

Channels

A Publication of



AUTUMN 1999
VOL. 10 NO. 4

You're Invited to Join Hughes Network Systems...

at the World's Largest Telecommunications Event

Join representatives from Hughes Network Systems (HNS) at Telecom '99 in Geneva, Switzerland. From October 10 to 17, and in partnership with Hughes Space and Communications (HSC), HNS invites you to visit its booth located in Hall 4, stand 4023. Itself an exciting convergence of the latest communications and networking technologies, the dramatic booth forms the backdrop to an exhibition of both HNS and HSC's latest achievements and future plans. Featuring a state-of-the-art intranet, visitors will be able to view online the entire range of HNS and HSC products and services. In addition, users will be able to select the literature that they want and have it emailed directly back to their home offices for perusal at a later and more convenient time.

HNS will join more than 600 companies, representatives of 200 governments, and over 200,000 attendees, to celebrate recent accomplishments and display new technology in the converging fields of telecommunications, broadcasting, and the Internet. Demonstrations on the wide range of products and services offered by HNS and all its subsidiaries will run throughout the show. HNS personnel will be on hand to offer

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HNS Introduces World's Fastest Multimedia Networking Product — DirecWay Multimedia VSAT™

Enterprises today increasingly need to distribute media-rich, IP-based content to support internal communications and they need to do it in a cost-effective and reliable manner that offers uniform service to geographically dispersed multiple sites. To support these requirements, HNS is introducing the highest-performance, two-way very small aperture terminal (VSAT) available on the market — DirecWay Multimedia VSAT™. An integration of HNS' technologically advanced, reliable, and proven



PEST™ and DirecPC®/Enterprise Edition, DirecWay Multimedia provides users with greater economy and ease of operation for enterprises requiring an integrated solution for providing broadband IP with a return channel. It offers outbound route speeds up to 24 Mbps and has a return channel that

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Executive CORNER



As we face the dawn of a new century, we have taken time to reflect on where we have come from and where we must go in the future — not only to sustain growth, but to better serve the needs and demands of our customers. Consequently, we have taken the opportunity of this historical juncture to create a little history of our

Roberto Campitelli, President, HNS Europe

own. In recognition of the importance and diversity of the European marketplace and in keeping with the customer-driven philosophy of Hughes Network Systems (HNS), we are proud to announce the creation of Hughes Network Systems Europe (HNSE).

Dedicated to the unique demands of Europe's escalating communications

needs, HNSE is committed to providing first-class products, services, and support from its offices, facilities and staff located across Europe. Not limited to sales and customer service, this new European presence will encompass product development, manufacturing, and support capabilities. Through HOT

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Telecommunications

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more comprehensive information on all HNS solutions and how they can be applied to your business needs.

HNS plans a wide range of live demonstrations to highlight the latest developments in high-speed, high-bandwidth applications.

- DirecPC Turbo Internet – High-speed Internet delivery system.
- DirecPC Enterprise Edition – Highest-bandwidth delivery of IP data, video, and multimedia available.
- Very small aperture terminals (VSATs) – Most cost-effective wide area networking solution for point-to-multipoint data delivery and collection
- Interactive distance learning systems – Highest-quality, interactive distance learning systems available
- Cable modems – Latest developments in high-speed Internet access and video streaming.

AIReach™ 9000: The Best Solution for “Last-Mile” Access

AIRreach™ 9000 is a fiber-class wireless access system designed to offer high-bandwidth services to business and multidwelling residential customers. HNS’ second-generation, point-to-multipoint radio product integrates access for services such as switched voice, high-speed data – whether circuit switched, TDM, or packet-based frame relay and ATM. AIReach 9000 will enable new emerging carriers to compete effectively using a broadband, last-mile, wireless-access solution that can be deployed both rapidly and cost effectively.

“AIReach 9000 fills a void by providing a complete integration of services, including voice, high-speed data, video, Internet, and more, in one fiber-quality, last-mile wireless solution,” said Suresh Arora, vice president and general manager, broadband products division. “Users can get the access they need without the expense and statutory difficulties of laying new landline, and carriers can implement new revenue generating services



immediately, without tearing up the streets.”

AIReach 9000 is easily adaptable to the needs of service providers as it gives both established and emerging providers a scaleable solution with low entry, deployment, operational, and maintenance costs. HNS’ state-of-the-art network management platform combines what traditionally have been discrete philosophies for managing radio, data, cellular and voice networks into a single unified approach to provisioning, operations, and maintenance.

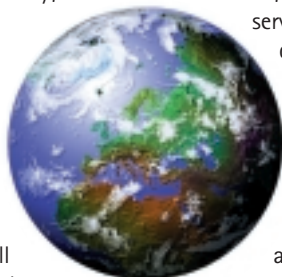
“New entrants don’t know what churn and penetration will be like. With AIReach 9000, operators can start with a single sector, placing one radio at a hub and adding equipment to meet traffic demands,” said Arora. “We believe that AIReach 9000 provides the low entry and deployment costs – as well as the deployment speed – that CLECs and other carriers need to complete effectively.” ■

Executive Corner

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Telecommunications, its telecommunications services arm, HNSE is already able to offer services and field and logistic support in 23 countries throughout Europe with major regional offices in Rome, Italy; Greisheim, Germany; Milton Keynes, UK; Prague, Czech Republic; and Paris, France. We hope that by establishing a pan-European organization driven by our customers’ requirements, we will offer products and value-added services based on a close understanding of customers’ business needs and that assist them in building own competitive advantages in their respective marketplaces.

The European telecommunications market has been deregulating



steadily over the last few years and there is now significant demand for alternatives to the traditional methods of delivering data – alternatives that can offer the bandwidth customers need, when they need it. HNSE is well positioned to offer a variety of satellite, wireless, and cable products and services to satisfy these demands. We specialize in broadband access solutions and are dedicated to providing a range of innovative Internet protocol (IP)-based products and services developed specifically for the European market. We are fully committed to European standards such as digital video broadcast (DVB) and the digital audio video interoperability council (DAVIC) and will ensure that all future products are designed with European needs in mind. In addition, HOT is the

European leader in the provision of very small aperture terminal (VSAT) services in Europe, and is meeting the ever-increasing global demands for more bandwidth for interactive and broadcast technology from its customers.

As we look into the future, it is our hope that this major initiative will create limitless possibilities for both HNSE and our customers. Not only will it allow us to add value to existing HNS products and develop new European products and services, but we can now offer unparalleled support and partnership to our customers. The fast pace of technological change and the acceleration in the development of new operators and services means that new opportunities are almost without bounds. With our new structure in place, we feel ready and able to meet the challenges of the 21st century where global business will be built on local relationships. ■

CHANNELS is published quarterly for customers of Hughes Network Systems, a unit of Hughes Electronics Corporation.

Correspondence is invited and, unless otherwise indicated, should be directed to:

Gayle Armstrong, Editor,
Corporate Communications.
Telephone: 301-601-4185
Fax: 301-601-4071
E-mail: garmstrong@hns.com

Hughes Network Systems
11717 Exploration Lane
Germantown, MD 20876
Telephone: 301-428-5500
Fax: 301-428-1868

For more information about Hughes Network Systems products and services, business news and professional opportunities, please visit our Web site at <http://www.hns.com>.

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HUGHES
NETWORK SYSTEMS

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Spaceway™ — Changing the Way the World Communicates

Beginning as soon as 2002, Hughes Electronics' new broadband satellite network will provide high-speed, bandwidth-on-demand satellite communications. With its spot-beam technology and affordable services, Spaceway™ will change the way the world communicates. A global project, Spaceway's initial deployment will be in the North American market with additional systems being commissioned in

Europe/Middle East/Africa, Latin America, and Asia in a phased approach to create an integrated worldwide system.

Businesses and consumers will both benefit from Spaceway-enabled fast access to large video, audio and "streaming" media files, Internet broadcast or "push" services and other interactive multimedia applications, including distance learning and telemedicine — all at faster speeds and lower costs

Spaceway's initial deployment will be in the North American market with additional systems being commissioned in Europe/Middle East/Africa, Latin America, and Asia.

A cooperative project involving all operating companies of Hughes Electronics, HNS, the market leader in current VSAT corporate data networking and satellite broadband Internet services, will manage the project. In addition, HNS is developing Spaceway user terminals and the system's overall ground infrastructure. PanAmSat will operate the telemetry, tracking and control center for the Spaceway satellites in orbit and will assist HNS in operating the network control center. Hughes Space and Communications is building three HS 702 geosynchronous orbit satellites for the initial North American Spaceway network that will employ innovative on-board digital processing, packet switching, and spot-beam technology to offer single-hop connectivity throughout the service area, regardless of location. DIRECTV will market selected Spaceway data services to its subscribers. ■

than those currently offered by today's land-based technologies. Spaceway will incorporate complete digital electronics that can interface with a variety of end-user equipment such as telephones, facsimiles, personal computers, and video monitors and a wide range of terrestrial transmission standards such as ATM, ISDN, frame relay and X.25.

HNS Launches AIReach™ 3000, an Exciting Addition to the AIReach Broadband Family of Wireless Products

The latest addition to the HNS' broadband family of products, AIReach™ 3000 will allow its customers to provide interactive broadband IP services without needing to install expensive copper fiber. A second-generation, point-to-multipoint system for broadband wireless access, AIReach 3000 is designed to provide high-speed, low-cost, last-mile access for the residential and SoHo market. AIReach 3000 is the ideal choice for operators wishing to provide Internet protocol (IP)-based distribution of virtual private network data, multimedia, video services, interactive digital TV, and voice over IP, as well as Internet access. Based on digital video broadcast (DVB) cable modem technology, AIReach 3000 is compatible with both MPEG and IP technologies and it is anticipated that it will include TV distribution to the residential market.

AIReach 3000 consists of compact, low-cost, unobtrusive equipment that can be installed rapidly with little or no disturbance to the surrounding environment. Its fully

integrated, carrier-class network management system provides remote monitoring and configuration of all network sites from a central console. High-speed data transmission rates are available over the radio link in either direction and costs are contained by sharing the available bandwidth between multiple users. AIReach™ 3000 base stations can serve a distance up to 5km, depending on radio transmission and quality-of-service parameters. The customer premises equipment is compact and unobtrusive and well suited to the demands of the consumer market.

The major components of AIReach 3000 are:
AIReach 3040 — The 28GHz variant of AIReach 3000

AIReach 3040 — The 40GHz variant of AIReach 3000

AIReach 3000 data modem — Provides IP data services to an Ethernet interface

AIReach 3000 digital TV receiver — Provides digital TV and domestic multimedia services. ■



Brazil Opens its Market for Alternative Telecommunications Providers

VICOM Launches Shared-Hub Services for VSAT Networks

When VICOM, a Brazilian telecommunications service provider, opened its doors in 1985, the company's founders had one objective in mind – to offer high-quality and innovative telecommunications services to all regions of Brazil, whatever the topography or current telecommunications infrastructure. VICOM executives decided early on that they must review alternatives in addition to traditional telecommunications service offerings.

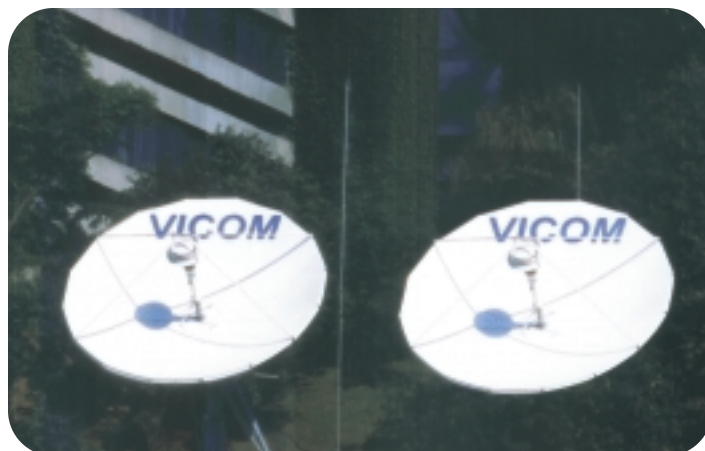
"Brazil is a large country with very diverse geography and its terrestrial networks have not always been able to provide the highest-quality service to all who need it," said Guilherme Saraiva, project manager at VICOM. "From day one, the company knew that we'd have to look beyond existing technologies and services if we wanted to achieve our mission

and remain competitive."

After evaluating the options, VICOM concluded that satellite communications based on very small aperture terminal (VSAT) networks would offer corporations the most effective method of supporting their wide area networks (WANs).

"VSAT networks provide rapid, reliable satellite transmission of data, voice, and video to an unlimited number of geographically dispersed sites or from these sites to headquarters," said Saraiva. "Because reliability and cost are so important to companies selecting a telecommunications backbone, VICOM felt that this was precisely the technology that would offer Brazilian businesses the best choice for their networks"

VICOM, formerly known as Victori Communications, initially established itself in the service arena, but in 1998, the Brazilian government deregulated the



telecommunications industry, thus opening the way for VICOM to become a shared-hub service provider.

As their business continued to grow VICOM found that they needed an established VSAT vendor with a comprehensive set of offerings that were scalable and well supported. According to Saraiva, VICOM based its decision on quality of network reliability, global experience, cost, and bandwidth capacity.

"Stability was a significant factor in selecting Hughes Network Systems as our satellite communications provider," said Saraiva. "The company has an excellent reputation for offering good quality products. The more stable our telecommunications services are, the more our customers can concentrate on their core businesses."

VICOM has customers in all segments of the Brazilian economy and has found that a wide range of industries from retail to agribusiness to utility companies have been quick to adopt VSAT technology for their corporate WANs.

"From retail applications to enterprise resource planning to monitoring consumption and usage to email facilities, our customers find that the range of applications supported meets their needs today and allows them the flexibility to expand their networks in the future," Saraiva said. "In addition, some of our

customers are located in rural areas where they just don't have terrestrial alternatives and a VSAT network gives them reliable service 24 hours a day at a price that they can afford."

"VSAT networks provide rapid, reliable satellite transmission of data, voice, and video to an unlimited number of geographically dispersed sites."

As Brazilian companies look for their networks to support second-generation applications, VICOM knows that VSAT technology will enable its corporate customers to implement applications such as IP multicasting and interactive distance learning.

"I'm confident that IP multicasting, satellite-supported intranets, and interactive distance learning are all applications that our customers will add in the near future," Saraiva said. "We're fortunate that whenever our customers need these next generation services, our satellite network is already in place to make them a reality." ■

The Broadband Revolution — Are you ready?

Hughes Network Systems Europe is pleased to invite you to a breakfast seminar for network operators



Future technology, future solutions.
Where are we going next?

12th October, Stand 4023, 9:30am-10:30am, Telecom '99, Geneva.

Come and meet with HNSE senior executives and enjoy coffee and a pastry as you learn how we can work together to propel your company into a leading position in your chosen market.

- How can you implement revenue-generating services quickly and cost-effectively?
- How is HNS implementing the digital video broadcast (DVB) multiservice concept?
- Wireless access and cable television (CATV) technologies are converging. What are the implications for you?
- How can AlReach help solve your last-mile challenges?
- Learn how AlReach Broadband and CableServe® can help carriers launch revenue-generating services to business and residential customers in a cost-effective and rapid way.

If you'd like to attend, please complete the attached fax reply or email n_james@hnsLtd.hns.com. We will forward you a special ticket for the event.

CableServe® — High-Speed Data Services over Cable TV Systems

Thanks to the introduction of high-speed modems on cable TV (CATV) networks, broadband data services are now available to business and residences alike. Significantly faster than the 56Kbps offered by telephone lines, cable modems provide outbound speeds up to 45Mbps using the CATV network and allow continuous connection without incurring the costs associated with telephone access. HNS Europe (HNSE) now offers a range of cable modems that meet the latest digital video broadcast (DVB) standards for distribution of multimedia services. CableServe's® range now includes the CS2500 data system, which provides two-way access at speeds that no current technology can match.

Targeted at small businesses, home office workers, and home users who want high speed Internet access and email services,



the CS2500 opens up a whole range of enhanced applications, such as virtual private networks, videoconferencing and distance learning. Key benefits for users of the CS2500 include the ability to receive downloads much faster than conventional modems, unlimited Internet access that eliminates dial tones and busy

signals, and phone lines that are now clear for other uses. It is anticipated that voice services will be added to the CS2500 within the next year.

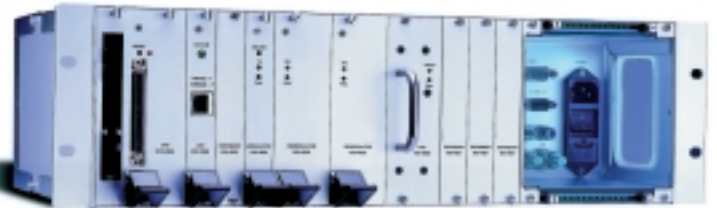
Data to the user is transmitted in a 8MHz or 6MHz TV channel band using 64-QAM or 256-QAM modulation giving user rates of up to 45Mbps. Multiple return channels are provided that are 2MHz wide, allowing a dedicated high-speed return channel of up to 3Mbps. These shared resources allow several hundred or a few thousand users on each channel.

CS2500 user equipment is extremely simply and consists of a

tabletop or wall-mounted modem that couples on one side directly to the CATV network and on the other via 10BaseT Ethernet to the user's PC. Three versions of modem are available — a simple bridger, a 1-port router and a 4-port router.

Headend equipment consists of a rack-mounted unit that couples via 100BaseT Ethernet to a local servers and routers.

Configurations can be supplied for local support for Internet access and e-mail services, together with local management and cache. Alternatively, these functions can



Leading the Way in VSATs HNS Introduces Next Generation of its Market Leading Product: PES™ 5000 Plus

Organizations looking to establish the most efficient, reliable, and cost-effective wide area network (WAN) that supports remote locations wherever they are located and whatever networking they require, should look no further than the latest evolution in networking solutions — PES™ 5000 Plus.

Representing more than 10 years of research and design and offering more life-cycle enhancements than any competing product, PES 5000 Plus is the most sophisticated, cost-effective, high-capability very small aperture terminal (VSAT) on the market today. Building on the product knowledge gained from more than 300,000 installed sites, PES 5000 Plus is unique. It is the only VSAT of its type to maintain backward compatibility, while at the same time offering the most comprehensive and sophisticated set of new features available.



This high-performance and flexible VSAT is a private WAN solution that supports two-way data, voice, and multimedia as well as

one-way broadcast video communications. From retail applications and banking platforms to Internet service providers' needs, from Internet/intranet applications and multimedia delivery to LAN internetworking and back-office systems,

Features

- Voice over IP H.323 compliant
- Extremely fast transmission speeds and very high bandwidth
- Low operating costs
- Ethernet ready
- DirecPC™ overlay option for multimedia
- Solar option

PES 5000 Plus supports every possible business application with reliable high-speed, high bandwidth voice and data delivery. HNS' proven PES line has the highest network availability in the industry with an average of 100,000 hours between failures — that's about 11 years.

PES 5000 Plus has the highest performance inroute and outroute available and when coupled with the industry's smallest Ku-band antenna, makes PES 5000 Plus the only choice

DirecWay Multimedia VSAT™ continued from page 1

offers rates up to 256 Kbps.

A pure IP-based transmission system, DirecWay Multimedia is specifically designed to support high-bandwidth IP applications such as video, Web browsing, Webcasting, business TV, and interactive distance learning. In addition, it simultaneously runs thin-route, interactive data networking in support of low-bandwidth IP-based applications such as credit and debit verifications, point-of-sale, ATM, inventory management, and sales polling. A key feature of DirecWay Multimedia is its ability to efficiently support multicast traffic to ensure timely delivery of information while avoiding the costly replications associated with terrestrial systems.

DirecWay Multimedia represents the latest generation of satellite technology and is a natural evolution of HNS' VSAT heritage. As HNS responds to its customer's needs for higher-speed services by providing a high-quality integrated video solution that coexists with low-bandwidth data networks, it again demonstrates the level of commitment it has to designing the most advanced satellite-communications products. ■

Hughes Software Systems: A Profile

Founded in 1992, Hughes Software Systems (HSS) has become the leading communications software company in India, offering a full spectrum of communications-related software services, products and solutions to telecommunications and data communications equipment manufacturers, system integrators, and communication services providers. Headquartered in a state-of-the-art campus in Electronic City, a New Delhi suburb, and with offices throughout the Americas, Europe, and Asia, HSS also has a development center focussing on Internet and e-commerce applications in Bangalore.

Significant investments in research and development have positioned the company at the forefront of emerging communication technologies including communication protocols, wireless networks, telecom/data networks, next-generation networks, intelligent networks, and network management solutions, as well as Internet and e-commerce applications. Its major customers are original equipment manufacturers (OEM) and telecommunication companies (Telco). HSS has developed OEM offerings that include

Significant investments in research and development have positioned the company at the forefront of emerging communication technologies.



protocol stacks, signaling interworking functions, gateways, and intelligent peripherals and Telco offerings that include mediation device systems, short message service center (SMSC), and an electronic bill presentment and payment solutions. All HSS products are backed by porting, consulting and custom engineering services to help customers integrate and build solutions. HSS also offers comprehensive after sales support service to its customers.

Key to HSS' success is the partnership that it creates with its customers. HSS gets involved from the early stages of definition, specifications, and system design, and extends its involvement in conducting field trials and postdelivery support.

Depth in communication technologies combined with an unparalleled track record of meeting schedule, cost and quality commitments are just a few of the reasons that companies around the world have chosen HSS as their communications software partner. To find out more information on HSS, please check out its Web site at www.hssworld.com to see how it can help provide your communications solutions. ■



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Germantown, MD 20876 USA

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