

HD With SES Global

ISOG Conference – Washington, D.C. 7-8 December, 2006



Samantha McCloskey

Vice President Special Events and Occasional Use

Presentation Overview

- ▲ SES Group structure
- ▲ SES Occasional Use
- ▲ SES and HDTV
 - SES Astra HDTV
 - SES Americom HDTV
 - SES News Skies HDTV
- ▲ SES New Skies expanding within SES



The SES Group Structure



The SES Group Structure

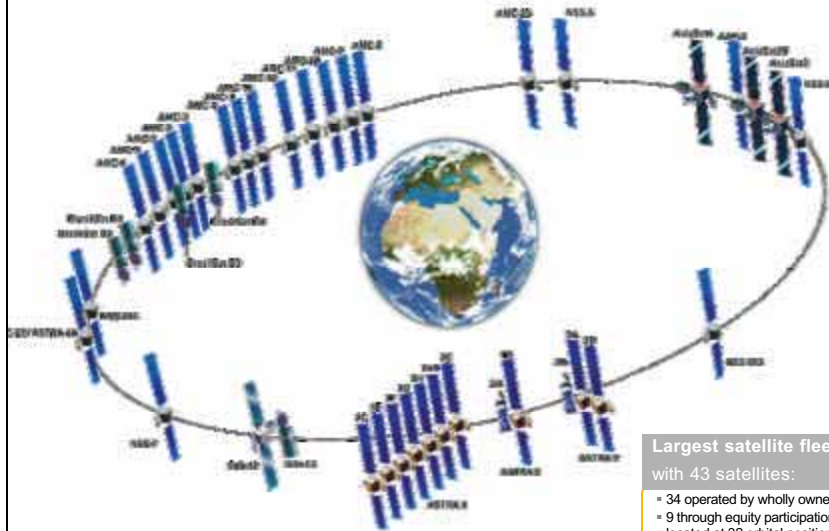
- **SES ASTRA** is Europe's #1 DTH satellite service provider reaching 107 million households (incl. cable)



- **SES AMERICOM** is a major player in broadcasting for US cable services reaching some 80 million US households
- SES Confidential

- **New Skies Satellites** is a premier provider of satellite communications services, with more than 250 customers based in 79 countries

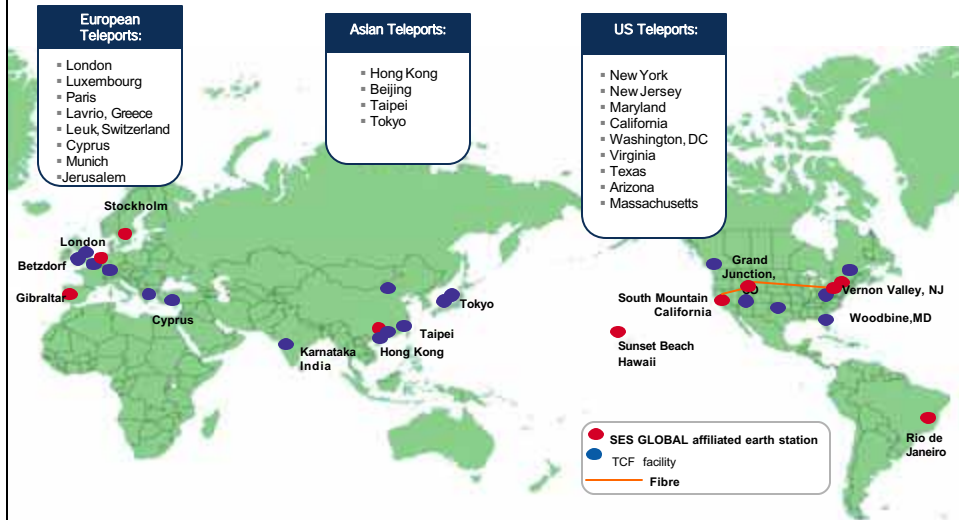
The SES Global Fleet



Largest satellite fleet with 43 satellites:

- 34 operated by wholly owned subsidiaries
- 9 through equity participations
- located at 32 orbital positions

Global facilities and partner sites



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SES GLOBAL

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SES Occasional Use

SES GLOBAL

- ▲ Unified Booking system coming in 2007
- ▲ SES Customers will have the ability
 - to view satellite transponder availability space and then book the required capacity directly "On-line" via an easy-to-use Web-enabled interface
 - use the old-fashioned pick up the phone
- ▲ Customers requiring occasional service can depend on our reliable, high-quality services and the following benefits:
 - 24 x 7 x 365 booking and access
 - C- and Ku-band capacity for analogue or digital service
 - Capacity world wide
 - Turnaround connectivities with select teleports worldwide



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Making HDTV happen in Europe

SES ASTRA
An SES GLOBAL Company

Target: Establish European HDTV Forum, coordinate technical standards, market introduction and communication:

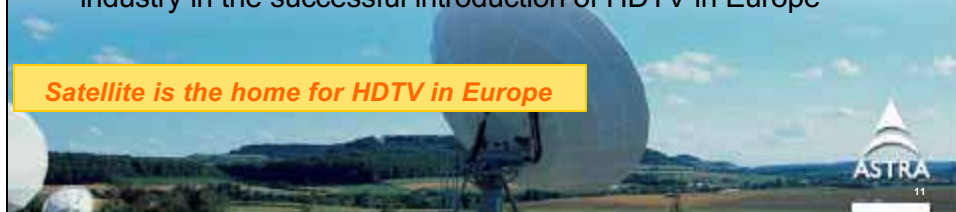
- ▲ Two HDTV conferences held in March and June 2004 with customers and industry representatives
- ▲ HD-ready label created with EICTA
- ▲ Sponsor to various HDTV events
 - HDTV Summits in UK and with Euroconsult
 - HDTV demos at all trade shows
 - Luxembourg EU presidency HDTV event in June 2005
- ▲ Hosted 1st European HDTV convention in July 2005
- ▲ Launched ASTRA HD demo channel
- ▲ Foster and support national HD initiatives all over Europe



HDTV in Europe – Status Today

- ▲ HDTV in Europe is a reality on satellite today
- ▲ Impressive sales of HD capable displays indicate real consumer demand for picture quality
- ▲ Broadcasters will all move towards HDTV however with different time lines
 - Pay-TV operators are already the first movers
 - FTA public and private broadcasters will follow swiftly
- ▲ SES ASTRA is committed to strongly support its customers and the industry in the successful introduction of HDTV in Europe

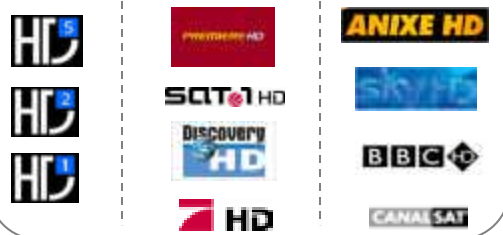
Satellite is the home for HDTV in Europe



Making HDTV happen in Europe

HD Prime™ neighbourhood on ASTRA

19 HD channels via ASTRA already today!



100+ HDTV channels available on ASTRA

2004

2005

2006

2010

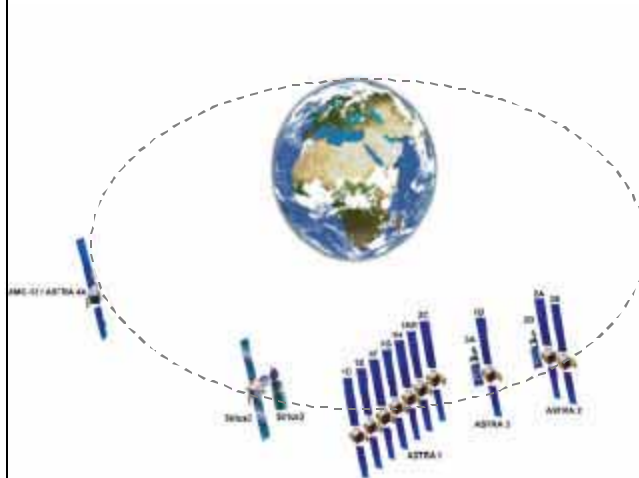
Making HDTV happen in Europe

HDTV forecast – Europe 2010

- ▲ Majority of new TV productions will be in HD
- ▲ Most of movie, sports, documentary channels in HD
- ▲ 100+ HDTV channels available on ASTRA
- ▲ Transition to digital completed in all core markets
- ▲ Economically viable due to new compression technologies
- ▲ Satellite will be frontrunner for HDTV
 - Ubiquitous coverage
 - Fastest time to market
 - Immediate roll-out



The ASTRA Fleet

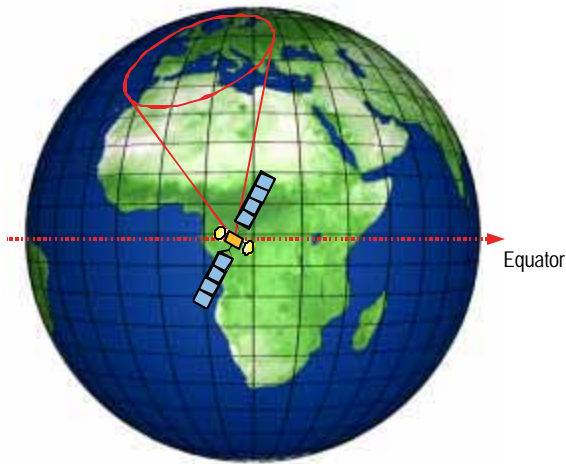


Operating 13 satellites
at 3 orbital positions

- 19.2° East – TV and Radio Broadcast, Interactive TV, DSL via satellite and other broadband services for Europe (except UK)
- 28.2° East – TV and Radio Broadcast, Interactive TV, DSL via satellite and other broadband services for UK
- 23.5° East – Cable feeds and broadband applications

The 19.2° East orbital position

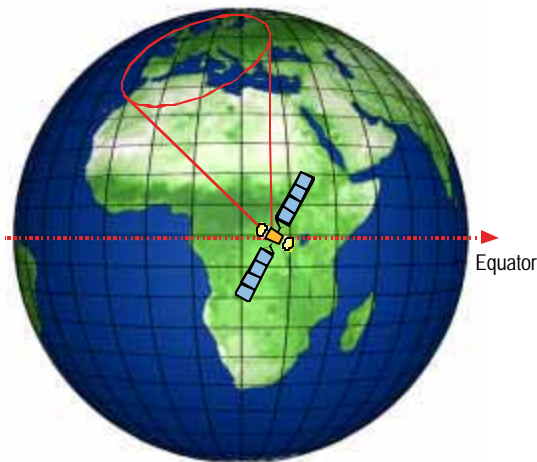
- ▲ TV, iTV, HDTV, radio



Satellite	Launch	Trp.
1C	May '93	18
1E	Oct. '95	18
1F	Apr. '96	22/20
1G	Dec. '97	32/28
1H	June '99	32/28
2C	June 2001	32/28
1K	April 2006	32/28

The 28.2° East orbital position

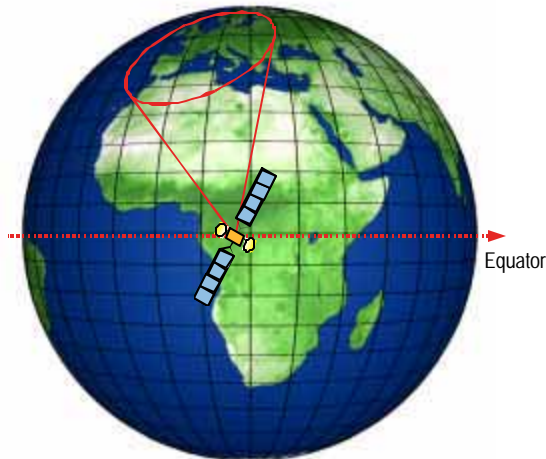
- ▲ TV, iTV, HDTV, radio for the UK and Irish markets
 - Fixed antenna coverage of Europe
 - Steerable antenna for coverage over Africa (2B only)



Satellite	Launch	Trp.
2A	Aug. '98	32/28
2B	Sep. 2000	32/28
2D	Dec. 2000	16/15

The 23.5° East orbital position

- ▲ Used for cable feeds, broadband DTH and occasional use
- ▲ Extension of 19.2E as additional DTH position
- ▲ Main target: CEE, Netherlands, Germany, Europe















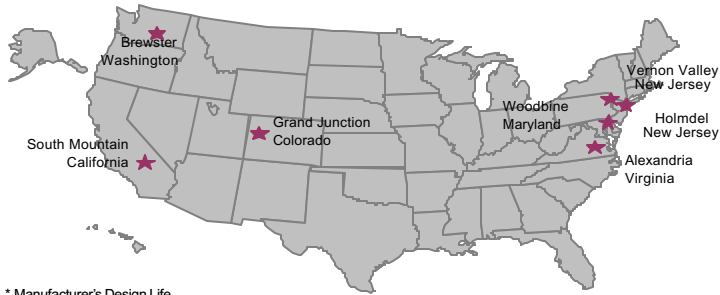
Satellite	Launch	Trp.
1D	Nov. '94	18
3A	Mar. '02	20



- ▲ High-definition television distribution for cable head-ends.
- ▲ Two identical satellites: AMC 10 at 135°W and AMC 11 at 131°W
- ▲ Neighborhood includes 20 Channels:
 - Discovery Communications, Scripps Networks, Viacom, E! Networks, A&E Television Networks, Hallmark Channel, iN DEMAND, Lifetime Entertainment, NBC, QVC and The Weather Channel.



 AMC-8 139° W C 2016*	 AMC-7 137° W C 2015*	 AMC-10 135° W C 2019*	 AMC-11 131° W C 2019*	 AMC-18 105° W C 4Q-06 Launch 2022	 AMC-1 103° W C & Ku 2011*	 AMC-4 101° W C & Ku 2014*	 AMC-3 87° W C & Ku 2012*	 AMC-16 85° W Ku & Ka 2020*	 AMC-9 83° W C & Ku 2018*	 AMC-5 79° W Ku 2010*	 AMC-6 72° W C & Ku 2015*
Fleet Spare		HD-Prime			AMERICOM2Cable						



* Manufacturer's Design Life
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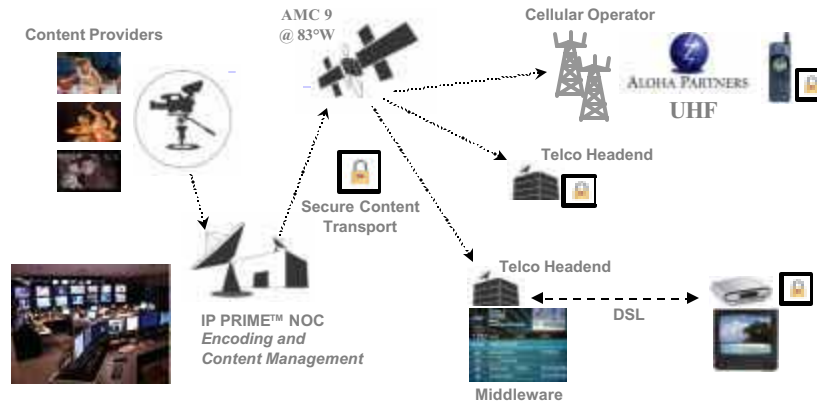


The Potent IPTV Solution TDS

October 24, 2006

What is IP Prime™ ?

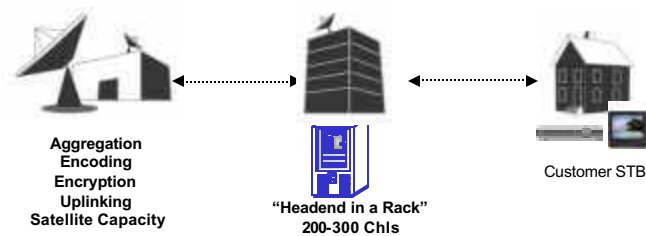
- Centralized, Wholesale, Multi-Channel Video Service
- Secure, Scalable and Operational
by Market, Customer and Screen Size



Delivering Turnkey "IPTV"

IP-PRIME delivers a new IPTV service that permits cost-effective bundling of high-quality television programming. Benefits for the Telco's are:

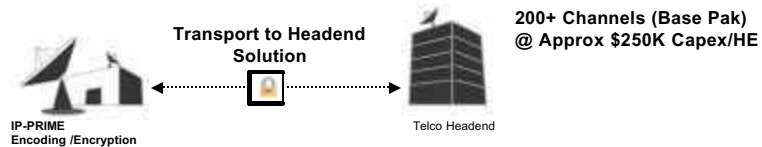
- Avoid a multi-million \$\$\$ up-front capital investment
- Accelerate speed to market
- A comprehensive turn-key solution
- End to End Service - Qualified and Certified in SES's Labs



Single Source, Multiple Solutions



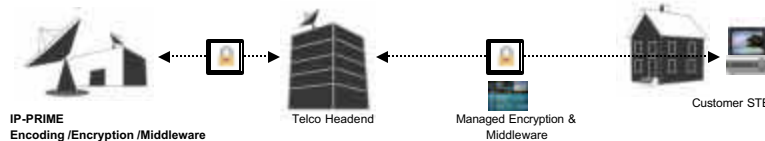
IP-PRIME can be dropped off at the Telco headend



IP-PRIME can be delivered through to the STB

- Centralized encryption and managed middleware
- Plus provides Telcos with full subscriber control and management, with customized look and feel

200+ Channels (Base Pak)
Transport plus Managed Solutions @ Approx \$150K Capex/HE



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Programmers are Demanding



▲ High Video/Audio Quality & Performance

- SD and HD
- Advanced Audio – HE AAC & Dolby Digital Plus

▲ Secure Delivery

- 100% Encryption of all the national feeds a must
- Authentication and Accountability
- Blackout management and enforcement

▪ Industry Compliance and Ancillary Features a must

- Implemented in accordance with Industry Standards
- SAP, Closed Captioning, Copy Protection, etc

▪ Service Integrity

- High Service Reliability and Service Availability

✓ **Programmer Performance Demos @ SES NOC**

SES has gained the trust and acceptance of the most demanding programmers

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HD Encoder Selection

- ▲ Considered 6 vendors – Tandberg, Modulus, Scientific Atlanta, Envivio, Harmonic, GrassValley
- ▲ Evaluated based on
 - Compliance to industry standards – interfaces, encoding
 - Performance at various rates / resolutions
 - Detail
 - Flat areas
 - Motion – slow pans, high action, zooms
 - Fades
 - Features
 - H.264 Tools / High profile support
 - Capped-VBR
 - Processing power for future growth
 - Dolby encoding & pass-through
 - PIP
 - interoperation with existing systems
 - price

HD Encoder Selection

- ▲ Selected Scientific Atlanta D9054
 - Best overall performance ...
 - Single-slice encoding
 - ... with room for improvement
 - Adding B-frames
 - Weighted prediction
 - High profile tools
 - Most features we need – existing and future roadmap
 - PIP
 - audio formats – Dolby / HE-AAC
 - Interfaces
 - redundancy flexibility
 - Etc.
 - Worked with existing ROSA management system
- ▲ 20 channels today – more coming soon
- ▲ H.264 is new – see large improvements and new encoders emerging.



HDTV and SES New Skies

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An SES GLOBAL Company

▲ Strictly a capacity play: News and Sports

NHK

KDDI/NTV

EBU

NFL

Fuji TV



HDTV Events

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An SES GLOBAL Company

Iranian earthquake

World Judo Championships

Iraq War coverage

Olympics 2006

Asian Games

World Cup

NFL

NHL



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Intercontinental Satellite Fleet

SES NEW SKIES
An SES GLOBAL Company

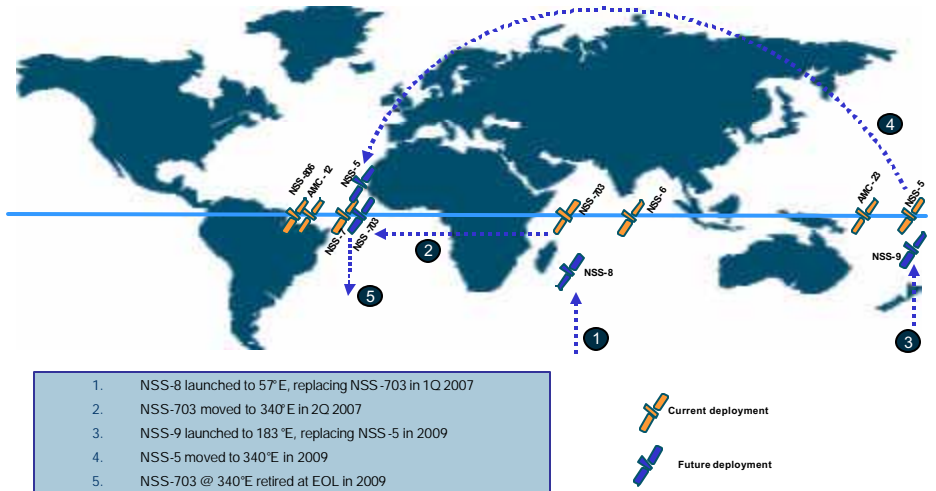
- Today: Five commercial Satellites
- One Satellite, NSS-8 to be launched in January 2007



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The SES New Skies Satellite Deployment Plan



1. NSS-8 launched to 57°E, replacing NSS-703 in 1Q 2007
2. NSS-703 moved to 340°E in 2Q 2007
3. NSS-9 launched to 183°E, replacing NSS-5 in 2009
4. NSS-5 moved to 340°E in 2009
5. NSS-703 @ 340°E retired at EOL in 2009



NSS-8 Expanding Power and Coverage at 57°E (in preparation)

- ▲ Builds upon existing coverage of Europe, Africa, Middle East and Asia by offering four times more power and twice the capacity of NSS-703
- ▲ Will be the most powerful satellite in orbit
- ▲ Eurasia beam offers unique opportunities for regional and international broadcasters targeting Asia with single beam coverage from London to Hong Kong
- ▲ Five high power Ku-band spot beams customized for DTH/Broadband applications
- ▲ First dedicated Ku-band spot beam to cover East Africa



NSS-8 Satellite Facts

Launch Date: Scheduled for late 2006

EOL: 2021

Payload:

C-band: 56 transponders

Ku-band: 36 transponders

Coverage: Indian Ocean region, including Europe, Africa, the Middle East, the Indian subcontinent and Asia



NSS-8 at 57° East

**NSS-703@340° East:
Creating New Opportunities in Africa**

▲ **Description:**

- ▲ NSS-703 will be re-located to 340° East once NSS-8 begins commercial service at 57° East
- ▲ From its new location, NSS-703 will cover the AOR
- ▲ Offers cost-efficient C-band on 'in-demand' EUR-Africa and US-Africa routes
- ▲ C-band beams: Globals, Hemis and Zones
- ▲ 3 steerable Ku-band spot beams
- ▲ Ideal for:
 - Pan-African VSAT networks
 - GSM backhaul Trunking solutions
- ▲ Will provide continuity of service at 340 East
 - NSS-5 will be relocated there in 2009, replacing NSS-703

NSS-703 @ 340 East
Launched: 1994
EOL: 2009
Payload: 38 C-Band and 20 Ku-band Transponders
Coverage: AOR including North and South America, Europe, Africa

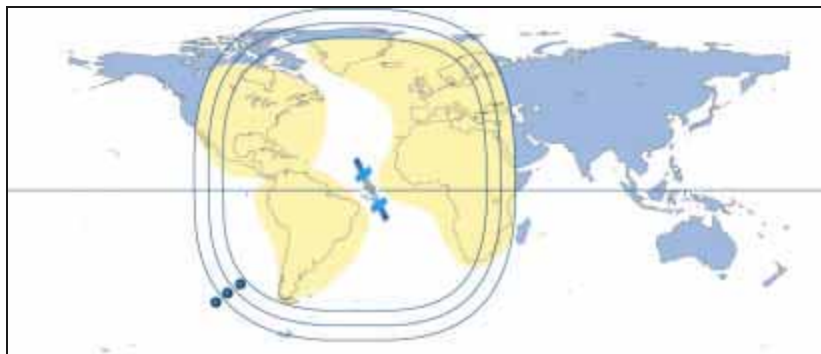


**AMC 12 @ 37.5° West L.
Atlantic Ocean Region**

▲ **Description:**

- ▲ High-powered C-band beams with greater than 43 dBW EIRP coverage
- ▲ The power of AMC 12 can offer small dish reception, or provide extended margins into existing antennas
- ▲ Highest level of reliability into high rain zones

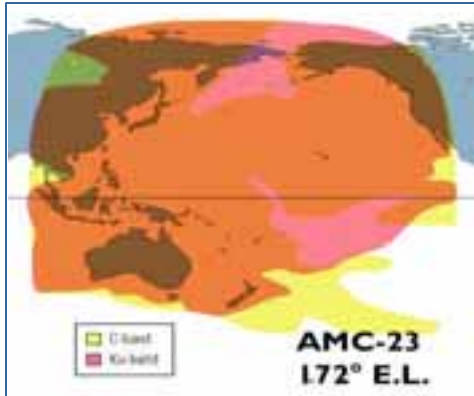
AMC 12 @ 37.5 West L
Launched: 2005
EOL: 2021
Payload: 72 X 36 C-Band Transponders
Coverage: AOR including North and South America, Europe, Africa



**AMC 23 @ 172° East L.
Pacific Ocean Region**



- ▲ **Description:**
- ▲ Highly advanced hybrid C/Ku- band satellite
- ▲ Serving local, transcontinental and transoceanic customers throughout the Pacific Ocean Region



AMC 23 @ 172 East L
Launched: 2005
EOL: 2021
Payload: 12 x 36 MHz; 6 x 72 MHz C-band and 20 channels switchable between 27, 36 and 72 MHz bandwidths
Coverage: POR including Western North America, Asia, Australia and New Zealand

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Thank you for your attention !



Meeting Title

Location Meeting Date

Intelsat & HD

Presented by Ron Rosenthal
Regional Vice President,
North American Broadcast
Solutions



one world, infinite possibilities
New 2005 Template - 1



Meeting Title

Location Meeting Date

HD Program Origination & Backhaul

- **Distribution capacity has grown tremendously**
 - 18 transponders over North America
 - Discovery launches Europe on PAS-12
- **Customers indicate increased demand in live events and SNG**
 - Fixed venue and high repeat sights fit fiber solutions
 - Breaking news, remote locations, lower frequency sights favor satellite
- **Intelsat providing hybrid solutions for all customers**
 - Partnered with Broadwing for fiber solutions
 - Multiple service and technical partners for HD transmissions



New 2005 Template - 3

North America Services Now

- **Dedicated VOC and Fiber/Satellite assets**
- **Event scheduled and confirmed**
- **Dedicated HD encoders are shipped to venues by Intelsat**
- **Transmissions occur on fiber or satellite**
 - Intelsat TMT network (with Broadwing) domestically
 - Intelsat Satellites for global distribution
 - Alliance with production and transmission vendors
 - Investigating HD backhauls via Ka-band



New 2005 Template - 4

Meeting Title

Location Meeting Date

Global Presence for Global Content

- Fleet of 51 satellites provides global connectivity
- Increased teleport presence extends reach
- Fiber connectivity between teleports and large POP count
- Localized partners for SNG trucks, production crews, etc.



New 2005 Template - 5

Merged Connectivity to Enable Applications

US West Coast		US East Coast			Europe	Asia Pacific
Riverside	Napa	Mountainside	Atlanta	Fuchsstadt	Hong Kong	
IA-7 IA-13 IS-605 IS-701 IS-805 IS-707	Galaxy 10R Galaxy 3C PAS-2 PAS-8 PAS-9	IA-7 IA-13 IA-5 IA-6 IA-8 IS-705 IS-903 IS-801 IS-907 IS-905 IS-603 IS-901	PAS 1 PAS 3 PAS 6 PAS 9 HORIZONS 1 GALAXY 10 GALAXY 11 SBS 6	IS-802 IS-706 IS-702 IS-904 IS-904 IS-902 IS-906 IS-704 IS-705 IS-903 IS-801 IS-907 IS-905 IS-901 IS-10-02	IS-902 IS-904 IS-906 IS-701	



Access to over 49+ GlobalConnex available satellites

New 2005 Template - 6

Meeting Title

Location Meeting Date

Long History with HD

- PanAmSat performed early HD satellite transmission trials
- First HD cable programming launched on Galaxy Fleet
- Special Events Success with:
 - Olympics
 - World Cup
 - F1 Racing
 - Government Services



New 2005 Template - 7

Looking Forward

- Upgrading Quick-spot for HD services
 - SCPC version available now
 - Auto-scheduling version still being developed
- Ka-Band solutions possible
 - Merger provides access to IA-8 Ka-band payload
 - DCI demonstrating HD in lobby

Galaxy 9 at 74 degrees

- Compliments location of SBS-6
- Fleet spare provides economical OU rates for HD
- Great look angles out of NYC



New 2005 Template - 8

Meeting Title

Location Meeting Date

IA-8 (G-28) - 89° West Longitude



Multiple uplink beams @ 66Mhz

Return path via:

- 1 of 4 downlink beams
- Fiber
- Turn-around in C of Ku-band




New 2005 Template - 9

Intelsat & HD

Thank you !




New 2005 Template - 10



WBU / ISOG

HD Collection
12/08/06

Proprietary and Confidential Information. Consider It There >>



IP/MPLS for Live Broadcast Video

- » **First backhaul of HDTV Super Bowl at 270Mbps end-to-end (2004)**
- » **Historical perception of IP**
- » **IP/MPLS widely supported technology**
- » **Optimized network to handle latency**
- » **Restoration is key**
- » **Increasing number of HD feeds**
- » **Importance of continued use of similar procedures, booking**

Mission Critical Content

Proprietary and Confidential Information.

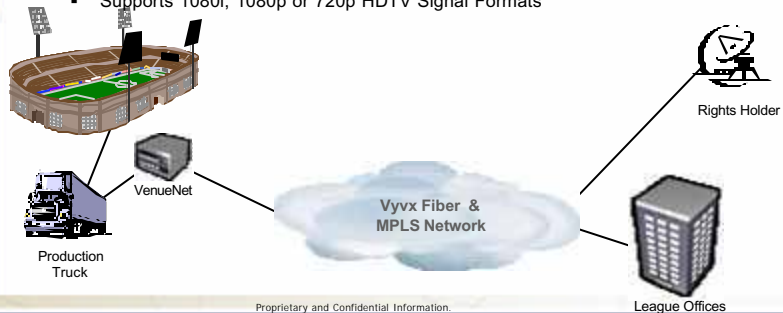
Sports Media Solutions

» VenueNet: Digital Connectivity to Major Professional Sports Venues

- Analog & Digital Video Capabilities
- Dual Transmission Paths
- Offering includes Local Loop, Monitoring, On-Premises Equipment Rack, Demarcation Box and Multiple Telephone Connections

» HD VenueNet Upgrade to Include HD Capabilities

- Industry's First and Only End-to-end 270 Mbps HD Product Over Fiber
- Utilizes Self-healing Multi-protocol Label Switching (MPLS) Architecture
- Supports 1080i, 1080p or 720p HDTV Signal Formats



Proprietary and Confidential Information.

League Offices

HD Content Collection

Digital Evolution

- HD VenueNet Expansion
- Occasional 270Mbps services (ASI, SDI, SDTi, & PAL)
- 270 Mbps local access connectivity
- 24x7 Monitoring and Management by TOC

Suggested Bit Rates

- 270 Mbps Uncompressed Serial Digital Interface (SDI) digital video: Perfect for production and post-production applications where workflow requires content exchange
- 270 Mbps High Definition (HD) Serial Digital Transport Interface (SDTi): Perfect for HD newsgathering, interviews and high profile events
- 213 Mbps High Definition Asynchronous Serial Interface (ASI) digital video: Also suitable for HD newsgathering, interviews and high profile events

Proprietary and Confidential Information.

Vyvx Video Network



Single Source Provider

- Teleports: Denver, Atlanta, LA
- Connected to all major sports and event venues
- DV-45, MPEG-2 and HD video services
- Turnkey offerings for sporting events, news and advertising distribution solutions

Proprietary and Confidential Information.



ARABSAT



WBU-ISOG Forum
7-8 Dec, 2006 / Washington, DC

The New BADR-4:
A Strategic Opportunity for
HD-TV & OU Services in the MENA region

Nabil. A. SHANTI
Director, Sales & Customer Services



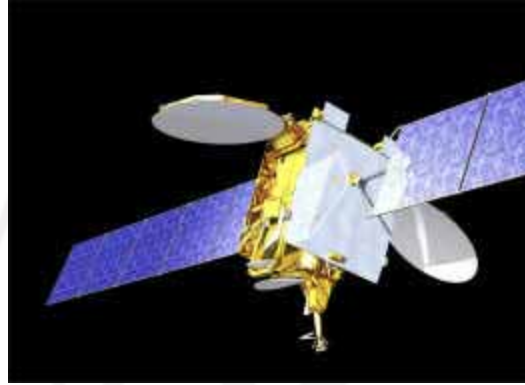
Table of Contents

- Launch of Badr-4
- Arabsat fleet:
 - 4 th Generation
 - 5 th Generation
- Broadcasting:
 - Free To Air , figures & strategy
 - HD TV
 - OU TV & Backhauling



Introducing: **BADR-4**

Launched, Nov-8th... SUCCESS!



BADR-4:

More Power to reach Farther





Latest Marketing Evolution at Arabsat:

re-Branding of Arabsat's constellation of DTH satellites
@ 26° East with the brand name "**BADR**" (*Full Moon*):

In Ku-band.

- Arabsat-2D is now **BADR-2**
- Arabsat-3A is now **BADR-3**
- Arabsat-4B, 4th Generation, is now **BADR-4** (*launched: Nov-9th, 2006*)
- Arabsat-5B, 5th Generation, will be **BADR-5** (*launch: 2009*)
- Arabsat-4AR will be **BADR-6** (*launch: 2008*)

In C-band.

- Arabsat-2C is now **BADR-C**; Followed by the **BADR-6 C-band** payload



? ARABSAT Fleet

20°E



Arabsat-5C
(2009)

26°E



BADR-2



BADR-3



BADR-4
(Nov-8, '06)



BADR-5



BADR-6
(Q2-2008)



30.5°E



Arabsat-2B



Arabsat-5A
(2009)

- ? Today, Arabsat operates 5 satellites, at 2 of its 3 orbital positions.
- ? We're adding a second 4th Generation satellite, Q2-2008.
- ? Complemented by 3 additional 5th Generation satellites, in 2009.
- ? This will provide **in-Orbit Back-up** and major **Growth Capacity** at our primary 26° East DTH « Hot » neighborhood, and for our Voice & Data customers.



Introducing our 4th Generation



- **Launches:** *Nov-8th, '06* & mid-2008? **The Youngest DTH Fleet in the Region!**
 - **Badr-4 & Badr-6**, State-of-the-Art technology: Quality & Reliability guaranteed.
- *Designed according to our Customers' needs & wishes.*
- **Larger reach than ever:**
 - **Ku-band** now covers 100% of MENA, *incl. Morocco & Algeria*, with a single beam specially shaped to provide 2 **"hot beam centers"** for DTH on North Africa & the Gulf;
 - **C-band** tilted south (*BADR-6*) will include **90% of Africa + Central Asia** in its footprint.
- **Enhanced downlink power** in major urban centers:
 - Reduced dish sizes **in main cities: As low as 40 cms!**
- **In-Orbit Back-Up** with *BADR-3 and BADR-6*, plus spare capacity on 5th G.
- **Room for expansion:**
 - Largest number of active transponders ever concentrated by ARABSAT at a single location: **24 C- & 52 Ku- active channels.**
 - **Enough spare capacity to welcome foreseen boom of HD-TV!**
 - **26° East** => Increasingly attractive as the Arab broadcast neighborhood of reference.



ARABSAT's BADR-4 Main Features



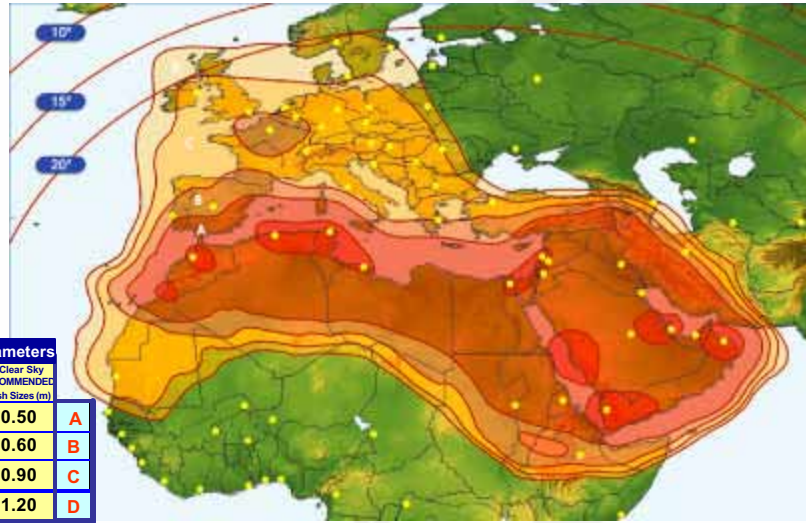
- **Successfully Launched:** **November, 8th - 2006**
- **Main Contractor:** EADS ASTRIUM,
- **Payload Subcontractor:** Alcatel Space,
- Based on the Eurostar 2000+ platform:
 - Very reliable platform with an impressive in-orbit record
 - 10 satellites successfully launched and still operational
 - No Constructive Total Loss on this platform
 - No satellites retired due to a major anomaly.
- **Badr-4 Payload:** **12 Ku-FSS & 20 Ku-BSS (BoL)**
- Space proven heritage equipment & processes.
- Subcontractors /suppliers selection based on heritage and recurrence (*i.e.* extensive Eurostar and/or industry experience)
- Satellite will undergo a very aggressive test plan
- **Lifetime:** **15 years contractual, 22 years design**
- **Orbital Location:** **26 deg East**
- **Launcher:** Proton-Breeze M *by ILS*



BADR-4

DOWNLINK Footprint (Ku-band)

Highest Power Ever: Tailored MENA Design!



Receive Parameters		
Rain Margin	Clear Sky	
COMFORTABLE	RECOMMENDED	
Dish Sizes (m)	Dish Sizes (m)	
0.70	0.50	A
0.90	0.60	B
1.20	0.90	C
1.60	1.20	D



BADR-4

Enhanced Direct-to-Home Performance

Major MENA Cities: as low as 40cms!



Direct-to-Home Reception		
Location	Clear Sky RECOMMENDED Dish Size (cm)	Rain Margin COMFORTABLE Dish Size (cm)
Abu-Dhabi	0.40	0.80
Algiers	0.40	0.80
Amman	0.40	0.80
Baghdad	0.50	0.90
Beirut	0.40	0.80
Cairo	0.50	0.90
Damascus	0.40	0.80
Djibouti	0.50	0.90
Doha	0.40	0.80
Dubai	0.40	0.80
Gaza	0.40	0.80
Jeddah	0.40	0.80
Jerusalem	0.40	0.80
Khartoum	0.50	0.90
Kuwait	0.40	0.80
Manama	0.40	0.80
Muscat	0.40	0.80
Nouakchott	0.80	1.20
Rabat	0.40	0.80
Ramsalah	0.40	0.80
Riyadh	0.40	0.80
Sanaa	0.40	0.80
Tripoli	0.40	0.80
Tunis	0.40	0.80

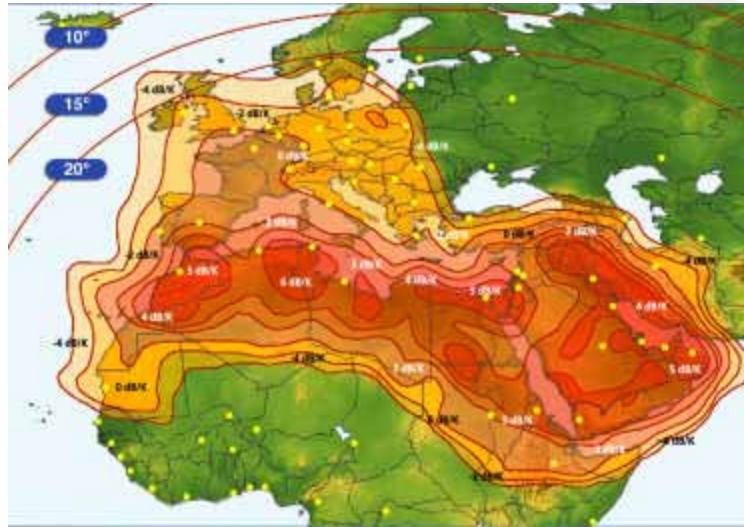
Direct-to-Home Reception		
Location	Rain Margin COMFORTABLE Dish Size (cm)	Clear Sky RECOMMENDED Dish Size (cm)
Amsterdam	1.20	0.80
Athens	1.00	0.80
Bahia	1.20	0.80
Berlin	1.20	0.80
Bombay	1.20	0.80
Buenos	1.20	0.80
Buvarini	1.40	1.00
Budapest	1.20	0.80
Capetown	1.40	1.00
Frankfurt	1.20	0.80
Geneva	1.20	0.80
Helsinki	2.40	2.00
Kansas	2.00	1.60
Kiev	2.40	2.00
Lagos	1.00	0.60
London	1.20	0.80
Luxembourg	1.20	0.80
Madrid	1.00	0.80
Minsk	2.40	2.00
Oulu	1.40	1.00
Paris	1.00	0.80
Prague	1.20	0.80
Riga	2.40	2.00
Rome	1.20	0.80
Santiago	1.20	0.80
Sofia	1.20	0.80
Toronto	2.40	2.00
Varna	1.20	0.80
Warsaw	1.40	1.00
Zagreb	1.20	0.80



BADR-4

UPLINK Footprint (*Ku-band*)

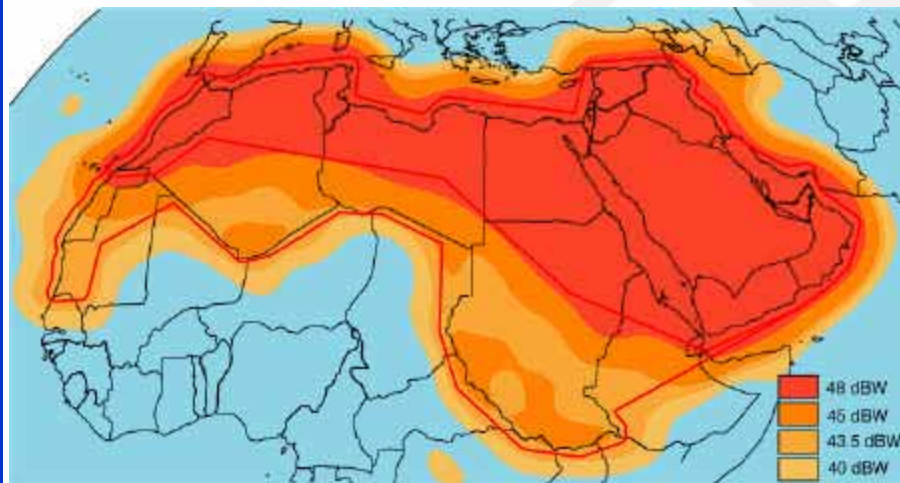
SNGs: Special High G/T over Urban Areas!



4th Generation: BADR-6

DOWNLINK Footprint (*Ku-band / BSS*)

Europe excluded: Rights Management



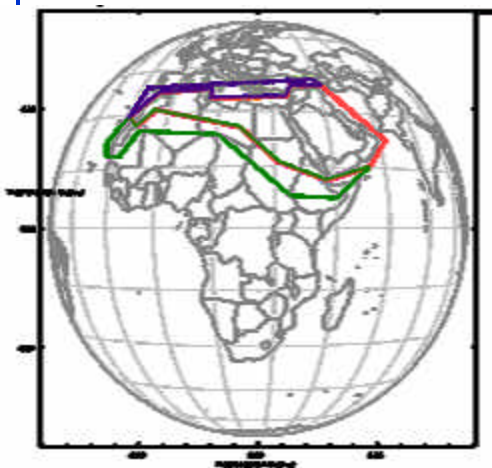


Our Future Proposed 5th Generation

- RFQ: July, 2006
- *Targeted contract date: Q1-2007 for replacement of -2B by 2009, + expansion & in-orbit back-up.*
- **Main Missions:**
 - Providing adequate capacity to **support Arabsat's growth in 10-20 years** and accommodate Customers' growth.
- **Some Preliminary Objectives:**
 - Provide replacement capacity
 - Provide **Xtra back-up** capacity
 - **Provide business expansion capacity for HD-TV**
 - Provide geographic expansion to adjacent regions



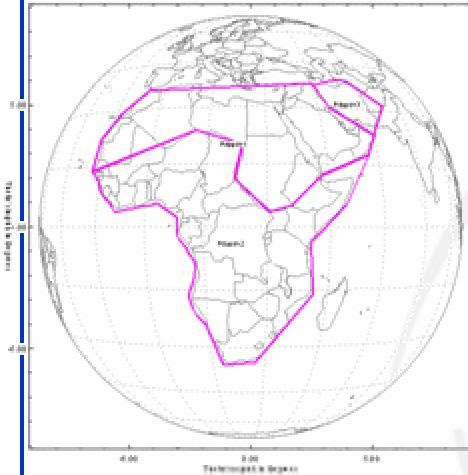
BADR-5 -FSS/BSS Wide Area Beam



- Core Coverage **similar to BADR-6, BSS/FSS**
- EIRP of ~ 48 dBW at EoC of inner contour, up to 51dBW in main cities: **Similar to BADR-6, i.e. excluding Europe for Content Rights management constraints.**
- Partial replacement of Ku-FSS capacity for -2B
- **Back-up** 'BSS capacity for BADR-4 & BADR-6



-5A @ 30.5°E- ANTICIPATED C-band COVERAGE



- Replacement Capacity for -2B;
- Back-up Capacity for BADR-6;
- Expansion Capacity (Iran & Sub-Saharan Africa);
- EIRP of 40 dBW at EoC in Arab world;
- EIRP of 38 dBW at EoC over sub-Saharan Africa & Iran.



? Broadcasting Our Region's Market Trends

- The MENA is admittedly among the world's fastest growing satellite services' markets: **+4% / year**. (*Euroconsult*)
- Broadcast represents about 2/3rds of industry revenues.
- Contrary to what was anticipated a few years ago, forecasts now show that **Broadcast will remain the key growth driver**.
- **130 Million Viewers:** More than ever!
 - Outstanding Market Penetration: **68.7%** of all Sat. TV in MENA



Broadcasting:

High Definition TV: Arabsat's Vision

- After years of slow progress, HD-TV deployment has been booming over the past 18 months in North-America, Japan and now Europe.
- *The whole TV value-chain moves onto seamless end-to-end HD:*
 - Always more content now directly created in HD!
 - Broadcasters rapidly upgrade their content origination facilities;
 - Flat panels' HD-TV consumers set sales take off rapidly;
 - IP-TV over xDSL fast deployment contributes to grow the whole market value chain exponentially.
- Arabsat is firmly committed to **actively support an extensive and fast deployment of HD-TV** throughout the whole MENA region.
- With the successful launch of **BADR-4** last month, Arabsat is now fully equipped to provide the large capacities required by HD-TV:
 - For preliminary technical TESTs,
 - For First **Demonstration Channels**,
 - For the launch of first **Commercial Channels**,
 - For **GUARANTEED** Medium and Long-term Expansion w/**BADR-6 mid-2008**.



High Definition TV: Arabsat's Proposal

- Arabsat believes the time has come for all the MENA players along the TV Value-Chain to **GROUP their forces** in order to:
 - Actively promote the benefits of HD-TV towards end-viewers;
 - Tease end-viewers to entice them to invest into HD-TV equipment;
 - Stimulate a rapid take-off of the end-viewers' **DEMAND** for HD-TV content.
- To achieve that goal, Arabsat has suggested that a **non-profit** organization of major MENA professional players should be created **ASAP** (similar to the "Euro1080"), in order to **coordinate and pro-actively promote HD-TV towards end-viewers**.
- Typical "**Arab HD**" Group members would include (not a limitative list):
 - ASBU;
 - Major MENA TV Media Groups, e.g. MBC, Rotana, Jazeera, etc.
 - **ARABSAT**;
 - Transmission Equipment Manufacturers, e.g. Newtec ;
 - STBs & Satellite Reception Equipment Manufacturers & Distributors;
 - Displays manufacturers & Distributors/Retailers;



High Definition TV: Arabsat's Commitment

- The " Arab HD " group's main tasks will include:
 - 2 to 4 Free-to-Air Promotional/Demonstration HD-TV Channel (full-time or 12 hours/day), w/content elements freely contributed by group members;
 - Retail Distributors' intensive in-shops demos/explanations;
 - Member TV channels' free intensive on-air promotion referring viewers to the FTA HD-TV Demo Channels.
 - First sat receive equipments and displays quickly available in shops at non-detering "entry prices" by member Manufacturers & Distributors/Retailers.
 - Any extra tasks identified and agreed by " Arab HD " Group members after its first meeting(s) setting-up initial Group's road-map.
- Arabsat is willing to contribute for 12-24 months the required space capacity (1-2 Xprs) FoC, as its share of the " Arab HD " Group's activities support.
- Arabsat has suggested that Group's Chair is handled by ASBU.



Broadcasting: OU-TV & Backhauling Services

- **Badr-4** provides dedicated huge capacities in both **FSS & BSS** ku band for OU & Backhauling
- One beam connecting the MENA with Europe with excellent performances
- Different options & offerings are available
- Possible connection to US through our partnerships with cross-Atlantic fiber networks
- Flexible Terms & Conditions



THANK YOU!

Nabil.A.Shanti

Director of Sales & Customer Services/Arabsat

eMail: nabils@arabsat.com

OCCASIONAL USE TELEVISION SERVICE

DEFINITION , TERMS AND CONDITIONS



Key notes :

- * According to Arabsat Satellites Re-Branding strategy , the new branded satellite names @ 26°East are :
 - o "BADR-6" :- is the replacement satellite of " Arabsat 4A "
 - o "BADR-4" :- previously named " Arabsat 4B " , the first 4th Generation satellites .
- * Arabsat 2-B @ 30.5 °East still unchanged .

OCCASIONAL USE TELEVISION SERVICE

1) Service Definition:

the occasional use digital TV services is defined as the transmission of digital video signals within Arabsat transponder in C or Ku bands for a minimum duration of 10 minutes at a time. For service application and service processing this service is categorized as follows:

- Adhoc: service is requested occasionally for defined period on specified date.
- Re-current: service is requested on prescheduled dates for same period of time each date.
- Full time: service is requested for permanent (full time) usage during predefined period (1-30 days). For full time usage beyond one month, this service is not considered occasional use type and a contract shall be signed with Arabsat as a full time lease service.

2) Service Specifications:

a) Type of assigned capacities:

From satellite capacity prospective this service is provided through different types of capacities.

- Assigned slots:

Three type of allocated capacity slots are provided namely: 4.5MHz, 6MHz, and 9MHz.

These slots are assigned on Arabsat satellites at all orbital slots 26 & 30.5 E and on all frequency bands (C, Ku FSS & Ku BSS) and on both polarizations.

On Badr 4 Satellite :

Transponder 13&14 are assigned on Ku Band BSS

Transponder 11&12 are assigned on Ku Band FSS

- DTH:

Arabsat is in process of introducing occasional TV service through its Direct to Home bouquets in 2007. To provide



this type of service , the TV programs shall be available at one of Arabsat digital platforms:

- Dubai Media City (DMC)
- Jordan Media City (JMC)
- Arabsat European Gateway (Madrid)
- Arabsat Tunis Platform (Tunis)

For more details, customers may contact Arabsat Sales and Customer Services Directorate.

- b) This service is provided on a “First come first serve” basis subject to the availability of space segment capacity allocated for this service.
- c) This service permit the use of all types of E/S’S & SNG’S. Prior testing and approval shall be granted before transmission for the first time.
- d) This service is provided on a non-preemptible basis.

3) Service provisioning

a) Service request

- A service request notice must be forwarded to Arabsat Operation Center (AOC)
Tel: 00966 1 404 2019
Fax: 00966 1 402 4169
aoc@arabsat.com
- The service request must designate the type of service, transmitting party, the desired time and duration, receiving entities , satellite, band, capacity, billing address.
Form of the service request is attached
- On line booking through the new Arabsat Website is under preparation. Through this tool, the request will be processed, automatically.
- Full description of On line Booking Service, related terms & conditions will be distributed to all broadcasters and service providers and will be available at Arabsat Website.



b) Service confirmation:

The requested service will be processed and confirmed by Arabsat Operation Center (AOC) or by the On line Booking System based at AOC.

The confirmation notice will be based on the space segment availability at the requested time.

The confirmation notice will be used as the a basis for billing, service modification or cancellation process.
Form of confirmation notice is attached (table– 3)

c) Service priority:

- Service requests are confirmed on First Come First Served basis, subject to the transponder capacity availability, service request will be accepted without lead time limitations.
- Prior scheduled (confirmed) programs start time, 5 minutes free of charge will be provided for line up testing and co ordination between transmit & receive sites.

4) Tariff:

The occasional TV service rates for all Arabsat satellites in C , Ku FSS & KU BSS bands are provided in Tables (1-3).

- a) minimum charge of 10 (ten) minutes per transmission is applicable.
- b) Two different service rate categories are available depending on the time of the day when the service is required . these categories are defined as Peak time & Off peak time as follows:

Service category	Time of the day
Peak time	06:00 – 19:00 GMT
Off peak time	19:01 – 05:59 GMT

- c) the rates are provided for the whole link (uplink & down link)



- d) the service request shall identify clearly the entity to be billed. In case the request has been issued by not the billable entity, the requested TV program cannot be confirmed before getting matching order notice from the billing entity.
- e) The total charge either for single or multi-destination transmission is firm fixed charge as per the rates indicated in tables (1-3).
- f) Tariffs for normal adhoc service is provided in table (1).
- g) Tariff for recurrent service will be treated based on table (1). In case the total requested periods exceeds the 10 hours per month , it will be treated as per table (2).
- h) Tariffs for full time (permanent) type will be treated based on table (3).
- i) The total charge for the transmission will be calculated based on the time period specified in the Arabsat confirmation notice. However, in case actual program duration exceeds the scheduled confirmed duration, the actual transmission time period will be charged for.

5) **Billing:**

the service will be billed in accordance with the instructions provided in the confirmation notice based on the service request.

- this service will billed on monthly basis.
- All space segment charges are payable in US\$
- Payment shall be due within 30 days from the time of issuing the billing invoice.
- A late payment charge of 1% per month of the outstanding payment amount will be charged commencing after 30 days following the issue of billing invoice.



6) **Cancellation:**

A service cancellation is deemed to have occurred whenever a previously confirmed service request is amended in such a manner that:

- The service is no longer required either in its entirety or in part, or
- There is a decrease in the total amount of Peak time minutes , or
- The transmission start time has changed by more than twelve (12) hours from the previously confirmed time.

In the event of cancellation of a previously confirmed occasional use standard service order, or any portion thereof, the following charges apply to the difference between the original and the remaining service order duration stipulated in the cancellation notice:

- No charge when the cancellation notice is received by Arabsat more than thirty (30) days before the commencement of the scheduled transmission order.
- 20% of the applicable tariff rate when the cancellation notice is received by Arabsat between eleven (11) days and thirty (30) days before the commencement of the scheduled transmission order.
- 40% of the applicable tariff rate when the cancellation notice is received by Arabsat between one (1) day and Ten (10) days before the commencement of the scheduled transmission order.
- 60 % of the applicable tariff when the cancellation notice is received by Arabsat less than 24 hours before the commencement of the scheduled transmission order.

Service requested under the Periodic committed Service specified in the incentives article no. 10 can not be cancelled. The full committed allotment will be charged even if the actual usage has been less than originally confirmed.



7) Renewals & Extensions:

- the duration of a confirmed order for service can be extended at any time subject to the availability of space segment capacity. An extension must be for a minimum duration of 5 minutes.
- Extensions can be made by phone, fax , e-mail or through Online Booking System. Confirmation modification reflecting this extension will be issued accordingly.
- Service extensions which include different time categories (peak or off peak) time will be charged based on the rate that applicable to the originally confirmed order.

8) Service conversion Options:

A change in the start time of a confirmed order for standard occasional use service is allowed without penalty, provided:

- The required space segment capacity is available, and
- The newly requested start time is within twelve (12) hours of the originally confirmed start time, and 6
- The revised time period is not less than the originally confirmed order, and
- The number of Peak Time minutes does not decrease from that of the originally confirmed transmission.

9) Quality of Service:

In the event a transmission does not meet the quality level specified for the respective service type, the customer should contact the Arabsat Operation Center immediately and submit a service quality report outlining the nature of the problem and all the associated information.



10) Incentives:

Arabsat offers its customers special rates for periodic service requests.

This service option provides a reduced rate incentive to customers who requires more than (10) hours of service during any 30 day calendar period.

The entire committed allotment must be transmitted by the same billable customer. Each transmission must be at least 10 minutes in duration.

Table (2) shows the rates for all types of services and duration categories.

TABLE-1

OCCASIONAL TV SERVICE RATES ON DIFFERENT SATELLITES (ALL BANDS C & Ku)

Satellite	Capacity Allocation MHz	Peak Time US\$ per minute	Off Peak Time US\$ per minute
2B	4.5	2.5	1.7
	6	3	2.1
	9	3.7	2.6
4 th Generation (BADR-6 & BADR-4)	4.5	3.5	2.4
	6	4.5	3.1
	9	5.5	3.9



TABLE-2

Occasional TV DTH Service

Satellite	Capacity Allocation Mbit/s	Peak Time US\$ per Hour (minimum 1 hour)
4 th Generation (BADR-6 & BADR-4)	3.5	300

TABLE-3

PERIODIC SERVICE INCENTIVES (COMMITMENT)
INC & KU-BAND ON 2B, BADR-6 & BADR-4
SATELLITES

Duration (hours) per month	Capacity Allocation Ku-band 2-B , BADR-6 & BADR-4	Peak Time US\$ per minute		Off Peak Time US\$ per minute	
		2B	BADR-6, BADR-4	2B	BADR-6, BADR-4
10 = D < 50	4.5	2.3	3.3	1.6	2.3
	6	2.8	4.3	2.0	2.8
	9	3.5	5.3	2.4	3.7
50 = D < 100	4.5	2.1	3.1	1.5	2.1
	6	2.6	4.1	1.8	2.8
	9	3.4	5.1	2.4	3.6
100 = D < 250	4.5	1.9	2.9	1.3	2
	6	2.4	3.9	1.7	2.7
	9	3.2	4.9	2.2	3.4
250 +	4.5	1.6	2.6	1.1	1.8
	6	2.1	3.5	1.5	2.4
	9	3.0	4.5	2.1	3.1



TABLE-4

FULL TIME (PERMANENT) RATES
ALL BANDS (C & KU)

Satellite	Capacity Allocation MHz	US\$ One Day	US\$ One Week	US\$ One Month
2B	4.5	600	3900	17100
	6	720	4680	20520
	9	960	6240	27360
4 th Generation BADR-6 & BADR-4	4.5	840	4620	21000
	6	1150	6325	28750
	9	1320	8580	37620

Satellite	Capacity Allocation MHz	US\$ One Day	US\$ One Week	US\$ One Month
2B	18	1824	11856	51984
	36	3456	22464	98496
4 th Generation BADR-6 & BADR-4	18	2508	16302	71478
	36	4752	30888	135432

Notes:

- The charges for period more than one day and less than one week (7days) will be calculated based on the daily rates.
- The charges for period more than on week and less than one month (30days) will be calculated based on weekly rates.

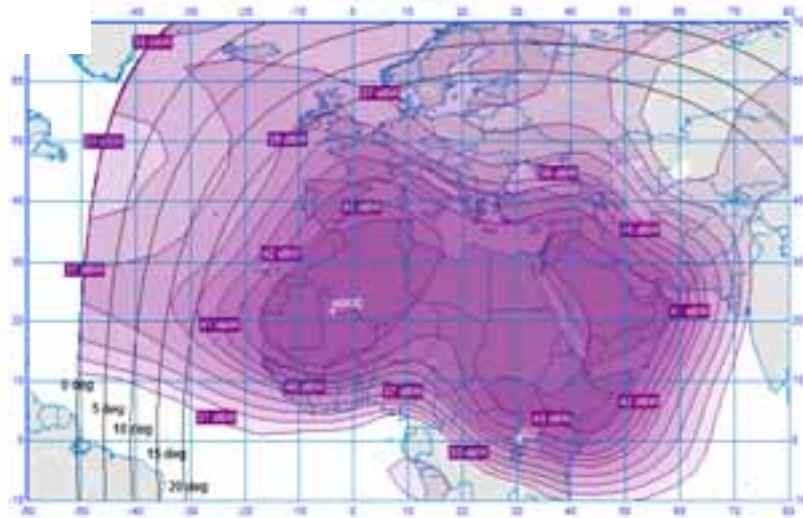


ARABSAT 2-B SATELLITE @ 30.5 DEG. E

SATELLITES COVERAGES ,
FREQUENCY PLANS & REQUESTS
FORMS



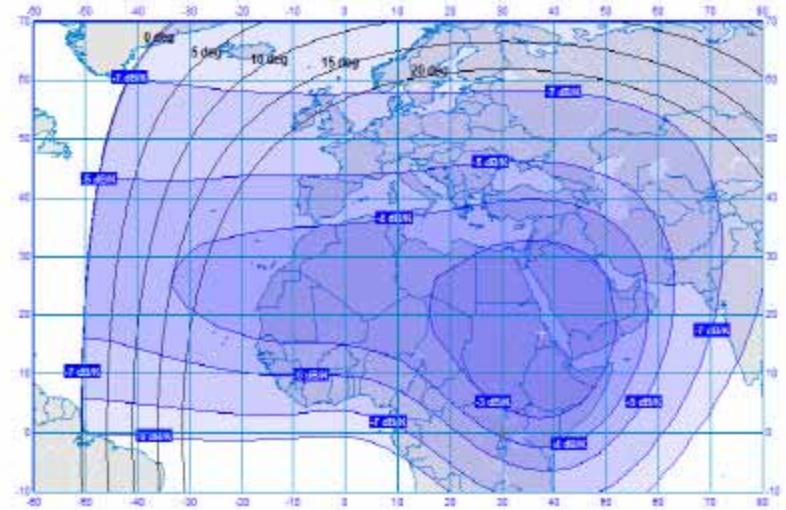
ARABSAT 2B (30.5°E)
C-Band Downlink EIRP (High Power Transponder)
Beam Peak: 44.6 dBW



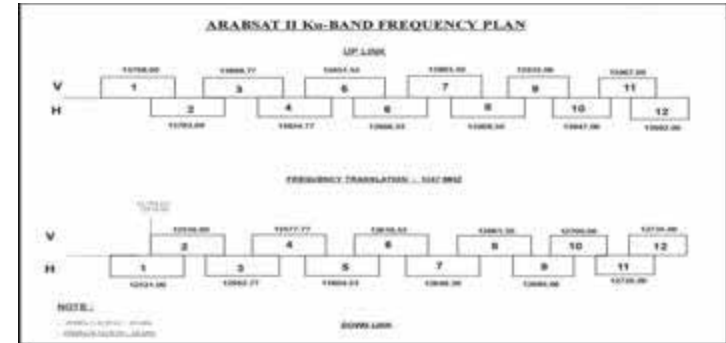
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ARABSAT 2B (30.5°E)
C-Band Uplink G/T
Beam Peak: -2.0 dB/K

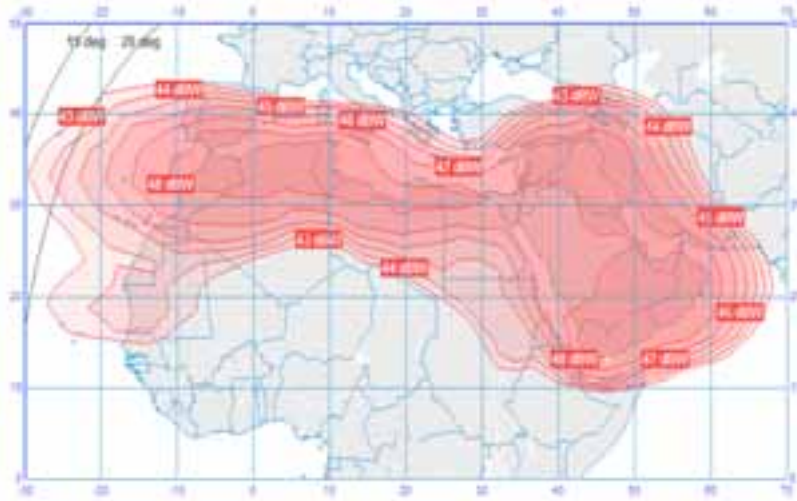


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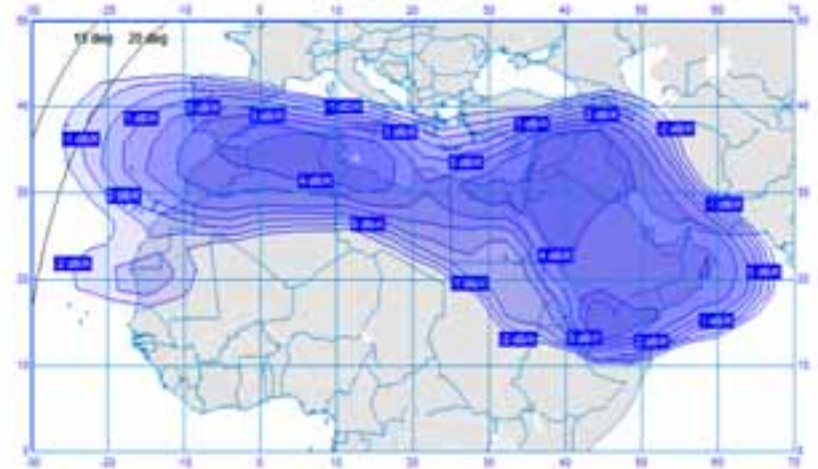
ARABSAT 2B (30.5°E)
Ku-Band Downlink EIRP
Beam Peak: 49.2 dBW



17



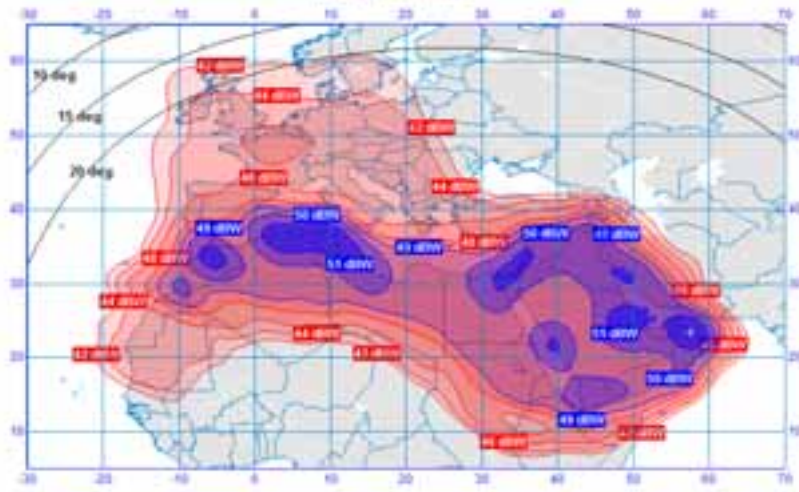
ARABSAT 2B (30.5°E)
Ku-Band Uplink G/T
Beam Peak: 5.2 dB/K



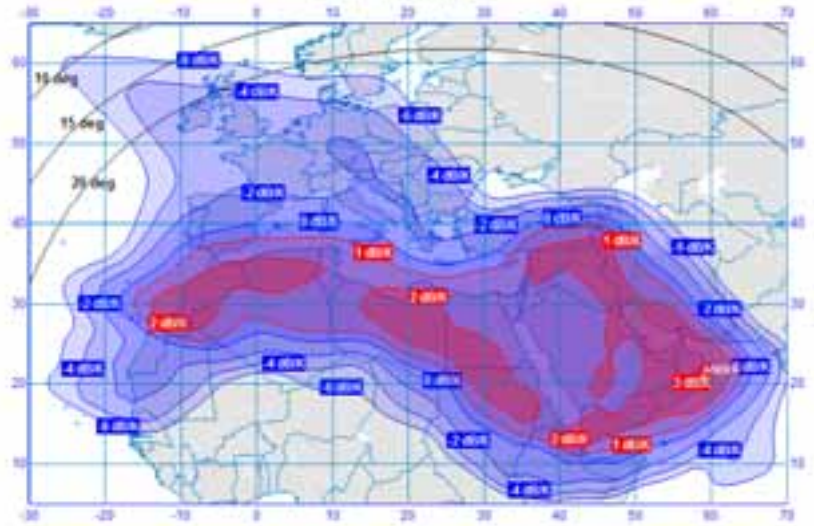
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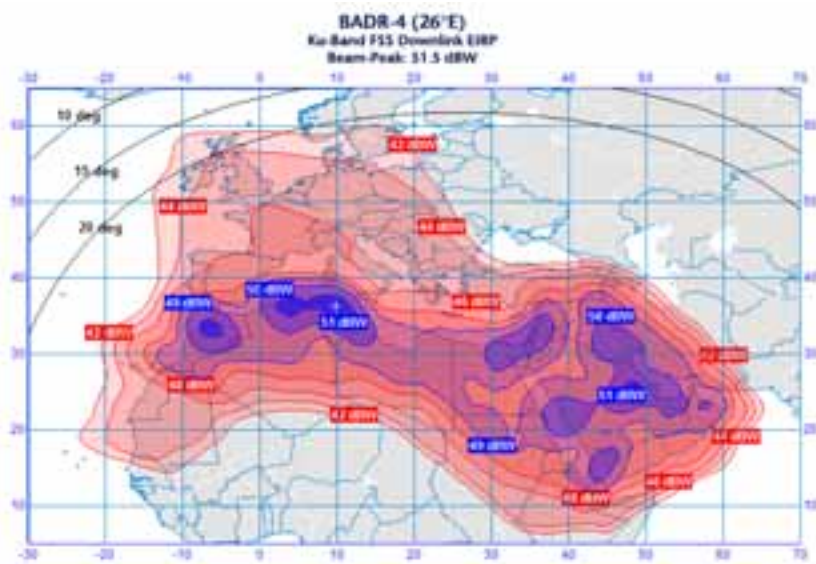


BADR-4 (26°E)
Ku-Band BSS Downlink ERP
Beam-Peak: 51.8 dBW

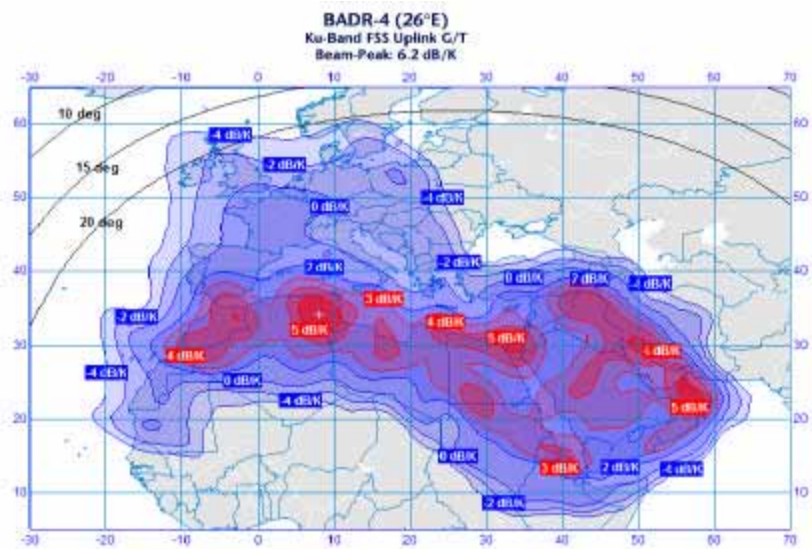


BADR-4 (26°E)
Ku-Band BSS Uplink C/T
Beam-Peak: 3.2 dB/K





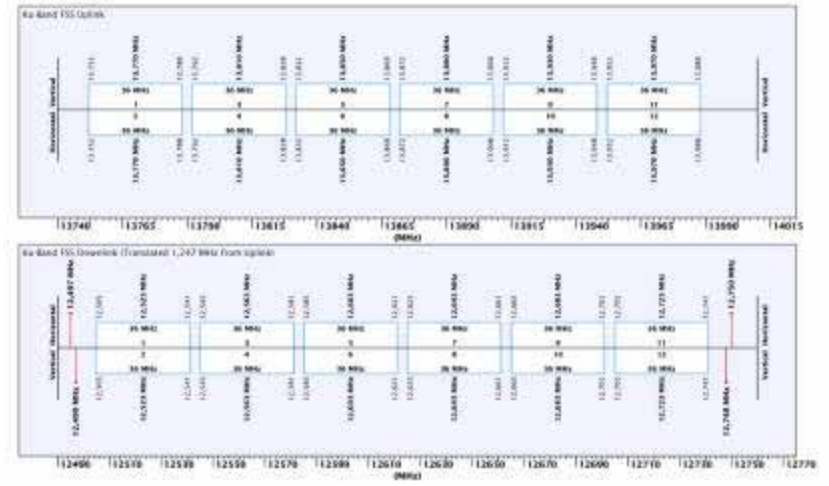
21



22



Transponder 13 & 14 are assigned for Occasional use on Ku Band BSS



Transponder 11 & 12 are assigned for Occasional use on Ku Band FSS



Occasional TV Exchange Service
Order Request Form

Section A : APPLICANT DETAILS	
Applicant Entity Name: _____	
Address: _____	
Phone No: _____	E-mail: _____
Fax No: _____	Your Ref.: _____
Section B : CORRESPONDENT DETAILS	
Correspondent Entity Name: _____	
Address: _____	
Phone No: _____	E-mail: _____
Fax No: _____	
Section C : REQUEST DETAILS	
Type Of Request: ? New ? Amendment ? Cancellation	
Type Of Service: ? Digital ? Analog	
Service Date(s): _____	
Service Time(s): _____ GMT	
Subject: _____	
Frequency Band: ? C-Band ? Ku-Band	
Transmit E/S: _____	Receive E/S: _____
Space Segment Charges Payable by: _____	
Signature: _____	
REMARKS	



ARABSAT - AOC
TV Service Confirmation

To : - Name of the company
Attn: Name of the Person
His Title -----

Email : _____
(Fax No: _____)

Our Ref : 14/TV- 000 Date: dd/mm/yy

Your Ref(s): 1- xxxxxxxxx dated : dd/mm/yy .

The Following TV Service is Confirmed:

1- Service Booking Informations:

A. TVC- dd/mm/yy-Nr (of the prgm)

B . TX E/S – RX E/S

C1. dd/mm/yy/ 00:00 - 00:00 GMT

D . ARABSAT S/C :
Frequency Up Link (_____)MHz X Pol
Down Link (_____) MHz Y Pol
Ku-Band (XDR-xx) Band Width xx MHz (Digital Carrier)
Symbol Rate: xxx MSps FEC: x/y

2- - Sub: -----.

3- - ARABSAT Up Link & Down Link Charges by : Adm. Name

Please don't hesitate to contact AOC for any comment.

Best Regards.

AOC TV Section

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Broadwing

Connecting with Customers at the Speed of Light

Media Services - HDTV

Desmond Gallahue

December 2006

Drive toward HDTV

"If you look at the evolution of television, from cable to DVD and now to HD, it has been an unrelenting quest for picture quality,"

said Clint Stinchcomb
Senior VP and General Manager
Discovery HD Theater

"We see HDTV as a natural progression."

-- Cable & Satellite

37" Widescreen 1080P LCD \$799 - Fry's Electronics



HD Video has rigid QoS requirements

- ⌘ The QoS requirements for video are much higher than the requirements for data and voice.
- ⌘ HD Video requires:
 - ⌘ Much greater bandwidth throughout the production chain
 - Contribution Quality
 - MPEG2 at 80Mbps, JPEG 2000 200+Mbps
 - ⌘ No Errors in end-to-end transport
 - ⌘ Delay must be very low and constant
 - ⌘ Very low jitter and wander
 - ⌘ Fast restoration with maintained QoS
 - ⌘ Scalable multicast with maintained QoS and fast restoration for distribution
- ⌘ The video QoS requirements must be maintained 24x7



3

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Why is DTM ideal for HD?

- Designed for real-time video requirements (not adapted to)
- Strong multiservice support
 - ⌘ HD SDI, SDTI, ASI, Gigabit Ethernet
- Cost-efficient use of all available bandwidth infrastructures
 - ⌘ Highest bandwidth utilization
 - ⌘ Any mix of network link capacities and media types
- 100% guaranteed quality of service
- Better positioned for video transport than any other solution

4

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Broadwing Media Network – Ideal HD Solution

❖ Contribution Quality Video via DTM

- ❖ Bandwidth Granularity
 - Configured in 512K increments
- ❖ Can multicast ASI, SDI/SDTI or Ethernet
- ❖ Mezzanine level HD
- ❖ Capacity can be assigned and reassigned at will



❖ Forward Distribution

- ❖ Can multicast Ethernet from any point on the network - efficient since you can create a path and drop the content off at any intermediate point rather than having to send content in several paths from one point
- ❖ Asymmetrical - i.e. can distribute content at 100 Mbps in one direction with a return path at 2 Mbps

5

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Television Operations Center (TOC)

- The TOC manages bookings, line-ups and troubleshooting for video customers

- ❖ Staffed by video experts 24x365
- ❖ Bookings are made by phone, email or fax
- ❖ Ability to remotely manage switching of signals at each video network component makes for easy and reliable line-ups
- ❖ Ability to remotely monitor live HD signals for quick resolution



6

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Why Broadwing is Your HD Solution?



- 100% QoS (no over-subscription)
- Ability to Multicast all services



- Bandwidth and access Flexibility
 - ⌘ 512Kbps Increments
 - ⌘ 1 Mbps to 1 Gbps



- Ability to accommodate Simultaneous HD and SD

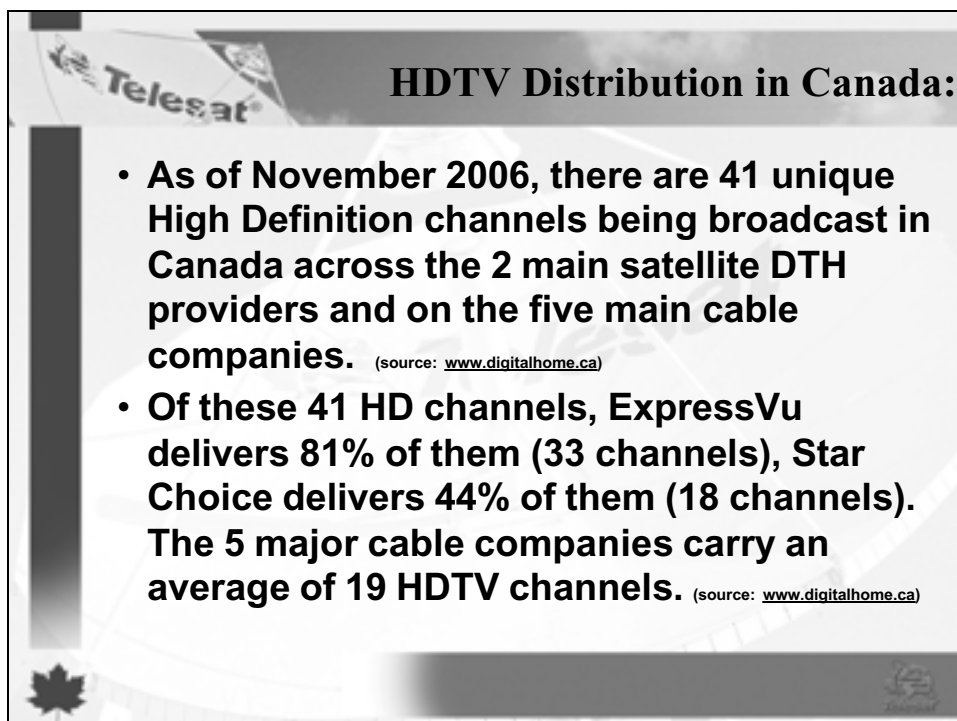
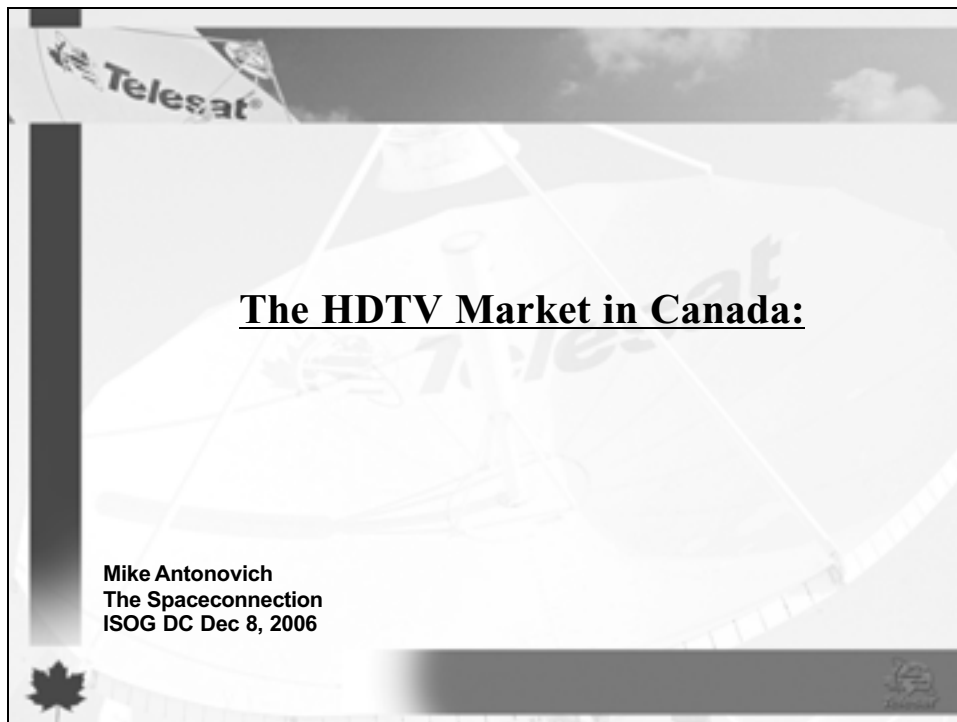
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Broadwing



Connecting with Customers at the Speed of Light






HDTV Satellite Providers:

- **Star Choice carrying HDTV offerings on Anik satellites in standard Ku-band**
- **Bell ExpressVu carrying HDTV on Nimiq DBS satellites**
- **CATV networks receive most of their HD from the Star Choice Ku-band package on the Anik fleet**



Future HDTV Growth:


- **By 2011, 75% of existing channels will launch in HD and 100% will launch by 2016.** (source: CSUA 2006)
- **There are an estimated 290,000 HD Subscribers in Canada in 2006, with the number projected to go to 540,000 in 2007, 830,000 in 2008, and 1,180,000 in 2009 for a CAGR of 42%.** (source: CCTA).





HDTV Penetration:

- It is estimated in Canada in 2006 that approximately 2.6M households have HD televisions and that by 2009, this will grow to 8.13M. (source: CCTA)
- New HD Transmitters are in place in Toronto, Montreal and Vancouver with the potential to reach into 5M Canadian homes.
(source: Canadian Digital Television, Consumer Drivers)



HDTV Contribution:

- Service is constrained in Canada by a shortage of available HDTV production capability. Activity is just starting to pick up.
- Most available Ku-band bandwidth is already in service; growth of backhaul and events contribution will end up in C-band, as that is where there is plentiful bandwidth, or post MPEG-4 compression transitions that free up bandwidth.

