SATMAGAZINE.COM

August 2003

WORLDWIDE SATELLITE MAGAZINE

# Satellite Manufacturing: The New Reality

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## NOTE FROM THE EDITOR

# *Summer of our Discontent*

Like most people, I was looking forward to an reinvigoratingly uneventful summer after months of bad news and going through one of the worst downturns in the satellite industry. The previous spring actually brought optimistic news and prognoses for the future of the industy. The Satellite Industry Association in its annual industry survey (see the feature in our April 2003 issue) reported that the industry as whole *grew* by 10% percent from the year before and a*n average of 15% in the last five years.* As we head into the much awaited summer vacation season, the consensus seems to be that the worse is over and that the corner has been turned.

But recessions don't take vacations. In the last month we received news of Loral filing for bankruptcy and selling off its North American satellite assets to INTELSAT, leaving one less global satellite operator. Almost across the board, 2Q and first half corporate financial results reflected either losses or drops in revenues. The clincher, was the $ 1.1 Billion charge taken by Boeing due to continued losses in its satellite manufacturing and Delta rocket divisions. The losses led to Boeing's decision to get out of the commerical launch business and focus on government business due to "weakening demand."

Commenting on the fateful decision, Jim Albaugh, president and chief executive of Boeing's Integrated Defense Systems, couldn't have put it more succintly: "In the commercial space segment, we've seen the market dip to historic lows and do not expect a near-term recovery." He further said that he doesn't see any increase in demand in three or more years.

Now when one of the major players does not see any recovery any time soon, and decides to pull out from a major segment of the industry, it usually portends difficult times ahead. Not just for that particular segment, ie. the launch business, but for the *whole* industry. For as you all know the weakened demand for launches is due to fewer satellites being ordered and manufactured, which is due to less demand for transponders which is due to less demand for satellite services and so on and so forth...

For our part, we hope to ride this downturn out no matter how long it takes. We hope to provide relevant information and analyses to guide the industy. It is apropos that in this issue we focus on the core of the industry--the satellite manufacturing business (which started it all). We also have articles covering every corner of the globe--from DTH in Spain to Indian television. We also have a case study in Africa of how a major DBS company is helping spread the benefits of satellite technology to African villagers. To me, worthwhile intiatives such as these serve as a constant reminder why I remain in this industy over the years--through its inevitable ups and downs.

Virgil Labrador

**(In addition to managing editor of *SATMAGAZINE*, Virgil Labrador is the editor of the subscription daily service, *Satnews Daily* and the free weekly website, *Satnews Online*. He can be reached at virgil@satnews.com)**

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Cover Image: Boeing Satellite Systems' MEASAT-3 (image courtesy of Boeing )

# CALENDAR OF EVENTS

## AUGUST

**August 18-21** **Long Beach, California, USA** **ISCe 2003**
**contact: Art Paredes Tel: +1-310-410-9191 / Fax: +1-310-410-9396**
**E-mail: info@isce2003.com Web: www.isce.com**

## SEPTEMBER

**September 2-7** **Istanbul, Turkey** **CeBIT Bilisim Eurasia**
**Tel: +90 212 212 3122 Fax: +90 212 212 3121**
**Email: serhat.cerit@hifas.com Web: www.cebitbilisim.com**

**September 11-16** **RAI Convention Center, Amsterdam** **IBC 2003**
**Email: show@ibc.org Web: www.ibc.org**

**September 16-19** **London, UK** **COMSYS VSAT 2003 Conference**
**Tel: +44-1727-832288 E-mail: maria@comsys.co.uk Web: www.comsys.co.uk**

**September 18-23** **Shanghai, China** **CeBIT Asia**
**Tel: +86 21 6886 3286 / Fax: +86 21 6886 3797**
**E-mail: cebit-asia@hfchina.com Web: www.cebit-asia.com**

## OCTOBER

**October 2-4** **Vicenza Fair, Italy** **SatExpo 2003**
**Tel. +39 0444 543133 E-mail: promospace@satexpo.it Web: www.satexpo.it**

**October 12-18** **Geneva, Switzerland** **ITU Telecom World 2003**
**Tel. +41-22-730-6161 Fax +41-22-730-6444**
**E-mail: telecominf@itu.int Web: www.itu.int/world2003**

**October 14-17** **Washington, D.C.** **Satellite Uplink Operators Training Seminar**
**Tel. 202-429-5346 Web: www.nab.org/scitech/satsem2003.asp**

**October 15-17** **Mumbai, India** **Satellite & Cable TV India Trade Show 2003**
**Tel: +91-22-2494 8280 /+91 -22- 2498 4273 Fax no: +91-22-2496 3465**
**E-mail: scat@vsnl.com Web: http://www.scatmag.com**

**October 23-26** **Istanbul, Turkey** **Cebit Broadcast, Cable and Satellite Eurasia**
**Tel: +90 212 245 3778 Fax: +90 212 245 3603**
**E-mail: info@hf-turkey.com Web: www.hannovermesse.com.tr**

**October 28-30** **Beijing, China** **China Satellite 2003**
**Tel: +86-10-84470266, 8447-0926 Fax: +86-10-84470267**
**E-mail: tracy@chinasatellite.org Web: www.chinasatellite.org**

# INDUSTRY NEWS

**U.S. Air Force Suspends Boeing's Eligibility for Government Contracts; Shifts Seven EELV Rocket Launch Contracts to Lockheed Martin**

The U.S. Air Force suspended three business units of Boeing's Integrated Defense System division and three former Boeing employees from eligibility for new government contracts. The suspensions were issued against Boeing's Launch Systems, Boeing Launch Services and Delta Program business units as they existed in the Boeing organizational structure as of July 21, 2003.

The individuals suspended were William David Erskine, former ground operations lead on Boeing's Evolved Expendable Launch Vehicle ( EELV) program; Kenneth V. Branch, former senior engineer/ scientist on Boeing's EELV program; and Larry Dean Satchell, a former member of Boeing's EELV proposal team.

The Air Force also shifted seven EELV launch contracts worth an estimated $ 1 billion awarded in October 1998 (known as "Buy I") to Lockheed Martin, increasing the number of Atlas V launches of the Buy I program to 14. The Air Force also announced the award of three EELV Buy II launch contracts to Lockheed Martin, disqualifying Boeing.

The suspensions come on the heels of Boeing's announcement of a $1.1 Billion charge to its satellite and launch units. The unprecedented charge also resulted in Boeing ceasing commercial operations of it's Delta rocket division and reorganizing the Expendable Launch Systems division, placing it under the Air Force Systems division to focus on Air Force contracts.

**Satellite Operators' Revenues Fall by 6% in 2002**

Consolidated revenues of fixed satellite service (FSS) operators fell by 6% to $6.3 billion in 2002 according to Euroconsult's 10th edition of the *World Satellite Communications & Broadcasting Market Survey.*

# INDUSTRY NEWS

For the first time in its history, the Fixed Satellite Service (FSS) industry experienced two consecutive years of decline (-3% in 2001) due to a combination of stagnant transponder demand (+ 1.5% between 2000 and 2002) and decreasing transponder lease prices (-7% on average transponder lease price between 2000 and 2002).

Despite the decline in revenues in the past two years, the FSS industry remains a profitable business, according to Euroconsult, with average industry margins in 2002 of about 73% for EBITDA, 38% for operating profit (EBIT), and 24% for net profit. **(www.euroconsult-ec.com)**

## Loral Files for Bankruptcy; Sells Six North American Satellites to Intelsat

Loral Space & Communications Ltd. filed voluntary petitions for reorganization under Chapter 11 of the U.S. Bankruptcy Code. Loral said thate bankruptcy filing was a precondition to the sale of six of its North American telecommunications satellites to Intelsat, Ltd. for up to $1.1 billion in cash subject to price adjustments based on Loral's ability to achieve specified operating parameters prior to the close.

Loral intends to reorganize around its remaining fleet of five satellites serving Latin America, Asia and Europe and its satellite manufacturing operations, Space Systems/ Loral. The Chapter 11 filing, made in the U.S. Bankruptcy Court for the Southern District of New York, will enable Loral to sell the six North American satellites free and clear of any encumbrances.

Through its Skynet subsidiary, Loral will continue to operate an integrated fixed satellite and network services business using its fleet of five telecommunications satellites and its established VSAT/fiber global network infrastructure. The Loral fleet will consist of the Telstar 10, 11 and 12 satellites currently in orbit and Telstar 18/Apstar V and Telstar 14/Estrela do Sul, which are scheduled to be launched within the next nine months.

Loral has been heavily affected by the downturn in the satellite market. It lost $1.47 Billion in 2002 on $ 1.10 billion in sales. Loral also heavily invested in Globalstar Ltd, a satellite phone company that lost over $ 4 Billion dollars.

## Huge Losses on Failed Channels

Pay-television is an important and growing market already worth more than €20 billion in Western Europe, and it will more than double this figure by 2008. If T-commerce revenues are included the figure will triple by 2008 to over €75 billion, according to a recent report. However, there is also a growing cost associated with channels that fail.

Pay-TV channels are failing because they have not produced professional business plans. The study (Pay-TV Business Planning, published by International Marketing Reports, www.im-reports.com $745) states that dozens of Pay-TV channels have failed because the business models have not been properly researched and implemented. Report author David Brown says that in the past six years there have been more than 150 failed channels across Europe that have cost investors more than $3 billion. Most of the lost money could have been saved had a proper business plan been formulated, says Brown.

### The Cost of Failure

- 30 channel closures in the UK over the past six years.
- Approximately 150 closures in Europe over the same period
- Each channel closure represents at a conservative estimate, at loss of £10m to £15m
- Wasted investment in the UK over past 6 years approx £300m to £450m
- For Europe approx: £1.5bn to £2.25bn
- On an annual basis this is: UK: £50m to £75m, Europe: £250m to £375m

"Obviously economic conditions in this industry are tough at the moment, but in many cases, channel operators are not giving themselves a chance because their costs are too high for the business models that they are following."

Some channel failures in Britain recorded losses of over £30 million, says the report. But even on the basis of an average loss of £10 million to £15 million (new venture Attheraces, for example, lost £11.1m in the 12 months to 31 December 2002) this means that £300m to £450m has been poured down the drain. Taking European as a whole the wastage adds up to Euros 2.25 billion to Euros 3.5bn.
The report highlights and analysis the structure of a potential broadcaster's business plan, along with the various revenue options open to niche broadcasters, as well as giving guidance to sensibly forecasting what the different income strands might be. Detailed costs on getting a signal to viewers are also tabled. SM

# EXECUTIVE MOVES


Paul Heinerscheid

## Satlynx Appoints Paul Heinerscheid as President and CEO

SATLYNX, a joint venture between SES GLOBAL, Gilat Satellite Networks and Alcatel Space, has appointed Paul Heinerscheid President and CEO.

Heinerscheid was a pioneer in the development of direct-to-home satellite TV services in the United States with USSB (United States Satellite Broadcasting). His other former responsibilities include: Founder, President and CEO of Satellite Network Systems, Inc; Managing Director and CEO of Global Radio S.A.; Vice President, Operations and Business Manager, USTV , Attache de Direction at CLT-RTL (today RTL Group), Guest Lecturer in the Graduate Management Program at the University of St. Thomas (US). He is also the is also the Honorary Consul of Luxembourg for the State of Minnesota.

Heinerscheid, 51, is a Luxembourg citizen, holds an MBA from the Harvard Business School and a Master of Science from the Swiss Federal Institute of Technology.

## Gilat Names Bill Gerety, Former CEO of Astrolink, as New Spacenet CEO

Gilat Satellite Networks Ltd. named Bill Gerety as the new CEO of its Spacenet subsidiary. Gerety takes over from Nick Supron, who served as Spacenet's CEO for the last two years. The change was made effective on July 1.

During his tenure, Supron led a successful effort at Spacenet to optimize operations, streamline processes and increase efficiencies, in an effort to adapt the company to the changing characteristics of the market and business environment. Gilat said that Supron elected to step down in order to spend more time with his family and to pursue other business opportunities.

Prior to joining Spacenet, Gerety served as acting CEO and Chief Operating Officer of Astrolink International, a broadband satellite venture headed by Liberty Media, Lockheed Martin, TRW and Telespazio.

Gerety has also had a distinguished career as a senior officer in the US Army, and continues to serve as a colonel in the US Army Reserve. He holds a BS from the US Military Academy at West Point, an MS in Strategic Studies from the US Army War College, as well as an MS in Contracts & Acquisition Management and an MBA from the Florida Institute of Technology.


Doug Triblehorn

## INTELSAT Appoints Doug Triblehorn and Jean-Philippe Gillet to Media and Entertainment Business Unit

Intelsat has appointed Doug Triblehorn and Jean-Philippe Gillet to head regional sales efforts for the company's Media and Entertainment Business Unit in Asia and in Europe, Africa and the Middle East, respectively. Intelsat's "Video Business Unit" has recently been renamed the "Media and Entertainment Business Unit."

Mr. Triblehorn, now Regional Vice President Asia Pacific for Intelsat's Media & Entertainment Business Unit, is responsible for leading and managing sales activities in the region to position Intelsat strongly in the marketplace and achieve growth objectives and profitability.

Prior to joining Intelsat, Mr. Triblehorn served as CEO, GlobeCast Asia Pte. Ltd. Based in Singapore, ,where he was principally responsible for implementing the structure, strategy and business development for GlobeCast's interests in Asia and overseeing all operations, sales, marketing, financial and other aspects of the company.


Jean-Paul Gillet

Mr. Gillet, now Regional Vice President, Europe, Africa and the Middle East for Intelsat's Media & EntertainmentBusiness Unit, is responsible for the direction of overall development and execution of effective sales/customer service strategies for existing and potential customers. Additionally, he is in charge of overall customer relationship management and development of new business in the regions.

Mr. Gillet comes to Intelsat from GlobeCast North America. Most recently, he served as Vice President of International Sales where he

## EXECUTIVE MOVES

managed the strategy, development and sale of broadcast video services to all interna tional customers. Prior to that position at Globecast, he spent time as the company's Director of Sales for Europe and the Middle East.

### Mary Salih Appointed as Director of Broadcast Sales, GlobeCast America

Mary Salih has been appointed as Director of Broadcast Sales at GlobeCast America. As Director of Broadcast Sales, Mary Salih will be responsible for building and managing GlobeCast's broadcast services worldwide including its news, cable, sports and special events customer base.

She will be based in the company's sales and marketing office in New York City, which is newly located at 1270 Avenue of the Americas, Suite 2800, New York, NY 10020.

Mary possesses 15 years of experience in providing and selling satellite services to both the broadcast and broadband markets. Prior to joining GlobeCast, she was the Director/European Sales Manager at an international division of Vyvx Broadband Media Services, where she was responsible for sales to Europe, Latin America and the Middle East. Mary Salih's previous professional experience includes management positions at Loral Skynet and AT&T. SM

FEATURED EVENT

**International Satellite & Communications Exchange (ISCe) Conference and Expo**

**Long Beach Convention Center -Long Beach, California**
**August 18 – 21, 2003**

# Where Innovative Satellite Technologies and Business Meet


**Event Overview**

The International Satellite & Communications exchange (ISCe) Conference and Expo is the premier West Coast annual event that highlights the innovation and use of satellite technologies and services in the global commercial, government and military sectors.

**Spotlight Speakers, Compelling Conversations**

The lineup for ISCe 2003 includes many of the top executives and most respected thinkers in the satellite industry. They'll share their views on both the challenges and opportunities facing this international business community. The sessions promise to be both enlightening and interactive, providing participants valuable opportunities to engage with their leaders, peers and constituencies in meaningful dialog and leave the conference with tangible strategies for real-world success.

A sampling of the speaker roster for ISCe 2003 includes:

- **Yousuf Al Sayed**, CEO – Thuraya Satellite Telecommunications
- **Lt. General Brian Arnold**, Commander – SMC/CC
- **Dr. Illhami Aygun**, Director General and CEO – EurAsiaSat
- **Robert Berry**, Chairman – Space Systems Loral
- **Mark Bitterman**, Chairman, US Space Enterprise – US Chamber of Commerce
- **Michael Butler**, CEO – Inmarsat
- **Anita Cohen**, Director, Office of the Americas – NIMA
- **Mark Dankberg**, Chairman and CEO – ViaSat, Inc.
- **Ted Gavrilis**, President – Lockheed Martin Commercial Space Systems

## FEATURED EVENT

- **Keith Hall**, VP – Booz Allen Hamilton (and former Director – NRO)
- **David Helfgott**, President & CEO, Government Services – SES AMERICOM
- **Susan Miller**, President, Government Services – Intelsat
- **Elon Musk**, Founder and President – Space Exploration Technologies
- **Dean Olmstead**, President and CEO – SES Americom
- **Dr. William Patzert**, Technology Transfer Office – NASA JPL
- **Gino Picasso**, CEO – Iridium Satellite
- **Ramu Potarazu**, President and COO – Intelsat, Ltd.
- **Rick Sanford**, Director, Space Initiatives, Space & Defense Group – Cisco Systems
- **Herb Saterlee III**, CEO – DigitalGlobe
- **Michael Shaw**, Director, Radionavigation and GPS – US Dept. of Transportation
- **Frank Stirling**, Executive Director – Boeing Digital Cinema
- **Gregory Withee**, Asst. Administrator for Satellite & Information Services – NOAA
- **R. James Woolsey**, VP – Booz Allen Hamilton (and former Director – Central Intelligence)


**Matchmaking Program**

Unique to ISCe is its Matchmaking Program, which creates and coordinates opportunities for selected small businesses to meet with representatives from the world's leading satellite, space and communications companies. Private meetings between potential business partners will take place on August 19 and 20. All companies interested in participating in the Matchmaking Program must submit a registration form, complete a profile questionnaire and pay a one-time $99 fee for a maximum of three on-site meetings to be arranged by Hannover Fairs USA, the official show organizer.

**Welcome Luncheon**

Kicking off this year's event will be a welcome luncheon – *free* for the first 250 guests – on Monday, August 18. Hosted by the **California Space Authority** (CSA), the session will feature **U.S. Representative Dana Rohrabacher**. A Congressman who's served Southern California since 1988, Rep. Rohrabacher currently serves as a senior member of the International Relations Committee and Chairman of the Space and Aeronautics subcommittee of the powerful House Science Committee. He'll share with attendees his views on the future of the space industry and California's role in it. CSA is a non-

# PROGRAM SCHEDULE-AT-A-GLANCE

## Monday, August 18

| | |
|---|---|
| 9:30am -12:30pm | "Take-Off - Getting Up to Speed" **Satellite Training Workshop** (Hosted by the Satellite Industry Association and the Satellite Broadcasting & Communications Association) |
| 9:30am -12:30pm | "Hands-On: Satellite Technologies at Work" (Hosted by the Global VSAT Forum) |
| 12:30pm - 2:30pm | ISCe Welcome Luncheon **(Sponsored by the California Space Authority)** |
| 2:30pm - 5:30pm | "Inside Scoop - One-On-One with Satellite Industry Leaders (Hosted by Edelman Public Relations) |
| 6:00pm - 7:00pm | ISCe 2003 Opening Ceremony |
| 7:00pm - 8:30pm | ISCe 2003 Reception |
| 7:00pm - 8:30pm | Exhibit Hall Open |

## Tuesday, August 19

| | |
|---|---|
| 9:00am - 10:15am | Welcome and Opening Keynote Session: "Global Assurance and Homeland Defense: Implications for Our Infrastructure" |
| 10:00am - 7:30pm | Exhibit Hall Open |
| 10:15am - 11:00am | Refreshment Break **(Sponsored by Lockheed Martin Commercial Space Systems)** |
| 11:00am - 12:30pm | Conference Sessions |
| 12:30pm - 2:15pm | NASA and NOAA: Technology Partnership Forum and Luncheon **(Sponsored by the California Space Authority)** |
| 2:15pm - 3:45pm | Conference Sessions |
| 3:45pm - 4:30pm | Refreshment Break **(Sponsored by Stellar Solutions)** |
| 4:30pm - 6:00pm | Conference Sessions |
| 6:00pm - 7:30pm | ISCe Reception |

## Wednesday, August 20

| | |
|---|---|
| 8:40am - 10:15am | Welcome and Keynote: "Growth and Momentum - Key Drivers for the 21st Century" |
| 10:00am - 5:00pm | Exhibit Hall Open |
| 10:15am - 11:00am | Refreshment Break **(Sponsored by Mobile Satellite Ventures)** |
| 11:00am - 12:30pm | Conference Sessions |
| 12:30pm - 2:00pm | VIP Luncheon (by Invitation Only) **(Sponsored by Booz Allen Hamilton)** |
| 2:15pm - 3:45pm | Conference Sessions |
| 3:45pm - 4:30pm | Refreshment Break **(Sponsored by G2 Satellite Solutions)** |
| 4:30pm - 6:00pm | Conference Sessions |
| 6:30pm - 10:00pm | ISCe Reception and Awards Dinner **(Sponsored by Boeing)** |

## Thursday, August 21

| | |
|---|---|
| 8:30am - 10:00am | Welcome and Keynote Session: "Survive and Thrive - Global Alliance Strategies and Tactics for the Satellite Industry" |
| 10:00am - 2:00pm | Exhibit Hall Open |
| 10:00am - 10:30am | Refreshment Break |
| 10:30am - 12:00pm | Conference Sessions |
| 12:00pm - 1:30pm | CNN Special Session: The Use of Satellite Technologies During the War in Iraq |

profit organization that serves as the policy advisor to the Secretary of the California Technology, Trade and Commerce Agency on all space-related matters and represents the State of California on space issues to the international community, federal government, other states, and local and regional government entities.

**U.S.-Asia Satellite Business Roundtable**

The satellite industry is inherently global in nature and continues to evolve into a tightly knit international community. Asia is home to a concentration of satellite businesses and users, which presents great opportunity to U.S. companies and trading partners worldwide. ISCe 2003 will feature an intensive two-part **U.S.-Asia Satellite Business Roundtable**, hosted by the **Asia-Pacific Satellite Communications Council** (APSCC) and the **Satellite Industry Association** (SIA).

Part one, **"Opportunity Abroad: Prospects and Potential in Asia,"** is an ideal venue for satellite manufacturers, ground equipment and services companies, and launch providers to gain insights into emerging business opportunities and market strategies in the Asian marketplace. While the challenges and growing pains affecting this region have received much attention, there is long-term growth potential and important short-term considerations. Among the topics to be addressed are the impact of consolidation in the telecom industry, potential regulatory changes, and the effects of the SARS epidemic. U.S. companies interested in pursuing business opportunities or aligning strategic partners in Asia should be sure to attend.

Part two, **"Satellite Services: Growing Demand and Upcoming Breakthroughs in Asia,"** will focus on many of the advances in next-generation satellite technologies – such as DBS, broadband and VSATS – that are being steered by the Asian marketplace. This provides great opportunity for savvy satellite operators, content providers, and the services sector in the U.S. Top executives from some of the leading companies helping build consumer demand and create business opportunities in the region will share their perspectives on the possibilities of today and the promises of tomorrow. This session is a can't miss for anyone interested in learning about and leveraging the growing demand for satellite broadband, DBS, and voice, video and data services in Asia.

Roundtable participants include:

- Illhami Aygun, Director General and CEO – EurAsiaSat
- Christopher Baugh, President – Northern Sky Research
- Jeanette Chan, Partner – Paul, Weiss, Rifkind, Wharton & Garrison
- Tom Choi, CEO – SpeedCast
- Richard DalBello, President – Satellite Industry Association (SIA)
- Kalpak Gude, Vice President of Government and Regulatory Affairs and Associate General Counsel – PanAmSat Corporation
- Eui Koh, President – Asia-Pacific Satellite Communications Council (APSCC)
- K.C. Kuo, Vice President and General Manager, Asia-Pacific Group – Hughes Network Systems International
- John Stanton, President of Data, Carrier and Internet Services – Intelsat

**CNN Special Session: The Use of Satellite Technologies During the War in Iraq**

Closing ISCe 2003 will be one of the most timely and compelling sessions of the conference, **"The Use of Satellite Technologies During the War in Iraq."** A distinguished panel of experts, in a conversation moderated by **CNN Headline News Anchor Renay San Miguel**, will share insights on how the recent war in Iraq truly highlighted the value and advantages of satellite technologies and services. For the strategist in the war room, pilot in the air, soldier in the battlefield, reporter embedded with the troops, and viewer watching the war on television as never seen before, satellite technologies proved to be a tremendous asset. Come hear the providers and users of those technologies share firsthand experiences and lessons learned. Gain insights into the role satellites played in applications such as navigation, remote sensing, communications and broadcasting during this war and the ways in which our military and media may be forever changed. SM

## REGISTRATION

**To register for the event or for more information on attending or exhibiting at ISCe 2003, visit www.isce.com or call +1- 310-410-9191.**

COVER STORY

# The New Reality in the Satellite Manufacturing Segment

**by Bruce Elbert**
**President, Application Technology Strategy, Inc.**

If the 1990s were the days of super expansion in satellite development, then the current decade represents a new reality – or realism – for manufacturers and their customers. Those of us who have been in this industry for some decades have seen the spacecraft purchase cycles come and go, this one being no different in many respects. What is unique, perhaps, is the shear volume of satellite capacity now in orbit and the depth and variety of applications thus supported. But, this is little recompense for the major manufacturers who depend on new orders and backlog to maintain their organizations, revenues and profits, and R&D.

### A More Level Playing Field

Having been part of the old Hughes Aircraft Company, I can look back to the "good old days" when one company led the industry in terms of technology, sales and influence. By 1980, the US aerospace industry had produced strong competitors in RCA and Ford; Europe was also showing an interest and ability to construct communications satellites. Less dominant but still strong in terms of reputation, Hughes built its manufacturing business at the same time that it entered the services segments, leading ultimately to DIRECTV and the PanAmSat acquisition/merger. Along the way, the RCA and Ford spacecraft manufacturing arms found themselves key parts of Lockheed Martin and Loral Space and Communications, respectively. And a new entrant, Orbital Sciences, gained access to the field as well.

**Galaxy13/Horizons 1 spacecraft in the High Bay at Boeing Satellite Systems**

Strong satellite manufacturing capabilities are no longer confined to North America. European giants Alcatel and EADS resulted from similar forces to produce capabilities that supply satellites equal in performance and reliability to the US counterparts. New orders for spacecraft used to be heavily biased toward American manufacturers, but the table turned in 2002 to give the Europeans the advantage. In sum, what we appear to have today is a level playing field that requires all buyers to do their homework both during the procurement process and subsequently while their spacecraft are under construction.

### Outsourcing as a Way of Life

Satellite manufacturing has gone from pure R&D to more of a systems integration model. This is not to denigrate what satellite manufactures do – we are talking about a very complex system that must deliver on its service requirements after the rigors of launch. The commercial jets that we fly are integrated by Boeing, Airbus

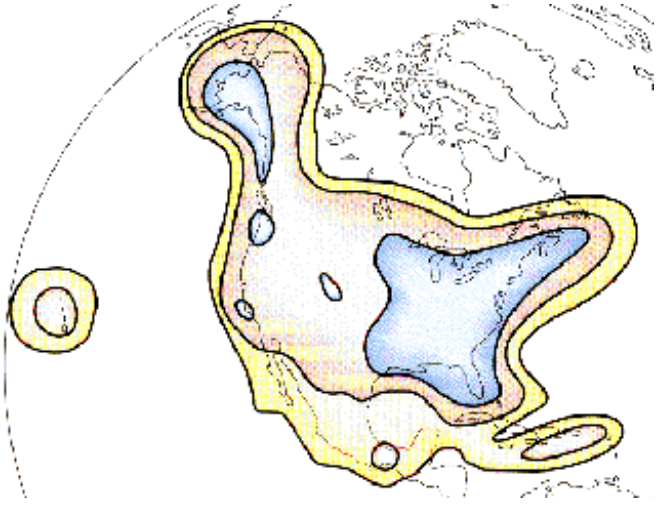
## COVER STORY

and others in much the same manner. But my point is that the companies that deliver satellites now purchase the bulk of their components and subsystems from the outside. This better protects them from the boom and bust cycle that results from how satellite procurements lay out over a period of, say, 10 years. Companies like ComDev, EMS and L-3 Communications that were once small shops may rival their outsourcing customers in key financial terms.

**Consolidation in Satellite Operation**

The development of mega-satellite operators like SES-Global has certainly changed how satellite manufacturers do business. The four operators that hold 50% of global capacity call the shots on satellite requirements, delivery schedules and prices. In years past, the manufacturers could stimulate sales in countries around the world by working with governments and local service providers who want to join the voyage to space. When Dr. Taksin Shinawatra, Prime Minister of Thailand, headed his own computer services firm, he personally purchased two satellites from Hughes and created the company that now pursues iPSTAR.

Such opportunities are less likely but other approaches to the game can produce sales. When PanAmSat planned for replacement of Galaxy 9, a C-band cable satellite at 127° West Longitude, they saw an opportunity to develop a Ku band neighborhood as well. The Ku spectrum at this slot was registered by JSAT through the Administration of Japan and the two companies created a joint



**Horizons 1 Ku-band downlink footprint (127 WL) - shaded areas represent minimum EIRP values of 48, 44 and 40 dBW.**

venture to own and market this capacity. The payload, known as Horizons 1, was constructed by Boeing Satellite Systems as part of Galaxy 13 (which is the name given to the C-band payload) and is to be launched by SeaLaunch in the Fall of this year. Horizons 1 offers a new compliment of 24 Ku-band (FSS) transponders at 36 MHz each, suitable for a broad range of services including video broadcast and distribution, data communication networks employing VSATs, and other broadband services for private and government users. This partnership has produced the sale of another large Boeing 601HP satellite and the creation of a new Ku-band orbit slot to serve all of North America.

**Expectations of Satellite Operators**

Traditional satellite operators like Intelsat and Telesat have always maintained strong technical teams who understand the requirements, design and testing of the products they buy. Newer customers tended to rely on the manufacturers to give them what they need, allowing them to stand by until handover in orbit. The story has shifted as satellites have become more complex and powerful; a downside has been some rather spectacular failures on orbit and in the business as well. Buyers of satellites now have strong technical teams that match the ability of the manufacturers in key areas of expertise. As a result, many of the experts who were only found at leading manufacturers and research organizations are now working on the buyers' side, helping ensure that what is bought is actually delivered.

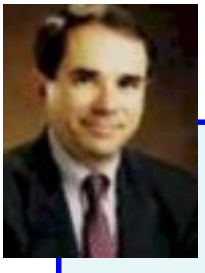
**What Value, Digital Processing?**

Digital on-board processing satellites are a reality and do provide value in systems like Thuraya and Hot Bird. On the other hand, major initiatives like Astrolink and Teledesic, which depended on the efficiency of digital processing to transfer and manage broadband traffic, have fallen by the wayside and many wonder if such a system will ever happen. What we have here is a change in timing and focus – telecom boom-chasing to post 9-11 reality. Processor technology from the North Grumman division formerly known as TRW of Redondo Beach, CA, and Boeing Satellite Systems, will likely find its way into advanced government satellites (see my article in SatMagazine May 2003 issue).

Digital processor technology along with the RF capability from phased array antennas at L through Ka band provide the foundation for advanced capabilities on the commercial as well as government sides. In time, we can expect to see impressive capabilities on replacement GEO satellites that allow beam patterns to be altered in response to service demands (something now very difficult to implement with fixed reflector systems) along with bit-regeneration and packet switching capabilities to better serve the broadband data market still in its relative infancy.

**The Evolving GEO Satellite**

Putting these points together we have a picture of what the satellite manufacturing business will be like in the next three to ten years. The dominant satellite operators will continue to push the major manufacturers to give more value in terms of performance and lifetime, and to add those features that provide more flexibility and throughput. Outsourcing of technology to companies like EMS and Northrop Grumman should expand and other specialists will appear that provide solutions that can be integrated into the space and ground portions of the overall system. Innovative joint ventures like the Horizons 1 Ku-band payload at 127° West Longitude provide operators and manufacturers alike with the basis for new sales opportunities that cross traditional boundaries. With a more level playing field across America and Europe, satellite buyers have new options and yet must expend more effort through a satellite development cycle that lasts from concept to service inauguration. Overcoming this puts demands on the technical and management resources of satellite operators, who themselves are bigger companies with the depth they need to serve users of satellite bandwidth. The availability of this bandwidth in coming years is assured and the path to providing new and improved capabilities is there. SM



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FEATURES

# Video File Distribution and Management: Evolving Satellite Applications in Television

**By Dan Freyer**

Satellite technology is the most cost-effective solution for one-to-many broadcasting - be it TV or data. As broadcast and cable network, program, spot and promo acquisition and distribution are increasingly being managed in digital file formats while storage costs continue to decline, Television operations are increasingly using satellite enterprise networking technologies. A quick look at some applications in the television industry, in news, broadcasting and cable TV shows that non-real-time file delivery via satellite broadcast is alive and growing.

**Feeding Commercial Spot Servers – In 30 Seconds**

Companies like DG Systems have beamed commercials over satellite to TV stations in digital file format for years. The typical 30-second spot, MPEG2-encoded at 8 Mb/s, takes 30 megabytes of storage on a server. With today's reduced cost of server and storage, caching server costs are in the few thousand dollars — versus tens of thousands a few years ago for an off-the-shelf service that can hold 1,000 spots. Satellite multicasting is an ideal way to refresh hundreds of widely dispersed server sites rapidly with the same spot files.

Dallas-headquartered DG Systems, uses a Ku-Band satellite network to deliver advertising spots to nearly 900 TV broadcast facilities around the US for its client base of 5,000 advertisers and agencies. According to the company, DG Systems is the largest single digital distribution network for the delivery of television spots, with a network reaching nearly 95% of the four major network affiliates in the top 100 U.S. markets.

TVN Network Operations Center (TVN photo)

A growing number of TV stations, cable networks and local cable broadcasters receive their commercials digitally, within hours, from national advertisers via DG Systems.
They include CBS, CNN Networks (CNN, CNN-Sports Illustrated, CNN-Headline News, CNNfn, and CNN-Airport Network), the WB broadcast network, Telemundo, E! Entertainment Television, Lifetime Television, The Weather Channel, Fox Sports, The Soap Network, Toon Network, WGN, and Sunshine Network.

DG Systems installs its Digital Video Playback System (DVPS) receiver at TV stations, enabling the network to digitally receive ads from agencies for insertion of national spots in its programming.
In the cable TV advertising business, National Cable Communications (NCC), an ad sales organization co-owned by Comcast Corp., Cox Communications, Inc., Time Warner Cable, AT&T Broadband and Internet Services and Katz Media Group, operates a two-way satellite linked video library system. NCC's system is intended to simplify the buying process in the top 50 markets with consolidating ad buying. It was designed to deliver MPEG2-encoded spots from a central server at NCC's hub to ad-servers at head-ends. NCC purchased its ad-insertion server system from SeaChange and combined that with a Hughes Network Systems (HNS) two-way VSAT network allowing both delivery of spots via the outbound channel, and delivery and playout verification data to be captured on the VSAT return channel.

# FEATURES

**Newsclips to the Desktop: " Give Us 20 Megabytes, We'll Give you the News"**

Another way in which distributed server networks connected via satellite are helping the broadcast industry is news operations.

Roswell, GA-based Pathfire has developed a satellite-based IP (Internet Protocol) multicast store-and-forward content delivery system to digitally transmit broadcast-quality video to stations. The system has been used by NBC to deliver its News Channel affiliate feed service, and it is deployed for ABC's News One. The system allows local station news producers to receive, sort, and order clips of edit-ready format footage from their desktops, avoiding the hassle of satellite downlink feed tape recording and tape-based operations.

Meanwhile, CBS Newspath which provides 24-hour news services to over 200 CBS stations and affiliates has been rolling out a digital file-based solution for its own--and affiliated stations with the help of BitCentral's Mediapipe News application. BitCentral's solution integrates satellite broadcast, IP, and MPEG technologies to increase the productivity of news producers through an easy-to-use desktop application. CBS is using the opportunity to reduce costs by minimizing satellite-refeeds, eliminating tape equipment and automating news production processes according to the company.

In April, NBC News Channel also signed up with BitCentral to use the integrator's content management system and is rolling it out to 250 NBC affiliates. In selecting the system, Bob Horner, President, NBC News Channel said "We think the MediaPipe approach will enable us to continue to play an important role in the digital transformation of station newsrooms" and NBC will have "greater control and opportunities for personalization in our newsroom and at the stations".

**BitCentral's MediaServer**

**Syndicated Program Delivery: Tonight's Program FTP'd to You by Satellite**

Storing a day's worth of 5-minute newsclips requires some server space, but replacing the tape playback of most of the day's syndicated shows takes a lot more storage space. Nevertheless, with declining costs, long form content store-and- forward over satellite is more viable than before.

An example is Pathfire's service for Warner Bros. Pathfire signed a deal last year with Warner Bros. to deliver syndicated programming to its 835 TV-station clients via satellite. Pathfire servers that are being installed at the stations, reportedly at no cost to them. This system replaces traditional analog TV feed transmission and tape playback at the stations. The service should cut Warner Bros. distribution costs by using less bandwidth while making it simpler for stations to prep the content for air, according to Pathfire.

**Hotel Pay-Per-View, Cable VOD's Precursor**

The economics and scale of hotel in-room movies have made video file store-and-forward applications via satellite viable before the technology has been deployed in commercial cable TV systems.

Delivering movies by satellite to VOD servers at hotels cuts the cost of distribution and boosts hotel revenues by offering guests a greater choice of new films.

A case in point is GlobeCast's service for Quadriga Worldwide, a major European distributor of in-room Pay-Per-View programming to the hotel industry. GlobeCast, a leading global satellite transmission service provider headquartered in Paris, France provides a service called GlobeCast File which Quadriga uses to feed video servers connecting to thousands of hotel rooms in Europe for leading hotel chain brands like Marriott.

Before the GlobeCast service, many in-room entertainment systems relied on videotapes, which were expensive to duplicate and distribute across Europe, and often manually played by hotel staff. In addition, new pay-TV guides had to be printed for every scheduling update and placed in thousands of rooms. GlobeCast encodes video content in London and beams it via satellite to hotels throughout Europe. By replacing manual tape delivery and playout by hotel staff, as well as the need to print and supply program guides for each room, Quadriga was able to help its hotel clients enhance guest experiences.

## FEATURES

GlobeCast uses IP-based file transfer technology to deliver movies as MPEG files to video pay-per-view server systems installed at the hotels. The solution gives Quadriga secured access via the Internet to the GlobeCast satellite platform's conditional access system so Quadriga can authorize in-room access to content by viewers. GlobeCast also developed an electronic on-screen program guide component.

Unlike its printed predecessor, the on-screen comes guide with preview and promo clips and trailer capabilities to boost movie buy rates. On initial implementation, viewing was increased as much as 30% in some cases, boosting hotel and programmer revenue.

**Cable Video-on-Demand Delivery: Refreshing New Film Fare**

A key competitive feature of cable TV versus DBS is cable's ability to provide true video-on-demand (VOD), which DBS can't offer. Cable operators have been steadily rolling out commercial VOD services in key systems, after over a decade of technology development and trials. Gone are the VOD ventures like Enron-Blockbuster's JV, DIVA and Intertainer, but by the end of 2003, Cable TV analysts Kagan projects 8.8 Million Video-On-Demand (VOD)-enabled subs will be passed by US cable systems.

As VOD has rolled out to an increasing number of head-ends sites, satellite multicast technology has become more cost-effective for VOD-file distribution, replacing DLT tape-based delivery.

Burbank-based TVN Entertainment, Inc. offers over 1,200 programmer hours per month of VOD content to cable systems - delivering encrypted movie files via its C-band digital satellite network on the Galaxy XR spacecraft. In addition, Pay-Per-View programmer, iN Demand is providing VOD offerings featuring Studio and sports content delivered via its satellite network for Affiliate VOD services.

TVN's system has been in the market for over three years and has been deployed in five of the top ten cable companies, with nearly 100 sites around the country in production receiving satellite VOD content. About 1,500 hour's per month of refreshed data is sent, and some affiliates take down as much 600 hours of content. All of the VOD content is multicast over a single satellite transponder via a 13 Mb/s of data capacity and delivered to docking stations located at the cable headend.

Using TVN's asset management software, the content suppliers can remotely track their on-demand content assets through the delivery system. According to Dave Bartolone, VP Technology for TVN, "The docking station rebuilds files we send over the satellite until they're complete as a pre-described package consisting typically of a movie, or trailer and metadata file. Once the package is complete, it's pushed over to the VOD server system's asset manager". A web utility allows affiliates and content providers to view the database to follow the status of the asset. According to Bartolone, who sees a contining role for satellite in TVN's business "Satellite makes the most sense because of the multicast environment as opposed to point-to-point land lines. In the future we're looking at real-time encoding so we can for example send time-sensitive content out as files out in a matter of hours, not days".

By helping its cable clients take advantage of cable's interactivity. TVN hopes to provide more value in the future. "Another goal we have" says Bartolone " is to make the VOD experience like a DVD experience, by including chaptering, 5.1 audio and extra content associated with movies."

**Feeding The Future**

Whether its faster-than-FEDEX electronic delivery and tracking of 30-second commercials spots—sending a weeks' worth of syndicated shows to stations — or beaming the top 20 new Hollywood film releases to cable VOD providers every month— when it comes to broadcasting high-bandwidth video content to hundreds of locations, the marriage of satellite and servers is making more and more dollars and sense. SM

Dan Freyer is Director of Sales for GlobeCast, a global leader in satellite transmission services for professional broadcast, enterprise multimedia and Internet content delivery. Prior to GlobeCast, he has helped leading satellite companies like Intelsat, PanAmSat, Hughes and TRW grow their revenues and markets since 1989 in various sales, marketing and business development management positions. He has helped numerous cable, broadcast, Internet and VSAT users deploy satellite networks in the US and overseas. He has served as a Board member and Vice President of the Society of Satellite Professionals International, and is a partner in Westwood Media Group in Los Angeles. Email questions/comments to: dan@westwoodmedia.com

FEATURES

# DTH in Spain: "Savings on Satellite Transmissions"

**by Chris Forrester**

A recent major report on Spain's Sogecable ("The Power to Dictate Terms") from Morgan Stanley praises the company's business plan for the now merged former pay-TV rivals, Via Digital and Canal+Espana/Canal Satelite Digital. The detailed 30 page study, by senior analyst Javier Marin, highlights three key areas for cost-savings for the new platform: programming acquisition, management costs per subscriber and satellite transmission. Currently, the company is dual emitting satellite signals to Via Digital's 734,000 subs (Hispasat) and CSD's 1.2m using SES Astra at 19.2 deg East.

For some time Hispasat and Astra have responded to questions regarding their client's plans with perfectly reasonable statements along the lines of "We'll get the exclusive long-term contract" (Hispasat), or "Our long-term contracts remain in place" (SES Astra). The Morgan Stanley report doesn't clear the confusion, saying that the company has decided to "postpone" making a decision on which satellite to use. The report stressed: "We expect Sogecable to make savings on satellite transmissions..." Two weeks ago Sogecable issued nearly 29m new shares leaving core shareholder Telefonica with a 22.23% economic stake (and 16.38% voting rights) in the merged platform, and the report reminds us that the telco is committed to staying as a "core shareholder" for at least 3 years. Groupe Canal+ also has a 16.38% stake (and matching voting rights) in the merged business, while Prisa holds 16.38%.

Sogecable has indicated that it expects to incur around €300m-€400m of restructuring costs spread over the rest of this year and 2004, which as well as the re-design of the company's programming offer, and reduction in personnel, also includes "the rationalisation of satellite distribution infrastructure". The Morgan Stanley report goes on to add that, in its view, there are around 500,000 new installations a year at stake and that the company's first thrust should be to start winning these new viewers, offering "technology neutrality" to viewers. "Then," says the report, "we think the company will use its option either to let [current] contracts expire or to cancel them early, whichever is the cheapest."

This is entirely logical, of course, but doesn't help us move forward in predicting who will win and who will lose the long-term transmission contracts. Morgan Stanley does not itemise in detail the new company's costs, except to show the programming, personnel and "other" costs going forward. The "other" element includes transmission charges, with "other" currently (2003) stated as 27.3% of revenues at €316.2m, and falling next year to 19.4% of revenues (€280.8m), and to 14.9% by 2008 (€299.8m). This, to our thinking, suggests that the dual emission policy will be in place for the next 18 months or so, and will fade away by January 2005. Morgan Stanley agree: "Our model assumes the company will maintain both the Hispasat and Astra contracts for 2003 and most of 2004, which implies to us some €30m of duplicated expenses."

On-the-ground observers might get firmer clues from new dish installs: are they pointing at Hispasat or Astra? No platform that is organising new dish installs wants to revisit that subscriber to expensively realign/replace a dish.

But Sogecable has other challenges to overcome besides those of satellite transmission. First up is a possible near-instant loss of some 250,000 subs that are "under considerable pressure" says Morgan Stanley. The pressure comes from Via Digital subs that were used to lower monthly payment patterns. Sogecable expects to pull out all the stops to attempt to minimise this impact, upselling the new tiers as aggressively as possible. The downside is that Via Digital always made a strong selling virtue of its lower subscription charges, "and

**Spanish Pay-TV***

**"New" Sogecable- 2003 position**

| Company | Subscribers |
|---|---|
| Sogecable DTH | 1,201,000 |
| Sogecable terrestrial | 650,000 |
| Via Digital | 734,000 |

**Data: Morgan Stanley*

these subscribers are likely to be driven out of the market," says Morgan Stanley.

Staffing is another headache, especially with Spain's tough dismissal legislation. The 'old' Sogecable had 1500 permanent staff and another 1200 temporary workers. Via Digital had just 400 staffers. This overlap will result, says the report, in total staffing more or less in line with 'old' Sogecable and take a little time to resolve. The upside here is that many of Via Digital's staff have either already left, taken early retirement, or have been absorbed elsewhere within the Telefonica empire.

Spain is not the UK, nor is it fair to compare and contrast Sogecable with BSkyB. For a start, Sky 'gives away' its boxes (and expenses them on its balance sheet) while Sogecable capitalises the cost of its decoders. Indeed, Morgan Stanley praise Sogecable for creating a business in box rental which they describe as "very profitable" based on the rationale that renting a box which is paid for over 18 months and yet has a typical life of 7 years contributes "more than 10 percentage points to Sogecable's EBITDA margin". The actual rental figure paid by subscribers is €8 a month. The boxes currently cost no more than €130 each, and Sogecable will bank €96m this year from box rentals alone.

As to Sogecable's future prospects, Morgan Stanley say they are targeting 3.3m subs by 2008, from around 2.6m today. Of that 3.3m, around 2.7m will be digital DTH. Additionally, the bankers suggest that overall pay-TV penetration levels in Spain (including cable/ DTT) will rise from about 24% at the end of this year to around 34% by the end of 2008 with Sogecable taking the lion's share (67%) by 2008. The report also suggests that cable "poses no threat" to Sogecable's financial progress, even though cable subs might well grow to end up with a 33% market share.

Piracy has been a nightmare for 'old' Sogecable, when during 2000 and 2001 their subscribers would take out a basic tier card and then use a pirate card to view all the premium services. Morgan Stanley assumes no major piracy issues for the future. With this in mind, the report states that Spain's upside for pay-TV is considerable. Indeed, it predicts that even by 2008 the Spanish market will still be lagging considerably (10 percentage points) behind the UK, or put another way, Spain in 2008 will be at about the same point the UK was in 1998. Meanwhile, Sogecable's wholesaling of channels brings in €45m-€50m a year, and growing.

Today's merged Sogecable is, in reality, at least two distinct businesses. There's the legacy analogue terrestrial single channel Canal Plus service (currently bringing in 14% of revenues), and the Canal Satelite Digital (CSD) direct-to-home platform ((69% of revenues). Next year, in the first trading year of the merged platforms, Morgan Stanley forecast revenues of €1.443bn, and rising to €2bn by 2008.

Besides transmission costs and personnel reductions, the next area to save cash is clearly in programme and rights acquisitions. Without two rival platforms bidding one another into the stratosphere, Morgan Stanley expect programming costs to results in "hefty" savings. The target is to see programming costs fall to less than 50% of revenues by 2005, and this is "fully attainable" says the bank, suggesting 2005 costs will be 48.5% of revenues and fall to 47.5% by 2008. Last year they were at 51.9%, although Sogecable is earmarking €350m to fund cancelled programming contracts. The Hollywood 'majors' are safe for a few years yet, however, given that most of the studios have contracts in place until 2007. It is only then that Sogecable can really start to see "price flexibility" in new deals.

Spain's merged digital platform is now finalising its channel line up for Digital Plus. We already know that Multithematiques is dropping two channels (Seasons, the huntin', fishin' and shootin' channel, as well as movie service Cineclassics). SM

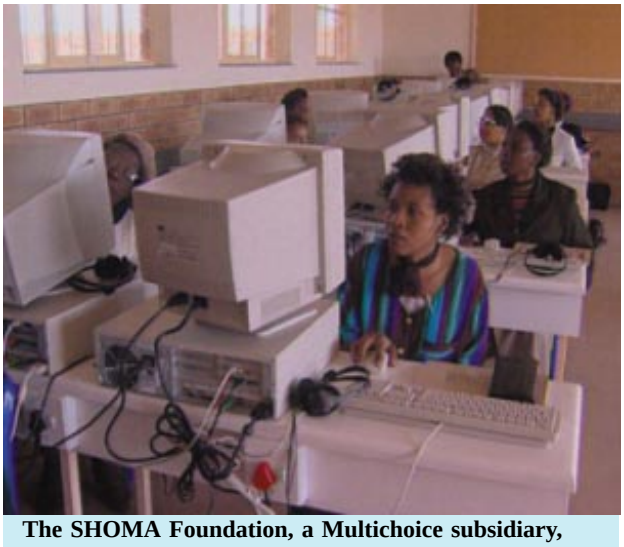
London-based Chris Forrester, a well-known broadcasting journalist is the Editor for Europe, Middle East and Africa for SATMAGAZINE. He reports on all aspects of the industry with special emphasis on content, the business of television and emerging technologies. He has a unique knowledge of the Middle East broadcasting scene, having interviewed at length the operational heads of each of the main channels and pay-TV platforms. He can be reached at chrisforrester@compuserve.com

VIEWPOINT

# Satellite Challenges and Solutions Cross All Borders: A Case Study in Africa

**by Howard Greenfield**

The communications satellite has appealed to the imagination ever since it was dreamed up in 1945 by Arthur C. Clarke, author of *2001: A Space Odyssey*. A breathtaking idea whose time has come, the business model remains challenging. Finding the right mix of services that will attract a large customer base for the right price is an ongoing task. While Silicon Valley and European are typecast as the centers for marketing new technical achievements, satellite delivers the benefits of those efforts around the world, across all borders.



**The SHOMA Foundation, a Multichoice subsidiary, providing teacher training in remote Afircan villages through satellite technology.**

Africa's infrastructure requirements are likely to be one beneficiary, and MultiChoice, headquartered in Johannesburg South Africa, serves the entire African continent by satellite with an interesting commercial and social approach. With 680,000 digital subscribers in South Africa, and more than a million subscribers across 50 African and Indian Ocean countries, their Satellite reach includes PAS 7 for Ku band coverage of southern Africa and PAS 10 for C band coverage of sub-Saharan Africa. They have invested in Ku band service on the back of the Eutalsat W4 satellite to attract customers by offering smaller dish requirement.

CEO Nolo Letele compares his business with that of the U.S. and Europe: "Our growth is also fueled by the fact that while your markets overseas are penetrated with TV sets, here, the economy is transforming in ways. You are starting to see upward mobility in the population, which is good and means that a market is being created as we go along. We expect our South African subscribership to peak at about two million."

"Some of what we do is not yet available where you are in Silicon Valley. As a sole operator you have the attention of your subscribers. Our average middle to higher income person hasn't got a lot of entertainment, so DSTV supplies 50 channels, with as many as four sports options, four movie, and all of this makes for enjoyable watching—and value that is higher than it's US counterpart."

There are a variety of issues that satellite technology must tackle such as providing commercially successful programming content for diverse audiences and new interactive services. Multichoice is concentrating on these areas. For instance, when Ford recently launched its Bantam bakkie in Africa, they chose to use an interactive approach for DSTV subscribers with Interactive capable decoders with Ku-satellite band. This included supplying a virtual catalog on new vehicle features and the ability to book a test drive.

Culturally, the technology is being applied to stimulate development by delivering online educational frameworks such as the Multimedia Rural Initiative which brings learning and technical tools to schools. But the modern school-age generation also demands the

most innovative services. As Linda Vermaas, head of DSTV content puts it "We know the 16 to 30 year-old market watching MTV wants greater interactivity. They are the computer and cellphone generation and the youthful market wants to be able to use it all, have a convergence. We're looking at that."

So, the major challenge is to deliver cutting edge competitive programming and services and to increase profitability in a mature South African market by offering additional services to subscribers, and for the rest of Africa, increase subscriber base.

This is also emphasized by Carl Fischer, head of local production for sister company M-Net: "Our packaging has to be desirable to subscribers. It has to be compelling and unique. Our challenge is to understand there's no such thing as a general audience, and then cater to that. We have to be innovative, we have to be relevant to our viewers. This is what we can do with local programming that we can't do with foreign content."

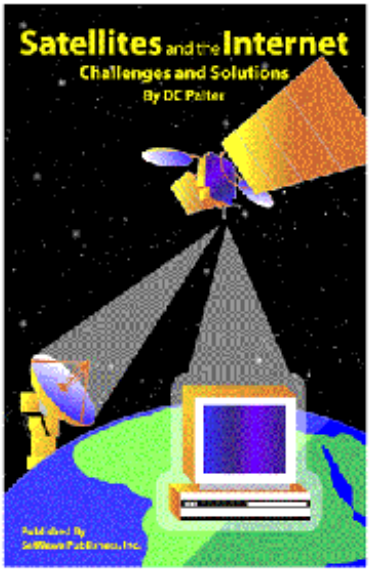
Wherever satellite covers, the business case must follow. It's crucial to take the risks of moving ahead quickly and capturing new markets. As Mr. Letele says, despite the growth and success: "We are a 'fast follower', studious of other global rollouts, but not too late to market. We've grown and learned our lessons . and paid the price of being a pioneer." SM



Howard Greenfield is principal of Go Associates Consulting Partners (www.go-associates.com), a leading consultancy that develops and implements high-tech product marketing and business development strategies. He has held leadership roles in Fortune 1000 and some of Silicon Valley's top companies including Sun Microsystems, Informix Software, General Foods/Kraft, University of California, Apple Computer and was VP, Product Marketing at Obvious Technology and Softface, Inc.. Mr. Greenfield is a frequent contributor to leading industry publications, and serves on the board of BlueVoice, a non-profit organization dedicated to ocean life and habitat. He was educated at the University of California, and Stanford University, where he received a Masters Degree in Interactive Technology. Howard can be contacted at howard@go-associates.com.

# TECHNICAL TUTORIAL

# IP Overview




**By D.C. Palter**

This chapter explains the basic operation of Internet Protocol, now known universally by its abbreviation, IP.

IP provides two primary functions: routing and fragmentation. Routing directs the packets of data across the network. Fragmentation divides the packets into pieces that fit into the frames of the underlying network. An IP packet is called a datagram.

IP was designed to be a relatively simple protocol for transporting packets of data across any type of physical network. From the user or application point of view, the physical infrastructure of the network becomes irrelevant. Unlike TCP, IP is not an end-to-end protocol, and only considers how to pass the packet to the next node. IP can be thought of as the routers themselves, taking in each packet, looking at the destination address in the packet header, and determining the next router to pass the packet to in order to reach the destination.

Probably the most important aspect of IP to understand, especially when considering the design limitations of TCP, is that IP is an unreliable protocol. IP provides no guarantees that a packet will arrive at the destination. In fact, if there is too much traffic for the link to support, IP will transmit what it can and simply throw away the excess with no notification to the sender. Similarly, if a packet is corrupted, IP will simply throw it away. IP is therefore called a best-effort service.

Because IP was designed to run over a constantly changing network where parts of the infrastructure may be added or removed at any instant, IP handles every packet independently of every other packet, even if the packets come from the same source and are being sent to the same destination. IP is therefore called a connectionless protocol.

Putting these together, the application and the transport layer protocol need to consider that any packet may arrive at the destination, or it may not. Each packet may travel by a different path and the stream of packets may therefore arrive in a different order from how they were sent.

## IP Addressing

The next chapter (Chapter 6) explains IP addressing in more detail. For this chapter, it is sufficient to understand that IP uses 32-bit addresses to uniquely identify every device on the Internet. Strictly speaking, this is only true for IP version 4 or IPv4, while the next generation IPv6 uses 128-bit addresses. In almost all instances, “IP” is still synonymous with IPv4.

To make it possible to actually find a specific device anywhere in the world, IP addresses are split into a portion that specifies the particular network on which the device is located, and a portion which specifies the device itself. Except at the last-hop, routers only need to look at the network portion of the address to know which direction to send the packet.

## Routing

The first and foremost job of IP is to transfer packets across the network from any source to any destination. IP accomplishes this heroic feat through the process of routing. At each interconnection point on the network, a switching device now known as a router (originally called an IMP [Interface Message Processor ] and later a gateway) maintains a table listing networks and addresses which can be reached through each of the router’s interfaces. As each datagram arrives, the router compares the destination address to the addresses in the table and sends it out the correct interface to the next router. This process is repeated,

router-by-router until the datagram arrives at the last-hop router on the same local network as the destination device.

The router is therefore a simple device (although an amazing amount of functionality has since been added onto the same platform with the routing functionality.) The complexity comes from creating and maintaining accurate routing tables of efficient routes. In the simplest case, the routing tables can be configured manually, called static routing. Static routing is common for routers with only two interfaces connecting a local network to a wide area network since the routing is extremely simple – the route for addresses on the local network is one interface and everything else goes out the other interface.

For complex networks that are changing frequently, it becomes necessary to configure and update the routing table automatically in a process called dynamic routing. Dynamic routing is accomplished through router-to-router communications to determine the best routes. Chapter 7 explains routing and dynamic routing protocols in more detail.

### Fragmentation

In addition to routing, the other primary job of IP is fragmentation. The largest IP datagram that can be carried across the network is a function of the frame size of the underlying physical network. The largest payload that an individual link can support is called the Maximum Transmission Unit, usually shortened to MTU. For example, Ethernet uses 1526-byte frames with a 1500-byte payload.

Figure 13 shows the MTU of a few common networking technologies. In general, slower link technologies have a smaller MTU while faster link layers send more data per frame to reduce header overhead.

Since different links may have different MTUs, what should IP do if a datagram arrives on one interface that is too large to send out the other interface? For example, an 8000-byte packet may arrive over an ATM wide area network on one interface of the router, but need to be forwarded to an end user on an Ethernet local area network which can only support frame sizes up to 1500 bytes.

The solution to the first issue is that if an incoming datagram cannot fit in the frame of the next hop, IP fragments the datagram into multiple smaller datagrams. For example, the router will divide the 8000-byte datagram from the ATM link into five 1500-byte datagrams that fit within Ethernet frames, and one additional datagram with the remainder of the data. Each fragment is a full IP packet and requires its own IP header, so the six new datagrams in this example will be greater than 8000 bytes. The new datagram headers include information on where each fragment fits within the original datagram so that IP can reconstruct the original datagram at the final destination, even if the fragments arrive out of order.

Fragments are not reassembled until they reach the final destination. Fragments may also be further fragmented as they continue to following hops. For example, if in the previous example, the final hop to the end user is a dial-up modem, the original 8000-byte datagram that was fragmented into 1500-byte datagrams, are then further fragmented into smaller 576-byte datagrams. The IP stack on the end user's machine then reassembles the fragments into the original 8000-byte datagram.

The exception to this process is if the "don't fragment" flag is set within the IP header. When this option is turned on, if a datagram is too large to fit in an outbound link frame, the router throws away the datagram and sends an ICMP error message to the original source of the datagram.

### Path MTU

The second question is what size datagram should IP normally send? Small packets are not optimal for two reasons. First, the smaller the packet, the greater the overhead of the headers and therefore the less data that can be carried over the link. Second, small packets increase the processing load on the routers. Since the router examines the header of each packet separately and routes the packet out the appropriate interface, the amount of processing required by the router depends almost entirely on the number of packets and is mostly independent of the amount of data in each packet. For efficiency and link utilization purposes, it is best to use as large a packet as the link layer can support.

If small packets are not good, why not simply use a huge datagram and let IP fragment it as necessary at each hop? This would ensure that

## TECHNICAL TUTORIAL

IP always uses the largest possible packet size for the particular path between source and destination. IP can support datagrams up to 65535 bytes.

Unfortunately, there are two problems with this approach. First, fragmentation and reassembly is much more processing intensive than routing, so this approach can easily end up less efficient than using small packets. Second, and more importantly, IP has no retransmission mechanism and will throw away datagrams during periods of congestion. If even one fragment of the original datagram is lost, IP has no choice but to throw away all of the other fragments from the original datagram that have arrived. If the 65535 byte datagram is fragmented into fifty 1500-byte packets, if even one of the fragments is lost, the other forty-nine fragments will also have to be thrown away.

The simplest solution is to manually configure a reasonable default MTU on the end devices. Microsoft Windows-based consumer operating systems use an MTU of 576 bytes, assuming that the user will likely be connecting to the Internet over a low speed dial-up modem with a small frame size. Most server operating systems either use an MTU based on the type of interface, or use 1500 bytes assuming that the device will either be connected by Ethernet or the connection will pass through Ethernet at some point. This value can also be manually adjusted as necessary by a system administrator installing a high speed network such as ATM which offers a larger MTU.

The other solution is to probe the network to automatically determine the largest MTU that can be supported for the particular path between the source and destination devices. This process is called Path MTU Discovery and is specified in RFC 1191. Path MTU works by sending out datagrams that cannot be fragmented. If the datagram is too large, the router at the hop with the small MTU will drop the datagram, but send back an ICMP error message with the size of the MTU for the next hop. IP will then try again using the indicated value. If there are later hops with even smaller MTUs, IP will repeat this process until the datagram reaches the destination without generating an ICMP error.

IP then caches the MTU for a particular destination and continues to use this value for future traffic, periodically probing the link with a larger packet to determine if the end-to-end link to the destination can now support a larger MTU.

Path MTU does violate the basic assumption of IP that every packet may travel over a different route, which could have a different MTU. The Path MTU process only works effectively if routes are not changing frequently between links with different MTUs, which fortunately is usually the case in real life.

Path MTU also has one other drawback. When initiating a connection to a new location, it can take one or more iterations before the datagram can reach the destination, causing a delay in the start of a new connection. Over terrestrial networks where acknowledgements return quickly, an extra one or two round trips to establish a new connection will usually not have a noticeable impact on performance. Over a satellite link, the extra round trips to establish the connection may be noticeable, especially if the problematic links are on the opposite side of the satellite link from the sender. Fortunately, most networks are now standardized on the Ethernet-sized 1500-byte MTU, so fragmentation from an initial 1500-byte MTU is becoming increasingly uncommon. SM

**(To be continued next issue)**

**DC Palter** is Vice President of Sales and Marketing of Mentat—a supplier of high-performance networking solutions to the computer and satellite industries. Previously, Mr. Palter held marketing and engineering positions at Hughes Electronics, Allied-Signal Aerospace, and Kobe Steel. Mr. Palter holds a BSME degree from Northwestern University and an MBA from the Anderson School at UCLA. Mr. Palter is also the author of a textbook on the Osaka dialect of Japanese. He can be reached at dc@mentat.com

This tutorial is excerpted from a book by D.C. Palter entitled "**Satellites and the Internet: Challenges and Solutions**." For more information about the book go to: www.satnews.com/free/pubs/internetinfo.html

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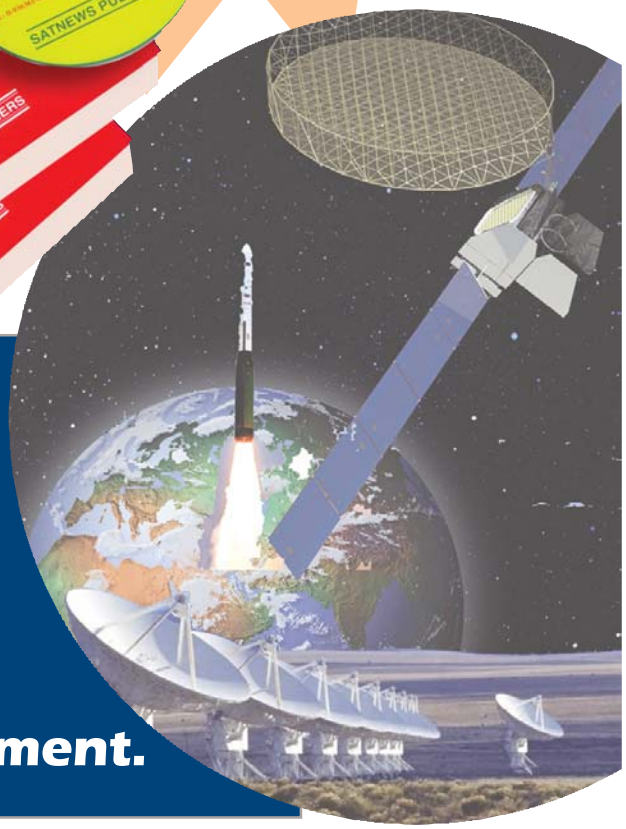

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FEATURES

# Indian TV in a Mess

**By Chris Forrester**

First it was the 'will they, won't they' legislation to permit DTH operators to beam signals into India. Then it was the notorious Conditional Access System (CAS) rules which required India's 30,000 so-called "cable-wallahs" to install set-top boxes in every household by July 14. Both sets of legislation have stumbled. India's media rules now allow limited foreign participation (to 26% of equity) for news channels that emanate from India, like Rupert Murdoch's Star News, part of his Star India portfolio of channels. Last week, India's influential GoM (Group of Ministers, drawn from media, law and finance ministries) announced it would hold a "final review" of Star TV's general DTH plans. Under the complex Direct-to-Home rules, foreign equity participation is limited to 49% with a further cap of 20% on direct investment. In addition, there is an important 20% sectoral cap for foreign equity participation from broadcasting companies.

These equity participation regulations have created problems. Doubts have arisen because Star's DTH applicant, Space TV, which has been formed by Star employees (as promoters and CEO). Questions have now arisen as to the source of the venture's funding. If it is fairly obvious that Space TV serves as a corporate veil, the government which has now ploughed through reams of paper on the shell companies floated by Star for uplinking purposes, is wary of similar arrangements for other DTH operations as well.

**Rupert Murdoch's STAR TV stands to benefit from liberalization of India's media foreign ownership rules**

The prize, for Murdoch as well as rivals like his former local partner Subhash Chandra, is India's fast-growing cable penetration, claimed by Star to be topping 55m homes, and probably significantly more. Under-reporting of actual numbers is normal amongst the cable operators, and some broadcasters suggest that up to 80% of cable's numbers are under-stated. The cable operators say they have "about" 6 million homes paying for TV signals. Fees are low, around 50 Rupees a month ($1) in rural communities, for around 20 channels. City-dwellers (and better paid) get charged between 250-400 Rupees for a larger portfolio of 60-odd channels that contain a mix of local and international programming.

The Indian government ruled that viewers in the country's four main cities: Mumbai, Chennai, Kolkata (Calcutta) and New Delhi, cable operators had to install cable set-top boxes, thereby allowing programmers to earn a few extra rupees by establishing a premier tier of higher-value channels. The boxes had to be installed by June 15, then when this was clearly impossible a fresh date was given, July 14. This has also been abandoned, with media authorities now saying operators have until the autumn to start box installation. Normally, set-top boxes also attract a punitive 51% tax on their installation. This has been cut to 5% until July 31, although as this is written it is uncertain whether this tax holiday will be extended to a suggested date of September 30.

A ministerial proposal is that this two-month extension of the duty reduction on imported set-top boxes be allowed. The former structure was due to come back into force on August 1 of 25% basic customs duty, 16% countervailing duty and 5% Special Additional Duty. With an intention to provide a level-playing field to indigenous manufacturers, the finance ministry also abolished excise duty on STBs and reduced customs duty from 25% to 5% on

## FEATURES

key components of STBs, namely tuners, remote control units and RF-modulators.

The government's view is that CAS "empowers" viewers. "CAS is designed to empower the consumer... We will make sure that it is consumer-friendly," Information and Broadcasting Minister Ravi Shankar Prasad said. Prasad said cable TV rates had gone up by 11 per cent in the last six years and CAS would give the consumer the right to choose pay channels and pay only for those they wanted to view. Data supplied by the Customs and Central Excise authorities showed that just 50,000 set-top boxes had been imported by various MSOs by July 16.

Having last year passed the DTH rules, and this year attempted to introduce the CAS rules on the cable sector, now the Indian government is planning to think again. The government on July 24 accepted that there is "clearly a need for [further] institutional mechanism for regulation of broadcasting." A statement by Ravi Shankar Prasad, minister for information and broadcasting, says that a wider consultation with stakeholders is necessary to decide a new appropriate framework. The comment suggests the I&B ministry's recent experience with the industry in the context of CAS, uplinking, FM radio and other issues, is prodding the leadership to explore tougher options

While there's this government confusion, there seems little incentive for cable operators to get behind the new rules. Indeed, last weekend a meeting of cable-wallahs in Kolkata generally postponed their threat for a black-out of all TV, as a protest against the CAS concept. But some did interfere with feeds. General secretary and spokesperson of Cable Operators Sangram Committee Tarak Saha said in some pockets of the city cable operators had already begun blacking out cable channels. "It is already happening. Operators are not happy at the way in which CAS is being introduced," he said. Saha said the Sangram Committee and all its members were "in favour CAS being introduced" but not as announced by government. More importantly the 72 Rupees fee for all channels that the government has offered during a transition 'honeymoon period' seems to be "all wrong". "Many channels have already told us that they will not agree to this honeymoon period offer," he added. "And we will have to pay them the old rates even then. This is impossible. Most [urban] cable operators earn Rs 250 to Rs 300 per month at present. If a bulk of this is reduced to Rs 72 and yet we have to pay up the old rates, all cable operators will run out of business." There's other criticism. India's

## FEATURES


Consumer Guidance Council asked: 'Why should any cable operator bother with boxes. There is no policing of the rules.' This is correct, and there's no planned policing of the regulations although the government has expressed hope that the broadcasters would behave "rationally". Another public watchdog has argued that the government is foolish to legislate nationally for local tastes. Anil Patwardhan of the Consumer Corordination Council asked: "Who is to decide which channel a person in Mumbai is to watch. Can some official in New Delhi [India's capital] decide which channels someone in a remote corner of India should watch?"

Meanwhile, Star News is operating its all-Hindi service on a temporary weekly licence issued by the Ministry of Information. There's talk locally of 'dirty tricks' behind the company, which lost its main backer (Kumar Mangalam Birla) in mid-July, and allegations that Star's licence-holder (Media Content & Communications Services) is just a front, a shell company in effect, made up of a handful of friendly locals to Mr Murdoch. Local telecoms giant VSNL, which handles Star's uplink services (and in which the Indian government holds a small stake) has reportedly threatened to drop Star's feeds.

Then, there's the increasingly acrimonious relationship between one-time pals Murdoch and Zee TV's owner, local mogul Subhash Chandra. Murdoch and Chandra ended their relationship some 3 years ago and have since been seen as fierce rivals for India's viewing loyalty. Currently, Murdoch's Star operation is well ahead, helped by the switch from English to Hindi on Star News, taking its market share soaring from 7% to 30%. Star Plus has 45 out of the top 50 programmes, and has allegedly led Chandra to use his many parliamentary links with the ruling VJP political party to lobby against Murdoch and Star. Star's next move is to establish regional versions of its services, in local languages, and for this extra capacity will be needed. If nothing else this is good news for the DTH and distribution sector. SM

London-based Chris Forrester, a well-known broadcasting journalist is the Editor for Europe, Middle East and Africa for SATMAGAZINE. He reports on all aspects of the industry with special emphasis on content, the business of television and emerging technologies. He has a unique knowledge of the Middle East broadcasting scene, having interviewed at length the operational heads of each of the main channels and pay-TV platforms. He can be reached at chrisforrester@compuserve.com

### ADVERTISER'S INDEX

## VITAL STATISTICS

# World's DTH Subscribers Top 50 million

According to a recent study (Screen Digest, June 2003) digital satellite pay-television connections grew last year by almost 6 million subscribing homes to 50.17 million. Asia is the fast-growing region with 33% growth in subscribers. The best-performing single country in percentage terms was Greece, where Nova's subscriber base grew 50.3% helped by the collapse of its rival (from 88,100 subs to 132,500). Western Europe added more subscribers (2.3m) than North America (2.1m) last year while Latin America's continuing economic troubles held back progress (0.3% growth to 3.02m).**(Chris Forrester)**

SM

**Data:Screen Digest**

**Digital DTH/DBS subs (000) by country**

| Country | 2001 | 2002 | %change |
|---|---|---|---|
| Denmark | 200.5 | 239.1 | 19.3 |
| France | 3,139.0 | 3,447.0 | 9.8 |
| Finland | 50.9 | 64.1 | 25.9 |
| Germany | 834.0 | 1,154.0 | 38.4 |
| Greece | 88.1 | 132.5 | 50.3 |
| Italy | 2,159.5 | 2,666.8 | 23.5 |
| Netherlands | 43.8 | 47.0 | 7.3 |
| Portugal | 224.0 | 290.0 | 29.5 |
| Spain | 2,036.4 | 1,995.0 | (-2.0) |
| Sweden | 438.3 | 530.7 | 21.1 |
| UK+Ireland | 5,716.0 | 6,562.0 | 14.8 |
| **W. EUROPE** | **15,330.5** | **17,612.5** | **14.9** |
| Czech Rep | 42.3 | 52.0 | 22.9 |
| Hungary | 59.1 | 79.1 | 33.8 |
| Poland | 601.7 | 688.0 | 14.3 |
| **C.EUROPE** | **703.1** | **819.1** | **16.5** |
| USA | 17,576.0 | 19,400.0 | 10.4 |
| Canada | 1,768.1 | 2,088.9 | 18.1 |
| **N. AMERICA** | **19,344.1** | **21,488.9** | **11.1** |
| Mexico | 692.0 | 706.0 | 2.0 |
| Brazil | 708.0 | 732.0 | 3.4 |
| Other Latino | 1,610.0 | 1,582.0 | (-1.7) |
| **C/S AMERICA** | **3,010.0** | **3,020.0** | **0.3** |
| Africa | 793.6 | 920.0 | 15.9 |
| Middle East | 600.0 | 620.0 | 3.3 |
| **AF/MID-EAST** | **1,393.6** | **1,540.0** | **10.5** |
| Indonesia | 25.0 | 25.0 | 0.0 |
| Japan | 2,506.8 | 2,939.3 | 17.3 |
| Korea | 0.0 | 450.0 | 0.0 |
| Malaysia | 590.0 | 800.0 | 35.6 |
| Taiwan | 80.0 | 100.0 | 25 |
| Thailand | 254.5 | 291.0 | 14.3 |
| **ASIA/PAC** | **3,456.4** | **4,605.3** | **33.2** |
| New Zealand | 300.3 | 354.5 | 18.1 |
| Australia | 726.5 | 732.6 | 0.8 |
| **AUST** | **1,026.8** | **1,087.1** | **5.9** |
| **World Total** | **44,264.4** | **50,172.8** | **13.3** |

# MARKET INTELLIGENCE

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## TURKEY

'Statistics and evaluations reveal that Turkey has become an outstanding trade location for foreign companies… Production and sales opportunities are gradually rising in both domestic and international fields. Uniting with international investors who bring along new production technologies, local companies are becoming world-wide brands…'

*Market Report, CeBit Broadcast, Cable & Satellite Eurasia 2003*

Turkey's East-West location is its strength. The country is experiencing a change in fortune after recession, and its demography may prove to be a primary reason for growth in satellite communications. The population is young; the average age is 26, and the hunger for new technology and development is strongly pronounced. The liberalisation of import and export trade regulations, the privatisation of state owned enterprises and the encouragement of foreign investment have also created a market with huge potential.

In 2001 the world-wide telecommunications industry was in turmoil, with the fewest satellites orbited in any year in nearly a decade. Now, there are signs of recovery. As a whole, the commercial satellite industry generated revenues of US$86.8 billion in 2002, compared to US$78.6 billion in 2001. Increasing global demand for satellite services is expected to continue between 2003 and 2011. So, for Turkey, where will the growth areas be?

Telecoms account for 3.1% of the Turkish Gross National Product (GNP). It is one of just 17 countries to operate its own satellites: Turksat 1-B & 1-C, and Eurasiasat 1. Eurasiasat provides Internet, TV, GSM and VSAT applications to Turkey. Other satellite operators active in the region include Inmarsat, Eutelsat and Intelsat.

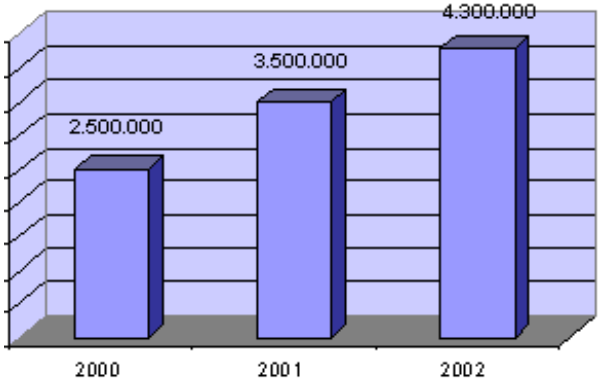
Growth in demand for satellite technology in Turkey is increasing. The analogue TV system is slowly being replaced by digital programming and receiver systems. Supply of cable TV infrastructure cannot match burgeoning demand, thus opening the door for satellite to service the residential market.

Direct-to-home (DTH) television is beginning to infiltrate the Turkish market but currently totals only 500,000 receiver units units per year. However, digital technology is becoming more popular with use of new services such as Pay-TV, tele-banking and shopping and high speed Internet access. With a young and adaptable population, the outlook for the DTH market looks positive.

Low noise block down converters are also expected to provide an excellent opportunity for foreign investment. Currently, such advanced products are not domestically manufactured and Turkey relies on imports. Domestic antenna manufacture in Turkey is well developed and competition is intense, however foreign companies may still find niche demand for smaller, more efficient designs VSATs are widely used in the domestic and international business and financial arenas. There is also an increasing demand for high capacity, online VSAT services via satellite. Turk Telecom uses their own satellite, Turksat 1-B for domestic and international use.

If we look at Turkey in comparison with the European market, we can see that it has huge potential. The European market has been saturated, whereas, the Turkish market is open and ready for foreign investment. The country's demographics presents opportunities for satellite technology. The country is ready to progress and is willing to pay the price for quality goods from abroad.

**INTERNET Subscribers in Turkey**




**Source: CeBit Broadcast, Cable & Satellite Eurasia 2003**

SM

In the next issue: ***Iran Market Intelligence Report*** and details of the **Middle East Satellite Summit**, to be held in Tehran, Iran on 1-2 October 2003. This Summit is jointly organised by the Global VSAT Forum and the Iran ISP Association. For further details go to **www.gvf.org** or contact **helen.jameson@gvf.org**