

## Draft CEPT Brief on Agenda Item 1.8

**Agenda item 1.8:** *to consider the results of ITU-R studies on technical sharing and regulatory provisions for the application of high altitude platform stations operating in the bands 27.5-28.35 GHz and 31-31.3 GHz in response to Resolution 145 (WRC-03), and for high altitude platform stations operating in the bands 47.2-47.5 GHz and 47.9-48.2 GHz in response to Resolution 122 (rev. WRC-03)*

### Issue

This agenda item covers the following issues:

#### **Resolution 122 (rev. WRC-03): Use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz by HAPS in the FS and by other services**

- 1 to consider results of studies of power limitations applicable for HAPS ground stations to facilitate sharing with space station receivers;
- 2 to consider results of studies of the regulatory provisions that might be needed in order to address those cases where the deployment of HAPS in the territory of one administration may affect other administrations;
- 3 to consider results of studies on the appropriate technical sharing criteria for the situations referred to in *considering* k) and m), taking into account the operational environments and the requirements of systems in the FSS,

#### **Resolution 145 (WRC-03): Potential use of the bands 27.5-28.35 GHz and 31-31.3 GHz by HAPS in the FS**

- 1 to consider the results of studies on the feasibility of identifying a suitable and preferably a common 300 MHz segment of the band 27.5-28.35 GHz paired with the 300 MHz band at 31-31.3 GHz, for use by HAPS in the countries listed in Nos. **5.537A** and **5.543A** or countries in Region 2 planning provisional operation;
- 2 to consider ITU-R Recommendations on the technical sharing criteria or HAPS system design conditions that are necessary to ensure that HAPS applications in the fixed service operate successfully on a non-harmful interference, non-protected basis in the bands 27.5-28.35 GHz and 31-31.3 GHz;
- 3 to consider the results of studies on the interference criteria and methodology for evaluating interference from the downlink (HAPS-to-ground direction) of systems using HAPS to the uplink of the GSO satellite networks in the FSS within the band 27.5-28.35 GHz, taking into account Recommendation ITU-R SF.1601;
- 4 to consider the results of studies of the regulatory provisions that might be needed in order to address those cases where the deployment of HAPS in the fixed service in the bands 27.5-28.35 GHz and 31-31.3 GHz in the territory of one administration may affect other administrations;
- 5 to consider the results of studies on the appropriate interference mitigation techniques for the sharing between fixed-service systems using HAPS and other conventional fixed-service systems in the same area in the bands 27.5-28.35 GHz and 31-31.3 GHz.

## **Preliminary CEPT position**

1. Resolution 122 (rev. WRC-03): CEPT would support a method that would create a simple regulatory regime in order to facilitate the use of the 47.2-47.5 GHz and 47.9-48.2 GHz bands by HAPS while protecting the existing services.
2. Resolution 145 (WRC-03): Support the protection of existing services e.g. FSS at 27 GHz, the radio astronomy, Earth exploration-satellite (passive) and space research (passive) service in the band 31.3-31.8 GHz. Further consideration is required with respect to the possibility of a proposal to facilitate HAPS on a wider basis within Region 1 countries.

## **Background**

### ***History***

A high-altitude platform station (HAPS) denotes a communications platform that is kept aloft and on a station, at an altitude of around 20-50 km and at a specified, nominal fixed point relative to the Earth. The operation of HAPS is currently restricted to bands specifically identified in RR Article 5 (RR4.15A). To date, bands at 2 GHz for mobile applications, 28 GHz (not on a global basis) and 47 GHz for Fixed applications have been authorised in the radio regulations.

The bands 47.2-47.5 GHz and 47.9-48.2 GHz were designated within the fixed service (FS) for the use of HAPS at WRC-97. The studies in these bands were completed by WRC-03 and the results are contained in Recommendation ITU-R SF.1481, with the exception of interference to and from FSS spacecraft, and border area coordination matters in the FS.

The studies are to focus particularly, but not exclusively, on the bands 27.5-28.35 GHz and 31.0-31.3 GHz. In addition, country footnote 5.537A was adopted to permit the use of HAPS (HAPS-to-ground) in the FS allocation in the band 27.5-28.35 GHz on a non-interference, non-protected basis in certain Region 3 countries and five Region 1 countries.

WRC-03 modified the two RR footnotes (5.537A and 5.543A) to permit the use of HAPS in the fixed service within 300 MHz of spectrum in the band 27.5-28.35 GHz and in the band 31-31.3 GHz in certain Region 3 countries and in five Region 1 countries on a non-harmful interference, non-protection basis. It was further agreed that provisionally, countries listed in the two footnotes and those countries in Region 2 which intend to implement systems using HAPS in the fixed service in the 30 GHz band shall seek explicit agreement of concerned administrations under the conditions which have been set forth in new Resolution 145.

For the 47 GHz band, administrations should follow the provisions introduced in existing Resolution 122(Rev. 2003). Administrations are still encouraged to facilitate coordination between the fixed service using HAPS operating in the 47/48 GHz bands and the co-primary satellite services by using the procedures of Article 9 on a provisional basis however the Radiocommunications Bureau will defer examination of such systems under 9.36 and 11.32 as well as the application of Article 9 coordination procedures between HAPS and satellite systems until further decision by WRC-07. Furthermore the Radiocommunications Bureau can only accept notices from countries in Region 2 only, for earth stations and geostationary space stations providing service exclusively within Region 2 countries. WRC-03 added a request to ITU-R to study, as a matter of urgency, power limitations applicable for HAPS ground stations to facilitate sharing with space station receivers.

## ***ITU Studies***

As identified by CPM06-1, Working Party 4-9S has the entire responsibility for the development of draft CPM text on this issue, with WP 9B and 9 D as interested groups. A summary of work for HAPS issues and the work division of the Working Parties within Study Group 9 is basically as follows:

### **Studies on Resolution 145**

#### **- Interference from HAPS into FSS:**

At its October 2004 meeting, Working Party 4-9S considered contributions related to the revision of Recommendation ITU-R SF.1601 (Methodologies for interference evaluation from the downlink of the fixed service using high altitude platform stations to the uplink of the fixed-satellite service using the geostationary satellites within the band 27.5-28.35 GHz). These have been used to develop a draft revision of SF.1601 to provide two interference assessment methods. Method 1 may be used to assess the level of interference from the HAPS-to-ground (downlink) transmission in the FS to the Earth-to-space (uplink) of the FSS using geostationary (GSO) satellites within the frequency band 27.5-28.35 GHz. Method 2 may be used to estimate the e.i.r.p. of transmissions in the HAPS-to-ground direction within the band 27.5-28.35 GHz that would cause a given increase in the interference-to-noise ratio of receivers of FSS satellites in the geostationary orbit. The joint meeting of SG4 and SG9 sent the revised recommendation for approval (PSAA).

At its May 2005 meeting, WP4-9S agreed to a further draft revision to the Recommendation ITU-R SF.1601-1, adding a third methodology for interference evaluation in terms of a C/I assessment. The draft revision has been adopted by Joint Study Group 4-9 (document 4/57 - 9/65) at its meeting on 5<sup>th</sup> September 2006 and sent to Member States for final approval.

#### **- Interference from HAPS into other systems in the FS:**

Working Party 9B (meeting May 2005) approved a revision of Recommendation ITU-R F.1609 on interference evaluation from HAPS systems to FWA systems in the 28/31 GHz range. This was subsequently adopted by SG9 at its December 2005 meeting (Document 9/57).

#### **- HAPS Characteristics and mitigation techniques:**

Work toward preliminary revisions of Recommendation ITU-R F.1569 on characteristics of HAPS systems in the 29-31 GHz range and Recommendation ITU-R F.1607 on interference mitigation techniques for HAPS systems in the 28 GHz band is ongoing within WP9B.

### **Studies on Resolution 122**

At the March 2006 meeting of WP4-9S, based on a contribution from Korea, a working document was developed on power limitations for HAPS ground stations to facilitate sharing with space station receivers in the 47 GHz bands (Resolution 122). This was further developed at the August 2006 meeting of WP4-9S and turned into a PDNR.

## ***Discussion on the methods included in the CPM Report to satisfy the agenda item***

At the August 2006 meeting of WP4-9S, the draft CPM text was completed with a single method agreed in response to Resolution 145, and two methods for Resolution 122 as follows:

With respect to **Resolution 145**, two possible sub-bands have been identified (27.5 – 27.8 GHz (CITEL option) and 28.05 – 28.35 GHz (APT option)) and necessary modifications of 5.537A and revision of Resolution 145 have been included within the CPM text.

At the CPM07-2 meeting, APT members contributed to support the choice of the upper band (28.05-28.35 GHz) but there was no agreement among the administrations. Therefore, the CPM text has not been modified and the two possible sub-bands still remain in the CPM Report.

Within CEPT, the Russian Federation (the only CEPT administration listed in the footnote n° 5.537A that allows the use of this band by HAPS) indicated a preference for the 28.05-28.35 GHz option taking into account that the lower sub-band (27.5-27.8 GHz) is heavily used by FSS (Earth-to-space) and that only the upper sub-band (28.05-28.35 GHz) belongs to the band designated to the FS by the ECC Decision(05)01.

Other views were expressed that, from an interference point of view, the sharing scenario in the lower sub-band (back-lobe interference from HAPS into the satellite) is more favourable than the sharing scenario in the upper sub-band (interference from HAPS into FS stations on the ground).

Further consideration is required on this issue.

With respect to **Resolution 122**, the options are either:

- Method A: Suppression of Resolution **122 (Rev.WRC-03)** to be replaced by a new Resolution to address coordination mechanisms based on Article 9 type procedures between systems using HAPS and other co-primary services in the 47-48 GHz range, and consequential changes to a relevant footnote.
- Method B: maintain Resolution **122 (Rev.WRC-03)** with revisions to facilitate sharing between systems using HAPS and other services or other systems in the FS in neighbouring countries. One of the proposals to facilitate sharing consists in limiting assignments for HAPS user terminals to 150 MHz within each of the 47.2-47.5 GHz and 47.9-48.2 GHz fixed service bands. One of the consequences of this method is that the regulatory priority for HAPS at 47 GHz in Regions 1 and 3 will be maintained. This Method would include the adoption of provisions ending the maintenance of notices concerning HAPS that were received by the Bureau prior to 22 November 1997 and provisionally recorded in the MIFR, and the removal of current restrictions on the examination of notices from FSS networks and systems.

It should be noted that no example of regulatory text corresponding to the Method B has been included in the CPM Report and that further discussion is expected at the next WP4-9S meeting on some details of this method.

CEPT would welcome a method that would create a simple regulatory regime in order to facilitate the use of the 47.2-47.5 GHz and 47.9-48.2 GHz bands by HAPS. For that objective, Method B is promising but there are still some elements to be properly defined in this method. Consequently, further consideration is needed, in particular taking into account the outcome of the next WP 4-9S meeting in May 2007.

## List of relevant documents

### List of ITU-R Recommendations etc. dealing with HAPS systems

Recommendation	Short title	Developed by
ITU-R SF.1481	Frequency sharing between HAPS systems and GSO FSS in the 47 GHz band	WP 4-9S
ITU-R F.1500	Preferred characteristics of HAPS systems in the 47 GHz band	WP 9B
ITU-R F.1501	Coordination distance for HAPS systems sharing the 47 GHz band with other FS systems	WP 9B
ITU-R F.1569	Characteristics of HAPS systems in the 28/31 GHz bands <i>Note: working document toward a preliminary revision of Recommendation ITU-R F.1569 has been prepared</i>	WP 9B
ITU-R F.1570	Impact of HAPS up-links on EESS (passive) in the band 31.8-33.4 GHz	WP 9D
ITU-R SF.1601-1	Methodology for interference evaluation from HAPS down-links to GSO FSS up-links in the 28 GHz band <i>Note: (document 4/57 - 9/65) Draft revision of Recommendation ITU-R SF 1601-1</i>	WP 4-9S
ITU-R F.1607	Interference mitigation techniques for HAPS systems in the 28 GHz band <i>Note: preliminary revision of Recommendation ITU-R F.1607 has been prepared</i>	WP 9B
ITU-R F.1608	Frequency sharing between HAPS systems and conventional FS systems in the 47 GHz band	WP 9B
ITU-R F.1609	Interference evaluation from HAPS systems to conventional FS systems in the 28/31 GHz bands <i>Note: A revision of Recommendation ITU-R F.1609 was adopted by SG9 at its December 2005 meeting (Document 9/57).</i>	WP 9B
ITU-R F.1612	Interference evaluation to protect RAS from HAPS up-links in the band 31.3-31.8 GHz	WP 9D
Annex 7 of the Chairman's report on the meeting of Working Party 4-9S, Geneva, 25 August to 1 September 2006	Preliminary draft new Recommendation ITU-R SF.[4-9S/HAPS-PLIMIT] - Methodology for determining the power level for HAPS ground stations to facilitate sharing with space station receivers in the bands 47.2-47.5 GHz and 47.9-48.2 GHz	WP4-9S

### Other relevant documents

Annex 8 of the Chairman's report on the meeting of Working Party 4-9S, Geneva, 25 August to 1 September 2006: Working document - Regulatory and procedural considerations regarding the use of HAPS in the FS in the bands 27/31 GHz and 47/48 GHz.

[CPM Report to WRC-07 on agenda item 1.8]

### Proposals from outside CEPT

#### European Union

**(see: ECC/CPG07(2004)006)**

At WRC-03, the EU supported making sufficient spectrum available to HAPS, as an alternative and complementary network topology for the radio delivery of various broadband services, but ensuring the adequate protection of other existing services, in particular IMT-2000 base stations on the ground. Outside Europe, new bands at 28 and 31 GHz have been made available in additional Asian and American countries. In Europe, the protection of terrestrial and scientific services precluded this option.

## **Regional telecommunication organisations**

### **APT (January 2007)**

#### **APT Preliminary views**

APT members generally support continued sharing studies between systems using HAPS and other systems as identified in Resolution **122 (Rev. WRC-03)** for the band 47.2-47.5 GHz and 47.9-48.2 GHz and Resolution **145 (WRC-03)** for the band 27.5-28.35 GHz and 31-31.3 GHz on a fair basis for all concerned parties.

APT members will further consider and facilitate the studies under the above two Resolutions.

Regarding the Resolution **145 (WRC-03)**, for the identification of an appropriate 300 MHz segment in the band 27.5 – 28.35 GHz for use by HAPS in the countries listed in Nos. **5.537A** and **5.543A** or countries in Region 2 planning provisional operation, APT Members have a view that it is appropriate to choose 28.05 – 28.35 GHz, as the common 300 MHz segment considering that, in the lower parts of the band 27.5-28.35 GHz, there are a number of other existing/planned systems in the primary services, as well as the identified frequency band (i.e. 27.5-27.82 GHz) for use by high-density applications in the fixed-satellite service (HDFS) in Region 1. APT Members support the modifications to RR No.**5.537A** and revisions to Resolution **145 (WRC-03)** appropriately to reflect the decision on the identification of the 300 MHz in the band 27.5 – 28.35 GHz.

Regarding the Resolution **122 (Rev. WRC-03)**, APT Members support maintaining Resolution **122 (Rev. WRC-03)** with certain revisions including power density reduction of a HAPS ground station to avoid interference to space stations in the fixed-satellite service, the conditions for avoidance of unwanted emissions to the radio astronomy service in the 48.94-49.04 GHz band and the technical and regulatory requirements for protection of the fixed service in neighbouring countries.

APT members are encouraged to consider the text for the revisions of this Resolution at the next APG meeting.

For the frequency bands stated in both Resolutions above, APT Members have a view that data elements to be provided with respect to HAPS systems, when an administration seeks to effect coordination to obtain agreement or to notify such a system, should be developed and incorporated in the relevant provisions.

## Arab League

It is understood that although the Arab League have not developed a formal position, preliminary views are similar to CEPT.

## CITEL (October 2006)

Proposals for modifications to two footnotes and Resolution 145 (WRC-03).

### DIAP/1.8/1 MOD

**Support:** Canada, United States of America

**5.537A** In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 27.5-27.835 GHz may also be used by high altitude platform stations (HAPS). ~~The use of HAPS within the band 27.5-28.35 GHz is limited, within the territory of the countries listed above, to a single 300 MHz sub-band.~~ Such use of 300 MHz of the fixed-service allocation by HAPS in the above countries is further limited to operation in the HAPS-to-ground direction and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems or other co-primary services. Furthermore, the development of these other services shall not be constrained by HAPS. See Resolution **145 (Rev. WRC-073)**. (WRC-073)

**Reason:** WRC-03 called for the identification of a common 300 MHz band, within the 27.5-28.35 GHz band, for use by HAPS in those countries wishing to implement such service. Such identification will help to ease the implementation and harmonization of HAPS in those countries. Identifying the lowest 300 MHz segment for potential use by HAPS maximizes the amount of contiguous FSS spectrum in the 27.5-30.0 GHz band that would not be impaired domestically in any way as a consequence of any potential use of the band by HAPS.

### DIAP/1.8/2 MOD

**Support:** Canada, United States of America

**5.543A** In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 31-31.3 GHz may also be used by systems using high altitude platform stations (HAPS) in the ground-to-HAPS direction. The use of the band 31-31.3 GHz by systems using HAPS is limited to the territory of the countries listed above and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems, systems in the mobile service and systems operated under No. **5.545**. Furthermore, the development of these services shall not be constrained by HAPS. Systems using HAPS in the band 31-31.3 GHz shall not cause harmful interference to the radio astronomy service having a primary allocation in the band 31.3-31.8 GHz, taking into account the protection criterion as given in Recommendation ITU-R RA.769. In order to ensure the protection of satellite passive services, the level of unwanted power density into a HAPS ground station antenna in the band 31.3-31.8 GHz shall be limited to -106 dB(W/MHz) under clear-sky conditions, and may be increased up to -100 dB(W/MHz) under rainy conditions to mitigate against fading due to~~take account of rain attenuation,~~ provided the effective impact on the passive satellite does not exceed the impact under clear-sky conditions ~~as given above~~. See Resolution **145 (Rev. WRC-073)**. (WRC-073)

**Reason:** Revisions to text add clarity. Consequential to the changes to Resolution 145 in DIAP/1.8/3

### **DIAP/1.8/3 MOD to Resolution 145**

**Reason:** Changes to frequency ranges throughout, deletion of *invites 1*, and other minor changes are consequential to proposal **DIAP/1.8/1**. Deletion of *noting* is made recognizing that this is a simple statement of fact. Deletion of *invites 4* is made recognizing the retention of old *resolves 4*, now *resolves 3*. Changes to *invites administrations* are proposed to clarify that administrations are to supply technical details of their systems along with an indication of their intention to implement HAPS in these frequency bands. The changes also bring the Resolution up to date.

### **Proposals for modifications related to Resolution 122 (WRC-03).**

**Background:** The ITU has been considering the implications of HAPS in the fixed service in the 47.2-47.5 GHz and 47.9-48.2 GHz band since 1997, when WRC-97 first made provision for the operation of HAPS within the fixed service. Studies have been ongoing under versions of Resolution **122** since WRC-97.

Resolution **122 (Rev. WRC-2000)** indicated that sharing studies remain to be completed between the fixed-satellite service (FSS) and HAPS operations in the FS. Pending the completion of studies, Resolution **122 (Rev. WRC-2000)** instructed the Radiocommunication Bureau “that from 22 November 1997, and pending review of the sharing studies in *considering j*) and review of the notification process by WRC-99, the Bureau shall accept notices in the bands 47.2-47.5 GHz and 47.9-48.2 GHz only for high altitude platform stations in the FS and for feeder links for the broadcasting-satellite service (BSS), shall continue to process notices for FSS networks (except for feeder links for the broadcasting-satellite service) for which complete information for advance publication has been received prior to 27 October 1997, and shall inform the notifying administrations accordingly.” In other words, notices received after 22 November, 1997 from non-BSS feeder link FSS networks in the 47.2-47.5 GHz and 47.9-48.2 GHz bands have not been accepted.

Resolution **122 (Rev. WRC-03)** extended the restriction on processing of notices for FSS networks other than those providing service exclusively within Region 2. It also instructed the Bureau to maintain, until a date to be decided by a future WRC, notices concerning HAPS that were received by the Bureau prior to 22 November 1997 and provisionally recorded in the Master International Frequency Register. This is a substantial exception to No. 11.26, which provides that “[n]otices relating to assignments for high altitude platform stations in the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz shall reach the Bureau not earlier than five years before the assignments are brought into use.”

The studies regarding HAPS in the 47.2-47.5 GHz and 47.9-48.2 GHz bands have been completed and the results are contained in Recommendation ITU-R SF.1481. This recommendation makes clear that co-frequency operations between HAPS in the fixed service and FSS networks and systems are feasible in the 47.2-47.5 GHz and 47.9-48.2 GHz bands, even while noting that “there may be a need to develop the maximum allowable power flux-density at satellites on the GSO due to aggregate interference caused by ground user terminals of high altitude platform networks.” The revision to Resolution **122** that was approved at WRC-03 confirms that co-existence between HAPS in the FS and the FSS at 47.2-47.5 GHz and 47.9-48.2 GHz is feasible, as administrations were encouraged to facilitate interservice coordination.



In the WRC-03 revision of Resolution **122**, the ITU-R was invited to study power limitations on HAPS ground stations to facilitate sharing with space station receivers, regulatory provisions to address deployment of HAPS in the FS near country borders, and technical sharing criteria between HAPS in the FS and both radio astronomy and FSS systems (taking into account the operational environments and the requirements of FSS systems). With the exception of interference to and from FSS spacecraft, and border area coordination matters in the FS, the deployment of HAPS is a national issue. The issue of interference between the FSS satellite and HAPS networks can be addressed through coordination using Articles **9** and **11** of the Radio Regulations. As a result, Resolution **122** can be suppressed, provided that reference to the use of Article **9** for HAPS is included in a new resolution that is referenced in No. **5.552A** of the Radio Regulations. The Bureau should be instructed to retain all notices concerning HAPS that are maintained in the MIFR only by virtue of *instructs the Director of the Radiocommunication Bureau* 1 of Resolution **122 (Rev. WRC-03)** only until 1 January 2010, unless the notifying administration earlier informs the Bureau that the notified assignments have been brought into use.

**Proposals:**

**DIAP/ 1.8 /4**                      **SUP Resolution 122 (Rev. WRC-03)**

**Support:** Canada, United States of America

**Reasons:** Studies called for in relation to HAPS at 47 GHz have been completed. The Resolution **122** application of the provisions of Article **9** is proposed for incorporation into the Radio Regulations (see **DIAP** below).

**Proposal:**

**DIAP/ 1.8 /5**    **MOD**

**Support:** Canada, United States of America

**5.552A**    The allocation to the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz is designated for use by high altitude platform stations. The use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz by high altitude platforms in the fixed service is subject to the provisions of Resolution **VBANDHAPS (WRC-07)** ~~Resolution **122 (WRC-97)**~~. All notices for high altitude platform stations in these bands that were filed with the Bureau prior to 22 November 1997 shall be canceled as of 1 January 2010 unless the notifying administration informs the Bureau before this date that the notified assignments have been brought into use.

**Reasons:** Consequential to the suppression of Resolution **122**. While studies have been completed, HAPS systems still need to be subject to the provisions of Article **9** to ensure coordination with the FSS at 47 GHz. Nos. **9.17** and **9.18**, which apply for the coordination of terrestrial stations, including HAPS, with earth stations, are currently applicable without having to be called out in a footnote to Article **5** of the Radio Regulations. Resolution **VBANDHAPS** is a new resolution (see **DIAP** below) that is intended to address the previously unaddressed coordination case of transmitting HAPS ground-based stations with receiving space station of the FSS, when the HAPS ground station appears in the coverage area of a satellite network. The final sentence of the provision is needed because Resolution **122 (Rev. WRC-03)** instructs the BR to maintain HAPS notices received prior to 22 November 1997 “until a date to be decided by a future WRC.”

**DIAP/ 1.8 /6**                      **ADD Resolution VBANDHAPS (WRC-07)**

**Support:** Canada, United States of America

**Reasons:** Incorporates into a new resolution the coordination provisions in Article 9 that are not already applicable by operation of regulation to HAPS stations in the fixed service in the 47.2-47.5 GHz and 47.9-48.2 GHz bands.

### **RCC (September 2006)**

*Resolution 145 (WRC-03) Potential use of the bands 27.5-28.35 GHz and 31-31.3 GHz by high altitude platform stations (HAPS) in the fixed service*

In order to minimize the potential impact of the FS systems using the high altitude platform stations (HAPS) on the FSS systems to consider possibility to identify for HAPS a 300 MHz segment in the band 27.5-28.35 GHz subject to the protection of the existing and planned stations. On the assumption of the fact that the FSS systems use more intensively the low part of the band 27.5-28.35 GHz it is advisable to designate a 300 MHz segment in the band 28.05-28.35 MHz. For such identification the modification of Resolution 145 (WRC-03) shall be required.

*Resolution 122 (Rev.WRC-03) Use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz by high altitude platform stations (HAPS) in the fixed service and by other services*

The compatibility of the FSS and FS systems using HAPS in the 47.2-47.5 GHz and 47.9-48.2 GHz bands is possible on the basis of the frequency assignments coordination principles. It is advisable to designate in the bands 47.2-47.5 GHz and 47.9-48.2 GHz the frequency resource 2x150 MHz for the FS systems using HAPS and high density FS terminals operating through the HAPS.

### **International organisations**

**The Space Frequency Coordination Group (SFCG)** (*European Members: EUMETSAT, ESA, CNES, DLR, Eumetnet, NVIR*) (October 2006)

SFCG supports the need for protection of the 31.3-31.8 allocation to the radio astronomy, Earth exploration-satellite (passive) and space research (passive) services. The maximum levels of unwanted emissions by HAPS in the passive band contained in RR No. 5.543A must continue to apply. SFCG members are encouraged to take an active role in the development of proposals and positions within their respective Administrations' preparatory processes for the CPM and WRC-07.

### **Eumetnet / WMO (February 2007)**

WRC-03 incorporated power density limits in RR footnote 5.543A to protect to protect the EESS (passive) in the bands 31.3-31.5 GHz with regards to HAPS operating in the Fixed Service (FS). These limits adequately protect passive satellite services operating in 31.3-31.8 GHz and are assumed to provide sufficient power for operation of ground-to-HAPS links.

Eumetnet and WMO urge that Resolution 145 (WRC-03) shall not lead to relaxation of these power density limits.

### **Actions to be taken**

Consider further the two possible options (27.5-27.8 or 28.05-28.35 GHz) for the selection of a 300 MHz sub-band for HAPS within the 27.5 – 28.35 GHz band in response to Resolution 145.

Study the potential regulatory implications of the two methods proposed with respect to Resolution 122, paying particular attention to the on-going developments on the details of Method B. .