

Gottlieb's

SATELLITE MOBILITY WORLDsm

Highlighting Disruptive, New, Mobility-Focused Satellite Ventures and Technologies



In This Issue...

Editorially Speaking: "In Aero and Maritime: The Future of LEO has its Limits"

Feature Interview: "At the Helm of OneWeb: New Leadership for Difficult Challenges" with CEO Neil Masterson

"All Satellites. One Terminal. A New World of Multi-Orbit Services" with Isotropic Systems CEO John Finney

"Viasat Advances IFC with "Viasat Select" with James Person Sr. Director, Business Aviation

"Infrastructure Networks: (iNet): Satellite and 5G in the Oilfield" with CEO Mark Slaughter

"Upcoming Mobility Events"

Volume VI, No. XI December 2021

Cover: Isotropic Systems Multi-Orbit Antenna and CEO John Finney

With Isotropic Systems CEO John Finney

All Satellites. One Terminal. A New World of Multi-Orbit Services

The age of single satellite communications is setting. The next generation is dawning, and it's multi-orbit.

In this new era, GEO, LEO and MEO constellations are combined to enhance capacity, provide pole to pole coverage, low latency and high-speed streaming capabilities.

Isotropic Systems is at the forefront of this unstoppable trend. It's soon to be released antenna is a fundamental building block of the world's next satellite infrastructure.

We have known John Finney for a long time, and watched the development of Isotropic Systems, his fascinating new company. To find more about the company, its new antenna and the future of multi-orbit networks, we scheduled a meet up with John.

SMW: Congratulations on the successful milestone field test of your antenna. What are the next steps in the development of a commercially available antenna?

Completing our multi-orbit antenna's successful trials at the SES Media Port in



Manassas, Virginia, is of great significance. Our Isotropic Systems antenna simultaneously connected with satellites in GEO and MEO, and we will soon be conducting LEO trials. The trials proved our terminal's multi-beam capability and the potential for a whole new era in which GEOs, LEOs, and MEOs can work together in harmony using a single antenna.

We're continuing to further refine the terminal through a series of commercial and government tests as we move toward the final production stage. We anticipate releasing our first multi-link antenna products in the summer of next year.

SMW: There are many electronically steerable antennas (ESAs) under development, both active and passive and several with multi-beam capabilities. While many ESAs are in development, it appears that your only near-term multi-orbit ESA competitors are the Kymeta u8 and Thinkom's VICTS. How does your antenna compare in terms of performance and economics?

The antenna industry has produced some great

innovations. However, the quest for a true multi-beam, multi-orbit capable has remained one of the industry's greatest challenges. Some antenna developers are claiming multiple link capabilities using pairs of parabolic antennas and there are those who divide a single aperture ESA in two, a beam-splitting solution, that cuts antennas the antennas performance in half. There are others who electronically fast switch a single beam from one satellite to another but can't handle more than two satellites at any one time. Finally, some incorporate multiple antenna modules in a single array, an expensive and impractical solution. None of these achieve the goal of a true multi-beam antenna - the harmonious aggregation of multiple satellite beams into a single IP stream. That's what we are doing at Isotropic Systems.

What we've developed and proven is a proper multi-link antenna fully capable of

simultaneously linking with multiple satellites in multiple orbits. It's a no-compromise solution that can support as many



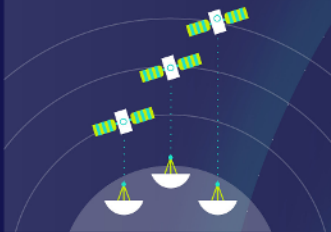
One Terminal. All Satellites.

Using ground-breaking innovation to empower customers to connect to multiple satellites through a single Isotropic terminal.

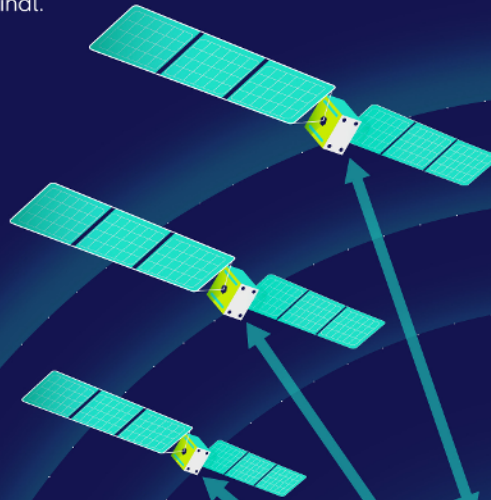


Today: Single Connections

- Satellites orbit the earth in three orbits: LEO, MEO & GEO
- Current terminals/dishes can communicate or receive from only one orbit of satellites at a time
- Terminals are used for global communications on land, in the air and at sea



A next generation ground terminal for next generation satellites from SES, Inmarsat, OneWeb, SpaceX, Amazon, Telesat and many, many more.



The Future: Multiple Connections

- Breakthrough optical technology terminals can communicate with multiple satellites simultaneously
- 'Multibeam' terminals combine the power of many existing terminals into one
- Providing limitless bandwidth for global connectivity
- 'Multibeam' terminals ready for future satellites launching in 2022 and beyond



links as necessary without a reduction in the performance. It's a simple, transformational solution that's scalable to meet customer requirements.

After years of development, we've made it easy for our customers to enjoy the high-performance of GEO, the global coverage and low latency of LEO and MEO, and the enhanced bandwidth made available when the capacity of these satellites is combined. It's a unique success in the industry and one that will be welcomed across many market verticals, commercial aviation, maritime, defense, and government.

SMW: The Isotropic System's website lists several target markets, consumer, aeronautical, buses and coaches, commercial maritime, river ferries, mobile backhaul, rail, and defense. What is your largest potential market, and if you had an antenna available to sell today, which market would you target first, second, and why?

Government is our initial focus. The increasingly adversarial environment in space makes our antenna a critical element in the U.S.

and NATO's defensive strategy. Large GEO satellites are easy targets that threaten the military's ability to respond in the battlefield if taken out by adversarial forces. Isotropic's antenna mitigates that risk. A single terminal capable of delivering mission-critical communications over multiple satellites avoids catastrophic network outages and empowers a proactive space offensive.

SMW: Aviation: I understand Isotropic intends to license its technology to aero integrators rather than build an antenna on its own. If licensing is still your strategy, what progress have you made in finding an appropriate licensee, and when do you anticipate an aero antenna will be commercially available?

A true multi-link antenna is needed to fill the passenger experience gap that has been so elusive for years. By combining GEO and LEO services, airlines can provide high-speed streaming, polar coverage, and the high speeds and low latency necessary to provide a superior passenger experience. Isotropic Systems is in advanced discussions in the aero sector, and we will announce our plans for aviation next year.

SMW: Cruise Vessels: *Cruise vessels already access multi-orbit and multi-frequency constellations using 2.4-meter multi-frequency, Ku, Ka, and C-band, capable antennas. How can your antenna further the advancements already enjoyed and deployed in the cruise vessel market?*

O3b's MEO constellation has played an enormous role in elevating connectivity aboard leading cruise lines. Imagine what cruise passengers and operations teams can do with GEO and MEO delivered connectivity at sea. With GEO delivering high-quality television content to the ship and MEO providing high-quality, high-speed broadband services – from voice to streaming and gaming offerings – cruise lines can provide an at-home or at-office level service to passengers and crew over a single terminal. While we see potential in the Cruise market, the segment is relatively small compared to opportunities in other markets – only around three hundred vessels. So initially,

our focus is to go after markets with much larger volume potential.

SMW: Maritime Cargo: *While the cargo market for VSAT antennas is around 100,000 vessels, most have less than thirty crew members and use less than 5 Mbps links. GEO HTS Ku-and Ka- band and \$20,000 mechanically stabilized antenna typically serve this market. Do you see cargo maritime as a potentially large market and can you compete in terms of cost with a mechanically stabilized antenna? Will low-latency access to the Cloud help you penetrate this market?*



That's a great question that really highlights the

problem we solve.

We believe the maritime VSAT market offers a huge opportunity for disruption. To date, crews on cargo ships lived with single beam Ku-band

services and minimum data rates of around 5 Mbps. Sharing 5 Mbps with 29 other crew members is a bad online experience. You don't need any more incentive to appreciate the potential improvements in network performance possible through the blending of several satellite's capacities, especially when combining Ka-band capacity with Ku. That's a solution that provides the weather-resistant capabilities of Ku with the low latency possible with high-capacity Ka LEO whenever its available.

SMW: Earth Stations: O3b ground stations typically involve several 2.4-meter tracking antennas. Their high cost (around \$150,000 each), ground infrastructure, and maintenance requirements have restricted the size of O3b's market. Can you replace the two tracking parabolic antennas with a single Isotropic antenna?

Yes, we can. We can supply operators such as SES with all the links they want, enabling them to explore new and better ways to serve businesses and organizations across the globe. They can leverage LEO while connected to GEO

and hand over between the satellites. Telesat and Inmarsat could do the same while connected to GEO and HEO satellites. With it, our customers can add value, command higher margins, and win in the face of significant competition.

Using our antennas, operators can also avoid the need to deploy multiple large tracking antennas, establishing service faster avoiding the extensive maintenance expense associated with large mechanically tracking antennas. As the only technology globally, that can truly mesh orbital assets together without unworkable tradeoffs, we're being noticed. Right now, we're talking a lot with the CFOs of major satellite operators.

SMW: Consumer Market: Building an ESA that can sell for less than \$1,000 has remained a challenge for the industry. Given the honeycomb configuration of your antenna, can you design a unit that breaks that price barrier?

Isotropic Systems turned its focus on the enterprise and government markets early on. We're addressing applications that need these

multi-link capabilities today – namely defense, mobility, and enterprise. However, we have a consumer antenna that gets to a sub-\$500 price point. We believe Kuiper and Telesat could substantially benefit from our capability to deliver truly powerful, profitable, and affordable consumer broadband.

SMW: Military Market: Are you actively targeting the military market? If so, in what applications do you see the most significant opportunity?

The military market is our first target market, and we already have an impressive contract backlog in defense – We have already booked our 2022 targets and are well into meeting our 2023 sales objectives. We've cracked the code allowing them to deliver redundant, high-speed broadband across the battlespace, avoid intentional jamming and effectively confront adversarial threats. That's a huge competitive advantage.



SMW: In September of this year, you secured an additional \$32 million in Series B funding, raising the total capital raised to over \$100 million. Will you need to raise more money, or is the sum you have raised so far sufficient to launch the first commercial product?

Investors understand the value our multi-link antenna brings to a broad range of major markets – from mobility to government and enterprise. That's has enabled us to raise over \$116 million from various sources. We have sufficient funding to bring the first product to market with the capital we have raised so far. We'll launch our first series of terminal products by summer,

as SES' new O3b mPOWER constellation begins to initiate service.

SMW: While mPower deploys in 2022, the LEO constellations are at least 2-3 years away. How do you see the opportunities building for Isotropic as new NGSO constellations start coming online?

While our initial antenna is Ka-band, we also plan a Ku-band antenna. Our roadmap also includes an antenna capable of switching from Ka-band to Ku-band, an especially attractive offering for maritime cargo markets.

With a product that meshes well with multi-orbit plans of SES and Inmarsat, that's just the beginning. With the only platform needed to offer true orbital convergence, operators can unleash the full potential of their multi-orbit capacity around the globe. That's a significant opportunity for Isotropic.



Satellite 1



About John Finney:

Prior to his founding Isotropic Systems, John spent 25 years in the telecoms sector during which he brought Huawei into Europe and took them into their first billion in revenue.

He then moved across into the satellite industry working at medium Earth orbit satellite constellation O3B, which stood for the "Other 3 billion" of the population of the world where broadband internet is not available, going on to raise 1.5 billion USD, launch 12 MEO satellites around the world, before exiting to SES for



Government • Aero • Enterprise • Telco • Maritime

All Satellites. One Terminal. No Compromise



Contact Us →

Isotropic Systems is developing the world's first multi-service, high-bandwidth, low power, fully-integrated range of high throughput terminals to support the satellite industry to "reach beyond" traditional markets.



Launching in 2022

www.isotropicsystems.com