

# Comparison Table of Space Networks And Satellites as of the beginning of 2013

Lubos Perek

Emeritus, Astronomical Institute, Academy of Sciences, Prague, Czech Republic

7 March 2013

The situation at the beginning of the year 2013 is based on the **ITU Space Network List** of 28 December 2012 in the expectation that few, if any, changes would be made in the three last days of the year. There were 1041 entries of NOTIFIED space networks at all longitudes of the geostationary orbit. For the satellites, the information has been taken from Issue 15 of the **Classification of Geosynchronous Objects** produced with the DISCOS Database and published by T. Flohrer at the European Space Operation Center in Darmstadt, Germany, on 25 February 2013. It reflects the situation at the end of 2012.

As in previous editions, the left-hand side of a page contains space networks in boxes for each nominal position. Satellites at or near the nominal position appear in the right-hand half of the page. The last but one column contains the latest position in 2012. The last column refers to the relevant item in the "Classification".

**C1.nnn** refers to Section 3, Objects with recently updated Two-Line-Elements data of the "Classification", Table 1, containing 284 objects under E-W and N-S control.

**C2.nnn** refers to Section 3, Table 2 containing 85 objects under E-W control only. In those cases the Comparison Table gives also the inclination of the orbit.

**2C1.n** refers to Section 4, Objects without TLE data, Table 4.1, containing 5 objects under E-W and N-S control.

**2C2.nn** refers to Section 4, Table 4.2, containing 28 objects under E-W control only. In those cases the Comparative Table gives also the inclination of the orbit.

**Ind.n** refers to Section 6, Objects of Indeterminate Status, p.141 and 147 of the "Classification". These 20 objects exhibited recent changes in position. Seventeen of them had TLE in January and February 2013. Their tentative positions permitted to list them under respective nominal positions.

The total number of satellites capable to use relevant ITU space networks has been 439 on 1 January 2013.

A certain number of space networks of an administration had at its orbital position satellites of a different administration. Whether or not both administrations had an agreement of operating the relevant space networks is a fact which may be known to the administrations only. If such an agreement was absent, no operation of the network was possible.

As in previous years, a certain number of space networks have had no satellite at all at their nominal positions. Those networks could not transmit any communications, therefore they have not contributed to an efficient use of the geostationary orbit. The WARC Conference of 2012 extended the time allowed for putting a space network into operation from two to three years. Comparison Tables dating from 2008 to 2013 have shown, however, that the permitted span has been exceeded in quite a few cases. Rectification of the situation is in the hands of respective administrations. Either a satellite should be placed at the relevant orbital position or the unused space network should be withdrawn.

# Comparison Table of Space Networks and Satellites

Version of 9 March 2013

SPACE NETWORKS - NOTIFIED				SATELLITES IN THE GEOSTATIONARY ORBIT			
Nom. Long.	Adm	Ntwk Org	Space Network Name	COSPAR Int. Designation	Satellite Name	Longitude	Section in Classific...
0.00 E	F	USA	ESA MSG USCID-A1	2005-049B	MSG 2 (Meteosat 9)	0.2 W	C1.1
1.00 E	RUS		VOLNA-21				
	RUS		GALS-15				
	RUS		TOR-15M				
	RUS		STATSIONAR-22				
2.00 E	HOL		NSS-20	1993-031A	Astra 1C, i=5.57	2.0 E	C2.1
3.00 E	F		TELECOM-2C	2010-037B	RASCOM-QAF 1R	2.9 E	C1.2
	F		TELECOM 3C	2009-008B	Eutelsat 3C, Atlantic Bird 4A	3.1 E	C1.4
	F		SYRACUSE-3F	2007-021A	Eutelsat 3A, Xinnuo 3	3.2 E	C1.3
	F		VIDEOSAT-8-KU-C				
	F		SYRACUSE-31F				
	F		TELECOM-4C				
	F		GEOSAT-3E				
4.00 E	F	EUT	EUTELSAT 2-4E suspended				
	USA		MILSTAR 13				
	USA		USGAE-2				
	F	EUT	EUTELSAT 3-4E suspended				
	F		F-SAT-KU2-E-4E suspended				
4.80 E	S		SIRIUS-2	2007-057A	Sirius 4, Astra 4A	4.8 E	C1.5
5.00 E	USA		USMB-5	2012-036A	SES-5	5.0 E	C1.6
	S		SIRIUS-3B				
	S		SIRIUS-P				
	S	NOT	TELE-X				
	S		SIRIUS-5E				
5.50 E	CTI	RAS	RASCOM-C				
5.70 E	MLA		MEASAT-SA1 suspended				
	MLA		MEASAT-5.7E suspended				
6.00 E	G		SKYNET-4B				
	G		SKYNET-4K				
	G		SKYNET-5C	2007-007B	Skynet 5A	6.0 E	C1.7
7.00 E	F	EUT	EUTELSAT 2-7E				
	USA		USMB-6				
	F	EUT	EUTELSAT 3-7E	2004-008A	Eutelsat W3A, 7A	7.0 E	C1.8
	F	EUT	EUTELSAT-KA-7E				
	F	EUT	EUTELSAT-B1-7E				
	F		F-SAT-KU2-E-7E				
	F	EUT	EUTELSAT 1-3				
	F		F-SAT-KA-E-7E				
8.00 E	RUS		VOLNA-15				
	RUS		STATSIONAR-18				
	RUS		GALS-7				
	RUS		TOR-8M				
8.50 E	USA		USGON-2				
9.00 E	F		F-SAT-KA-E-9E	2006-007B	Hot Bird 7A	9.0 E	C1.9
				2010-069A	KA SAT	9.0 E	C1.10
10.00 E	F	EUT	EUTELSAT 2-10E	2009-016A	Eutelsat W2A, 10A	10.0 E	C1.11
	F	EUT	EUTELSAT 3-10E				
	F	ESA	MSG-S1	2002-040B	MSG 1, i=0.97, (Meteosat-8),i=1.8	9.3 E	C2.2
	BEL		SATCOM-4/10E				
	F		3GSAT-G17R				
	F		F-SAT-C-E-10E				
	F		F-SAT-KU2-E-10E				
11.50 E	G		INTELSATN KA 11.5E, susp.	1990-021A	Intelsat VI F-3, i=9.26, IS-603)	11.5 E	C2.3
11.80 E	I		SICRAL-3H	2009-020A	SICRAL 1B	11.8 E	C1.12
12.00 E	RUS		PROGNOZ-2	2009-010A	Raduga 1-8, i=2.40	11.5 E	C2.4
	RUS		TOR-18M				
	RUS		GALS-17				
	RUS		STATSIONAR-27				
	RUS		VOLNA-27				
13.00 E	F	EUT	EUTELSAT 2-13E	2008-065A	Hot Bird 9, (Eutelsat 13C)	13.0 E	C1.13
	F	EUT	EUTELSAT 3-13E	2006-032A	Hot Bird 8, Eutelsat 13B)	13.0 E	C1.14
	F	EUT	EUTELSAT-B1-13E	2002-038A	Hot Bird 6 (Eutelsat 13A)	13.0 E	C1.15
	F	EUT	EUTELSAT-KA-13E	2010-021B	COMSATBw-2	13.2 E	C1.16
	F		F-SAT-KA-E-13E				
	D		GENESIS-8				
	D		GENESIS-11				
	F		F-SAT-KU2-E-13E				
14.00 E	RUS		TOR-12M				

15.00 E	RUS RUS RUS		GALS-12 VOLNA-23 STATSIONAR-23				
16.00 E	F F F F F	EUT EUT F-SAT-KU2-E-16E EUT EUT	EUTELSAT 2-16E EUTELSAT 3-16E F-SAT-KU2-E-16E EUTELSAT-KA-16E EUTELSAT-B1-16E	2011-057A 1998-013A 2000-019A	Eutelsat W3C, 16A Eutelsat 16B, Hot Bird 4, i=1.06 Sesat (Eutelsat 16C), i=1.00	16.0 E 15.8 E 14.5 E	C1.17 C2.6 C2.5
16.20 E	I I		SICRAL-2A SICRAL-3A	2001-005A	Sicral 1, i=4.36	16.2 E	C2.7
17.00 E	RUS RUS	IK IK	INTERSPUTNIK-17E INTERSPUTNIK-17E-CK	2012-040A 2011-074A	Tian Lian 1-03 Amos -5	16.7 E 17.0 E	C1.18 C1.19
19.00 E	LUX		LUX-KA-19E	1997-002A	AMC-2 (GE-2)	19.0 E	C2.8
19.20 E	LUX LUX LUX		GDL-7 GDL-6 LUX-G3-19.2E	2008-057A 1999-033A 2006-012A 2007-016A 2001-025A	Astra 1M Astra 1H Astra 1KR Astra 1L Astra 2C	19.2 E 19.4 E 19.2 E 19.2 E 19.2 E	C1.20 C2.9 C1.22 C1.23 C1.21
20.00 E	ARS ARS	ARB ARB	ARABSAT 2-C ARABSAT 5C-20E	2011-049B	Arabsat 5C	20.0 E	C1.24
21.00 E	USA		AFRIBSS	1997-008A 1998-063A	USA 130 (DSP F18) , i=10.6 AfriStar 1, i=0.49	20.8 E 21.0 E	2C2.1 C2.10
21.50 E	F F F F F F	ESA EUT ESA EUT ESA EUT	ARTEMIS-21.5E-DR EUTELSAT 2-21.5E ARTEMIS-21.5E-LM EUTELSAT 3-21.5E ARTEMIS-21.5-NAV EUTELSAT 1-5	2001-029A 2012-062B	Artemis i=10.30 Eutelsat 21B	21.4 E 21.6 E	C2.11 C1.25
23.00 E	RUS RUS RUS		VOLNA-17 GALS-8 STATSIONAR-19				
23.30 E				1997-025A	Thor II, i=4.07	23.3 E	C2.13
23.50 E	D D LUX		DFS II-1 DFS-1 LUX-G3-24.2E	2002-015B 2010-021A 1994-070A	Astra 3A Astra 3B Astra 1D, i=4.65	23.7 E 23.5 E 23.1 E	C2.14 C1.26 C2.12
24.00 E	RUS		TOR-7M				
24.20 E	LUX		LUX-24.2E				
24.30 E				1996-026A 2012-075A	USA 118, Mercury 2, i=9.1 Skynet 5D, i=0.45	24.3 E 24.4 E	2C2.2 Ind. 19
25.00 E	G G		INMARSAT-3 IOR WEST INMARSAT-4 25E	1998-006B 2005-044A	Inmarsat-3 F5, i=0.30 Inmarsat 4 F2, i=2.26	24.8 E 25.1 E	C2.15 C2.16
25.50 E	F F F	EUT EUT F-SAT-KU3-E-25.5E	EUTELSAT 1-8 EUTELSAT 3-25.5E F-SAT-KU3-E-25.5E	1998-057A	Hot Bird 5, Eutelsat 25A	25.5 E	C1.27
26.00 E	IRN ARS ARS ARS ARS ARS ARS		ZOHREH-2 ARABSAT 2-B ARABSAT 1-B ARABSAT-EXT-C2 ARABSAT-KA-26E ARABSAT 5B-26E ARABSAT-KU-26E	2010-025A 2006-051A 2008-034B	Badr 5 = Arabsat 5B Badr 4 = Arabsat 4B Badr 6 = Arabsat 3C	26.0 E 26.0 E 26.0 E	C1.28 C1.29 C1.30
28.20 E	LUX LUX		LUX-28.2E LUX-G3-28.2E	1998-050A 2000-081A 2000-054A 2011-041A 2012-051A	Astra 2A Astra 2D Astra 2B Astra 1N Astra 2F	28.2 E 28.0 E 28.3 E 28.2 E 28.2 E	C1.31 C2.17 C1.32 C1.33 C1.34
28.50 E	D		DFS II-2 DFS-2	2001-011A 2008-065B	Eurobird 1, Eutelsat 28A Eutelsat 28B, W2M	28.5 E 28.5 E	C1.35 C1.36
29.00 E	USA E		FLTSATCOM-C INDOC-1 SECOMSAT B29E	1993-056A 2005-005A	USA 95 (UFO F2), i=6.43 XTAR-EUR	29.1 E 29.0 E	2C2.3 C1.37
30.00 E	USA		USGAE-16R	2002-001A	USA 164 (Milstar-2 F3), i=5.30	30.0 E	2C2.4
30.50 E	ARS ARS ARS	ARB ARB ARB	ARABSAT 2-A ARABSAT 5A-30.5E ARABSAT 5A-30.5E	2010-032B	Arabsat 5A = Badr 5A	30.5 E	C1.38
31.00 E	ARS LUX TUR TUR TUR	ARB ARB ARB ARB ARB	ARABSAT 1-C LUX-G3-4 TURKSAT-1B resuming op TURKSAT-K1 resuming op TURKSAT-2b	1997-076A 2012-043B	Astra 1G Hylas 2	31.5 E 31.0 E	C1.40 C1.39

<b>33.00 E</b>	USA USA F F F F F USA USA USA USA	USASAT-55I USASAT-60N EUTELSAT 2-33E EUTELSAT 3-33E EUTELSAT-KA-33E F-SAT-KU3-E-33E SAT-KU3-E-33E INTELSAT5 33E INTELSAT7 33E INTELSAT8 33E INTELSAT9 33E	2003-043A       1999-009B 1994-034A  2011-016A 1996-063A	Eurobird 3, Eutelsat 33A       Skynet 4E, i=6.00 Intelsat 702 Intelsat New Dawn Arabsat-2B, i=0.37	33.1 E       32.4 E 33.0 E 32.8 E 34.0 E	C1.42       C2.18 Ind.3 C1.41 C2.19	
<b>34.50 E</b>	ARS	ARB	ARABSAT 6E-34.5E	2008-011A	AMC 14, i=15.90	34.4 E	C2.20
<b>35.00 E</b>	RUS RUS RUS RUS RUS		PROGNOZ-3 STATIONAR-D3 TOR-2M STATIONAR-2 GALS-6 VOLNA-11	1993-076A	NATO IV B, USA98, i=10.34	35.5 E	C2.21
<b>36.00 E</b>	RUS F F F F	EUT EUT EUT EUT	RST-1 EUTELSAT 2-36E EUTELSAT 3-36E F-SAT-KU3-E-36E EUTELSAT-KA-36E	2009-065A 2000-028A	Eutelsat W7, 36B Eutelsat W4(36A)	35.9 E 36.1 E	C1.43 C1.44
<b>38.00 E</b>	PAK PAK PAK		PAKSAT-1 PAKSAT-1R1 PAKSAT-1R	2011-042A	PakSat-1R	38.0 E	C1.45
<b>39.00 E</b>	GRC CYP CYP		HELLAS-SAT KYPROS-SAT-C KYPROS-sat-L4	2003-020A	Hellas Sat 2	39.0 E	C1.46
<b>39.50 E</b>	G		DJCF-1A				
<b>40.00 E</b>	RUS RUS RUS RUS		LOUTCH-7 EXPRESS-4 EXPRESS-4B VOLNA 4R	2004-043A	Ekspress AM-1, i=2.26	40.0 E	C2.22
<b>42.00 E</b>	TUR TUR TUR TUR		TURKSAT 1D TURKSAT-K2 TURKSAT-KX TURKSAT-1A	2008-030B 2001-002A 2011-077A 2009-047A	Turksat 3A Turksat 2A (Eurasiasat 1) NigComSat-1R USA 207, PAN	42.0 E 42.0 E 42.5 E 42.5 E	C1.47 C1.48 C1.49 2C1.1
<b>44.00 E</b>	USA USA UAE UAE UAE		USGGR-4 USCSID-A2 EMARSAT-1E EMARSAT-4f EMARSAT-1F/M	2009-001A 2003-026A	USA 202, i=3.36 Thuraya 2, i=3.39	44.0 E 44.0 E	2C2.5 C2.23
<b>45.00 E</b>	RUS RUS D RUS RUS RUS		STATIONAR-D4 VOLNA-3 EUROPE*STAR-1 STATIONAR-9 STATIONAR-9A GALS-2 TOR-3	1999-052A 2000-068A	Galaxy 27, Telstar 7 Europe*Star F1=Intelsat12	45.1 E 45.0 E	C1.51 C1.50
<b>46.00 E</b>	G MLA		DJCF-1B MEASAT-46E	1996-002B	Measat 1, Africasat 1-1,i=4.60	46.0 E	C2.24
<b>47.00 E</b>	F F		SYRACUSE-3h SYRACUSE-31H	2005-041B	Syracuse 3A	47.0 E	C1.52
<b>47.50 E</b>	D		EUROPE*STAR-3	1996-035A 2001-019A	Intelsat 709, vii F-6, i=0.60 PAS 10, Intelsat 10, i=0.09	47.5 E 47.5 E	C2.25 Ind. 10
<b>48.00 E</b>	IND IND IND IND IND		INSAT-2T(48) INSAT-2(48) INSAT-EK48 INSAT -2M(48) INSAR-EK48R	2012-016A 1996-067A  1999-018A	Yahsat 1B Eutelsat 48A, Hot Bird 2, i=3.29 Eutelsat W3, i=0.25	47.6 E 48.2 E 47.9 E	C1.53 C2.26 Ind. 7
<b>49.00 E</b>	USA RUS RUS RUS RUS RUS		USMB-8 TOR-16M ROSCOM-4 STATIONAR-M11 GALS-13 VOLNA-25 STATIONAR-24	2003-053A 1994-054A	Yamal 200 N2 (Yamal 202) USA 105, Mercury 1, i=8.60	49.0 E 48.7 E	C1.54 2C2.6
<b>50.00 E</b>	TUR TUR THA		TURKSAT-1C TURKSAT-K3 TURKSAT-C50E	1997-007A 1999-005A 2012-034A	JC-SAT 4 = Intelsat 26,i=4.51 Telstar 6 = Galaxy 26 USA 237, NROL-15	50.2 E 50.0 E 49.9 E	C2.27 C1.55 2C2.7
<b>50.50 E</b>	THA		THAICOM-C1	1997-053A	NSS-803, Intelsat VIII F-3,i=0.53	50.5 E	C2.28
<b>51.50 E</b>	CHN		CHINASAT-51.5E	1996-039A 1998-056B 2012-067A	Apstar 1A, i=6.65 Sirius 3, i=3.44 Zhongxing 12, i=0.14	51.9 E 51.2 E 51.5 E	C2.30 C2.29 Ind.16
<b>52.50 E</b>	UAE		EMARSAT-1G	2011-016B	Yahsat 1A	52.5 E	C1.56

53.00 E	RUS	VOLNA-4	2007-056B	Skynet 5B	52.7 E	C1.57
	G	SKYNET-4C				
	G	SKYNET-4L				
	G	SKYNET-5D				
RUS	RUS	EXPRESS-5B	2003-060A	Ekspress AM-22, Sesat-2	53.0 E	C1.58
	RUS	EXPRESS-5				
55.00 E	RUS	KUPON-1	2012-075A	Yamal-402,i=0.12	54.8 E	Ind.18
	IND	INSAT-2(55)	2003-043E	Insat 3E	55.1 E	C1.60
	IND	INSAT-2T(55)	1996-021A	Astra 1F	54.9 E	C1.59
	USA	MILSTAR 4				
	RUS	KUPON-1T				
	RUS	KUPON-1S				
	IND	INSAT-EK55R	2011-022A	GSat-8	55.1 E	C1.61
	IND	INSAT-EK55				
	IND	INSAT-KU10(55)E				
	RUS	KUPON-1M				
56.00 E	RUS	RST-2	1998-068A	Bonum 1, i=1.07	56.0 E	C2.31
			1999-056A	DirecTV 1R	55.8 E	Ind. 8
57.00 E	HOL	INTELSAT5A INDOC2	2000-065A	USA 153 (DSCS III B), i=3.13	56.7 E	2C2.8
	HOL	INTELSAT8 57E				
	HOL	INTELSAT7 57E				
	USA	USGCSS PH3 INDOC-2				
	USA	USGCSS PH3B INDOC-2				
HOL	NSS-8	2009-058A	NSS 12	57.0 E	C1.62	
HOL	NSS-36					
57.50 E	D	EUM	1997-049B	Meteosat 7 i=8.09	57.4 E	C2.32
58.00 E	RUS	TOR-13M				
58.50 E	KAZ	KAZSAT1 suspended				
	KAZ	KAZSAT1M suspended				
58.75 E	CHN	COMPASS-58.75E	2012-008A	Beidou G5, DW11	58.7 E	C1.63
60.00 E	USA	USGCSS PH3 INDOC	2009-017A	USA204 (WGS F2)	60.20E	2C1.2
	USA	USGCSS PH3B- INDOC				
	USA	USGOVSAT-10				
	USA	INTELSAT6 60E				
	USA	INTELSAT8 60E				
	USA	INTELSAT9 60E	2002-007A	Intelsat 904	60.0 E	C1.64
62.00 E	USA	INTELSAT7 62E				
	USA	USMB-9				
	USA	INTELSAT8 62E				
	USA	INTELSAT6 62E				
	USA	INTELSAT9 62E	2001-039A	Intelsat 902	62.0 E	C1.65
63.00 E	D	GENESIS-9	2009-054B	COMSATBw-1	63.0 E	C1.66
64.00 E	G	INMARSAT 3 IOR-1				
	G	INMARSAT GSO-2N				
	USA	INTELSAT9 64E	2002-041A	Intelsat 906	64.2 E	C1.67
	USA	INTELSAT8 64E				
	USA	INTELSAT7 64E				
64.50 E	G	INMARSAT-2 IOR 1	1996-020A	Inmarsat 3-F1, i=0.71	64.5 E	C2.33
65.00 E	G	INMARSAR-3 IOR-2				
	G	INMARSAT GSO-2H				
66.00 E	USA	INTELSAT9 66E	2010-065B	Intelsat 17	66.0 E	C1.68
	USA	INTELSAT7 66E				
68.00 E	USA	USASAT-14I-2	2003-041A	USA 171 (Adv.Orion 3), i=6.11	68.0 E	2C2.9
68.50 E	USA	USASAT-14I-3	1998-052A	PAS 7 = Intelsat 7	68.7 E	C1.70
	USA	USASAT-60C				
	USA	USASAT-14I	2012-043A	Intelsat 20	68.5 E	C1.69
69.00 E	RUS	TOR-14M				
	RUS	GALS-14				
70.00 E	RUS	VOLNA-19	2007-058A	Cosmos-2434 (Raduga-1M1)	70.0 E	C1.71
	USA	USGON-1	2004-004A	USA 176, DSP F22, i=5.02	69.6 E	2C2.10
	USA	USTRO-6				
	RUS	STATSIONAR-20				
	RUS	GALS-16				
	RUS	TOR-17M				
	TON	TONGASAT-H70				
70.50 E	F	EUTELSAT-E-70.5E	2002-051A	Eutelsat W5. 70A	70.5 E	C1.72
	F	EUTELSAT 3-70.5E	2012-069A	Eutelsat 70B	70.5 E	Ind.17
	F	F-SAT-KU3-E-70.5E				
72.00 E	USA	FLTSATCOM-C INDOC-2	1990-002B	Leasat 5 ,i=10.33	72.0 E	C2.34
	USA	USASAT-14J-2	2003-057A	USA 174 (UFO F11), i=3.23	71.6 E	2C2.11
	USA	KASATCOM-3	2012-011A	Intelsat 22	72.1 E	C1.73
	USA	USASAT-14J	1999-063A	USA 146 (UFO F10), i=4.60	72.3 E	2C2.12
	AUS	DEF-R-SAT-2A				

<b>74.00 E</b>	IND IND IND IND IND IND IND		INSAT-1B INSAT-2(74) INSAT-2K(74) INSAT-2T(74) INSAT-2M(74) INSAT-EK(74) INSAT-2E(74) INSAT-EK74R	2002-002A 2002-043A  2007-037A	Insat 3C Kalpana-1 (MetSat-1), i=3.29  Insat 4CR	74.1 E 74.0 E  74.0 E	C1.74 C2.35  C1.75
<b>75.00 E</b>	RUS USA USA USA RUS RUS	IK    IK IK	INTERBELAR-2 FLTSATCOM-C INDOC-3 USMB-10 USCSID-A3 INTERSPUTNIK-75E-CK INTERSPUTNIK-75E-Q	1999-053A 1996-003A 1990-097B	LMI 1, ABS-1 Koreasat 2, ABS-1A, i=5.34 USA 67 (SDS 2F2), i=15.68	75.0 E 74.8 E 75.2 E	C1.76 C2.36 2C2.13
<b>76.00 E</b>	RUS F F		GOMS-M F-SAT-KU3-E-76E F-SAT-KU-E-76E	2011-001A	Elektro-L1, GOMS 2	76.1 E	C1.77
<b>76.50 E</b>	CHN CHN		APSTAR-4 APSTAR-76E	2012-013A	Apstar 7	76.5 E	C1.78
<b>77.00 E</b>	RUS CHN		CSSRD-2 CTDRS-1-77E	2008-019A	Tian Lian 1A (CTDRS-1)	77.0 E	C1.79
<b>77.50 E</b>	KAZ		KAZSAT7				
<b>78.50 E</b>	THA THA THA THA		THAICOM-A2 THAICOM-AK2 THAICOM-G1K THAICOM-A2B	2006-020B	Thaicom 5	78.5 E	C1.80
<b>79.60 E</b>	CHN		CHINASAT-34A				
<b>80.00 E</b>	RUS RUS RUS RUS CHN RUS RUS CHN CHN RUS		STATIONAR-1 PROGNOZ-4 POTOK-2 EXPRESS-6 CHINASAT-31 EXPRESS-6B FOTON-2 COMPASS-80E CTDRS-1-80E VOLNA-8R	2011-048A 2005-010A 2009-007B  2012-059A	Cosmos 2473 Ekspress AM-2 Express-MD1  Beidou G6, DW16	80.0 E 80.0 E 80.1 E  80.2 E	C1.81 C1.82 C1.83  C1.84
<b>81.75 E</b>	RUS		YAMAL-E3				
<b>82.00 E</b>	USA USA USA J AUS		USMB-11 USGGR-8 USCSID-A4 N-SAT-82E DEF-R-SAT-1A	1985-010B	USA 8 (MAGNUM 1), i=17.56	82.2 E	2C2.14
<b>83.00 E</b>	IND IND IND IND IND IND		INSAT-2(83) INSAT-2K (83) INSAT-2E83 INSAT-2M(83) INSAT-EK83 INSAT-EK83R	2005-049A 2011-034A 2012-051B	Insat 4A GSat-12 GSat-10	83.0 E 83.0 E 83.0 E	C1.85 C1.86 C1.87
<b>84.00 E</b>	CHN		CHINASAT-84B				
<b>85.00 E</b>	RUS RUS RUS USA RUS CHN RUS USA USA USA USA USA		VOLNA-5 STATIONAR-3 TOR-4M USTRO-9 GALS-3 SINOSAT-3A TOR-4 INTELSAT6 85E INTELSAT KFOS 85E INTELSAT7 85E INTELSAT8 85E TDRS 85E	2010-002A 2009-067A 2007-063B 1995-035B	Raduga-1M2 Intelsat IS-15 Horizons-2 TDRS 7, i=13.43	85.0 E 85.2 E 84.9 E 84.9 E	C1.89 C1.90 C1.88 C2.37
<b>85.40 E</b>	RUS RUS		STATIONAR-D5 SADKO-1				
<b>86.50 E</b>	CHN CHN KAZ KAZ RUS		FY-2B FY-2BS KAZSAT2 KAZSAT2M KUPOON-4M	2011-035B	KazSat-2	86.5 E	C1.91
<b>87.50 E</b>	CHN CHN CHN		DFH-3-OC DFH-3-OCM CHINASAT-1	1998-033A 2006-053A	Zhongwei 1, Chinasat 5A FengYun 2D, i=2.80	87.5 E 87.3 E	C1.92 C2.38
<b>88.00 E</b>	SNG SNG  J		ST-1A ST-1A-CK  N-SAT-88E	1998-049A 2011-022B 1992-037A 2012-003A	ST-1, i=1.18 ST-2 USA 82, DSCS III F6, i=9.44 USA 233, WGS F4	88.2 E 88.0 E 88.3 E 88.4 E	C2.39 C1.93 2C2.15 2C1.3
<b>89.00 E</b>	USA		TDRS 89E	2000-034A	TDRS 8, i=4.37	89.3 E	C2.40

90.00 E	RUS	VOLNA-8				
	RUS	STATIONAR-6				
	RUS	EXPRESS-7	2003-053B	Yamal 200 N1 (Yamal 201)	90.0 E	C1.94
	USA	MILSTAR 5	1989-090B	USA 48 (MAGNUM2), i=16.56	89.5 E	2C2.16
	USA	USTRO-7				
	USA	MILSTAR 5				
	RUS	EXPRESS-7B	2012-061B	Yamal 300K	90.0 E	Ind. 15
	RUS	EXPRESS-7				
90.75 E	J	DRTS-90.75E	2002-042B	Kodama (DRTS), i=1.84	90.7 E	C2.41
91.50 E	MLA	MEASAT-91.5E	2009-032A	Measat-3A	91.5 E	C1.96
	MLA	MEASAT-1	2006-056A	Measat 3	91.5 E	C1.95
	MLA	MEASAT-AK 91.5				
	MLA	MEASAT-1R				
	MLA	MEASAT-51.5E				
92.00 E	USA	USMB-12	2000-080A	USA 155, (SDS 5F2), i=5.68	92.1 E	2C2.17
	USA	USCSID-A5				
92.20 E	CHN	CHNBSAT-92.2E	2008-028A	Zhongxing 9, Chinasat 9	92.2 E	C1.97
	CHN	APSTAR-92E				
	CHN	APSTAR-92E				
	CHN	CHINASAT-92.2E				
93.00 E	AUS	DEF-R-SAT-3A	1997-036A	Superbird A3, i=3.63	93.0 E	C2.42
93.50 E	IND	INSAT-2(93.5)	2003-013A	Insat 3A	93.5 E	C1.98
	IND	INSAT-2K(93.5)	2007-007A	Insat 4B	93.5 E	C1.99
	IND	INSAT-2M(93.5)				
	IND	INSAT-2K(93.5)	2011-019A	USA 230, SBIRS-GEO 1, i=5.72	94.0 E	2C2.18
	IND	INSAT-EK93.5				
	IND	INSAT-EK93.5R				
	IND	INSAT-2E93.5				
95.00 E	HOL	INTELSAT KA 95E				
	HOL	INTELSAT8 95E				
	HOL	INTELSAT7 95E				
	HOL	INTELSAT5A 95E				
	HOL	NSS-9	2002-057A	NSS 6	95.0 E	C1.100
	RUS	CSDRN-M suspended				
	HOL	NSS-KA41				
	RUS	CSDRN	2010-063A	USA 223 (NROL-32), i=5.22	95.8 E	2C2.19
96.50 E	RUS	STATIONAR-14	2008-003A	Ekspress AM-33	96.5 E	C1.101
	RUS	LOUTCH-9				
	RUS	EXPRESS-8				
	RUS	EXPRESS-8B				
97.50 E	CHN	SINOSAT-3 suspended				
98.00 E	RUS	PROGNOZ-8				
	CHN	CHINASAT-22	2012-028A	Chinasat 2A, ZX 2A	98.3 E	C1.103
	CHN	CHINASAT-3	2003-052A	Zhongxing-20	98.1 E	C1.102
	CHN	DFH-3A-OC				
	CHN	CHINASAT-44				
	CHN	CHINASAT-64				
98.50 E	UAE	EMARSAT-4S	2008-001A	Thuraya 3, i=4.76	98.6 E	C2.43
99.00 E	RUS	STATIONAR-T				
	RUS	STATIONAR-T2				
100.00 E	USA	FLTSATCOM-A INDOC-4	1986-096A	USA 20,(FLTSATC. F7), i=13.77	99.4 E	2C2.20
			2006-024A	USA 187, Mitex OSC, i=0.07	99.6 E	2C2.21
100.50 E	CHN	ASIASAT-EKZ				
	CHN	ASIASAT-E	2009-042A	Asiasat 5	100.5 E	C1.104
	CHN	ASIASAT-EK1				
	CHN	ASIASAT-EKS				
	CHN	ASIASAT-EKX				
101.50 E	CHN	CHINASAT-45 suspended	2006-038A	Zhongxing-22A, FH1, i=2.67	101.5 E	C2.45
103.00 E	RUS	STATIONAR-21				
	RUS	LOUTCH-5				
	USA	USGON-3	2000-001A	USA 148 (DSCS III B-08),i=3.80	103.8 E	2C2.23
	CHN	STW-2				
	RUS	EXPRESS-9	2000-013A	Ekspress 2A, i=6.19	102.5 E	C2.44
	USA	USTRO-8	2001-033A	USA 159 (DSP 21), i=7.16	103.5 E	2C2.22
	RUS	EXPRESS-9B				
	CHN	CHINASAT-65				
	CHN	DFH-4-OB				
	CHN	DFH-3-OB				
104.00 E	AUS	DDSP-104E				
	AUS	ADF WEST 5				
105.00 E	AUS	ASIABSS	2000-016A	AsiaStar	105.0 E	C1.105
	CHN	FY-2A	2008-066A	FengYun 2E, i=0.97	104.5 E	C2.46
	CHN	FY-2AS				
	CHN	CHINASAT-46				

105.50 E	CHN	ASIASAT-CK-1	2011-069A	Asiasat 7	105.6 E	C1.107
	CHN	ASIASAT-1	1999-013A	Asiasat 3S	105.5 E	C1.106
	CHN	ASIASAT-CKS				
	CHN	ASIASAT-CK				
	CHN	ASIASAT-CKX				
106.50 E	USA	USMB-13				
107.70 E	INS	INDOSTAR-1				
108.00 E	INS	PALAPA-B1	2009-027A	Indostar II/Protostar II, SES-7	108.2 E	C1.108
	INS	PALAPA-B1-EC				
	INS	PALAPA-C2	1999-042A	Telkom 1	108.0 E	C1.109
108.20 E	G	AM-SAT A4	2000-059A	GE-1A	108.2 E	C1.110
			1995-055A	Astra 1E, i=2.25	108.3 E	Ind.5
109.00 E	G	INMARSAT-3 POR WEST	1990-093A	Inmarsat 2-F1, i=9.24	108.9 E	C2.47
109.65 E	J	TAIKI-109.65	2010-056B	BSAT-3B, i=0.65	109.6 E	C2.48
109.85 E	J	BS-3N	1998-024B	BSAT-1b	109.9 E	C1.111
	J	BSAT-109.85	2007-036B	BSAT-3A	109.9 E	C1.112
			2003-028A	BSAT-2c	109.9 E	C1.113
110.00 E	USA	USGGR-11				
	USA	USCSID-A6				
	J	N-SAT-110	2000-060A	N-SAT-110, JCSAT-110	110.1 E	C1.115
	J	BSAT-110	2011-041B	BSat-3c, Jcsat-110R	110.0 E	C1.114
	J	N-SAT-110E				
	J	JMCS-2				
	J	BS-3				
110.50 E	CHN	CHINASAT-6	2011-026A	Zhongxing 10	110.5 E	C1.117
	CHN	CHINASAT-2				
	CHN	CHINASAT-33				
	CHN	CHINASAT-33	2010-024A	Beidou DW 4, G3	110.6 E	C1.116
	CHN	COMPASS-110.5E				
111.50 E	IND	INSAT-KU10(111.5)E				
113.00 E	INS	PALAPA-B2	2009-046A	Palapa D1	113.0 E	C1.119
	KOR	KOREASAT-113E	2006-034A	Mugunghwa 5, Koreasat-5	113.1 E	C1.120
	KOR	KOREASAT-2	2012-002A	Fengyun 2F	112.5 E	C1.118
	INS	PALAPA-C1-K				
	KOR	INFOSAT-B				
	KOR	KOREASAT-113X				
	INS	PALAPA-C1				
115.50 E	CHN	DFH-4-OD	2007-031A	Zhongxing 6B	115.5 E	C1.121
	CHN	CHINASAT-MSB4				
	CHN	DFH-3-OD				
	CHN	DFH-5-OD				
	CHN	CHINASAT-115.5E				
116.00 E	CHN	ASIASAT-B	2010-070B	Koreasat 6	116.0 E	C1.123
	KOR	INFOSAT-C	1999-046A	Mugunghwa3,Koreasat 3,ABS7	115.9 E	C1.122
	KOR	KOREASAT-1				
116.20 E	KOR	COMS-116.2E				
118.00 E	INS	PALAPA-B3	2005-046A	Telkom 2	118.0 E	C1.124
	INS	PALAPA-C3-K suspended				
	INS	PALAPA-C3				
	INS	PALAPA-B3 TT&C				
	INS	PALAPA-B3-EC suspended				
	INS	PALAPA-C3X				
119.50 E	THA	THAICOM-1P1	2005-028A	Thaicom 4	119.5 E	C1.125
120.00 E	THA	THAICOM-AK3				
	THA	THAICOM-A3				
	THA	THAICOM-A3B				
	THA	THAICOM-G2K				
	THA	THAICOM-N3.				
121.00 E	CHN	DFH-3-OE				
	AUS	DEF-R-SAT-4B 121.0E				
122.00 E	CHN	ASIASAT-A	2003-014A	AsiaSat 4	122.1 E	C1.126
	CHN	ASIASAT-AK				
	CHN	ASIASAT-AK1				
	CHN	ASIASAT-AKS				
	CHN	ASIASAT-AKX				
123.00 E	INS	GARUDA-2	2000-011A	Garuda 1, i=1.06	123.0 E	C2.49
123.50 E	CHN	FY-2C	2004-042A	FengYun 2C, i=4.38	123.5 E	C2.50
123.50 E	CHN	FY-2CS				
124.00 E	J	JCSAT-FO-124E	1999-006A	JC-Sat 6, Jcsat-4A	123.9 E	C1.127
	J	JCSAT-3B	2012-023A	JCSAT-13	124.0 E	C1.128
	J	N-SAT-124E				
	J	SJC-1				
125.00 E	CHN	STW-1	2010-042A	Zhongxing 6A, Chinasat 6A	125.0 E	C1.129
	CHN	DFH-3-OA				
	CHN	DFH-4-OA				
	CHN	CHINASAT-49				
	CHN	CHINASAT-MSB5				



			1995-022A	USA 110 (Adv. Orion 1),i=11.23,	127.0 E	2C2.24
<b>127.50 E</b>	J	JCSAT-T-127.5E				
<b>128.00 E</b>	RUS	STATIONAR-D6				
	RUS	GALS-10	2006-033A	JCSAT 10 (JCSat 3A)	128.0 E	C1.130
	J	N-SAT-128				
	RUS	TOR-6M				
	RUS	STATIONAR-15				
	J	JCSAT-FO-128E	2009-044A	JCSAT 12 (JCSAT-RA)	128.0 E	C1.131
	RUS	VOLNA -9				
	RUS	TOR-6				
	J	N-SAT 128E				
	J	JCSAT-3A				
<b>128.20 E</b>	KOR	COMS-128.2E	2010-032A	Cheollian, Coms 1	128.2 E	C1.132
<b>130.00 E</b>	RUS	GALS-5				
	CHN	SINOSAT-3C	2011-047A	Zhongxing-1A = Chinasat 1A	129.8 E	C1.133
	RUS	TOR-10M				
	RUS	PROGNOZ-5				
	CHN	DFH-3A-OD				
	CHN	CHNSAT-130E				
	CHN	CHNSAT-2-130E				
	CHN	CHINASAT-4	2010-064A	Zhongxing 20A	130.1 E	C1.134
<b>131.00 E</b>	CHN	APSTAR-1				
<b>132.00 E</b>	J	JCSAT-FO-132E	2006-010A	JCSAT 9, 5A	132.0 E	C1.137
	J	D-STAR-1				
	J	N-STAR-A				
	J	N-STAR-A2				
	VTN	VINASAT-4A2	2008-018A	Vinasat -1	131.9 E	C1.136
	J	N-STAR-F				
	VTN	VINASAT-4A3	2012-023B	Vinasat- 2	131.8 E	C1.135
	VTN	VINASAT-TTC				
<b>133.00 E</b>	USA	TDRS 133E				
<b>134.00 E</b>	CHN	APSTAR-2	2005-012A	Apstar 6	134.0 E	C1.138
	CHN	CHINASAT-134E				
	TON	TONGASAT C/KU-2				
	TON	TOGASAT-2/134E				
	TON	TONGASAT AP-2				
<b>136.00 E</b>	J	JCSAT-FO-136E	2002-035B	N-Star 3 (N-Star c), i=1.38	136.0 E	C2.51
	J	D-STAR-2				
	J	N-STAR-B				
	J	N-STAR-B2				
	J	N-STAR-E				
<b>138.00 E</b>	CHN	APSTAR 5-KU	2004-024A	Telstar 18 (Apstar 5)	138.00E	C1.139
	CHN	CHINASAT-138E				
	TON	TONGASAT C/KU-3				
	TON	TONGASAT 2/138E				
	TON	TONGASAT AP-3				
<b>140.00 E</b>	RUS	LOUTCH-4				
	RUS	STATIONAR 7				
	RUS	EXPRESS-10				
	RUS	EXPRESS-10KA				
	J	MTSAT-140E	2005-006A	Himawari-6, MTSAT-1R	140.0 E	C1.142
	J	MTSAT-B-140E				
	CHN	CHINASAT-32				
	CHN	COMPASS-140E	2010-001A	Beidou DW 3, G1	140.0 E	C1.140
	j	GMS-140E				
	J	MTSAT-C-140E				
	CHN	CHINASAT-35B				
	RUS	EXPRESS-10B	2005-023A	Ekspress AM-3	139.9 E	C1.141
<b>140.40 E</b>	CHN	CHINASAT-35B				
<b>142.00 E</b>	CHN	APSTAR-142E				
	THA	THAICOM-G3K				
<b>143.00 E</b>	J	WINDS-A	2008.007A	Kizuna	143.0 E	C1.143
<b>143.50 E</b>	G	INMARSAT-3 POR-3				
	G	INMARSAT-4 143.5E	2005-009A	Inmarsat 4 F1, i=2.56	143.5 E	C2.52
<b>143.72 E</b>	J	N-SAT-14372E				
<b>144.00 E</b>	J	JMCS-1				
	KOR	SKDAB-2	2004-007A	MBSAT	144.1 E	C1.145
	J	N-SAT-146				
	J	JMCS-C2-X	2008-038A	Superbird C2	144.0 E	C1.144
	J	SB-SAT-144				
	J	JMCS-1R				
	J	SUPERBIRD-C				
	J	SUPERBIRD-C2				
<b>144.50 E</b>	J	CHINASAT-35C				

145.00 E	RUS RUS RUS RUS USA J J	LOUTCH-10 STATIONAR-16 EXPRESS-11 VOLNA-6R USGON 6 MTSAT C-145E MTSAT-B-145E	2006-004A	MTSAT-2	145.0 E	C1.146
146.00 E	INS INS J	PALAPA PAC-KU 146 E PALAPA PAC C 146E ETS-8	2006-059A	Kiku-8 (ETS VIII), i=2.40	145.7 E	C2.53
148.00E	MLA MLA MLA	MEASAT-2 MEASAT-148E MEASAT-2R	1996-063B	Sinosat 1, Chinasat 5B, i=1.13 Measat-2 = AfricaSat-2, i=4.56	146.0 E	C2.54 C2.55
150.00 E	J USA J J	JCSAT-1 USGCSS PH3B W PAC-3 JCSAT-1R JCSAT-FO-150E	1997-075A 1995-038A	JC-Sat 5, i=2.41, USA 113 (DSCS III F9), i=7.78	150.0 E	C2.56 C2.57 2C2.25
150.50 E	INS	PALAPA-C4	1996-030A	Palapa C2, i=2.40	150.5 E	C2.57
152.00 E	AUS AUS AUS AUS USA	AUSSAT A 152E AUSSAT B 152E MOB AUSSAT B 152E MXL AUSSAT B 152E USGAE-9R	2007-044A 2001-009A	Optus D2 USA 157 (Milstar-2F2), i=5.93	152.0 E	C1.147 C2.26
154.00 E	J J J	JCSAT-2 JCSAT-2R JCSAT-FO-154E	2002-015A	JC-SAT 8, 2A	154.0 E	C1.148
156.00 E	AUS AUS AUS AUS AUS AUS AUS AUS AUS AUS AUS	AUSSAT B 156E S AUSSAT B 156E R AUSSAT B 156E AUSSAT B 156EMXL AUSSAT B 156E MXL AUSSAT B 156E MC AUSSAT B 156E NZ ADF 156E GOV AUSSAT C 156E FSS AUSSAT C 156E GOV AUSSAT D 156E FSS	2009-044B 2003-028B	Optus D3 Optus C1 (Defense C1)	156.0 E	C1.150 C1.149
157.00 E	USA USA USA USA	INTELSAT 5A 157E INTELSAT8 157E INTELSAT6 157E INTELSAT7 157E	1993-066A 1995-023A	Intelsat 701, IS-701, i=0.92 Intelsat VIIA F-1, i=1.20	157.0 E	C2.58 Ind.4
158.00 E	J J J J J	SUPERBIRD-A2-KA JMCS-3A SUPERBIRD-A2-R SUPERBIRD-A SUPERBIRD-A2				
160.00 E	AUS AUS AUS AUS AUS AUS AUS AUS CHN	AUSSAT B 160E R AUSSAT B 160E MOB AUSSAT B 160E MXL AUSSAT B 160E S AUSSAT B 160E MC AUSSAT B 156E AUSSAT B 160E NZ COMPASS-160E	2006-043B 2010-057A	Optus D1 Beidou DW 6, G4	160.0 E	C1.152 C1.151
162.00 E	J J J J J J	JMCS-3B N-SAT-162E SUPERBIRD-B2-R CHINASAT-163E SUPERBIRD-B2-KA N-SAT-162E	2000-012A	Superbird 4, B2	162.0 E	C1.153
163.00 E	CHN	CHINASAT-163E	1994-043A	Apstar 1, i=7.32	163.0 E	C2.59
164.00 E	AUS AUS AUS AUS AUS	AUSSAT A 164E AUSSAT A 164E PAC AUSSAT B 164E MOB AUSSAT B 164E AUSSAT B 164E MXL	1994-055A	Optus B3, i=4.45	164.0 E	C2.60
166.00 E	USA RUS USA	USASAT-14H PROGNOZ-6 USASAT-60B	2012-030A 2012-012A	Intelsat 19, IS 19 Cosmos 2479	166.0 E	C1.155 C1.154
167.00 E	RUS	VSSRD-2	2011-074B	Luch-5A, i=4.08	167.1 E	Ind. 13
169.00 E	USA USA	USASAT-14G USASAT-60J	1998-065A	Intelsat 8, PAS 8	169.0 E	C1.156
172.00 E	USA USA USA USA USA	FLTSATCOM- W PAC FLTSATCOM-C W PAC-1 KASATCOM-5 USASAT-14K USASAT-60A	2005-052A 1998-016A	AMC 23 USA 138 (UFO F8), i=5.29	172.0 E	C1.157 C2.27

175.00 E	USA USA USA	USGCSS PH3 W PAC USGCSS PH3B W PAC USGOVSAT-12	2007-046A	USA 195 (WGS F1)	175.0 E	2C1.4
176.80 E	CHN	CTDRS-2-176.8E	2011-032A	Tian Lien 1B	176.8 E	C1.158
177.00 E	USA	INTELSAT7 177E				
177.50 E	USA USA	MILSTAR 14 USGAE 4				
178.00 E	G USA USA USA USA	INMARSAT-3 POR-2 INTELSAT6 178E INTELSAT9 178E INTELSAT7 178E INTELSAT8 178E	1996-070A	Inmarsat 3-F3	178.1 E	C1.159
180.00 E	USA USA USA USA	USGCSS PH3 W PAC-2 INTELSAT7 180E USGCSS PH3B W PAC-2 INTELSAT5 PAC3	2011-056A	Intelsat 18, IS-18	180.0 W	C1.160
177.00 W	HOL HOL USA HOL HOL HOL HOL	INTELSAT5 183E INTELSAT IBS 183E FLTSATCOM-C W PAC-2 INTELSAT5A 183E INTELSAT8 183E INTELSAT7 183E NSS-19	2012-009A	USA 234, MUOS, i=4.79	177.0 W	2C2.28
174.00 W	USA	TDRS 174W	2002-055A	TDRS-10, i=1.95	174.4 W	C2.61
171.00 W	USA	TDRS WEST				
170.00 W	RUS RUS RUS RUS RUS RUS	TOR-5M STATIONAR-10A VOLNA-7 STATIONAR-D2 STATIONAR 10 GALS-4 TOR-5				
168.00 W	RUS RUS	POTOK-3 FOTON-3				
167.50 W	USA	TDRS 167.5W	1991-054B	TDRS 5, i=12.47	167.6 W	C2.62
165.00 W	USA	USGON-4	2000-024A	USA 149 (DSP F20), i=8.16	164.6 W	2C2.29
164.20 W	USA	TDRS 164.2W				
160.00 W	RUS	ESDRN				
159.00 W	RUS	PROGNOZ-7				
150.00 W	USA	USGAE-10R	1995-060A	USA 115(Milstar DSF-2), i=10.27	150.0 W	2C2.30
145.00 W	USA USA	USGON-7 FLTSATCOM-C W PAC-3	1991-080B	USA 75 (DSP F16), i=13.71	145.1 W	2C2.31
144.00 W	USA USA USA USA USA	USLL-PAC P92-6 P-197-2 USTRO-2 USCSID-W2				
142.00 W	G G	INMARSAT-3 POR EAST INMARSAT-2 POR EAST	1991-018A	Inmarsat 2-F2, i=8.57	142.0 W	C2.63
141.00 W	USA USA USA USA USA	P-92-5 P-197-3 USLL-PAC2 USTRO-3 USCSID-W1	2001-046A	USA 162 (SDS 3F3), i=6.17	141.0 W	2C2.32
139.00 W	USA	USASAT-22I	2000-081B	GE 8 (Aurora 3), AMC-8	139.0 W	C1.162
137.00 W	USA USA	USASAT-22G USASAT-22J	2000-054B	GE 7, AMC-7	137.0 W	C1.163
135.00 W	USA USA USA USA USA USA	GOES WEST USGCSS PH3B E PAC USASAT-21A GOES-WEST-1 USASAT-22K GOES WEST-2	2004-003A 2003-008A 2010-008A	AMC-10 (GE 10) USA 167 (DSCS III A-3), i=1.47 GOES 15	135.0 W 135.4 W 135.4 W	C1.165 2C2.33 C1.164
133.00 W	USA USA USA USA	USASAT-22A USASAT-35Y USASAT-50B LM RPS-133W	2005-041A	Galaxy 15	133.0 W	C1.166
131.00 W	USA USA	USASAT-22H USASAT-35A	2004-017A	AMC-11 (GE-11)	131.0 W	C1.167
130.00 W	USA USA	USGCSS PH3 E PAC-2 USGCSS PH3B E PAC-2	1997-065A	USA134(DSCS III F10), i=6.19	130.1 W	2C2.34
129.00 W	USA	USASAT-24N	2008-063A	Ciel 2	128.8 W	C1.169
128.00 W	USA	ASC-1	2003-013B	Galaxy 12	129.0 W	C1.168
127.00 W	USA USA USA J	USASAT-35C USASAT-24O USASAT-50A N-SAT-127W	2003-044A	Galaxy 13, Horizons-1	127.0 W	C1.170

<b>125.00 W</b>	USA G USA USA	USASAT-22B AM-SAT 125W USASAT-50C USASAT-35D	2005-030A 2008-038B	Galaxy 14 AMC 21	125.0 W 124.9 W	C1.171 C1.172
<b>123.00 W</b>	USA USA USA	USASAT-24P USASAT-35E USASAT-60H	2008-024A	Galaxy 18	123.0 W	C1.173
<b>121.00 W</b>	USA PNG USA	USASAT-31G PACSTAR-L4 USASAT-23G	2003-034A	Galaxy 23, Echostar 9, Telstar 13	121.0 W	C1.174
<b>120.00 W</b>	USA	MILSTAR 6	2012-019A	USA 235, AEHF 2, i=3.28	120.0 W	2C2.35
<b>119.00 W</b>	USA USA	USABSS-10 USABSS-7	2004-016A	DirecTV 7S	119.1 W	C1.175
<b>118.70 W</b>	CAN CAN CAN CAN	ANIK E-D CANSAT KA-SX CANSAT KA-5 CANSAT-18	2007-009A 2002-006A 2010-010A	Anik F3 EchoStar 7 Echostar 14	118.7 W 118.8 W 118.9 W	C1.179 C1.176 C1.177
<b>116.80 W</b>	MEX MEX	MORELOS-2 SATMEX-8	1998-070A	Satmex 5	116.8 W	C1.179
<b>115.00 W</b>	G USA	IOMSAT-11A USASAT-28G	2006-049A 2011-059A 2001-018A 2001-012A	XM Radio 4 (Blues) ViaSat-1 XM Radfio 1 (Roll) Sirius XM-2 ( Rock)	115.1 W 115.1 W 115.3 W 115.2 W	C1.183 C1.182 C1.180 C1.181
<b>114.90 W</b>	CAN MEX	CANSAT-17 MEXSAT-114.9C-KU	2012-075B 1994-065A	Mexsat Bicentenario Solidaridad 2, i=4.40	114.9 W 114.9 W	Ind. 20 C2.64
<b>113.50 W</b>	MEX	MORELOS 1				
<b>113.00 W</b>	MEX MEX MEX MEX	SOLIDARIDAD 2 SOLIDARIDAD 2M SOLIDARIDAD-2MA SATMEX-7	2006-020A	Satmex 6	113.0 W	C1.184
<b>111.80 W</b>			1993-074A	USA 97, DSCS III B-10, i=8.11	111.8 W	2C2.36
<b>111.10 W</b>	CAN CAN CAN	ANIK-F2 CANSAT KA-4 ANIK E-B	2004-027A 2006-054A 2009-035A	Anik F2 Wildblue 1 Terrestar 1, i= 4.40	111.1 W 111.2 W 111.0 W	C1.185 C1.186 C2.65
<b>110.20 W</b>	USA	USABSS-6	2006-003A	EchoStar 10	110.2 W	C1.187
<b>110.00W</b>	USA CAN	USABSS-5 ANIK E-B	2008-035A 2002-023A	Echostar 11 DirecTV-5	110.0 W 110.1 W	C1.189 C1.188
<b>107.30 W</b>	USA CAN CAN	LM-RPS-107.3W ANIK-F1 ANIK E-A	2012-035A 2005-036A 2000-076A	Echostar 17 Anik F1R Anik F1	107.1 W 107.3 W 107.3 W	C1.192 C1.191 C1.190
<b>106.50 W</b>	CAN	MSAT	1996-022A	MSAT, i=4.85	106.5 W	C2.66
<b>105.00 W</b>	USA USA USA USA USA G	ATS-5 FLTSATCOM-C E PAC-1 USASAT-23H USASAT-31K USASAT-35G GIBSAT A1	2004-041A 1995-003A 2006-054B 2009-033A	AMC-15 USA 108, UFO F4, i=7.66 AMC-18 GOES 14	105.0 W 105.2 W 104.9 W 105.1 W	C1.193 2C2.37 C1.194 Ind. 11
<b>103.00 W</b>	USA USA USA	USASAT-24F USASAT-31L USASAT-35H	1996-054A 2005-015A 2011-035A 2007-032A 1995-019A	GE 1 Spaceway 1 SES-3 DirecTV 10 AMSC-1, i=7.44	103.0 W 102.9 W 103.1 W 102.8 W 103.3 W	C1.196 C1.197 C1.195 C1.198 C2.67
<b>102.80 W</b>	USA	USASAT-70W	2009-075A	DirecTV 12	102.8 W	C1.199
<b>101.20 W</b>	USA	USABSS-1	2010-061A	SkyTerra	101.3 W	C1.200
<b>101.00 W</b>	USA USA USA USA USA	ACS-1 MCS-1 USASAT-31M USASAT-35I USASAT-7D	2006-043A 2010-016A 2001-052A	DirecTV 9S SES-1 DirecTV-4S	101.1 W 101.0 W 101.2 W	C1.202 C1.203 C1.201
<b>100.80 W</b>	USA	USABSS-2	2005-019A	DirecTV-8	100.9 W	C1.204
<b>100.00 W</b>	USA USA	FLTSATCOM-E PAC FLTSATCOM-C E PAC-2	1995-057A	USA 114(UFO F6), i=7.01	99.8 W	2C2.38
<b>99.20 W</b>	USA	USASAT-70V	2008-013A	DirecTV 11	99.2 W	C1.205
<b>99.00 W</b>	USA USA USA USA	USASAT-35J USASAT-31N USASAT-60G USASAT-24J	2005-046B 2006-023A	Spaceway 2 Galaxy 16	99.1 W 99.0 W	C1.206 C1.207
<b>98.00 W</b>	G G	INMARSAT-3 AOR WEST3 INMARSAT-4 98W	2008-039A	Inmarsat 4F3, i=3.01	97.6 W	C2.68
<b>97.00 W</b>	USA USA	USASAT-24D USASAT-35K	2008-045A	Galaxy 19	97.0 W	C1.208
<b>96.80 W</b>	USA	USOBO-2				
<b>96.00 W</b>	USA	USASAT-28L	2009-034A	Sirius FM5	96.0 W	C1.209

<b>95.00 W</b>	USA USA USA USA G USA USA	COMSTAR D-2 USASAT-23F USASAT-24L USASAT-35L UKSAT-10 USASAT-60F USASAT-70O	2007-036A 2002-030A	Spaceway 3 Galaxy 3C	94.9 W 95.1 W	C1.211 C1.210
<b>93.00 W</b>	USA USA G	USASAT-24S USASAT-35M ICO-G	1997-026A 2008-016A	Telstar 5 = Galaxy 25 ICOG1, i=4.55	93.1 W 92.8 W	C1.212 C2.69
<b>92.00 W</b>	B	SBTS B4				
<b>91.10 W</b>	CAN	CAN-BSS2 TTAC	2002-062A 1999-027A 2012-026A	Nimiq 2 Nimiq 1 Nimiq 6	91.1 W 91.1 W 91.1 W	C1.214 C1.213 C1.215
<b>91.00 W</b>	USA USA USA USA	USASAT-35N USASAT-9A USASAT-24K USASAT-60E	2007-016B	Galaxy 17	91.0 W	C1.216
<b>90.00 W</b>	USA USA	MILSTAR 1 USGAE-1	2003-012A	USA 169 (Milstar-2 F4), i=4.48	89.9 W	2C2.39
<b>89.00 W</b>	USA USA USA	USASAT-24E USASAT-31S USASAT-35O	2005-022A	Intelsat Amer.8, Telstar 8, G-28	89.0 W	C1.217
<b>87.00 W</b>	USA USA	USASAT-24T USASAT-35P	2011-049A	SES-2	87.0 W	C1.218
<b>86.50 W</b>	CAN	CAN-BSS9				
<b>85.20 W</b>	USA	USASAT-28K	2010-053A	Sirius XM-5	85.2 W	C1.219
<b>85.10 W</b>	USA	USASAT-28F	2005-008A	XM Radio 3 (Rhytm)	85.1 W	C1.220
<b>85.00 W</b>	USA USA USA USA	USASAT-24U USASAT-9C USASAT-35Q USASAT-31U	2004-048A	AMC 16	85.0 W	C1.221
<b>84.00 W</b>	B	B-SAT P	2000-046A	Brasilsat B4	84.0 W	C1.222
<b>83.00 W</b>	USA USA	USASAT-24V USASAT-35R	2003-024A	AMC-9 (GE-12)	83.0 W	C1.223
<b>82.00 W</b>	CAN CAN	CANSAT KA-3 CAN-BSS1 TTAC	2008-044A	Nimiq 4	82.0 W	C1.224
<b>81.00 W</b>	ARG	P-P-SAT-1	1998-063B	AMC-5 (GE5), i=2.20	80.9 W	C2.70
<b>79.00 W</b>	USA USA USA USA	TDRS-CENTRAL TDRS-C2 USASAT-24W USASAT-35T				
<b>78.00 W</b>	URG	VENESAT-1	2008-055A	Venesat-1, Simon Bolivar	78.0 W	C1.225
<b>77.00 W</b>	USA	USASAT-24Q	2002-039A 2000-038A 1995-073A 2011-054A	EchoStar 8 Echostar 6, i=0.91 Echostar 1 QuetzSat-1	76.9 W 76.8 W 77.1 W 77.1 W	C1.227 C2.71 C1.226 Ind. 12
<b>75.00 W</b>	USA B B USA USA	GOES EAST B-SAT-S SISCOMIS-4 GOES-EAST-1 GOES-EAST-2	2006-018A 1998-006A 2012-062A	GOES N, i=0.34, Goes 13 Brazilsat B-3A, i=0.78 Star One C3	74.6 W 75.0 W 75.0 W	C1.229 C2.72 C1.228
<b>74.00 W</b>	USA USA USA	USASAT-22E USASAT-15B USASAT-35V				
<b>72.70 W</b>			2009-050A	Nimiq 5	72.7 W	C1.230
<b>72.00 W</b>	ARG USA	NAHUEL-C USASAT-35W	2000-067A	GE 6, AMC-6	72.0 W	C1.231
<b>70.00 W</b>	B B B B	SBTS B1 SBTS C1 SISCOMIS-3 B-SAT-1C	2008-018B 2011-054A	Star One C2 QuetzSat-1	70.0 W 77.1 W	C1.232 Ind. 12
<b>68.00 W</b>	USA B	MILSTAR 8 B-SAT-1J	2010-039A 1995-016A	USA 214 (AEHF SV-1), i=3.37 Brazilsat B2, i=4.28	69.0 W 68.0 W	2C2.40 C2.73
<b>67.00 W</b>	CLM ASA	SIMON BOLIVAR 2	1999-060A 1997-050A 2012-065A	GE 4, AMC-4 AMC-3, GE-3 Echostar 16	67.0 W 67.0 W 67.0 W	C1.234 C1.235 C1.233
<b>65.00 W</b>	B B B B	SBTS B2 SISCOMIS-2 B-SAT-1R B-SAT-R	2007-056A	Star One C1	65.0 W	C1.236
<b>63.00 W</b>	B B	B-SAT E B-SAT I	2011-021A	Telstar 14 (Estrela do Sul 2)	63.0 W	C1.237
<b>62.00 W</b>	USA	TDRS 62W	1993-003B	TDRS 6. i=11.89	62.5 W	C2.74
<b>61.50 W</b>	USA USA	USABSS-8 USABSS-17	2003-033A 2010-034A 1997-059A	Rainbow 1, Echostar 12 Echostar 15 Echostar 3	61.3 W 61.7 W 61.8 W	C1.239 C1.238 C1.240

<b>61.00 W</b>	B B USA	SBTS B3 B-SAT-O USMB-1	2009-054A 2004-031A	Amazonas 2 Amazonas 1	61.0 W 61.0 W	C1.242 C1.241
<b>59.60 W</b>			2001-031A	GOES 12, i=2.68	59.6 W	C2.75
<b>58.00 W</b>	USA USA USA	USASAT-25G USASAT-26G-3 USASAT-26G	2010-006A	Intelsat IS-16	58.1 W	C1.243
<b>55.50 W</b>	USA USA USA	INTELSAT8 304.5E INTELSAT9 304.5E INTELSAT7 304.5E	2012-045A 1999-071A 1998-037A	Intelsat 21 Galaxy 11 Intelsat 805	58.1 W 55.5 W 55.5 W	C1.244 C1.245 C1.246
<b>55.00 W</b>	G	INMARSAT-2 AOR WEST				
<b>54.00 W</b>	G G	INMARSAT-3 AOR WEST2 INMARSAT GSO-2J	1997-027A	Inmarsat 3-F4, i=2.66	54.0 W	C2.76
<b>53.00 W</b>	USA USA USA USA G	INTELSAT7 307E INTELSAT IBS 307E INTELSAT8 307E INTELSAT9 307E INMARSAT GSO-2L	1996-015A 2012-057A	Intelsat VIIA F-2, 707 Intelsat 23	53.0 W 53.0 W	C1.247 C1.248
<b>52.50 W</b>	USA	USGCSS PH3B W ATL	2003-040A	USA 170 (DSCS III B-6), i=0.52	52.2 W	2C2.41
<b>50.00 W</b>	USA USA USA	INTELSAT7 310E INTELSAT10 310E INTELSAT9 310E	2000-072A	PAS 1R, Intelsat 1R	50.0 W	C1.249
<b>49.40 W</b>		USOBO 3	1994-084A	USA 107 (DSP F17), i=12.29	49.4 W	2C2.42
<b>49.00 W</b>	USA	TDRS 49W	1988-091B	TDRS-West, i=13.95	48.6 W	C2.77
<b>47.00 W</b>	USA G	USASAT-25E GIBSAT-8B	1994-064A	NSS 703, Intelsat VII F-3, i=2.92	47.0 W	C2.78
<b>46.00 W</b>	USA	TDRS 46W				
<b>45.00 W</b>	USA USA USA USA USA	USASAT-13I USASAT-13I-2 USASAT-25D USASAT-55G USASAT-60I	2009-064A	Intelsat IS-14	45.0 W	C1.250
<b>43.00 W</b>	USA USA USA USA	USASAT-55F USASAT-25C USASAT-26C USASAT-50D	2007-044B 2000-043A	Intelsat IS-11 PAS 9 Intelsat 9, i=0.40	43.0 W 43.1 W	C1.251 Ind.9
<b>42.50 W</b>	USA USA	USGCSS PH3 MID- ATL USGCSS PH3B MID-ATL				
<b>41.00 W</b>	USA USA	TDRS-EAST-ISS TDRS EAST	2002-011A	TDRS 9, i=1.96	40.9 W	C2.79
<b>40.50 W</b>	HOL HOL HOL HOL HOL HOL	INTELSAT5A 319.5E INTELSAT K 319.5E INTELSAT7 319.5E INTELSAT8 319.5E NSS-18 NSS-35 INTELSAT IBS 319.5E	1998-014A	Intelsat 806 , NSS-806	40.5 W	C1.252
<b>39.00 W</b>	USA G	USGAE-17R DJCF-2A	1994.009A	USA 99 (Milstar DSF-1), i=9.05	39.1 W	2C2.43
<b>38.00 W</b>	USA	USGON-5				
<b>37.50 W</b>	USA USA USA	USASAT-25A USASAT-26A USASAT-25A-1	2009-009A 2005-003A	Telstar11N AMC 12, NSS 10	37.6 W 37.4 W	C1.253 C1.254
<b>34.50 W</b>	USA USA USA USA	INTELSAT8 325.5E INTELSAT6 325.5E INTELSAT9 325.5E INTELSAT7 325.5E	2002-016A	Intelsat 903	34.5 W	C1.255
<b>34.00 W</b>	G G G	SKYNET-4D SKYNET-4M SKYNET-5A	2001-005B	Skynet 4F, i=6.45	34.0 W	C2.80
<b>33.50 W</b>	G G	UKDIGISAT-3 UKDIGISAT-4A TT&C	2010-065A	HYLAS-1	33.5 W	C1.256
<b>31.50 W</b>	USA USA	INTELSAT9 328.5E INTELSAT8 328.5E	2008-034A	Protostar 1, Intelsat 25	31.5 W	C1.257
<b>30.40 W</b>	USA	USDKH2	2012-033A	USA 236, SDS 3 F7, i=4.48	30.4 W	2C2.44
<b>30.00 W</b>	E E E E USA USA USA E E E E E E	HISPASAT-2B KU HISPASAT-2A KU HISPASAT-2C3 KU HISPASAT-2D KU USMB-2 USGGR-3 USCSID-E4 HISPASAT-2AKA HISPASAT-2B 30KA HISPASAT-2AX HISPASAT-1DKU HISPASAT-1	2000-007A 2006-007A 2002-044A 2010-070A	Hispasat 1C Spainsat Hispasat 1D Hispasat 1E	30.0 W 30.0 W 30.0 W 30.0 W	C1.258 C1.259 C1.260 C1.261

<b>29.50 W</b>	USA USA USA	INTELSAT8 330.5E INTELSAT9 330.5E INTELSAT6 330.5E	1997-009A	Intelsat 801, i=3.75	29.5 W	C2.81
<b>27.50 W</b>	USA USA USA USA	INTELSAT7 332.5E INTELSAT6 332.5E INTELSAT8 332.5E INTELSAT9 332.5E	2003-007A	Intelsat 907	27.5 W	C1.262
<b>26.50 W</b>	RUS RUS RUS RUS	STATIONAR-D1 VOLNA-13 TOR-1M STATIONAR-17 GALS-1				
<b>26.00 W</b>	G	DJCF-2B	1998-029A	USA 139 (Adv.Orion 2), i=8.85	25.8 W	2C2.45
<b>25.00 W</b>	RUS RUS RUS RUS	GALS-9 VOLNA-1A STATIONAR-8 TOR-9M				
<b>24.50 W</b>	USA USA USA USA	INTELSAT7 335.5E INTELSAT6 335.5E INTELSAT8 335.5E INTELSAT9 335.5E	2002-027A	Intelsat 905	24.5 W	C1.263
<b>24.00 W</b>	RUS USA	PROGOZ-1 USCSID-E3				
<b>23.00 W</b>	USA	FLTSATCOM-ATL	1996-042A	USA 127 (UFO F7), i=6.20	22.8 W	2C246
<b>22.50 W</b>	USA USA	FLTSATCOM-C E ATL-1 KASATCOM-2				
<b>22.00 W</b>	HOL	NSS-16	2012-007A	SES 4	22.0 W	C1.264
<b>21.50 W</b>	HOL HOL HOL HOL	INTELSAT K 338.5E INTELSAT5A 338.5E INTELSAT8 338.5E INTELSAT7 338.5E				
<b>20.20 W</b>	BEL	SATCOM-4/20.2W				
<b>20.00 W</b>	USA USA USA USA HOL	INTELSAT7 340E INTELSAT6 340E INTELSAT8 340E INTELSAT9 340E NSS-31	2002-019A	NSS-7	20.0 W	C1.265
<b>19.00 W</b>	USA	USMB-3				
<b>18.00 W</b>	USA USA USA	INTELSAT7 340E INTELSAT8 342E INTELSAT9 342E	2001-024A	Intelsat 901	18.0 W	C1.266
<b>17.80 W</b>	G	SKYNET-5E	2008-030A	Skynet 5C	17.8 W	C1.267
<b>17.00 W</b>	G	INMARSAT-3 AOR EAST2				
<b>16.00 W</b>	RUS RUS RUS	ZSSRD-2 WSDRN-M WSDRN	2012-061A	Luch 5B, i=0.49	16.0 W	Ind. 14
<b>15.50 W</b>	USA G G	FLTSATCOM-C E ATL-2 INMARSAT-3 AOR EAST INMARSAT-2 AOR EAST	1989-077A 1996-053A	USA46 (FLTSATCOM F8),i=11.5 Inmarsat 3-F2	15.4 W 15.5 W	2C2.47 C1.268
<b>15.00 W</b>	USA	USASAT-14L	1999-059A	Orion 2, Telstar 12	15.0 W	C1.269
<b>14.50 W</b>	RUS	GOMS-1M				
<b>14.00 W</b>	RUS RUS RUS	VOLNA-2 EXPRESS-2B EXPRESS-2	2002-029A	Ekspress A4, i=2.98	14.0 W	C2.82
<b>13.50 W</b>	RUS RUS	POTOK-1 FOTON-1				
<b>13.00 W</b>	USA USA USA USA	P92-4 P-197-4 USCSID-E2 USTRO-4				
<b>12.50 W</b>	USA F F	USLL-ATL2 EUTELSAT 3-12.5W F-SAT-KU2-E-12.5W	2002-040A	Atlantic Bird 1, Eutelsat 12W A	12.5 W	C1.270
<b>12.00 W</b>	USA USA USA	USGCSS PH3B ATL USGOVSAT-8 TDRS 12W	2009-068A	USA 211 (WGS F3)	11.96W	2C1.5
<b>11.00 W</b>	RUS	EXPRESS-3	2009-007A	Ekspress AM-44	11.0 W	C1.271
<b>10.00 W</b>	USA USA USA USA USA USA F	USLL-ATL P92-3 P-197-5 USMB-4 USCSID-E1 USTRO-5 MSG-s2	2011-011A	USA 227 (NROL 27), i=4.81	10.0 W	2C2.48
<b>9.50 W</b>	RUS	KUPON-3				

<b>8.00 W</b>	F	TELECOM-2A	2001-042A	,Atlantic Bird 2, Intelsat 8W A	8.1 W	C1.272
	F	TELECOM-3A				
	F	SYRACUSE-3C				
	F	TELECOM-4A				
	F	VIDEOSAT-6-KA				
	F	SYRACUSE-31C				
	F	F-SAT-KU-E-8W				
	F	VIDEOSAT-6				
<b>7.00 W</b>			2000-046B	Nilesat 102	7.0 W	C1.276
			1998-024A	Nilesat 101	7.0 W	C1.275
			2010-037A	Nilesat 201	7.0 W	C1.274
			2011-051A	Atlantic Bird 7, Eutelsat 7W A	7.3 W	C1.273
<b>5.00 W</b>	F	TELECOM-2B	2002-035A	Atlantic Bird 3, Eutelsat 3W A	5.0 W	C1.278
	F	TELECOM-3B				
	F	SYRACUSE-3E	2006-033B	Syracuse 3B	5.2 W	C1.277
	F	VIDEOSAT-7-KA				
	F	TELECOM-4B				
	F	SYRACUSE-31E				
	F	F-SAT-KU-E5W				
	F	VIDEOSAT-7				
<b>4.00 W</b>	ISR	AMOS 1-B	2003-059A	Amos 2	4.0 W	C1.279
	ISR	AMOS 2-B	2008-022A	Amos 3	4.0 W	C1.280
	ISR	AMOS 3-A	1998-035A	Thor III, i=2.34	4.3 W	C2.83
			2012-035B	MSG-3, Meteosat-10	3.5 W	C1.281
<b>3.00 W</b>	RUS	GALS-11	1997-042A	Agila 2 =ABS 3, i=1.67	3.1 W	C2.84
	RUS	STATSIONAR-M2				
	RUS	IK INTERSPUTNIK-3W				
	RUS	TOR-11M				
	RUS	IK INTERSPUTNIK-3W-Q				
<b>1.00 W</b>	G	SKYNET-4A	1990-079A	Skynet 4C, i=12.23	1.3 W	C2.85
	G	SKYNET-4J				
	USA	INTELSAT8 359E	2004-022A	Intelsat 10-02	1.0 W	C1.282
	G	SKYNET-5B				
	USA	INTELSAT9 359E				
	USA	INTELSAT10 359E				
	USA	INTELSAT7 359E				
<b>0.80 W</b>	NOR		2008-006A	Thor 2R, Thor 5	0.8 W	C1.284
	NOR		2009-058B	Thor 6	0.8 W	C1.283