

# GPATS and TOA Systems Lightning Detection Network

The lightning network is designed to provide optimal performance for customers and is capable of detecting lightning strikes with high accuracy.

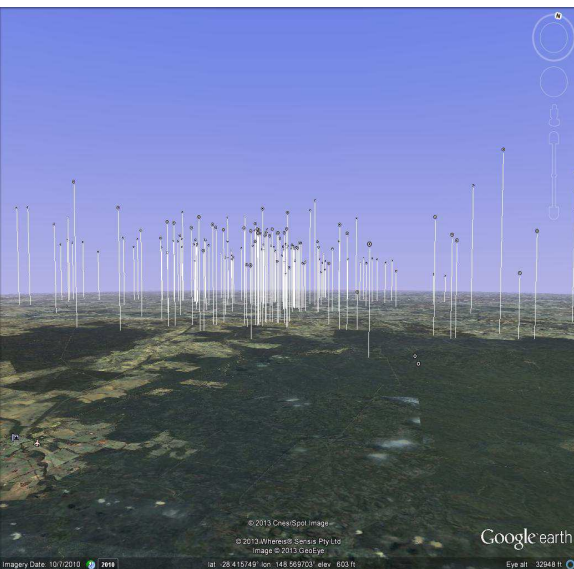
The lightning detection network consists of an appropriate number of sensors as deemed necessary to satisfy the user's requirements for lightning detection efficiency and location accuracy. Pictured are the locations of the latest lightning sensor distributed around the globe.

## Sensors Provide Reliable Lightning Detection & Discrimination

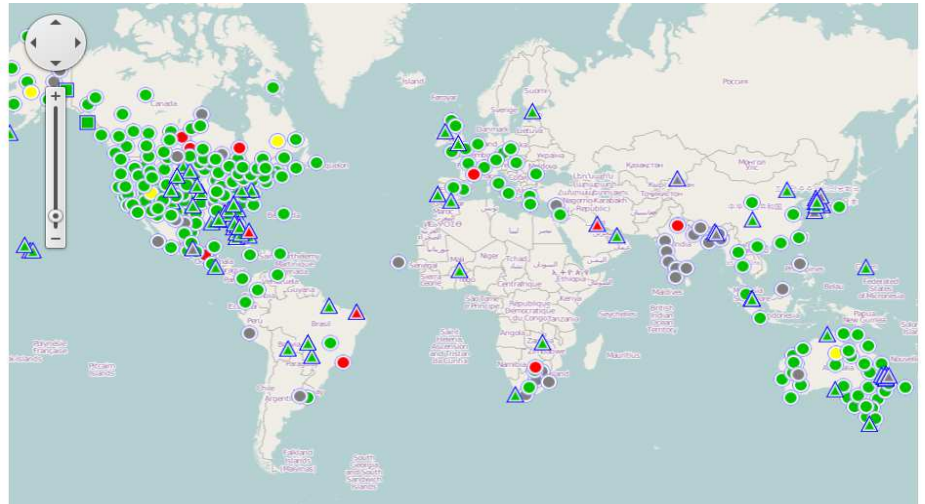
The advanced lightning sensors automatically detect and analyze the radio wave produced by each lightning stroke (cloud-to-ground and inter-/intra-cloud). Sensors record the precise time of the detection, as well as important characteristics including rise time, fall time, amplitude, and a digitized output of the lightning waveform. The GPATS sensors also have the ability to monitor the altitude of the lightning strokes as shown in the image below.

## Sensor Management

GPAT's sensor management programs are very valuable performance analysis tools that should be used by factory-trained technicians, under management supervision. An authorized user can access and communicate directly with any of the active sensors. The programs are equipped to download new software and firmware, monitor oscillator frequency, power supply levels, read the temperature in the sensor unit, as well as scores of sensitive receiver parameters.



The latitude, longitude and altitude of events for intra-cloud lightning discharges over Southeast Queensland.



The latest GPATS sensor has been distributed as part of lightning location systems around the world including the United States, Australia, Canada, South Korea, and South Africa.

## CAP™ Provides Lightning Analysis & Location Processing

The raw lightning data from the sensors is passed over communication lines to the Central Analyzer Processor (CAP™). The CAP™ is preprogrammed to contain information related to the particular sensor sites in addition to other mathematical and physical coefficients. With this information, the CAP™ performs many functions but ultimately computes a position for a particular lightning strike or reject the information as noise. The solution information can be accessed from CAP™ in binary or ASCII text format.

## Lightning Database Functions

After the CAP™ calculates the location of the stroke, it then transfers the solution data to the database subsystem known as the lightning archive. This database will archive the detection network data, with online storage for over one year of storms, plus allow automatic offline archiving to CDROM, or other storage media. The sub-system also provides system manager access for monitoring the lightning system using a network monitoring tool.

## Lightning Real-Time Display System

The display system software is designed to be user-friendly. The different programs provide real-time plotting of cloud-to-ground and cloud lightning on selectable map bases, with flexible zooming capability. Besides the graphical presentation, text format messages are also available for display or printing.

## Performance Monitoring and Maintenance

The lightning network central data processing and management system is delivered with a comprehensive set of system performance monitoring and maintenance tools. This system collects and displays real-time performance and status information on all the network's lightning sensors. The information provided includes important data such as the number of times each sensor reports activity, the number of times the sensor takes part in the solution, and a broad range of other network performance data. The software included can also access the database server to support historical performance analysis.



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