

N-STAR

SS/L satellites have amassed 650 years of cumulative on-orbit service.

Two Space Systems/Loral (SS/L) satellites with the highest capacity of any commercial payloads in space were delivered on orbit in 1995 and 1996 and are now providing a variety of fixed and mobile domestic communications services to customers throughout Japan.

These satellites, N-STAR-a and -b, replace the service of the SS/L CS satellites, which have now exceeded their expected lifetimes, and will also provide significant new services, which range from providing alternate routes for telephony, to emergency communications, to marine and terrestrial mobile services, and ISDN.

The N-STARs were built for Nippon Telegraph and Telephone (NTT) and NTT Mobile Communication Network Inc. (NTT DoCoMo).

Dubbed "switchboards in the sky," for their wide range of abilities, these 26-transponder satellites each carry five separate communications payloads operating in four frequency bands:

- The S-band payload provides terrestrial and maritime mobile communications services in four S-band antenna beams via a radio-frequency feeder link at C-band. Dual-mode phones enable users to connect to either conventional cellular or satellite service.
- The Ka-band multibeam payload provides satellite switched time-division multiple-access (SS-TDMA) communications for the main Japanese islands and Okinawa. This payload is a dynamic switch, programmable by commands from telemetry uplinks to switch traffic from any of eight uplink beams into any of three downlink beams as needs and conditions change.
- The Ka-band shaped-beam payload provides five 100-MHz wide channels, operating as a conventional turnaround repeater.
- The C-band payload provides six 72-MHz channels, one of which serves as a dedicated feeder link for the S-band mobile system.
- The Ku-band payload provides eight 54-MHz channels, each using a high-power TWTA as its final amplifier. One of the channels serves as a backup to the C-band feeder link for the S-band mobile system.

In N-STAR, SS/L delivered a turnkey package on orbit that included design and construction of the satellite, procurement of launch services and insurance, orbit raising, and in-orbit checkout. The N-STARs were launched aboard Ariane 44P vehicles.

N-STARs are based on SS/L's three-axis, body-stabilized 1300 platform, whose modular design has proven its worth during some 290 years of cumulative on-orbit service, close to one-half of the total of 650 years amassed by SS/L satellites to date.



SS/L's 1300 platforms are designed to achieve long useful orbital life — in this case 10 years — through use of a bipropellant propulsion system and a momentum-bias system for excellent stationkeeping and orbital stability. Solar arrays and nickel-hydrogen batteries provide uninterrupted electrical power.

Space Systems/Loral, a wholly owned subsidiary of Loral Space & Communications, is a premier provider of a full range of satellite systems and services, including the procurement of insurance and launch services and mission control operations from its Palo Alto, California, headquarters. SS/L is ISO 9001 certified.

SS/L's product mix comprises the 20.20™, the most powerful geostationary (GEO) commercial spacecraft to fly, 1300 GEO satellite platform and the 401S low-earth-orbit (LEO) spacecraft.

SS/L's backlog consists of more than 60 satellites designed for applications such as digital tele-communications, telephony, direct-to-home broadcast, environmental monitoring, or air traffic control.

SS/L's international customer base includes businesses and government agencies involved in communications and environmental monitoring. Customers for satellites under construction or recently launched include: APSTAR, CD Radio, Chinasat, Globalstar, NASA, INTELSAT, Rocketdyne, KaSTAR, Mabuhay, MTSAT, Loral Orion, PanAmSat, Loral Skynet, and TEMPO. For more information, visit Space Systems/Loral's web site at <http://www.ssloral.com>.

Loral Space & Communications (NYSE:LOR) is a high technology company that primarily concentrates on satellite manufacturing and satellite-based services, including broadcast transponder leasing and value-added services, domestic and international corporate data networks, global wireless telephony, broadband data transmission and content services, Internet services, and international direct-to-home satellite services. For more information, visit Loral's web site at <http://www.loral.com>.

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