

RESOLUTION 160 (WRC-15)

**Facilitating access to broadband applications delivered
by high-altitude platform stations**

The World Radiocommunication Conference (Geneva, 2015),

considering

- a) that there is a need for greater broadband connectivity and telecommunication services in underserved communities and in rural and remote areas;
- b) that current technologies can be used for broadband applications delivered by base stations operating at high altitudes;
- c) that high-altitude platform stations (HAPS) are one possible means for providing fixed broadband connectivity that would enable wireless broadband deployment in remote areas, including mountainous, coastal and sandy desert areas;
- d) that HAPS using inter-HAPS links can provide broadband connectivity with minimal ground network infrastructure;
- e) that HAPS may also be used for disaster recovery communications;
- f) that some new entities are currently testing the delivery of broadband over lightweight, solar-powered aircraft and airships at an altitude of 20-50 kilometres for several months at a nominal fixed point relative to the ground below,

recognizing

- a) that existing services and their applications shall be protected from HAPS applications, and no undue constraints shall be imposed on the future development of existing services by HAPS;
- b) that HAPS is defined in No. **1.66A** of the Radio Regulations as a station located on an object at an altitude of 20-50 km and at a specified, nominal, fixed point relative to the Earth, and is subject to No. **4.23**;
- c) that WRC-97 added a global identification for HAPS in the frequency bands 47.2-47.5 GHz and 47.9-48.2 GHz, that WRC-2000 agreed, because of concerns with rain fade in that frequency range, on a HAPS identification for the frequency band 27.9-28.2 GHz (fixed downlink), paired with the frequency band 31.0-31.3 GHz (fixed uplink), outside Region 2, and that at WRC-12 five countries joined footnote **5.457** for a HAPS designation in the fixed service for frequency bands 6 440-6 520 MHz (HAPS-to-ground) and 6 560-6 640 MHz (ground-to-HAPS);
- d) that WRC-2000 decided on additional spectrum identifications for HAPS links under No. **5.388A** and No. **5.388B** in some countries;
- e) that the existing HAPS identifications were established without reference to today's broadband capabilities;

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f) that Recommendation 34 (Rev.WRC-12) noted that the development of common worldwide allocations is desirable in order to improve and harmonize utilization of the radio-frequency spectrum;

g) that, since WRC-12, the evolution of technology through advances in solar panel efficiency, battery energy density, lightweight composite materials, autonomous avionics and antenna technology may improve HAPS viability;

h) that the allotments of the Appendix 30B Plan, assignments in the Plans and the List subject to Appendix 30 and 30A and assignments in the Appendix 30B List shall be protected,

resolves to invite ITU-R

1 to study additional spectrum needs for gateway and fixed terminal links for HAPS to provide broadband connectivity in the fixed service taking into account:

- the existing identifications and deployments of HAPS systems;
- the deployment scenarios envisioned for HAPS broadband systems and related requirements such as in remote areas;
- the technical and operational characteristics of HAPS systems, including the evolution of HAPS through advances in technology and spectrally-efficient techniques, and their deployment;

2 to study the suitability of using the existing identifications in *recognizing c)*, on a global or regional level, taking into account the regulatory provisions, such as geographical and technical restrictions associated with existing HAPS identifications based on the study performed in *resolves to invite ITU-R 1*;

3 to study appropriate modifications to the existing footnotes and associated resolutions in the identifications in *recognizing c)* in order to facilitate the use of HAPS links on a global or regional level, limited to the currently identified frequency bands and, where the use of an identification is not technically feasible for HAPS use, the possible removal of the unsuitable identification;

4 to study, in order to meet any spectrum needs which could not be satisfied under *resolves to invite ITU-R 2* and 3, for the use of gateway and fixed terminal links for HAPS, the following frequency bands already allocated to the fixed service on a primary basis, not subject to Appendices 30, 30A, and 30B in any region:

- on a global level: 38-39.5 GHz, and
- on a regional level: in Region 2, 21.4-22 GHz and 24.25-27.5 GHz,

further resolves

1 that the studies referred to in *resolves to invite ITU-R 3* and 4 include sharing and compatibility studies to ensure protection of existing services allocated in the frequency ranges identified and, as appropriate, adjacent band studies, taking into account studies already performed in ITU-R;

2 that modifications studied under *resolves to invite ITU-R 3* shall not consider the use of HAPS links in the frequency bands subject to Appendix **30B**;

3 to develop ITU-R Recommendations and Reports, as appropriate, on the basis of the studies called for in *resolves to invite ITU-R 1, 2, 3, and 4* above,

invites administrations

to participate in the studies and to provide input contributions,

resolves to invite the 2019 World Radiocommunication Conference

to consider the results of the above studies and take necessary regulatory actions, as appropriate, provided that the results referred to in *resolves to invite ITU-R* are complete and agreed by ITU-R study groups.

