Boeing and IBM Set New Record with World's Most Powerful Satellite Digital Communications Processor

Boeing Satellite Systems (BSS), a unit of The Boeing Company (NYSE:BA), and IBM (NYSE:IBM) today announced they have created the world's most powerful satellite-based digital signal processor, designed to make space-borne wireless communications available to a wide audience of users.

This digital signal processor is the heart of the Thuraya satellite, a powerful Boeing-built GEO-Mobile (GEM) spacecraft that was launched in October 2000 for Thuraya Satellite Telecommunications Co., Ltd., based in the United Arab Emirates. The digital signal processor provides the satellite with more computing power than 3,000 Pentium III-based computers, enabling the spacecraft to handle up to tens of thousands of phone calls simultaneously.

Space-based wireless systems offer a new means of connectivity for areas of the world where telephone lines and other infrastructure for traditional communications are less developed or don't exist. Boeing is tapping IBM's advanced custom integrated circuit technologies to improve the performance, reliability and cost of satellite-based communications, vastly improving the performance of previous digital satellite systems.

"We are extremely proud of our digital signal processing expertise," said Randy Brinkley, president of Boeing Satellite Systems. "The digital signal processor aboard the Thuraya satellite is five times more capable than any previous Boeing digital processor. We are proving that by advancing the state-of-the-art in satellite communications technology, we can provide viable alternatives to land-based communications systems."

Thuraya's chief executive Yousuf Al Sayed added: "We are pleased to be powering our system using such advanced processing technology. The digital signal processor is one example of how Thuraya has incorporated the most powerful technological options available today toward the creation of a truly pioneering telecom initiative."

Key to the highly flexible digital processor is its high density Application Specific Integrated Circuit (ASIC) chip technology. Designed by BSS and built by IBM, Thuraya satellite ASICs contain up to 3.8 million gates (circuits) each and represent the first adaptation of commercial ASIC technology to very large-scale digital satellite payloads. In a 17-month period, Boeing and IBM jointly designed, built, and delivered nine multimillion-gate ASICs with 100-percent first-pass success rate, enabling delivery of flight units just 24 months after the official start of design.

"We're constantly refining our custom chip technology for higher performance, lower power and faster time-to-market, with improved costs," said David Balkin, director of ASIC and Electronic Design and Automation development, IBM Microelectronics Division. "Our work with Boeing is another example of the wide range of applications that can benefit as a result. IBM chip technology has become a key component in extending the reach of the communications infrastructure."

On November 12, 2000, Boeing engineers brought the powerful Thuraya digital signal processor online for service, placing phone calls only three days after orbital insertion of the spacecraft at 44 degrees East longitude. The satellite has since completed in-orbit test and evaluation, allowing Thuraya to begin launching commercial service to more than 20 countries in July. The Thuraya satellite communication system serves the Middle East, North and Central Africa, Europe, the Indian subcontinent and Central Asia with medium-bandwidth data exchange and voice conversations using compact cellular telephone handsets.

The satellite's digital communications processor incorporates variable-bandwidth channel capability, on-board circuit switching for more than 25,000 full duplex circuits, and agile transmit/receive digital beam forming for more than 300 projected cell sites. Using the satellite's built-in on-orbit test capability, engineers confirmed perfect performance of this critical commercial digital signal processing technology in record time.

Incorporating BSS' third-generation very large-scale digital processing technology, the Thuraya payload is one of more than 28 major digital communication systems delivered by BSS in the last eight years. Together, these systems contain more than 43,000 ASICs of 50 major types that represent a chain of design successes unparalleled in the satellite industry.

The Boeing regional digital voice and data communications systems are now available on short schedules as "off-the-shelf" catalog items from the space-proven GEM product line. A fourth-generation BSS digital signal processor is currently in production for a Boeing 702 Spaceway broadband satellite scheduled for launch in late 2002. That payload is based on even more advanced IBM copper ASIC technology with more than 8 million gates per chip.

About Thuraya
Thuraya is a leading regional mobile satellite telecommunications company. Established in April 1997 in the UAE as a private joint stock company, Thuraya has a shareholder base made up of 18 prominent telecommunications operators and investment houses. Thuraya is a US $1 billion mobile satellite telecommunications project that will serve about 100 nations in Europe, Africa and Asia. Besides its integrated satellite-GSM handsets, Thuraya's product offerings include a vehicular adapter, a home docking unit for indoor use and a fleet management system. For more information, visit Thuraya on the web at www.thuraya.com.

About Boeing Satellite Systems
BSS is the world's leading manufacturer of commercial communications satellites, and is also a major provider of space systems, satellites, and payloads for national defense, science and environmental applications.

The Boeing Company, headquartered in Seattle, is the largest aerospace company in the world and the United States' leading exporter. It is the world's largest manufacturer of commercial jetliners and military aircraft, and the largest NASA contractor. The company's capabilities in aerospace also include rotorcraft, electronic and defense systems, missiles, rocket engines, launch vehicles, and advanced information and communication systems. The company has an extensive global reach with customers in 145 countries and manufacturing operations throughout the United States, Canada and Australia.

About IBM
As the number one supplier of ASIC (custom, "application-specific integrated circuit") chips worldwide, IBM has the design know-how to combine more circuitry on a single chip than anyone. IBM also has a unique collection of technologies to manufacture the smallest, densest circuits in the industry, using copper wires, silicon-on-insulator (SOI) transistors and improved "low-k" dielectric insulation.

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For further information:
Sana Bagersh
Thuraya
9-7-1-2-6161-338 or 9-7-1-5-617-8820
Diana Ball
Boeing Satellite Systems
(310) 662-7473
Cary Ziter
IBM
(845) 892-5005
BOEING SATELLITE SYSTEMS, INC.
Public Relations Department 7/01 P.O. Box 92919 (S10/S323) Los Angeles, CA 90009
Public Relations (310) 364-6363