The consumer doesn't care how content gets to their personal devices – it just needs to be cost effective, highly available, at good quality, and ubiquitously usable. Photo courtesy Adobe Stock

Full speed ahead: How satellite operators manage to be both – an ISP and a TV broadcaster

Over the past few years, stagnating revenues in the TV and radio broadcast market have led GEO satellite operators to consider a change in their market approach. Most of them have identified internet for maritime and aeronautical customers requiring governmental and civil services as key market drivers. With the arrival of services exploited by NewSpace ventures in the same market space, traditional operators must quickly adjust their commercial and technical orientation to compete. Hence, the only way forward is "full speed ahead."

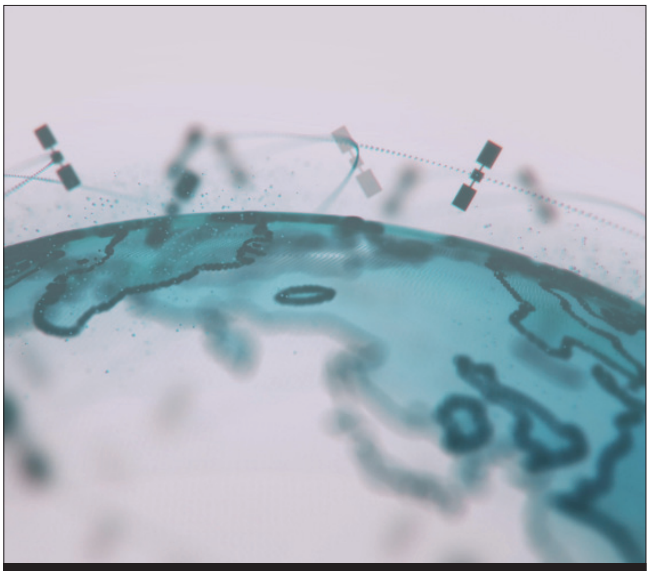
Andreas Voigt, Director, the Satcoms Innovation Group

Broadcasting has been the cash cow for GEO operators for years and consequently a massive area of focus for the entire business. With the transition to being predominantly a B2B and B2C internet service provider, internal service structures needed to be adjusted to accommodate all the new requirements. Although satellite operators always had the idea to provide internet access as a business line in their portfolio, the game changer has been the move to mass market and the shift in the competitive landscape. Satellite has left its niche market position and is now required to compete against other service providers, not just other traditional satellite operators.

That said, the broadcast market is still substantially big and continues to represent a customer base. Moreover, the broadcast market will remain a key component as operators look to move towards IP service delivery. While some operators and market analysts might have seen broadcast vanish completely, additionally accelerated by the COVID-19 pandemic considerably affecting free-to-air (FTA) programs, it needs to be recognized that GEO satellites have the exact infrastructure to deliver additional value in this arena. Reaching hundreds of millions of spectators with one transmitter is and will be the only truly cost-effective technical solution. As long as linear television sets exist, so too will geostationary satellite broadcast – delivering content to CATV providers, cruise ships, airplanes, and as a DTH (Direct to Home) service.

ADAPTING VIEWING HABITS

The way in which TV and radio is consumed has changed drastically. When you consider that the average household



Satellite operators always had the idea to provide internet access as a business line in their portfolio, but the game changer has been the move to mass market and the shift in the competitive landscape. Photo courtesy Adobe Stock ●●●

has more mobile phones than television sets and consumers expect all content to be available across any device, the ability to enable viewing on mobile devices is important to stay relevant. The consumer doesn't care how content gets to their personal devices, just that it is cost effective, highly available, at good quality, and ubiquitously usable.

It is important to understand that satellites in GEO are the technological solution for broadcast – not the format or modulation that is used to transmit the channels. Linear TV and radio programs are watched by many hundreds of millions of users worldwide via installed DVB infrastructure on their TV sets. Currently, almost none of those programs being distributed using satellite technology are viewed on mobile phones or tablets. This is mainly because of satellite's incompatibility with the signal structures of the mobile communication industry.

An intermediate transmission format change is needed to translate DVB broadcast content into IP delivery content. Broadcast channels are no longer demodulated at home, but at a DSL/CATV/RAN headend and delivered for an extra fee via the end customer's specific internet access, reaching their phone, tablet, or TV set all at the same time. It is a question of economics of scale to implement the service as such. Revamping DVB receivers to forward content into an existing home IP network will always have limiting factors.

Giving up on broadcast completely or staying in the status quo of today's broadcast technology development is not an option for a successful future of combined services. There are a lot of countries in the world whose political leaders or spiritual groups want to ensure proper unidirectional distribution of information in and around their country, including regional coverage as well as worldwide perspective. GEO satellite operators can provide this service via their proven broadcast technology platforms for an attractive price at high availability using proven technology.

By applying clever market innovation and selected company cooperation, this content will then be able to be consumed on those traditional TV sets as well as on mobile phones and tablets—all at the same time and within the global service delivery portfolio of satellite communications. To make that step possible, the satcom and mobile communication industries need closer cooperation. They also need to clarify their roles to find synergies in worldwide recognized broadcast norms.

HOW OPERATORS ADOPT CHANGES

Driven by the needs of its users, the broadcast industry is embracing various technology changes that will start to bear fruit. To reduce RTT (round trip time) for Internet access, most of the traditional geosynchronous satellite operators have decided upon using satellite constellations in lower orbits using a mix of satellite fleets that provide truly flexible and fully global communications.

For internet access, those additional LEO or MEO fleets are already in service or close to being officially operational. In addition, the traditional GEO operators have opened new markets with the latest new flexible and customer definable satellites on the fly, very high throughput (VHTS) systems with Ka, Q and V-band, and powerful satellites in Ku-Band with ultrawide footprints for broadcasting.

An interesting dilemma that is unfolding with regards to providers of NewSpace satellite fleets is the lack of understanding that the frequency licensing rights need to be fully coordinated on a worldwide perspective. This is becoming of critical importance as LEO/MEO fleets are using the same frequencies in uplink and downlink both in Ku- and Ka-Band as the GEO operators do to close their communication links.

Up until now, we do not have any filing of interference for any GEO/LEO combination with regards to gateway or user links on either system. Developments in flat panel antenna (FPA) multiple beam pointing on board these LEO satellites – using, in combination, live onboard GPS data correlation – has made that possible. As such, these low-orbiting satellites know exactly, 100 percent of the time with minimum error, where they are in latitude, longitude, and altitude. This allows for accurate onboard beam pointing to their gateways and user terminals, while avoiding disruption of existing GEO satellite links.

These technology developments will eventually be a game changer with the help of innovative FPA ground segment antennas, no matter if installed for mobile or fixed services. Only a FPA assembly will allow a bidirectional IP connection through the LEO/MEO fleet or VHTS satellites while receiving GEO broadcast content in parallel with multibeam technology in transmission and reception.

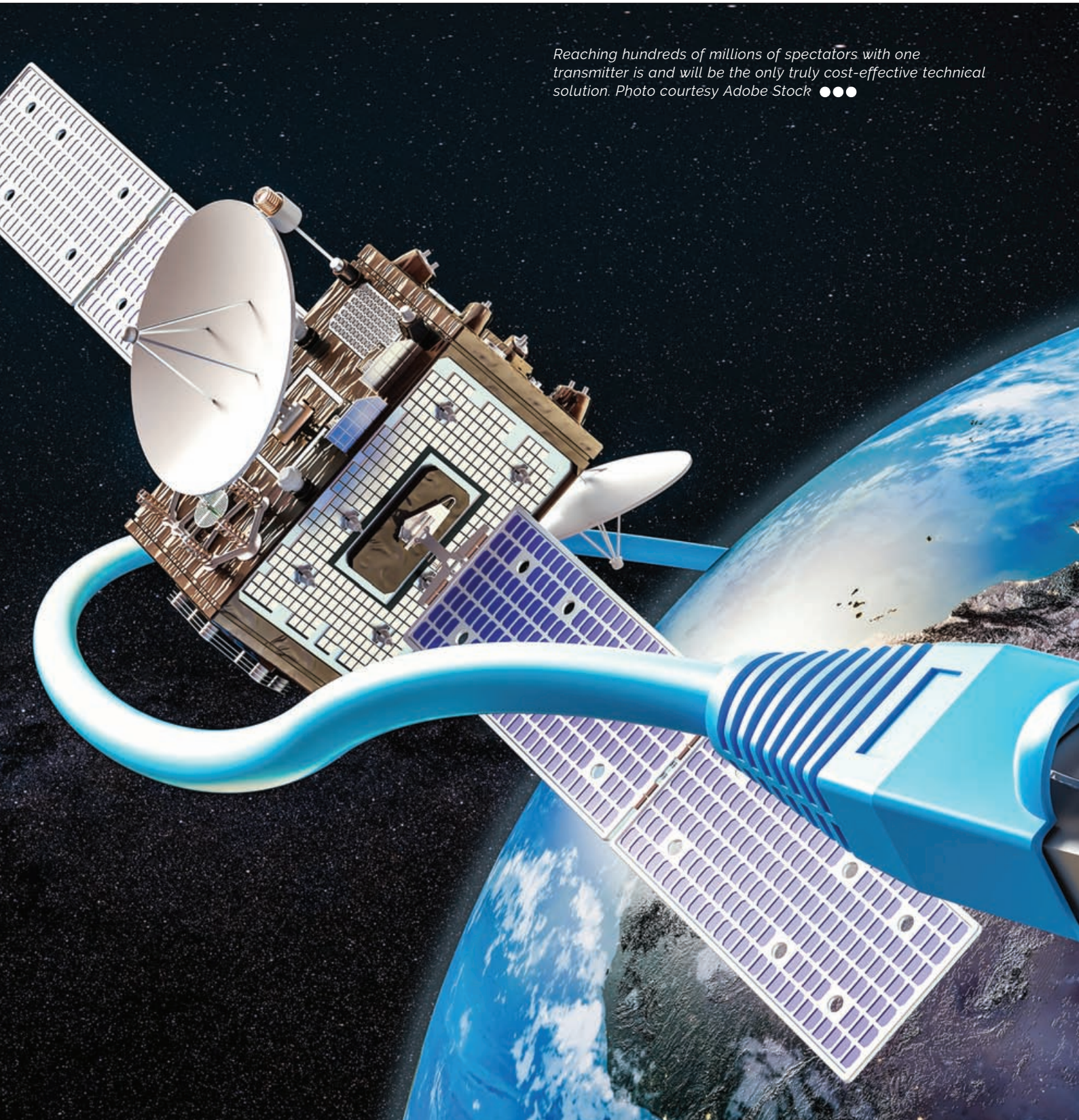
Any FPA system that can receive from and transmit to GEO satellites today, will eventually be able to do the pointing on LEO satellites in the same frequency range without a problem. Flexible beam pointing and adjustments grant it. It does not matter if the vehicle or the satellite moves – or both. In addition, with such a GEO capable FPA system, link margins for LEO will be excellent.

THE FUTURE OF SATELLITE IP CONNECTIONS AND BROADCAST

Because of NewSpace activities, traditional GEO satellite operators have understood the changing climate and are evolving by rewriting the rules of the game. Worldwide low-level RTT Internet access delivery can now be

guaranteed and delivered where needed, even in polar regions that GEO satellites can't reach. In parallel, existing and relatively low-cost user terminals for VHTS connectivity, flexible satellite infrastructure with customer definable space capacity for secure communications, and high power DTH broadcast capabilities are all available at the same time—adjustable and tailorable for customer needs.

They are installable at home, in a car, on a boat or on a plane. The satellite solution of the future will be a combination built from several services, potentially combined in one FPA installation, having several links to multiple satellites at a time. As such, the customers can go "full speed ahead" with their individual communication requirements, no matter if it is in IP, DTH or a combination of both.



Reaching hundreds of millions of spectators with one transmitter is and will be the only truly cost-effective technical solution. Photo courtesy Adobe Stock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