

SUMMARY OF CHANGES: Domestic GEO Satellite Inventory

January 29, 2004

These notes provide an update of recent and expected new satellite operations in the Domestic Satellite Inventory.

SATELLITE LAUNCHES (Since July 01, 1999)

000.0 deg W Relocated from original orbital slot

Operator/

<i>Satellite</i>	<i>Launch Date</i>	<i>Location</i>	<i>Bandwidth</i>	<i>Comments</i>
CableVision Systems:				
Rainbow 1	07/17/03	61.5 degW	Ku	DBS satellite service delivered from 36 transponders with 22 programmable spot beams. Manufactured by Lockheed Martin Commercial Space Systems and launched by ILS Inc. Comcast/Rainbow is DBS service provider
DirecTV (DSS):				
DirecTV 1R	10/09/99	101.2 deg W	BSS/Ku	Replaces DBS-1 which was moved to 109.8 deg W.
DirecTV 6	03/08/97	<i>109.5 deg W</i>	BSS/Ku	Known as Tempo 2, when originally launched. Renamed DirecTV 6 in November, 2000 after DirecTV acquired PrimeStar assets.
DirecTV 4S	11/27/01	101.2 deg W	BSS/Ku	Spot beam configuration to facilitate delivery of local-into-local programming
DirecTV 5	05/07/02	119.0 deg W	BSS/Ku	The 1300 model satellite was built by Space Systems/Loral and is used to provide entertainment programming and broadband services. Application before the FCC during 1Q04 to move satellite to 72.5 deg W to provide local into local service.
EchoStar (DISH Network):				
EchoStar 5	09/23/99	<i>110.0 deg W</i>	BSS/Ku	Provides local-into-local and set-aside

DTH service on 29 of the 32 frequencies available at this location.

EchoStar 6	06/14/00	119.0 deg W	BSS/K	Co-locate with EchoStar 4.
EchoStar 7	02/21/02	119.0 deg W	BSS/Ku	Spot beam DTH local-into-local service. Lockheed-Martin platform. Service for Alaska and Hawaii.
EchoStar 8	08/23/02	110.0 deg W	BSS/Ku	Spot beam DTH local-into-local service. Loral Space Systems platform.
EchoStar 9	08/08/03	121.0 deg W	C-Ku-Ka	LS 1300 platform. EchoStar manages the Ku transponders; Loral Skynet manages the C-band transponders. Loral will identify its transponders as Telstar13. Possible Business to Business and 2-way Internet service.

Loral Skynet:

On October 24, 2003, the US Bankruptcy Court approved of the sale of assets by Loral Skynet to Intelsat .The sale includes the operational satellites Telstar 5, 6, 7 and 13 and the yet to be launched Telstar 8. The sale and transfer should be completed during 1Q04.

Telstar 7	09/25/99	129.0 deg W	C-Ku	Operational in Nov., 1999. Part of the Loral Skynet cable headend neighborhood.
Telstar 13	08/08/03	121.0 deg W	C	LS 1300 platform. EchoStar manages the Ku transponders; Loral Skynet manages the C-band transponders. Loral will identify its transponders as Telstar13. Possible Business to Business and 2-way Internet service.

PanAmSat (Hughes):

Galaxy 11	12/21/99	91.0 deg W	C-Ku	Coverage of CONUS, Mexico, Canada, Puerto Rico and the US Virgin Islands.
Galaxy 10R	01/24/00	123.0 deg W	C-Ku	Part of the “Galaxy Cable Neighborhood”. Coverage of North America including Hawaii and the Caribbean.

Galaxy 4R	04/18/00	99.0 deg W	C-Ku	Original parking orbit at 73 dgr W. CONUS, Southern Canada, primary Alaska population centers, Hawaii, Mexico, Northern Caribbean including, Puerto Rico and US Virgin Islands.
Galaxy 3C	06/15/02	95.0 deg W	C-Ku	Boing 702 satellite providing coverage for the United States and Latin America from 77 transponders. Customer service initiated on October 29, 2002. Latin American DTH service for DirecTV.
Galaxy 12	04/09/03	74.0 deg W	C	In-orbit spare. Coverage of North America
Galaxy 13	10/01/03	127.0 deg W	C	Replacement for Galaxy 9. Transponders are located on the same satellite as Ku band transponders of Horizons 1.
Horizons 1	10/01/03	127.0 deg W	Ku	Transponders located on same satellite as C band transponders of Galaxy 13. Transponders owned by the PanAmSat/JSAT joint venture.
SES Americom: (Formerly GE Americom)				
AMC-4*	11/13/99	101.0 deg W	C-Ku	Operational on 12/21/99. Ku-band transponders individually switchable between North and South American coverages.
AMC-7*	09/14/00	137.0 deg W	C	Replacement for Satcom C1. CONUS, Alaska, Hawaii & Caribbean; 20 Watts SSPA; Cable TV distribution
AMC-6*	10/22/00	72.0 deg W	C-Ku	CONUS, Canada, Mexico Caribbean & Central America coverage; Government, VSAT, IP, media and entertainment.
AMC-8*	12/19/00	139.0 deg W	C	Replacement for Satcom C5. CONUS, Alaska, Hawaii & Caribbean; Service for regional and national radio and cable television programmers.
AMC-9*	06/06/03	85.0 deg W	C-Ku	Constructed on an Alcatel Spacebus 3000B3 platform. Launched by International Launch Services (ILS) from Baikonur Spacedrome.

CONUS, Canada, Mexico, Caribbean and Central America.

* Satellite identification changed from GE to AMC as a result of the purchase of GE Americom by SES (Societe Europeens des Satellites) Global on November 12, 2001.

Telesat Canada:

Anik F1	11/21/00	107.3 deg W	C-Ku	North and South American Coverage. Began commercial service 02/19/01. Replaced Anik E2 which was relocated to 111.1 deg W.
Nimiq 2	12/29/02	82.0 dgr W	BSS/Ku Ka	ExpressVu DBS service for Canada.

XM Satellite Radio:

XM 2	03/18/01	115.0 deg W	S	Also called XM Rock. Satellite controlled by Telesat Canada. Broadcasts to mobile digital radio receivers in the 2332.5 MHz to 2345 MHz spectrum.
XM 1	05/08/01	85.0 deg W	S	Also called XM Roll. Satellite controlled by Telesat Canada. Broadcasts to mobile digital radio receivers in the 2332.5 MHz to 2345 MHz spectrum.

PENDING SATELLITE LAUNCHES

Operator/

<i>Satellite</i>	<i>Est. Launch Date</i>	<i>Location</i>	<i>Bandwidth</i>	<i>Comments</i>
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DirecTV (DSS):

DirecTV 7S	1Q04	119± deg W	BSS/Ku	37 spot beam transponders for local-into-local programming and 7 supper high-power transponders for national coverage. Satellite will be built on a type 1300 bus by Space Systems/Loral.
DirecTV 8	1Q05	101± deg W	BSS/Ku	National coverage. Satellite to be built by Space Systems/Loral.

DirecTV 9S	2Q05	119± deg W	BSS/Ku	Satellite, built by Space Systems/Loral will serve as a back-up for DirecTV 4S and 7S
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EchoStar (DISH Network):

EchoStar 10	3Q05	TBA	BSS	Direct to home broadcast services to CONUS, Alaska and Hawaii. A2100 satellite built by Lockheed Martin Commercial Space Systems.
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Loral Skynet:

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Telstar 8	2Q04	89.0 deg W	C-Ku-Ka	Coverage for CONUS, Alaska, Hawaii, Caribbean, Canada and Latin America from 68 transponders. Will replace Telstar 4.
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PanAmSat (Hughes):

Galaxy 16	2005	TBD	C-Ku	Hybrid satellite to be build by Space Systems/Loral.
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SatMex:

SatMex 6	3Q03	109.2 deg W	C-Ku	An agreement was signed in June, 2002, with Aarianespace for launching the satellite. SatMex 6 will carry 36 C-band and 24 Ku-band transponders and will serve Mexico, Central America and parts of Latin and North America.
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SES Americom: (Formerly GE Americom)

AMC-13*	4Q03	172.0 deg W	C	Formerly GE-2i. Will provide service to the Pacific Rim.
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AMC-12*	1Q04	37.5 deg W	C	Formerly GE-1i. Europe, Africa, North and South America coverage. 72 multi-purpose transponders @ 36 MHz;
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AMC-10*	2Q04	135.0 deg W	C	Will replace Satcom C4. Part of the SES Americom Cable Neighborhood providing coverage to CONUS, Mexico and the Caribbean.
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AMC-11*	3Q04	131.0 deg W	C	Will replace Satcom C3. Part of the SES Americom Cable Neighborhood providing coverage to CONUS, Mexico and the Caribbean.
AMC-15*	3Q04	105.0 deg W	Ku-Ka	Both A2100 series satellites are being build by Lockheed Martin.
AMC-16*	3Q04	Ground Spare	Ku-Ka	
AMC-18*	Ground Spare for AMC 10 & 11*			AMC-10,11 and 18* are A2100-type satellites built by Lockheed Martin Commercial Space Systems (LMCSS).

* Satellite identification changed from GE to AMC as a result of the purchase of GE Americom by SES (Societe Europeens des Satellites) Global on November 12, 2001.

Telesat Canada:

Anik F2	1Q03	111.1 deg W	C-Ku-Ka	Multimedia services for North America. Includes 52 Ka-band transponders.
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WildBlue:

Two-way broadband Internet service will be offered in the US and Canada.

WildBlue 1	3Q04	109.2 deg W	Ka	Contracted with Space Systems Loral.
WildBlue 2	3Q04	73.0 deg W	Ka	Contracted with Boeing Space and Communications (formerly Hughes).

WildBlue Communications was founded in 2Q95 as KaSTAR Satellite Communications. The FCC approved FSS licenses and orbital locations for two satellites then called KaStar 1 and 2 in May, 1997. The Satellite names were changed from KaStar 1 and 2 to iSky 1 and 2 in 1999 and to WildBlue 1 and 2 in September, 2000.

Worldspace:

AmeriStar	1Q01?	95.0 deg W	L	Digital radio services.
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RECENT AND PENDING SATELLITE RELOCATIONS

Operator/

Satellite

Comments

DirecTV (DSS):

DirecTV 1	Moved from 101.2 deg W to 109.8 deg W during Dec., 1999 to be held in reserve as back-up equipment for the DirecTV DBS fleet and to provide
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Spanish Language service on three frequencies. Moved back to 101.0 deg W during 3Q03 to provide system redundancy.

- DirecTV 3 The satellite experienced a failure of the primary Spacecraft Control Processor (SCP) on May 4, 2002. Control was automatically switched to a back-up SCP without a loss of service. After traffic was moved to other equipment in the 101 degree orbit, DirecTV 3 was converted to a spare in orbit. The satellite was decommissioned and moved to a graveyard orbit in February, 2003.
- DirecTV 5 The 1300 model satellite was built by Space Systems/Loral and placed into service at 119.0 deg W during 3Q02. The satellite is currently used to provide entertainment programming and broadband services. An application was submitted to the FCC during 1Q04 to move the satellite to the Telesat Canada DBS orbital slot at 72.5 deg W to provide local into local service.
- DirecTV 6 Launched into orbit at 109.5 deg W as Tempo 2 (PrimeStar) in March, 1997. Moved to 119.0 deg W during 2Q97. Renamed DirecTV 6 with purchase of PrimeStar assets by Hughes in November, 2000. Moved to 110.0 deg W during 3Q03.

EchoStar (DISH Network):

- EchoStar 1 This satellite was part of the original EchoStar fleet and was launched into orbit at 119.0 deg W on December 28, 1995. EchoStar 1 was moved to 148.0 deg W during December, 2000.
- EchoStar 4 Currently located at 157.0 deg W. Partial Failure of on-board systems has limited capacity of the satellite. FCC approved temporary assignment (STA) to 110.2 deg W during 4Q99 pending initiation of service from EchoStar 5. Relocated to 119.5 deg W. during 1Q00 and to 157.0 deg W during 3Q03.
- EchoStar 5 Moved from 110.0 degW to 119.0 deg W during 2Q03. Formerly known as Sky 1 or MCI 1. Satellite acquired from MCI-News Corp. prior to launch.
- EchoStar 6 Moved from 119.0 degW to 110.0 deg W during 1Q03. Formerly known as Sky 2 or MCI 2. Satellite acquired from MCI-News Corp. prior to launch.

Loral Skynet:

- Telstar 4 The satellite will be moved to 77 deg W. after the successful launch and testing of Telstar 8 during 1Q03. Telstar 4 will become an in-orbit-spare providing redundancy for the domestic Loral Skynet fleet.

PanAmSat (Hughes):

- Galaxy 3R Moved from 95.0 deg W to 74.0 deg W during 1Q03 with the successful testing of Galaxy 3C. Moved to 111.1 deg W during 2Q03 to provide temporary

replacement for Anik E2. On short-term lease to Telesat Canada. Temporary designation as Anik E2R.

- Galaxy 6 Formerly located at 74.0 deg W. This satellite was moved from 74 deg W. to 99 deg W. on 05/27/98. It was moved to 91.0 deg W during 2Q00. It was returned to 74 deg W during 3Q00 where it was co-located with SBS 6 (Ku-band). The satellite was decommissioned during 2Q03.
- Galaxy 7 Moved from 91.0 deg W. to 125.0 deg W. in November, 2000, with initiation of service for Galaxy 4R. The satellite was lost from service on November 22, 2000, due to the failure of the secondary control processor. The primary control processor failed in June, 1998.
- Galaxy 8i This satellite was placed in inclined orbit during 1Q03. Programming was moved from this satellite to Galaxy 3C.
- Galaxy 9 Currently located at 127.0 deg W. Moved from 123 deg W during 1Q00 following successful testing of Galaxy 10R. The satellite will be moved to 74 deg W upon successful testing of Galaxy 13/Horizons 1.
- Galaxy 11 Currently located at 91.0 deg W. This Satellite was moved from 99.0 deg W. when Galaxy 4R became operational.
- SBS 6 Currently located at 74.0 deg W. Moved from 95 deg W. on 11/01/95. Frequencies of some transponders were changed to avoid interference with adjacent satellites.

SatMex:

- Morelos 2 Moved from 120.0 deg W to 109.2 deg W during 3Q02 in preparation for replacement by SatMex 6.

SES Americom: (Formerly GE Americom)

- AMC-2 Replaced by AMC-9 at 85 deg W. Customers moved from AMC-2 to AMC-9 during July, 2003. Upon completion of customer service transition in August, 2003, AMC-2 was moved to 105 deg W where it serves as an EchoStar test satellite. Commercial service is not available on the C-band transponders.
- Satcom C-1 Formerly GE Satcom C-1. The satellite was originally launched into orbit at 137 deg W in 1990. It was first relocated to 141.5 deg W in November, 2000 to become a part of SES Americom's Cable Neighborhood. The satellite was moved to 79 deg W during April through June, 2001, where it was paired with the Ku-band satellite, AMC-5 (formerly GE-5). Satcom C-1 was moved out of CONUS service during 3Q02 to an orbital position at 37.7 deg W .

Spacenet 4 Formerly GE Spacenet 4. This satellite was moved from 101.0 deg W to 172.0 deg E during 2Q01 where it provides telecommunications services to the Pacific Rim including Hawaii, Alaska and the US West Coast.

Telesat Canada:

Anik E1 Moved from 111.1 deg W to 118.7 deg W. in March, 2001. Beam re-engineered for Canada and CONUS coverage. Approved by FCC for US domestic uplinks. Replaced at 111.1 deg W by Anik E2. Moved to 109.5 deg W during 3Q03 and put into inclined orbit.

Anik E2 Moved from 107.3 deg W to 111.1 deg W. during Feb-Mar, 2001. Beam re-engineered for Canada and CONUS coverage. Approved by FCC for US domestic uplinks. Replaced at 107.3 deg W by Anik F1. Moved to 118.7 deg W during 3Q03 due to on-board hydrazine fuel shortage. Commercial service temporarily provided at 111.1 deg W by Galaxy 3R on short term lease from PanAmSat which was given the temporary designation Anik E2R.

SATELLITES RETIRED FROM SERVICE

(Since 01/01/94)

<i>Satellite</i>	<i>Year Retired</i>	<i>Comments</i>
Morelos 1	1994	The satellite was withdrawn from service in March, 1994.
Galaxy 1	1994	Decommissioned in April, 1994.
Galaxy 2	1994	Decommissioned in May, 1994.
Telstar 402	1994	The launch vehicle was destroyed at the launch site by an explosion after pressurization on September 9, 1994.
Anik D1	1995	The satellite, also know as Telesat 6, was withdrawn from service in February, 1995.
Satcom 2R	1995	The satellite was moved to a junk orbit in March, 1995.
SBS 3	1995	The satellite was moved to a junk orbit on June 2, 1995.
Galaxy 3	1995	Satellite was de-orbited in October, 1995.
Telstar 301	1996	The satellite was moved to 20 deg E, leased to the Arabsat

Satellite Telecommunications Organization (ASCO) in January, 1995 and renamed Arabsat 1E. The satellite was removed from service in September, 1996.

SBS 2	1996	The satellite was placed in an inclined orbit in June, 1994, and de-orbited in September, 1996.
Telstar 401	1997	Satellite was destroyed by a magnetic storm on January 11, 1997.
G Star 1	1997	Satellite was de-orbited during 1Q97 when GE-2 became operational.
Anik C3	1997	The satellite, also know as Telesat 5, was de-orbited in June, 1997.
G Star 3	1997	The satellite was decommissioned in April, 1997 and moved to an inclined parking orbit at 105 deg W in December, 1999.
Satcom K1	1997	The satellite was de-commissioned in July, 1997.
G Star 2	1997	Satellite was moved to inclined orbit at 125 deg W in October, 1993 and was de-orbited in August, 1997.
Telstar 302	1997	The satellite was moved from 85 deg W to an inclined orbit at 97 deg W in January, 1997, and de-orbited on September 5, 1997.
Anik C2	1998	The satellite, also known as Telesat 7 and Nahuel C2 was placed in an inclined orbit in June, 1993 and was de-orbited in January, 1998.
Galaxy 4	1998	Fuel cell ruptured May 19, 1995. Attitude control and backup failed.
Satcom SN2 1998		The satellite also known as Spacenet 2 was decommissioned in, May, 1998, after being removed from domestic service in July, 1997.
Galaxy 10	1998	Satellite failed to reach geosynchronous orbit due to failure of the Delta 3 launch vehicle on August 26, 1998.
Telstar 303	1999	The satellite went into inclined orbit in May 1996 and was de-orbited in January, 1999.
Spacenet 1	1999	GTE Spacenet sold the satellite to China in 1995 and it was renamed Chinasat 1. The satellite was moved to 115.5 deg E during 1Q95 where is served until it was de-orbited in December,

1999.

Spacenet 3R	1999	Moved from 87 deg W. to 83.0 deg W on 10/01/99. The satellite was de-orbited in December, 1999.
SBS 5	2000	The satellite was replaced by Galaxy 10R and taken out of service in March, 2000.
Solidaridad 1	2000	The primary spacecraft control processor (SCP) failed in May, 1999 and the secondary SCP failed on August 27, 2000 resulting in a total loss of the satellite.
Galaxy 7	2000	Primary control processor failed in June, 1998. Secondary processor failed November 22, 2000. Electrical shorts in SCP suspected.
GE Satcom C-5	2001	This satellite was launched into orbit at 139 deg W in May, 1991, and was known as Aurora 2. The satellite was deorbited in March, 2001.
Satcom K-2	2002	The satellite was launched into orbit on the Space Shuttle Atlantis on November 26, 1985, and operated in orbit at 81 degrees WL. The satellite was retired in March 2002 after serving seven years beyond its expected life.
Galaxy 8i	2003	Three of four XIPS thrusters failed in September, 2000. Satellite put into inclined orbit in December, 2002 and retired from service during 1Q03 with service moved to Galaxy 3C.
DirecTV 3	2003	The satellite was decommissioned and moved to a graveyard orbit during 1Q03.
Galaxy 6	2003	The satellite was decommissioned and moved to a graveyard orbit during 2Q03 after 12 years of service.
Telstar 4	2003	The satellite was declared a total loss and decommissioned on September 22, 2003, after the spacecraft experienced a short circuit of its primary power bus on September 19th. Loral Skynet submitted an insurance claim for \$141 Million. Traffic was moved to Telstar 5 and 6. This satellite was due to be replaced by Telstar 8 during 3Q04.

SATELLITE FAILURES

(Since 01/01/94)

<i>Satellite</i>	<i>Year of Cause of Failure</i>	<i>Failure</i>	<i>Extent of Failure</i>
Telstar 402	1994	Catastrophic failure at launch	Total loss
Anik E2	1994	Magnetic storm damage	Partial loss
Anik E1	1996	Power subsystem failure	Partial loss
Telstar 401	1997	Electrical discharge	Total loss
EchoStar 4	1998	Solar array failed to deploy	Performance loss
Galaxy 4	1998	Control processor failure	Total loss
Galaxy 10	1998	Launch vehicle failure	Total loss
DirectTV 1	1999	Control processor failure	No service loss
Galaxy 7	2000	Failure of second control processor	Total loss
Solidaridad 12000		Failure of second control processor	Total loss
Galaxy 8i	2000	Failure of Xenon propulsion system	Partial failure
Galaxy 3R	2001	Primary control processor failure	No service loss
EchoStar 6	2001	Partial thruster failure	Performance loss
Telstar 6	2001	Control processor failure	No service loss
DirecTV 3	2002	Control processor failure	No service loss
DirecTV 4S	2002	Control processor failure	Status changed to in-orbit backup
Anik E2	2003	Shortage of on-board hydrazine	Service reduction
EchoStar 5	2003	Four failed solar panels	No service loss
Telstar 4	2003	Short circuit in primary power bus	Total loss

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