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ADVANCED HIGH THROUGHPUT COMMUNICATION SATELLITES

Abstract

In August 2010 Ka-Sat of Eutelsat has been launched into a 9o East orbital location. Nearly three years after launch (July 2013) Eutelsat had 91,000 customers on this spacecraft. The capacity of Ka-Sat is about 70 Gbit/s. Observing the subscriber growth a saturated behavior is visible. This is unexpected and not in line with common business models, were subscriber uptake growths after a few years. The reason for this behavior seems to be that some of the 82 spot-beams of Ka-Sat are already saturated, whereas a large number of the other spot-beams are under-utilized. The Ka-Sat design forbids the transfer of downlink resources (mainly RF-power) from under-utilized beams to the already saturated beams. To overcome this bottleneck of the business case a technical solution is urgently needed. The use of advanced semiconductor technologies for on-board processing provides the required flexibility at the cost of higher complexity. This is the route to a 'software defined payload' by changed the hardware function implemented in FPGA's during their lifetime in-orbit. Digital processed transparent as well as regenerative transponder concepts will be discussed. The latter allows. Besides other advantages, cheaper user two-way terminals to be implemented, helping the growth of the subscriber base.