An e-Newsletter from Anatech Electronics

FREQUENCY

CENTER

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What's News...

ANATECH ELECTRONICS INC

ARRL Pays Hackers \$1 million

The American Radio Relay League (ARRL) recently fell victim to a sophisticated cyber-attack. The ARRL made the difficult decision to comply with the ransom demand, agreeing to pay \$1 million to the attackers. The hackers, who had acquired sensitive information from the dark web, successfully breached the organization's network, gaining access to on-site headquarters systems and most cloud-based infrastructure. The attack employed an array of payloads targeting a wide range of devices and systems, from desktops and laptops to servers running Windows and Linux. The FBI deemed this cyber-attack "unique" due to its unprecedented level of sophistication compared to other incidents they have encountered.



Source: ARRL

Extraterrestrial Intelligence: The Search Continues

A Word from Sam Benzacar



Wireless Energy Transfer: Powering the Future?

By Sam Benzacar

Wireless power transmission has been a subject of scientific inquiry and experimentation for well over a century, dating back to the late 19th century, when Nikola Tesla conducted experiments on it at his laboratory in Colorado Springs in the 1890s, demonstrating the possibility of transmitting electricity through the air without wires.

Tesla's vision included plans for a global wireless power transmission system, epitomized by his partially constructed Wardenclyffe Tower project on Long Island, NY, in the early 1900s. Although Tesla's grand plans were never fully realized due to financial and technical limitations of the time, his work laid the foundation for future research in this field. Throughout the 20th century, interest in wireless power transmission waxed and waned. The 1960s saw a resurgence of interest, particularly in the context of space-based solar power systems. NASA and the U.S. Department of Energy conducted significant research into microwave power transmission during this period, exploring its potential for beaming solar energy collected in space back to Earth. The 1970s and 1980s witnessed further advancements, with researchers refining techniques for both near-field and far-field wireless power transmission, resulting in inductive and resonant inductive coupling that would form the basis for short-range wireless charging applications.

Radio astronomer Chenoa Tremblay of the Search for Extraterrestrial Intelligence (SETI) Institute and astrophysicist Steven Tingay of the International Centre for Radio Astronomy Research have conducted the first low frequency 98 to 128 MHz extragalactic techno-signature search for alien life in the cosmos. Tremblay says the vast distance between Earth and other galaxies means any signs of alien life they detect would be ancient and that aliens encountered today may no longer exist in any recognizable form. Tremblay and Tingay are now preparing to perform experiments at Europe's Low-Frequency Array (LOFAR) that are scheduled to start soon and will be designed to look for signs of advanced alien life instead of just trying to tease out the details from a galactic survey.



Source: SETI Institude

FCC Clears Next-Gen Starlink Satellites

The FCC has authorized SpaceX to upgrade its first-generation Starlink constellation with second-generation satellites. This approval is expected to significantly enhance the quality of Research into long-distance wireless power transmission has continued, with companies like EMROD pushing the boundaries in terms of range and efficiency. The New Zealand-based company is developing a system that employs microwave frequencies to send electricity a considerable distance with a beam collection efficiency of more than 97%.

EMROD's technology shapes electromagnetic energy into a beam that minimizes atmospheric and dispersion loss, which has been a major challenge with other such systems. Achieving higher efficiency is a primary goal, as some energy is inevitably lost during transmission. However, EMROD claims their system can achieve efficiency levels comparable to traditional copper lines. The technology is scalable in both distance and power levels, with very efficient relays placed between the transmitting and receiving antennas to redirect the beam and increase transmission distance. For safety reasons, the system uses collimated beam formation, which allows the beam to be electronically positioned to avoid anything on the ground passing through it. It also temporarily shuts down if any object is about to cross the beam.

broadband services provided by the company. The second-generation satellites have advanced beam-forming and digital processing technologies, enabling narrower beams for more targeted coverage. They will also reduce latency, which has been improving lately, with median latency decreasing by more than 30%, from 48.5 ms to 33 ms, and worst-case peak hour latency by more than 60%, from 150 ms to less than 65 ms. In other parts of the world, Starlink has reduced median latency by up to 25%, while worst-case latency has decreased by up to 35%.



Source: SpaceX

FCC Creates Dedicated Frequencies for Drone Operators

The FCC has implemented new regulations that permit drones to operate at around 5 GHz. Under the rules, the FCC has established a framework for operators to acquire direct frequency assignments between 5030 and 5091 MHz for non-networked operations. The FCC has implemented dynamic frequency management systems that .

The company's ambitions even extend into space, where satellites equipped with an array of antennas could direct incoming beams of energy, after which a satellite redirects the beam to a specific location on Earth. At this point, the incoming beam is sent back down again, rectified and diverted to rectifying circuits that convert the electromagnetic energy back into electricity.



Source: Emrod's Architecture EMROD's system uses repeaters to overcome losses and extend range.



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provide operators with temporary frequency assignments. This ensures dependable UAS control link communications in controlled airspace and other safety-critical scenarios.



Source: Wikimedia Commons | Capricorn4049

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