia and was founded with the mission of developing, manufacturing, selling and supporting lightning location networks, and lightning hazard warning sensors and systems. GPATS's beginnings started back in 1983 with Dr. Rodney B. Bent, the founder and CEO of GPATS, pioneering the Time-of-Arrival technology.

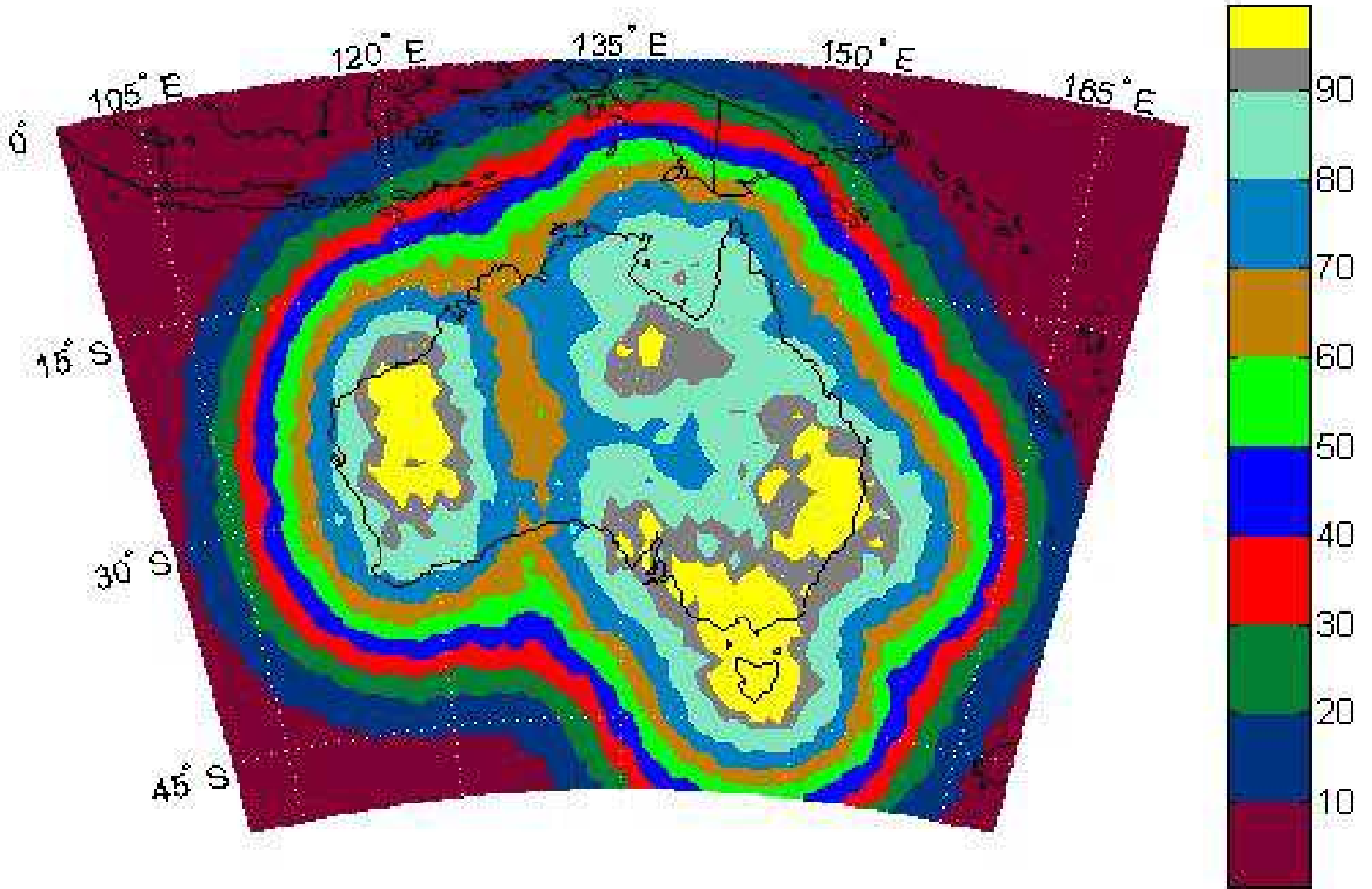
Advantages Over Competitors

- Provides accurate results over large distances
- Detects and locates strikes within seconds
- Superior to direction finding (DF) techniques
 - Less complex hardware/antennas
 - Fewer site requirements
 - Superior accuracy over longer ranges

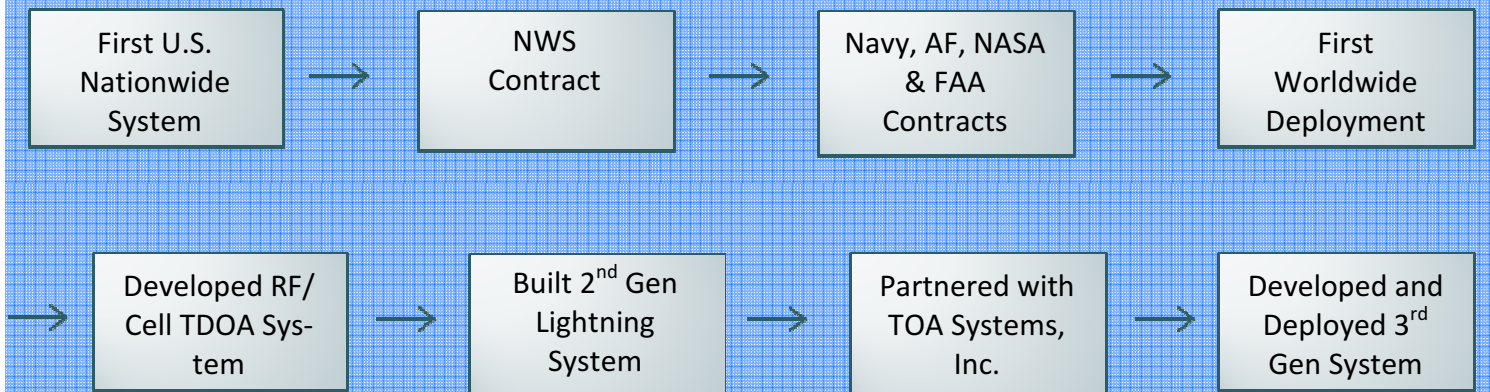
Data Coverage Around the Continent

The main operational requirement for the lightning network is providing timely detection and warning for approaching severe thunderstorm events.

For over 10 years, GPATS has been responsible for the operation and maintenance of the Australian National Lightning Network. The lightning location network incorporates over 40 of the GPATS precision lightning sensors. The real-time lightning data is also purchased by almost all the major utility companies in Australia for operational use.



Product Timeline



Real-Time Lightning Data for Client Applications

The lightning network is capable of detecting lightning strokes farther than 2,500 kilometers, enabling forecasters to detect threatening storms and forecast their future behavior well before they reach national territory.

GPATS understands that forecasters will use the lightning network data in order to monitor thunderstorm activity and nowcast thunderstorm impact on national infrastructure. This will support and improve the accuracy and timeliness of severe weather forecasting for various applications providing timely severe storm warnings, improving operational safety, etc.

Since our display systems are designed to support dissemination of forecast and warning products over the Internet, or internally via the client's intranet, the lightning network can assure that all authorized users have easy and reliable access to severe weather information on a timely basis.

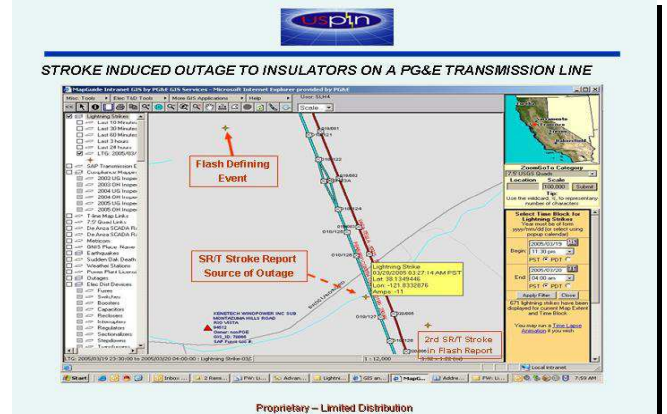
Critical Data for Aviation Safety

The lightning activity plotted by the USPLN immediately preceding the crash of AF flight 358 in Toronto clearly depicts the heavy lightning activity during final approach and landing. Some experts surmise that a thunderstorm-generated microburst contributed to this accident. It is noteworthy that the results shown here were accomplished without having any GPATS sensors situated in Canada. This sensor data was monitored from the United States sensors several hundred miles distant.

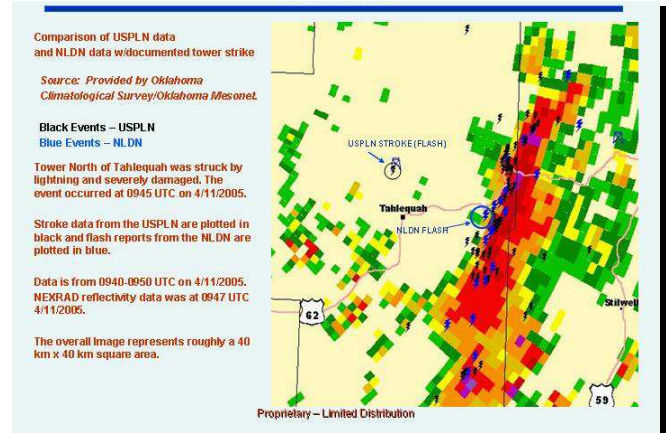
"Ongoing observation of satellite images overlaid with GPATS data indicates a good qualitative correlation with mesoscale convection systems."

Cost Effective Lightning Location Solutions

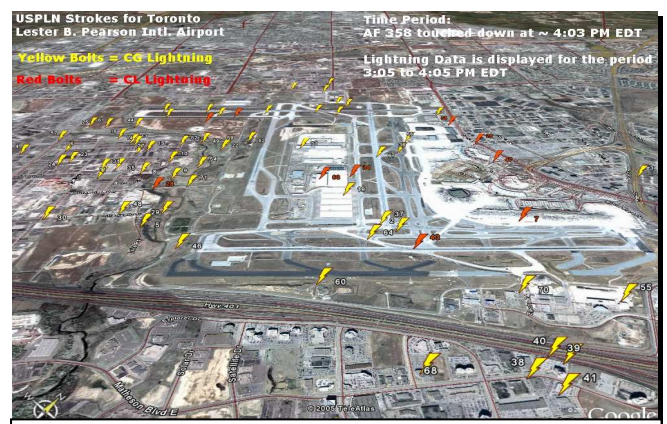
- Affordable Sensors and Processing Equipment
 - Lower equipment costs than competitors
 - Scalable processing software runs on standard processing hardware/equipment (computers) allowing cost effective deployment and future expansion
- Minimal Site Preparation
 - Sensors can be installed almost any facility that can provide power and network connectivity
 - Antenna mount easily to a variety of existing structures
- Low Maintenance
 - High reliability and excellent warranty terms results in low spare requirements
 - Remote software upgrades and diagnostics minimize site visits
 - Simple installation requires no special training for on-site replacement



Stroke to PGE Powerline California Detected



Stroke to Tower in Oklahoma located by USPLN



USPLN CG & CL Strokes at Toronto on 2 August 2005

Visit www.gpats.com.au or contact us at enquiries@gpats.com.au / +61 2 9211 1860

United States Precision Lightning Network is a trademark of TOA Systems, Inc.