# Actual Situation in the Geostationary Orbit

*Luboš Perek**

**Abstract**

1. The considered opinion of the UN COPUOS, that the geostationary orbit is part of outer space should not fall in oblivion.
2. An important fact emerged from the matching of space network radio stations with spacecraft operating at the same orbital positions. A certain number of radio space networks cannot operate because there has been no spacecraft at the relevant orbital positions for up to five years. This fact has to be taken into account when determining the overcrowding of the geostationary orbit or in steps for improving the efficient use of that orbit.

## 1 The Geostationary Orbit and Outer Space

The Geostationary Orbit (GEO) is one of the most used and most useful parts of outer space. It was not so in the past. The usefulness of the GEO was never in doubt but for many years there was no consensus in the UN COPUOS whether or not the GEO is part of outer space at all. It started with the Bogota Declaration in 1976 when equatorial countries raised sovereignty claims to arcs of the GEO over their territories. These claims were opposed by several countries and a consensus evaded the Committee for more than 20 years. In 1998 the Czech delegation presented a working paper[1] concerning scientific principles of satellite orbits. These principles were agreed by the Scientific and Technical Subcommittee[2] and later by the Legal Subcommitte[3] and COPUOS[4] tself. In 2000 another working paper[5] by the Czech Republic applied the above principles to GEO with the conclusion that GEO were a part of outer space.

* Learned Society of the Czech Republic, Emeritus of the Astronomical Institute of the Czech Academy of Sciences perek@ig.cas.cz.

1 UN Document A/AC.105/C.1/L.216.
2 UN Document A/AC105/697, para 117 and 118, of 25 Feb 1998.
3 UN Document A/AC.105/698, para 31 and 41.
4 UN Document A/53/20, para 107 of 7 Aug 1998.
5 UN Document A/AC.105/C.1/L.230.

With a very significant support of the delegation of Columbia and of other states the COPUOS adopted a considered opinion that "the geostationary orbit, characterized by its special properties, is part of outer space"[6].
In recent years, most recently in 2012, statements were made in the UN in the sense that "the GEO was a part of outer space". Indeed, paragraph 82 of the Report[7] of the most recent session of the Legal Subcommittee of the UN COPUOS reflects that view. In substance these statements are scientifically correct; however a reference to the considered opinion of the COPUOS would certainly not be out of place. A "considered opinion of the COPUOS" does not carry the weight of a treaty yet it stands out of ordinary wording. and should not fall into oblivion that early in the second millennium.

## 2 Efficiency of Use of the Geostationary Orbit

A highly efficient use of the GEO has become very important for several reasons. In the first place the number of active satellites[8] is steadily increasing and not all satellites are being re-orbited out of the GEO at the end of their active lives. Five years ago there were some 370 active satellites. That number increased to 406 at the beginning of 2012[9], an increase of 10%. The total number of systematically observed objects was 934 at the end of 2007. It increased by 16% to 1307 at the beginning of 2012.
Fixed antennas require that the position of a satellite is controlled in the direction North-South, as well as East-West. 280 active satellites meet that condition while the remaining 126 active satellites are controlled only in longitude, i.e. East-West. Besides the active satellites there are close to 800 objects and fragments, mostly inactive, which drift all around the orbit or around one or both stable points at longitudes 75° East or 105° West. These are old satellites and other objects which have not been re-orbited into a disposal orbit, i.e. at least 300 km above the GEO.
The population of active satellites is subject to frequent changes. The usual lifetime is at present around 15 years. In the time span of 2007 to 2011 141 new payloads and 15 rocket bodies were launched into the GEO while 76 satellites reached the end of their active lifetimes. Space objects including payloads and rockets are registered in accordance with the Registration Convention by the United Nations. An Online Index of objects launched into outer space is maintained and regularly updated by the Office for Outer Space Affairs[10] in Vienna.

---

6 UN Document A/56/20, para 126, of 2001.
7 UN Document A/AC.105/1003, of 30 Mar 2012.
8 To be quite clear, the term "satellite" refers to the entire spacecraft, with all subsystems on board, such as radio stations, antennas, station keeping motors, etc.
9 Tim Flohrer: Classification of Geosynchronous Objects, Issue 14, ESA ESOC Darmstadt, and earlier issues by other authors.
10 See at <www.unoosa.org/SORegister/index.html>.

Positions of satellites are systematically observed by the US Space Surveillance Network of 20 optical and radar sensor sites distributed mainly in the western hemisphere. Global coverage is attained by stations in the Atlantic, Indian and Pacific Oceans. Detected are objects down to 10cm in low orbits and down to 1m in the geostationary orbit. Positions are published in the NORAD Two Line Elements. Another network of observatories is the International Scientific Optical Network operated by the Russian Academy of Sciences since 2005, claiming a capability to detect objects down to 30cm in the GEO. Data from both sources are processed at the ESA-ESOC Institute in Darmstadt, Germany and Publisher in the Classification of Geosynchronous Objects[11].

It is believed that the list of commercial satellites is complete. However, satellites used for governmental communications, in particular those which do not appear in the list of Two-Line Elements, are observed by the ISON network. Their list was increasing last year and may continue to do so in the future. Consequently a few satellites used for governmental comunictions may be missing in this study.

Satellites use radio transmissions to and from ground stations. One or more radio stations are as a rule on board of each satellite (spacecraft) and, vice versa, each space radio station has to use the services supplied by a spacecraft, such as maintenance of proper temperature, supply of energy, etc. Radio stations and their transmissions are in the mandate of the International Telecommunication Union (ITU)[12]. The ITU maintains efficient procedures of coordinating telecommunications with a view to ensure optimal, fair and rational use of the radio frequency spectrum. The ITU handles over 3000 applications by countries (called administrations in the ITU terminology) for radio space networks. Of these, one third awaits processing (category A), one third is in the coordinating process (category C) and one third, specifically 1021 at the beginning of 2012, have been notified (category N) in the Master International Frequency Register. Category N space networks enjoy international recognition and protection against harmful interference. Only that last category of networks is expected to engage in space radio communications. All administrations respect the ITU system in order to avoid confusion and interference.

An important question immediately arises from the existence of two independent data bases dealing with radio transmissions from the GEO. Does the list of space radio networks match with the list of active satellites (spacecraft) and which satellite is thus in a position to operate a specific space radio network? No such official list exists, therefore one was set up. It can be found on the website <www.geostationary.cz> which contains one list established in 2008 and another one reflecting the situation at the beginning of 2012. The list

11 See footnote 9.

12 See in the Space Network List at <www.itu.int/ITU-R/space/snl>. That list gives longitudes of nominal orbital positions, abbreviations of administrations and the "sat_name". That symbol refers to the name of the space network, not to the name of a satellite.

cannot be published here because of its extent of 16 pages. The conclusions from those two lists and other lists referring to the situation in 2009 and 2010 are, however, the same: A certain number of radio stations cannot operate because there has been no satellite at the relevant orbital position for a number of years. Strictly speaking, theren has been no "publicly known" satellite. The difference between "all" and "all publicly known" is believed to be too small to explain the "effect of absent satellites".

Attached is a List of Space Networks with no publicly known satellites at Nominal Positions, version of 14 March 2012, showing the status in five years from 2008 to 2012. It contains 174 space radio networks (18% of all), and of 20 administrations (48% of all). The effect of "absent satellites" is widespread; it is not an exception concerning one or two administrations only. The effect will not disappear even if the positions of a few additional satellites devoted to governmental communications are detected in the future.

Of particular interest is the number of orbital positions with no known satellites. The total is 90 nominal positions which are 27% of all nominal positions. Of these, 48 positions were without a satellite for 5 years, 21 positions for 4 years, 2 positions for 3 years, 5 positions for 2 years, 12 positions for 1 year, and the remaining 2 positions had a satellite in 2012.

The situation is, however, even more complicated. At some nominal orbital positions several space radio networks belonging to different administrations are listed in the ITU documents. A satellite located at or near that position may have been launched by one of the countries (=administrations) or by a quite different country. It is quite probable that the satellite would serve all networks of its country. In principle, the satellite could serve also space networks of other countries if there was an agreement between the parties concerned. Some such agreements have been made public but we cannot be sure that all such agreements are known. There may be cases of space radio networks which do not enjoy cooperation with a satellite present at its nominal orbital position. The percentage of space networks which cannot operate because no cooperating satellite is present may be, and probably is, higher than the numbers quoted above.

This fact of absence of suitable satellites has to be taken into account when determining the overcrowding of the geostationary orbit or in taking steps for improving the efficiency of the use of the GEO by admitting new users. An absence of a satellite for one or two years may occur for various reasons, such as an unexpected failure, or the need to use the satellite elsewhere. Launching a replacement may take that length of time. But an absence of a satellite for 3 to 5 years raises a question of efficiency and intent. The total for those years is 71 and that number of satellites would be needed to remove the "effect of absence". At present, some 20 to 30 satellites are launched every year, mostly to new orbital positions or to replace satellites still in orbit, not to replace absent satellites. In fact, among the 19 satellites launched into the GEO in January to July 2012 almost all have been planned to replace active satellites. Only one or two seem to make one orbital position active, a conclusion reached in a very preliminary way.

Since new launches will hardly remove the "absence effect|" in a foreseeable future, the alternative has to be considered. The alternative is for administrations concerned to voluntarily abandon unused radio space networks and thus simplify the ITU coordinating process to the benefit of all users, as well as newcomers to the GEO. It is hoped that the next analysis, due in January 2013, will show at least some reduction in unused radio space networks.

Relying on voluntary actions of users of the GEO is a necessity. Public knowledge of the presence of satellites is very good but not absolute. It is time dependent and changing but very real.

In Highlight Lecture No. 1 at the 63rd International Astronautical Congress, held in Naples, the results of the World Radiocommunications Conference of 2012 were presented. Of interest was the decision to tolerate 3 years for starting the operation of a notified space network. Consideration of longer delays, such as those of 4 and 5 years found in this study, has not been reported.

## List of Space Networks with no Satellites at Nominal Positions

| Notified Space Networks | | | | Status as of | | | | |
|---|---|---|---|---|---|---|---|---|
| Nom. Long. | Adm | Ntwk Org | Space Network Name | 5 May 2008 | 30 Nov 2009 | 17 Feb 2010 | 13 May 2011 | 12 Mar 2012 |
| 1.00 E | RUS | | VOLNA-21 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | GALS-15 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | TOR-15M | No sat | No sat | No sat | No sat | No sat |
| | RUS | | STATSIONAR-22 | No sat | No sat | No sat | No sat | No sat |
| | F | | GEOSAT KU 1E | --- | --- | --- | No sat | No sat |
| 5.50 E | CTI | RAS | RASCOM-C | --- | --- | --- | No sat | No sat |
| | Remark: Satellite 2010-037B Rascom QAF is at 2.88E | | | | | | | |
| 8.00 E | RUS | | VOLNA-15 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | STATSIONAR-18 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | GALS-7 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | TOR-8 M | --- | No sat | No sat | No sat | No sat |
| 8.50 E | USA | | USGON-2 | USA149 | No sat | No sat | No sat | No sat |
| | Remark: Satellite 2000-024A USA 149 moved to 165W | | | | | | | |
| 14.00 E | RUS | | TOR-12 M | --- | No sat | No sat | No sat | No sat |
| 15.00 E | RUS | | GALS-12 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | VOLNA-23 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | STATSIONAR-23 | No sat | No sat | No sat | No sat | No sat |
| | Remark: Satellite 2011-057A Eutelsat W3C is at 15.12E | | | | | | | |

## List of Space Networks with no Satellites at Nominal Positions

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **16.50 E** | F | | SATDAB-3A | --- | No sat | No sat | No sat | No sat |
| **17.00 E** | BLR | IK | INTERSPUTNIK-17E | No sat | No sat | No sat | No sat | No sat |
| | Remark: Satellite 2011-074A Amos 5 possibly drifting to planned 17E | | | | | | | |
| **19.00 E** | LUX | | LUX-KA-19E | No sat | No sat | No sat | No sat | No sat |
| **23.00 E** | RUS | | VOLNA-17 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | GALS-8 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | STATSIONAR-19 | No sat | No sat | No sat | No sat | No sat |
| **24.00 E** | RUS | | TOR-7M | --- | No sat | No sat | No sat | No sat |
| **24.20 E** | LUX | | LUX-24.2E | --- | No sat | No sat | No sat | No sat |
| | LUX | | LUX-G3-24.2E | ---- | ---- | ---- | ---- | No sat |
| **35.00 E** | RUS | | GALS-6 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | PROGNOZ-3 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | STATSIONAR-2 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | STATSIONAR-D3 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | VOLNA-11 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | TOR-2M | --- | No sat | No sat | No sat | No sat |
| | Remark: Satellite 1999-009 Skynet 4E at 35.17E is not controlled in latitude | | | | | | | |
| **39.50 E** | G | | DJCF-1A | No sat | No sat | No sat | No sat | No sat |
| **50.50 E** | THA | | THAICOM-C1 | --- | --- | No sat | No sat | No sat |
| **58.00 E** | RUS | | TOR-13M | | No sat | No sat | No sat | No sat |
| **58.50 E** | KAZ | | KAZSAT 1 | | | | No sat | No sat |
| | Remark: Satellite 2006-022A KazSat 1 is drifting | | | | | | | |

## List of Space Networks with no Satellites at Nominal Positions

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **58.75 E** | CHN | COMPASS-58.75E | No sat | No sat | No sat | No sat | No sat |
| | Remark: Satellite 2000-69A Beidou 1A is drifting | | | | | | |
| **65.00 E** | G | INMARSAT-3 IOR-2 | No sat | No sat | No sat | No sat | No sat |
| | G | INMARSAT GSO-2H | --- | No sat | No sat | No sat | No sat |
| | Remark: Satellite 2006-024A USA 187 was at 65.04E in 2010 | | | | , at 168E in 2012 | | |
| **68.00 E** | USA | USASAT-14I-2 | No sat | No sat | No sat | No sat | No sat |
| **69.00 E** | RUS | GALS-14 | No sat | No sat | No sat | No sat | No sat |
| | RUS | TOR-14M | --- | No sat | No sat | No sat | No sat |
| **77.00 E** | RUS | CSSRD-2 | No sat | No sat | No sat | No sat | No sat |
| | Remark: Satellite 2008-019A Tian Lian A is at 77.03E | | | | | | |
| **79.60 E** | CHN | CHINASAT-34A | --- | --- | --- | --- | No sat |
| **81.75 E** | RUS | YAMAL-E3 | No sat | No sat | No sat | No sat | No sat |
| **82.00 E** | USA | USMB-11 | No sat | No sat | No sat | No sat | No sat |
| | USA | USGGR-8 | No sat | No sat | No sat | No sat | No sat |
| | USA | USCSID-A4 | No sat | No sat | No sat | No sat | No sat |
| | AUS | DEF-R-SAT-1A | No sat | No sat | No sat | No sat | No sat |
| **85.40 E** | RUS | STATSIONAR-D5 | No sat | No sat | No sat | No sat | No sat |
| | RUS | SADKO-1 | --- | --- | --- | No sat | No sat |
| **93.00 E** | AUS | DEF-R-SAT-3A | No sat | No sat | No sat | No sat | No sat |
| **99.00 E** | RUS | STATSIONAR-T | Ekran 21 | No sat | No sat | No sat | No sat |
| | RUS | STATSIONAR-T2 | Ekran 21 | No sat | No sat | No sat | No sat |
| **101.50 E** | CHN | CHINASAT-45 | --- | No sat | No sat | No sat | Asiasat 7 |
| **106.50 E** | USA | USMB-13 | No sat | No sat | No sat | No sat | No sat |

## List of Space Networks with no Satellites at Nominal Positions

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **109.65 E** | J | TAIKI-109.65-34.5 | --- | BSat-1A | BSat-1A | No sat | No sat |
| **111.50 E** | IND | INSAT-KU10(111.5)E | ---- | ---- | ---- | ---- | No sat |
| **113.20 E** | CHN | CHNBSAT -113.5E | ---- | --- | --- | --- | No sat |
| **116.20 E** | KOR | COMS-116.2E | --- | --- | --- | --- | No sat |
| **119.00 E** | CHN | CHNBSAT- 119E | --- | --- | --- | --- | No sat |
| **120.00 E** | J | GMS-120E | No sat | No sat | No sat | No sat | No sat |
| | THA | THAICOM-A3 | Thaicom1 | Thaicom1 | Thaicom1 | Thaicom1 | No sat |
| | THA | THAICOM-AK3 | Thaicom1 | Thaicom1 | Thaicom1 | Thaicom1 | No sat |
| | THA | THAICOM-A3B | Thaicom1 | Thaicom1 | Thaicom1 | Thaicom1 | No sat |
| | Remark: Satellite 2005-028A Thaicom 4 is at 119.50E, 1993-078B Thaicom 1 is driftimg | | | | | | |
| **121.00 E** | CHN | DFH-3-OH | No sat | No sat | No sat | No sat | No sat |
| | AUS | DEF-R-SAT-4B 121.0E | No sat | No sat | No sat | No sat | No sat |
| **126.00 E** | THA | THAICOM C2 | --- | No sat | No sat | No sat | No sat |
| | Remark: Satellite 1995-022A USA 110 is at 125.999E | | is not controlled in latitude | | | | |
| **127.50 E** | J | JCSAT-T-127.5E | ---- | ---- | ---- | No sat | No sat |
| **128.00 E** | RUS | GALS-10 | No sat | No sat | No sat | Raduga 1 | No sat |
| | RUS | VOLNA-9 | No sat | No sat | No sat | Raduga 1 | No sat |
| | RUS | STATSIONAR-15 | No sat | No sat | No sat | Raduga 1 | No sat |
| | RUS | STATSIONAR-D6 | No sat | No sat | No sat | Raduga 1 | No sat |
| | RUS | STATSIONAR-D6-30B | No sat | No sat | No sat | Raduga 1 | No sat |
| | Remark: Satellites JCSAT 10 and JCSAT 12 are close to position | | | | | | |

## List of Space Networks with no Satellites at Nominal Positions

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **130.00 E** | RUS | GALS-5 | No sat | No sat | No sat | No sat | No sat |
| | RUS | PROGNOZ-5 | No sat | No sat | No sat | No sat | No sat |
| | RUS | TOR-10M | --- | No sat | No sat | No sat | No sat |
| | Remark: Satellites Chinasat 1A and Zhogxing are close to position | | | | | | |
| **131.00 E** | CHN | APSTAR-1 | No sat | No sat | No sat | No sat | No sat |
| **133.00 E** | USA | TDRS 133E | --- | --- | No sat | No sat | No sat |
| **140.40 E** | CHN | CHINASAT-35B | --- | --- | --- | --- | No sat |
| **143.72 E** | J | N-SAT-143.72E | --- | No sat | No sat | No sat | No sat |
| **144.50 E** | CHN | CHINASAT-35C | --- | --- | --- | --- | No sat |
| **157.00 E** | USA | INTELSAT5A 157E | Int 6 F-2 | No sat | No sat | No sat | No sat |
| | USA | INTELSAT6 157E | Int 6 F-2 | No sat | No sat | No sat | No sat |
| | USA | INTELSAT7 157E | Int 6 F-2 | No sat | No sat | No sat | No sat |
| | USA | INTELSAT8 157E | Int 6 F-2 | No sat | No sat | No sat | No sat |
| | Remark: Intelsat 6 F-2 moved in 2008 from 157E to 178 E | | | | | | |
| **163.00 E** | CHN | CHINASAT-163E | --- | No sat | No sat | No sat | No sat |
| **163.50 E** | RUS | YAMAL-E5 | --- | No sat | No sat | No sat | No sat |
| **167.00 E** | RUS | VSSRD-2 | No sat | No sat | No sat | No sat | No sat |
| **174.00 E** | USA | INTELSAT5A PAC1 | Int 6 F-5 | No sat | No sat | --- | --- |
| | USA | INTELSAT7 174E | Int 6 F-5 | No sat | No sat | PAS 2 | No sat |
| | USA | INTELSAT8 174E | Int 6 F-5 | No sat | No sat | PAS 2 | No sat |
| | USA | INTELSAT9 174E | Int 6 F-5 | No sat | No sat | PAS 2 | No sat |
| | Remark: Satellite 1994-040A PAS 2 = In telsat 2 was drifting in 2011 | | | | | | |

## List of Space Networks with no Satellites at Nominal Positions

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **177.00 E** | USA | INTELSAT7 177E | --- | No sat | No sat | No sat | No sat |
| | Remark: Satellite 2011-032A TL-102 was at 176.90E in Dec 2011 | | | | | | |
| **177.50 E** | USA | MILSTAR 14 | No sat | No sat | No sat | No sat | No sat |
| | USA | USGAE-4 | No sat | No sat | No sat | No sat | No sat |
| **179.00 E** | G | INMARSAT-3 POR-1 | No sat | No sat | No sat | No sat | No sat |
| | Remark: Satellite 1996-070A Inmarsat 3 F-3 was at 178.10E in Dec 2011 | | | | | | |
| **170.00 W** | RUS | GALS-4 | No sat | No sat | No sat | No sat | No sat |
| | RUS | STATSIONAR-10 | No sat | No sat | No sat | No sat | No sat |
| | RUS | STATSIONAR-10A | No sat | No sat | No sat | No sat | No sat |
| | RUS | STATSIONAR-D2 | No sat | No sat | No sat | No sat | No sat |
| | RUS | STATSIONAR-D2-30B | No sat | No sat | No sat | --- | --- |
| | RUS | TOR-5 | No sat | No sat | No sat | No sat | No sat |
| | RUS | VOLNA-7 | No sat | No sat | No sat | No sat | No sat |
| | RUS | TOR-5M | --- | No sat | No sat | No sat | No sat |
| **168.00 W** | RUS | FOTON-3 | No sat | No sat | No sat | No sat | No sat |
| | RUS | POTOK-3 | No sat | No sat | No sat | No sat | No sat |
| **160.00 W** | RUS | ESDRN | No sat | No sat | No sat | No sat | No sat |
| **159.00 W** | RUS | PROGNOZ-7 | No sat | No sat | No sat | No sat | No sat |
| **144.00 W** | USA | P-197-2 | No sat | No sat | No sat | No sat | No sat |
| | USA | P-92-6 | No sat | No sat | No sat | No sat | No sat |
| | USA | USCID-W2 | No sat | No sat | No sat | No sat | No sat |
| | USA | USTRO-2 | No sat | No sat | No sat | No sat | No sat |
| | USA | USLL-PAC | --- | No sat | No sat | No sat | No sat |

## List of Space Networks with no Satellites at Nominal Positions

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **133.00 W** | USA | USASAT-22A | Galaxy 15 | Galaxy 15 | Galaxy 15 | Galaxy 12 | No sat |
| | USA | USASAT-35Y | --- | Galaxy 15 | Galaxy 15 | Galaxy 12 | No sat |
| | USA | LM-RPS-133W | --- | --- | Galaxy 15 | Galaxy 12 | No sat |
| | Remark: Satellite 2003-15B Galaxy 12 relocating to 129W, | | | | Galaxy 15 librating around L2 | | |
| **128.00 W** | USA | ASC-1 | No sat | No sat | No sat | No sat | No sat |
| **120.00 W** | USA | MILSTAR-6 | No sat | No sat | No sat | No sat | No sat |
| **114.90 W** | CAN | ANIK D-2 | No sat | Solid. 2 | Solid.2 | No sat | No sat |
| | CAN | CANSAT-17 | ---- | ---- | ---- | No sat | No sat |
| | Remark: Satellite 1994-065A Solidaridad 2 was at 114.79W in Dec 2011 | | | | | | |
| **109.20 W** | MEX | SOLIDARIDAD- 1MA | No sat | No sat | No sat | No sat | No sat |
| | MEX | SOLIDARIDAD-1 | No sat | No sat | No sat | No sat | No sat |
| | MEX | SOLIDARIDAD-1M | No sat | No sat | No sat | No sat | No sat |
| | MEX | SATMEX-6 | ---- | ---- | ---- | No sat | No sat |
| **96.80 W** | USA | USOBO-2 | --- | No sat | No sat | No sat | No sat |
| **92.00 W** | B | SBTS-B4 | No sat | No sat | No sat | No sat | No sat |
| **81.00 W** | USA | USASAT-9D | Galaxy 9 | Galaxy 9 | Galaxy 9 | PAS 3R | PAS 3R |
| | ARG | P-P-SAT-1 | --- | Galaxy 9 | Galaxy 9 | PAS 3R | PAS 3R |
| | Remark: Satellite 1996-033A Galaxy9 and 1996-002PAS 3R are drifting | | | | | | |
| **76.00 W** | USA | USASAT-12C | No sat | No sat | No sat | No sat | No sat |
| **65.50 W** | RUS | YAMAL-W3 | ---- | No sat | No sat | No sat | No sat |
| **62.00 W** | USA | TDRS 62W | TDRS 9 | TDRS 9 | TDRS 9 | TDRS 9 | No sat |
| | Remark: Satellite 2002-011A TDRS 9 was at 40.92W in Dec 2011 | | | | | | |

**List of Space Networks with no Satellites at Nominal Positions**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **55.00 W** | G | INMARSAT-2 AOR WEST | No sat | No sat | No sat | No sat | No sat |
| **46.00 W** | USA | TDRS 46W | TDRS 4 | TDRS 4 | TDRS 4 | TDRS 4 | No sat |
| **42.50 W** | USA | USGCSS PH3 MID ATL | No sat | No sat | No sat | No sat | No sat |
| | USA | USGCSS PH3B MID ATL | No sat | No sat | No sat | No sat | No sat |
| **38.00 W** | USA | USGON-5 | No sat | No sat | No sat | No sat | No sat |
| **36.00 W** | RUS | YAMAL-W2 | ---- | No sat | No sat | No sat | No sat |
| **30.40 W** | USA | USDKH2 | ---- | No sat | No sat | No sat | No sat |
| **26.50 W** | RUS | GALS-1 | No sat | No sat | No sat | No sat | No sat |
| | RUS | STATSIONAR-17 | No sat | No sat | No sat | No sat | No sat |
| | RUS | VOLNA-13 | No sat | No sat | No sat | No sat | No sat |
| | RUS | TOR-1M | --- | No sat | No sat | No sat | No sat |
| **26.00 W** | G | DJCF-2B | --- | No sat | No sat | No sat | No sat |
| **25.00 W** | RUS | GALS-9 | No sat | No sat | No sat | No sat | No sat |
| | RUS | STATSIONAR-8 | No sat | No sat | No sat | No sat | No sat |
| | RUS | VOLNA-1A | No sat | No sat | No sat | No sat | No sat |
| | RUS | TOR-9M | --- | No sat | No sat | No sat | No sat |
| **24.00 W** | RUS | PROGNOZ-1 | No sat | No sat | No sat | No sat | No sat |
| | USA | USCID-E3 | No sat | No sat | No sat | No sat | No sat |
| **22.50 W** | USA | FLTSATCOM-C E ATL-1 | No sat | No sat | No sat | No sat | No sat |
| | USA | KASATCOM-2 | No sat | No sat | No sat | No sat | No sat |
| **21.50 W** | HOL | INTELSAT K 338.5E | No sat | No sat | No sat | No sat | No sat |
| | HOL | INTELSAT5A 338.5E | No sat | No sat | No sat | No sat | No sat |
| | HOL | INTELSAT7 338.5E | No sat | No sat | No sat | No sat | No sat |
| | HOL | INTELSAT8 330.5E | No sat | No sat | No sat | No sat | No sat |

## List of Space Networks with no Satellites at Nominal Positions

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **20.20 W** | BEL | | SATCOM-4 20.2W | --- | No sat | No sat | No sat | No sat |
| **19.00 W** | USA | | USMB-3 | ---- | No sat | No sat | No sat | No sat |
| **17.00 W** | G | | INMARSAT-3 AOR East2 | No sat | No sat | No sat | No sat | No sat |
| **16.00 W** | RUS | | WSDRN | No sat | No sat | No sat | No sat | No sat |
| | Remark: Satellite 2011-074B Luch 5A drifting to planned 16W | | | | | | | |
| **14.50 W** | RUS | | GOMS-1M | No sat | No sat | No sat | No sat | No sat |
| **13.50 W** | RUS | | FOTON-1 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | POTOK-1 | No sat | No sat | No sat | No sat | No sat |
| **13.00 W** | USA | | P-197-4 | No sat | No sat | No sat | No sat | No sat |
| | USA | | P92-4 | No sat | No sat | No sat | No sat | No sat |
| | USA | | USCSID-E2 | No sat | No sat | No sat | No sat | No sat |
| | USA | | USTRO-4 | ---- | No sat | No sat | No sat | No sat |
| **12.00 W** | USA | | USGCSS PH3B ATL | USA 153 | No sat | No sat | No sat | No sat |
| | USA | | USGOVSAT-8 | ---- | ---- | ---- | No sat | No sat |
| | USA | | TDRS 12W | ---- | ---- | No sat | No sat | No sat |
| **9.50 W** | RUS | | KUPON-3 | No sat | No sat | No sat | No sat | No sat |
| **3.00 W** | RUS | | GALS-11 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | STATSIONAR-M2 | No sat | No sat | No sat | No sat | No sat |
| | RUS | | TOR-11M | --- | No sat | No sat | No sat | No sat |
| | BLR | IK | INTERSPUTNIK-3W | No sat | No sat | No sat | No sat | No sat |
| | BLR | IK | INTERSPUTNIK-3W-Q | --- | No sat | No sat | No sat | No sat |
| | Remark: Satellite 1997-042A Agila-2 = ABS-5 was at 3.08W in Dec 2011 | | | | | | | |