

Intelsat Epic Enhances Widely-deployed Ground Network Technology

iDirect Evolution is widely adopted in the U.S. Government with Ground-based Fixed/Deployable networks across the DoD such as the USSOCOM C2 networks, the Army CSS-VSAT network, and the DISA Enterprise SATCOM Gateway (ESGM) initiative.

In April 2016, IGC conducted iDirect Evolution performance testing on one of its Intelsat Epic satellites on a number of DoD user terminals from Tampa Microwave, L-3 GCS Panther II, Harris Seeker, GATR Flex and TECOM KuStream, to measure capability and verify gains on the first Intelsat Epic satellite. IGC specifically chose test assets that reflected the combatant commands desire to field systems with lower size, weight, and power requirements (SWaP).

IGC set up a test network on the satellite utilizing 12 MHz for the forward and return links each. Leveraging the hub terminal at Intelsat's Mountainside Teleport in Hagerstown, Maryland and various remote terminals, a TDMA network was established. Testing was conducted with multiple terminals and is summarized in the table below.

To compare Intelsat Epic performance to legacy wide-beams, a baseline was set based on IGC's experience of maximum throughput capability of various well understood customer networks, adjacent satellite interference, and ITU power spectral density (PSD), and terminal performance characteristics. IGC has operated many iDirect Evolution networks for a wide variety of customers on legacy wide-beam

iDirect Evolution Performance Testing on Intelsat Epic

Terminal	Intelsat Epic Data Rate				Galaxy 19 Data Rate			
	Transmit (Mbps)	Efficiency (bits/Hz)	Receive (Mbps)	Efficiency (bits/Hz)	Transmit (Mbps)	Efficiency (bits/Hz)	Receive (Mbps)	Efficiency (bits/Hz)
TECOM Ku-Stream1500	9.1	1.01	17.5	1.46	1.9	0.21	8.0	0.67
Tampa Microwave TM-65 (Legacy)	10.7	1.19*	19.5	1.63	3.75	0.42	10.0	0.83
Tampa Microwave TM-95 (Legacy)	10.7	1.19*	19.0	1.58				
Tampa Microwave TM-95 (Enhanced)	10.7	1.19*	26.0	2.17				
Tampa Microwave TM-130 (Legacy)	10.7	1.19*	29.0	2.42				
Tampa Microwave TM-130 (Enhanced)	10.7	1.19*	27.9	2.33				
L3-Communications Panther II - 60cm	10.7	1.19*	19.5	1.63				
L3-Communications Panther II - 95cm	10.7	1.19*	29.0	2.42				
Harris Seeker - 130cm	10.7	1.19*	29.0	2.42				
GATR Flex - 75cm	10.7	1.19*	29.0	2.42				

*The return rate (outbound) is a hardware limitation of the iDirect e850mp remote card whereas the maximum symbol rate of the return link is 7.5 Msps occupying 9 MHz. With newer e950mp remote cards, higher data rates can be achieved in the full allocated 12 MHz bandwidth.





“The extreme portability of our sub-meter GATR-FLEX terminal and IGC’s new high-throughput, high-performance satellite have been successfully tested to deliver command and control (C2) in addition to full-motion video capabilities.”

Paul Gierow, president of Cubic|GATR

satellites. On a typical Intelsat satellite wide-beam satellite the TECOM Ku-Stream 1500 airborne terminal could achieve 8 Mbps inbound (0.67 bits/Hz) and 1.9 Mbps (0.21 bits/Hz) outbound.

On an Intelsat Epic satellite, the TECOM terminal achieved 17.5 Mbps inbound (1.46 bits/Hz) and 9.1 Mbps (1.01 bits/Hz) outbound, yielding data rate improvements of 219% and 479% respectively. Broadband speeds to the tactical edge enable new network capabilities and applications not normally associated with traditional VSAT communications such as high definition full-motion video (HD FMV) and high data rate backhaul.

Information dominance is a key enabler in today’s military operations where throughput is paramount. Government networks continuously grow in size and complexity while remote systems decrease in SWaP; these evolutionary changes are undeniable and depend on the increased capability HTS systems like Intelsat Epic brings to bear. With more platforms, missions, and services battling for bandwidth, more throughput and speed is vital.

About Intelsat

Intelsat’s global team of professionals is focused on providing seamless and secure, satellite-based communications to government, NGO and commercial customers through the company’s next-generation global network and managed services. Bridging the digital divide by operating one of the world’s largest and most advanced satellite fleet and connectivity infrastructures, Intelsat enables people and their tools to speak over oceans, see across continents and listen through the skies to communicate, cooperate and coexist. Since its founding six decades ago, the company has been synonymous with satellite-industry “firsts” in service to its customers and the planet. Leaning on a legacy of innovation and focusing on addressing a new generation of challenges, Intelsat team members now have our sights on the “next firsts” in space as we disrupt the field and lead in the digital transformation of the industry.

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