

**United States of America****PROPOSALS FOR THE WORK OF THE CONFERENCE****AGENDA ITEM 1.16**

1.16 to consider allocations on a worldwide basis for feeder links in bands around 1.4 GHz to the non-GSO MSS with service links operating below 1 GHz, taking into account the results of ITU-R studies conducted in response to Resolution **127 (Rev.WRC-2000)**, provided that due recognition is given to the passive services, taking into account No. **5.340**

Background information

There is still worldwide unmet need and demand for low cost telecommunication services in developing countries, as evidenced most recently at the ITU's World Telecommunication Development Conference in Istanbul (WTDC-02) and the Plenipotentiary Conference in Marrakesh in 2002. Recommendation 8 (Rev.Istanbul, 2002) of WTDC-02 considered "that satellite-based services are particularly appropriate for developing countries with areas that are not served or underserved by terrestrial telecommunication infrastructures".

With sufficient spectrum, the non-geostationary (non-GSO) mobile-satellite service (MSS) with service links operating below 1 GHz or "Little LEOs" can provide such low cost telecommunication services. Their service is ubiquitous. They require minimal terrestrial infrastructure. Their applications include messaging, asset management and tracking, and data monitoring. The MSS below 1 GHz industry can play a key role in providing fast and universal access to information and communication technologies (ICT) for developing countries, particularly those with difficult geography, terrain constraints and rural conditions.

The MSS below 1 GHz industry with its data monitoring and control capabilities can also play a key role in providing telecommunication support for public safety and for protecting the environment, the critical importance of which was recognized in WTDC-94 (Buenos Aires, 1994), the Plenipotentiary Conference (Kyoto, 1994), the African Regional Telecommunication Conference (Abidjan, 1996) and the Regional Telecommunication Development Conference for the Arab States (Beirut, 1996). The role of space technologies in protection of the environment was addressed by developing countries most recently at WTDC-02, which adopted Recommendation 7, which specifically recommends "that space technologies be considered for use in environmental protection activities such as monitoring air, river, harbour and sea pollution. . . ."

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WRC-2000 recognized that many of the proposed non-GSO MSS networks cannot be implemented in the existing allocations because there is not enough spectrum. Specifically there is an acute worldwide shortage of spectrum for non-GSO MSS feeder links. In light of that, WRC-2000 called on the WRC-03 to consider allocations on the worldwide basis for feeder links in bands around 1.4 GHz to the non-GSO MSS with service links operating below 1 GHz (non-GSO MSS < 1 GHz). WRC-2000 also revised Resolution 127 to direct ITU-R to continue the study of sharing techniques for non-GSO MSS < 1 GHz feeder links (Earth-to-space) in the 1 390-1 400 MHz band and space-to-Earth feeder links in the 1 427-1 432 MHz band.

Sharing studies conducted in ITU-R under Resolution 127 with respect to the proposed allocation of spectrum for space-to-Earth feeder links (1 429-1 432 MHz) include: a) protection of the radio astronomy service by controlling out-of-band emissions to meet Recommendation RA.769-1 levels of $-255 \text{ dB(W/(m}^2/\text{Hz))}$ for the 1 400-1 427 MHz band; b) protection of EESS by meeting Recommendation SA.1029-1 requirements of $-171 \text{ dB(W/27 MHz)}$ for in-band power levels; and c) sharing with fixed and mobile services on the basis of not exceeding the levels established for sharing in the adjacent bands of $-146 \text{ dB(W/(m}^2/4 \text{ kHz))}$ (since no level had been established for the 1 429-1 432 MHz band). Sharing studies that have been completed with respect to the proposed allocation of spectrum for Earth-to-space feeder links include: a) protection of EESS by meeting Recommendation SA.1029-1 requirements of $-171 \text{ dB(W/27 MHz)}$ for in-band power levels; and b) sharing with the radiolocation service by equipping the non-GSO MSS satellites with adequate filtering. Protection of the radio astronomy service at nearby frequencies can be achieved by geographic separation of MSS uplinks from radio astronomy sites. In addition, sharing with the fixed and mobile services will be dependent on the characteristics of these services.

Studies have shown that interference to radio astronomy and the other passive services can be avoided using various techniques including low-power transmitter levels, choice of modulation, symbol shaping, output filtering and band limiting filters, the use of which can minimize the band separation necessary to meet the recommended interference threshold levels for protection of these services. Recognizing these facts, the United States proposes allocations in the 1 390-1 392 MHz (Earth-to-space) and 1 430-1 432 MHz (space-to-Earth) bands at WRC-03 for non-GSO MSS feeder links.

The United States' proposal for allocation of these bands to non-GSO MSS feeder links follows.

Proposal

ARTICLE 5

MOD USA/38/1

1 350-1 525 MHz

Allocation to services		
Region 1	Region 2	Region 3
1 350-1 400 FIXED MOBILE RADIOLOCATION 5.149 5.338 5.339 ADD 5.MSSUP ADD 5.MSSCOOR ADD 5.MSSPASS	1 350-1 400 RADIOLOCATION 5.149 5.334 5.339 ADD 5.MSSUP ADD 5.MSSCOOR ADD 5.MSSPASS	

MOD USA/38/2

1 429-1 452 FIXED MOBILE except aeronautical mobile 5.341 5.342 ADD 5.MSSDN ADD 5.MSSCOOR	1 429-1 452 FIXED MOBILE 5.343 5.341 ADD 5.MSSDN ADD 5.MSSCOOR
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Reasons: To provide necessary allocations for non-GSO MSS feeder links (Earth-to-space) and (space-to-Earth) in support of existing non-GSO MSS service link allocations below 1 GHz while ensuring protection of currently allocated services.

ADD USA/38/3

5.MSSUP *Additional allocation:* the band 1 390-1 392 MHz is also allocated on a primary basis to the mobile-satellite service (Earth-to-space). This allocation is limited to feeder links for non-geostationary orbit mobile-satellite systems with service links below 1 GHz.

Reasons: To provide additional allocations for non-GSO MSS feeder links (Earth-to-space) to support existing non-GSO MSS allocations below 1 GHz.

ADD USA/38/4

5.MSSCOOR The use of the bands 1 390-1 392 MHz and 1 430-1 432 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**.

Reasons: To provide protection to other primary services in the bands while enabling the additional allocations to the mobile-satellite service feeder links.

ADD USA/38/5

5.MSSPASS Earth stations in the mobile-satellite service operating in the band 1 390-1 392 MHz shall not cause harmful interference to stations in the Earth exploration-satellite (passive) and space research (passive) services operating in the 1 400-1 427 MHz band. Earth stations in the mobile-satellite service operating in the band 1 390-1 392 MHz shall avoid causing harmful interference to stations in the radio astronomy service operating in the 1 400-1 427 MHz band through appropriate geographical separation.

Reasons: To provide protection to passive services in the 1 400-1 427 MHz band.

ADD USA/38/6

5.MSSDN *Additional allocation:* The band 1 430-1 432 MHz is also allocated on a primary basis to the mobile-satellite service (space-to-Earth), limited to feeder links for non-geostationary systems in the mobile-satellite service with service links below 1 GHz. In order to protect the radio astronomy service in the 1 400-1 427 MHz band, the aggregate power flux-density radiated by all space stations produced in the 1 400-1 427 MHz band shall not exceed the level of $-180 \text{ dB(W/m}^2\text{)}$ in a 27 MHz band and a level of $-196 \text{ dB(W/m}^2\text{)}$ in any 20 kHz portion of the 1 400-1 427 MHz band, at the site of any radio astronomy station for more than 2% of the time.

Reasons: To provide additional allocations for non-GSO MSS feeder links (space-to-Earth) to support existing non-GSO MSS allocations below 1 GHz, and protect the radio astronomy service in the 1 400-1 427 MHz band.

APPENDIX 4 (WRC-2000)

Consolidated list and tables of characteristics for use in the application of the procedures of Chapter III

ANNEX 2A

Characteristics of satellite networks' earth stations or radio astronomy stations² (WRC-2000)

A.17 Compliance with aggregate power flux-density limits

ADD USA/38/7

e) For non-geostationary-satellite systems operating feeder links in the mobile-satellite service in the band 1 430-1 432 MHz, the aggregate power flux-density in the 1 400-1 427 MHz band, and in any 20 kHz portion of the 1 400-1 427 MHz band produced at the site of a radio astronomy station for more than 2% of the time, as defined in No. **5.MSSDN**.

Reasons: Reflect requirement to document that pfd's are not exceeded.
