



Application and Markets

Astrapi's technology has wide potential application to markets impacted by challenging communication environments. It is particularly relevant for closed communication systems.

Astrapi performance advances will enhance a wide variety of applications, some of which include more robust satellite links, more efficient cellular networks, and higher capacity field communications for defense and law enforcement.

Target markets include:

- *Satellite services*
- *Microwave backhaul*
- *Wireless networks*
- *Sensor-based networks*
- *Government/DoD communications systems*

Astrapi Spiral Modulation: Unlocking the Power of Future Communications

Astrapi® is the leader in a revolutionary method of communication – non-periodic, spiral-based signal modulation, which has the potential to be a transformative force in radio communications.

Based on new mathematics that has been repeatedly validated, Astrapi has proved that **spectral efficiency can be dramatically increased** by transitioning from traditional periodic signal modulation (based on circles) to Astrapi's patented non-periodic signal modulation (based on spirals).

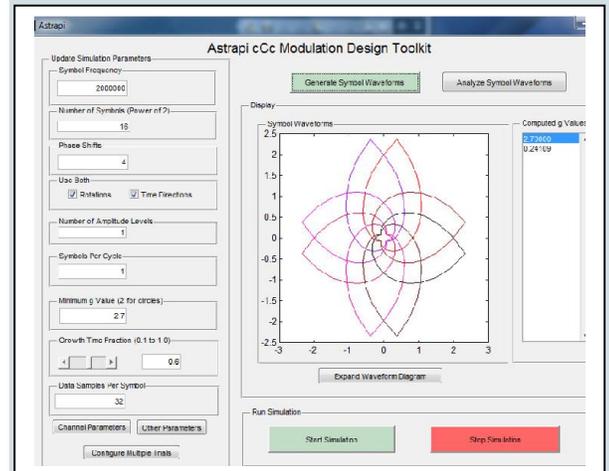
Astrapi's dramatically higher spectral efficiency makes it possible to optimize for any combination of higher data rate, lower signal power, lower error rate, and reduced bandwidth usage. Secondary benefits may include greater resistance to rain fade, lower latency, reduced need for Forward Error Correction (FEC), and greater resistance to multi-path interference.

Astrapi is in the commercialization phase of product development.

Exponential Communication® A Breakthrough in Spectral Efficiency Based on Non-Periodic Signals

Astrapi technology introduces a new generalization of Shannon's law, the formula that determines how much information can be carried by a given amount of bandwidth. Shannon's proof implicitly assumes that signals are periodic. Astrapi for the first time deliberately exploits the additional capacity provided by band-limited non-periodic signals.

Unlike all other alternatives, Astrapi is able to distinguish signals in six ways. In addition to the usual signal phase, frequency and amplitude parameters used by traditional techniques such as Quadrature Amplitude Modulation (QAM) and Frequency-Shift Keying (FSK), Astrapi introduces growth rate, rotational reversal and time reversal. This enables Astrapi to enhance communications in ways that are not otherwise possible.



Intellectual Property

Our spiral-based modulation IP includes fundamental patents issued and pending in the U.S. and around the world and sophisticated simulation software crafted to design and test non-periodic communication systems operating well beyond the current state-of-the-art.

Contact David Shaw or Andrew Roscoe to see how our revolutionary technology can make your radio communications more efficient.

Astrapi Corporation

Dallas, TX: dshaw@astrapi-corp.com

Washington, D.C.: aroscoe@astrapi-corp.com

www.astrapi-corp.com

