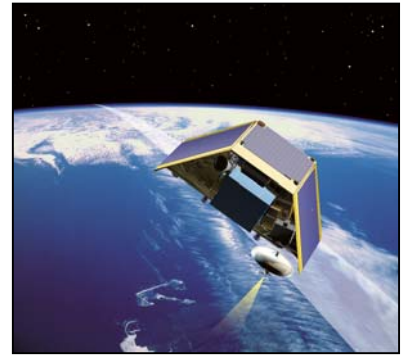


Summary

MDA Space Missions (MacDonald Dettwiler and Associates) has recently received funding for and begun development of the CASCADE satellite system, a fleet of low cost LEO small satellites for high bandwidth store-and-forward communications. Analogous to a "FedEx™-in-the-Sky", the CASCADE *GigaPackage* service will enable cost-effective pickup and delivery of extremely large digital data files, between 10s to 100s of Gbytes per user, anywhere in the world within hours. This store-and-forward service is not much different than the operations of a normal courier service but uses satellites rather than trucks and transfers very large digital data files instead of physical packages.



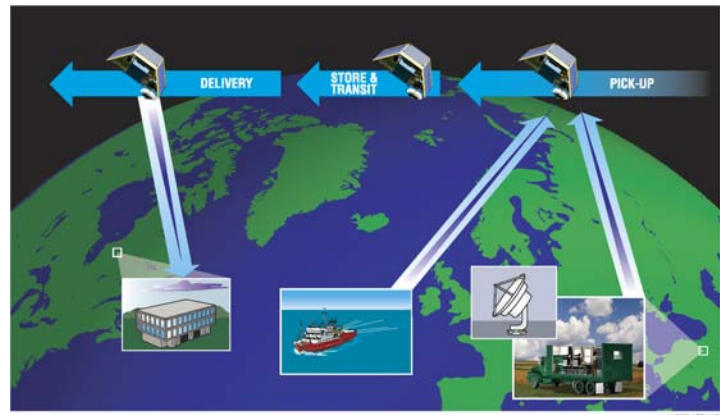
System Overview

A low cost solution for secure large volume batch data distribution, CASCADE will free up over-subscribed real-time military satellite communications networks and provide near term, cost effective high bandwidth connectivity in support of information superiority and network centric warfare.

As a fleet of small (approximately 300 kg) LEO satellites (orbit of 1200 km, 60-70° inclination), the CASCADE system (patent pending) will provide coverage of even the most remote regions on Earth, including ships at sea and beyond 80° N-S latitude (full polar coverage will be achievable with higher inclinations, which is an option). The service will meet the requirements of an identifiable niche market for very large volumes of data on a routine daily basis--demands that cannot now be met by any competing service. The satellites will service individual data sources and sinks sequentially on a pre-scheduled basis to effect simple but timely store-and-forward movement of large data packages, supporting point-to-point and point-to-multi-point applications.

The CASCADE satellites will support composite 1.4 Gbps data transmission rates and will have more than 6 Tbits of on-board storage. The uplink and downlink can support data transfer in excess of 9 Gbytes per minute, supporting an average single pass collection of 90 Gbytes. Data end-to-end fidelity is comparable to tape-to-tape copying, as pre and post processing techniques ensure that the end-to-end BER is no worse than 1x10⁻¹⁷.

Rugged marine-stabilized terminals will allow communication with ships at sea, while fixed or transportable terminals will permit delivery directly to or from the user's rooftop or base camp. The user terminals are compact and easy to use, incorporating dish antennas as small as 1.2 meters depending on the specific requirement. The terminals interface to any standard IP based LAN and no connection is required to terrestrial infrastructure. The service is very appropriate for security conscious users, as the system never reads the data and can pickup and deliver fully encrypted files.



Affordability and Implementation Readiness

The CASCADE system has been designed for simplicity and cost effectiveness. The system is fully scalable and can be started with one satellite; as demand increases, more satellites can be added to the fleet to improve overall throughput and reduce delivery latency. The service can also be offered on a per GB transferred type basis.

The Cascade technology demonstration mission, called CASSIOPE, is fully funded and scheduled for launch in 2008. CASSIOPE will demonstrate the key enabling and advanced technologies and operations required to implement the CASCADE system, including: the Ka-band RF transmit and receive chains; the high data rate space qualified modulators and demodulators; the high capacity, low power, low mass on-board data storage; and the end-to-end very large file transfer method. Leveraging the technology development work that is already well underway, the first CASCADE satellites could be ready for service as early as 2009.

Point of Contact

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