

Boeing Delta 2 to launch last deployment mission for Iridium system

Boeing News Release

HUNTINGTON BEACH, Calif. - A Boeing Delta II expendable launch vehicle will lift five Iridium telecommunications satellites into orbit Friday, May 15, from Vandenberg Air Force Base, Calif., to complete the last deployment mission for the Iridium system. The five-second launch window opens at 2:28 p.m. PDT.

The launch will be the ninth by Boeing [NYSE: BA] in a series of missions for Motorola, builder of the Iridium system satellites. Since May 1997, Boeing Delta II rockets have carried 40 Iridium system satellites into orbit.

Delta rockets are credited with 15 successful launches during the past 12 months, placing 53 satellites into orbit. Nine of the 15 launches were for the Iridium system.

There will be a live satellite feed of the launch. Satellite GE 3K, Transponder 16. GE 3K is at 87 degrees West. This is a 36 Mhz transponder. Uplink Frequency 14320 (Vertical), Downlink Frequency: 12020 (Horizontal). Broadcast time is 2 to 3 p.m. PDT.

Iridium launch to complete satellite constellation

Iridium LLC News Release

WASHINGTON, DC - The next five Iridium satellites will be placed into orbit on a Delta II rocket. These satellites will complete the 66-satellite Iridium system. This launch is the ninth scheduled Delta launch to take place at Vandenberg Air Force Base in California. It is the fifteenth Iridium system launch in just 12 months, and will bring the total number of operational satellites on-orbit to 67.

WHERE: Vandenberg Air Force Base, Lompoc, California -Launch Complex-2

WHEN: May 15, 1998 at 2:28 p.m. PDT (5:28 p.m. EDT)

LIVE FEED: Live satellite broadcast feed of the Iridium fifteenth launch will begin at 2:00 p.m. PDT and end at 3:00 p.m. PDT.

Satellite coordinates are as follows:

GE 3 Ku-band transponder 16

GE 3 is located at 87 degrees west longitude

Down link Frequency: 12,020 MHz, horizontal polarity

BACKGROUND: Iridium LLC is developing and commercializing a global digital wireless communications network that will combine the worldwide reach of 66 low-earth-orbit satellites with land-based wireless systems, to enable subscribers to communicate using handheld telephones and pagers virtually anywhere in the world. Service introduction is planned for September 1998.

COMPANIES: Iridium LLC is an international consortium of leading telecommunications and industrial companies funding the development and implementation of the Iridium System. Designed and built by Motorola's Satellite Communications Group based in Chandler, Arizona, USA, the five Iridium System satellites will be carried into orbit on a Delta II rocket.

Motorola, Inc. is one of the world's leading providers of global digital wireless network infrastructure, electronics equipment, systems, components and services for worldwide markets. Products include two-way radios, pagers and telepoint systems, cellular electronics, automotive and industrial electronics, computers, data communications, and information processing and handling equipment.

Iridium Satellite Communications System

Glossary

Arianespace

A company owned by the French government responsible for building and operating the Ariane launch vehicle.

CNES

France's space agency, the Centre National d'Etudes Spatiales.

consumables

Resources, such as propellants, aboard a spacecraft which are depleted during a mission and cannot be replaced.

Doppler shift

A change in the frequency of waves (usually sound or radio) from a given source when the source and the observer are moving with respect to each other. The frequency is higher than normal as they approach each other and lower as they part.

DORIS

Doppler Orbitography and Radiopositioning Integrated by Satellite.

gigahertz

One billion cycles per second.

hydrazine

A highly toxic liquid fuel typically used in attitude control thrusters on spacecraft. Hydrazine is typically not ignited to produce thrust, but rather is rapidly decomposed in a chemical reaction.

hypergolic

Propellants that will ignite upon contact of their components without external aid such as a spark.

inclination

The angle between the satellite orbit plane and the earth's equatorial plane.

ionosphere

The part of the earth's atmosphere beginning at an altitude of about 30 miles and extending outward 300 miles or more. The ionosphere contains a large quantity of positively and negatively charged particles or ions (a neutral plasma). 95% of the ionosphere is below the orbit of the TOPEX/Poseidon spacecraft.

JPL

NASA's Jet Propulsion Laboratory.

kb/s

One thousand bits per second.

low-gain

A radio-antenna system which has a low efficiency relative to a directional or "pointable" system. The advantage of a low-gain system is that the antenna does not need to be aimed at a receiver. The disadvantage is that since the radio signal is transmitted in all directions, most of the power is lost.

magnetic torquer bars

Electromagnets used to push against the magnetic field of the earth, causing the spacecraft to turn.

mono-propellant

A rocket propellant containing both the fuel and the oxidizer in a single substance.

nadir

The direction pointing from the satellite to the center of the earth, directly opposite the zenith.

NASA

National Aeronautics and Space Administration.

payload

Spacecraft equipment related directly to the purpose of the flight as opposed to equipment necessary for its operation.

safe-hold mode

Backup state of the spacecraft. A spacecraft will usually switch itself to a safe-hold, or protected state if a fault is detected. Various levels of backup states have been defined to cover different situations.

transponder

Transmitter and receiver aboard the satellite that receives and re transmits the ground signal for purposes of tracking the satellite.

zenith

The direction pointing from the center of the earth upward through the satellite, directly opposite the nadir.

zenith hemisphere

The area above and directly to the sides of the spacecraft.

Iridium Satellite Communications System

Financial Information

NASDAQ Exchange ticker code IRIDF.

Total Assets of US\$3,190,885,000 (sept 97)

Iridium LLC is far ahead of rival systems. Except in the Pacific Rim, Iridium LLC has virtually sewn up the world contractually tying in with public-switched telephone network owners and cellular system providers just about everywhere there's a phone. This virtually guarantees Iridium's survival and profitability provided they are able to get the network online as planned.

<Picture>

Investors

Investors include:

- Iridium Africa Corporation
- Iridium Canada, Inc.
- Iridium China (Hong Kong) Ltd.
- Iridium India Telecom Limited (IITL)
- Iridium Middle East Corporation
- Iridium SudAmerica Corporation
- Khrunichev State Research and Production Space Center
- Lockheed Martin
- Motorola
- Nippon Iridium Corporation
- o.tel.o communications GmbH
- Pacific Electric Wire & Cable Co., Ltd.
- PT Bakrie Communications Corp.
- Raytheon
- SK Telecom
- STET—Società Finanziaria Telefonica per Azioni
- Sprint
- Thai Satellite Telecommunications Co., Ltd.

<Picture>

Realtime Information

Iridium financial information is changing rapidly due to their ongoing launches and growing global partner network.

Financial figures posted on this site would be rapidly out of date, a frame system has therefore been built, allowing the following information to be displayed in a window within this site.

NEW SATELLITES FLASH THE SKIES

A giant constellation of 66 Earth- orbiting satellites, each the size of two large refrigerators stacked atop one another, is now in position 780 kilometres above the Earth's surface. The \$6 billion Iridium project, operated by communications giant Motorola, is the largest commercial space venture ever mounted, yet it remains virtually unknown to anyone outside the aerospace industry.

After a brief testing period, the satellite network will bring into service in September the first global cellular-type wireless phone system. Since at least one of the 66 satellites will be near overhead at any given time, Iridium subscribers will be able to call anywhere in the world without placing the call through the local telephone company.

<snip>

In addition, the satellites' highly reflective transponder antennas - each about the size of a standard household door - produce brilliant flashes as the satellites pass overhead. The flashes are reflected sunlight and, to the naked eye, look like bright stars that appear out of nowhere, then quickly fade. They can become brighter than Venus for a few seconds. Amateur astronomers have been enjoying watching for these Iridium flashes, but the novelty may wear off in a few months. Predictions are available on the Web at:

<http://www.gsoc.dlr.de/satvis/>

During annual meteor showers there is always the rare chance of observing a meteor that is heading almost directly at you. This meteor will also appear as a flash which will usually last for a fraction of a second (not many seconds as with the Iridium flashes) and will rarely be as bright as Venus, the third brightest celestial object in the sky next to the Sun and Moon. One excited amateur astronomer friend of mine once saw flashing lights in the sky that changed directions frequently. I pointed out to him that the flashes of light which he thought were UFOs in the distance were in fact nearby fireflies.

Go to the Web site above, note the times of the next Iridium satellite flashes and try to observe them. Some of these flashes, which will now occur regularly (more common than firefly sightings too?), may even be reported as UFOs.

Nick Balaskas

Voice, Data, & Video

Offering a complete line of direct satellite products including:

<Picture>Transponder time shares on more than 50 birds<Picture>VSAT offerings through 5 major providers<Picture>Broadband Satellite up to 45 Mbps point-to-point or multipoint<Picture>Transmission Grade Video Services (up to D3 grade)<Picture>Individual Satellite Phones with servicing through Inmarsat & others<Picture>Low Earth Orbit Handheld Satellite Phones through Iridium<Picture>Global Direct Satellite Paging in 25 GHz band through Iridium<Picture>Compressed voice solutions with up to 260 voice channel on 1.5 Mbps of broadband<Picture>Solutions for up to 10 voice channels on a single 56kbps satellite circuit<Picture>STU-III Encryption & Authentication Solutions

Ask yourself:

<Picture>Do all of my satellite services share common orbital planes ?<Picture>Even with my current satellite provider(s), am I exposed to carrier failures?<Picture>Would my enterprise benefit from supplementing or replacement our land-line circuit with VSAT?<Picture>How can you offer VSAT pricing so close to its frame-relay land-line alternative?<Picture>If someone snipped a few strands of fiber in the sewer - could my enterprise survive the repair time?<Picture>If my local CO or NAP was destroyed - Would the business survive the 60+ Days of repair time?<Picture>Can you really afford these risks?<Picture>What happens if carrier X in country Y missed a Y2K bug and goes down? Do I lose my European nodes?

ITS NOT ONLY FOR THE BIG GUYS!!!

<Picture>

Take a step toward a more resilient enterprise

Most of today satellites are simple transponders (bent pipe).<Picture>To avoid intermodes the GEO orbit is divided to 180 slots (2°).<Picture>Companys like Loral-Skynet and PanAmSat has many satellites and are selling transponder capacity.<Picture>Customers can use different protocols and modulation methodes.<Picture>New satellites systems based on NASA's ACTS (SpaceWay).

Teledesic Global, broadband "Internet in the SKY"

Using a constellation of 288 low-Earth-orbit satellites, that will orbit at 1,375 km<Picture>World's first network to provide affordable, worldwide, "fiber-like" access to telecommunications services such as : broadband Internet access, videoconferencing, high-quality voice and other digital data needs,