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| **Radiocommunication Advisory GroupGeneva, 22-24 May 2013** |  |
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| Chairman, Study Group 7 |
| RESPONSE TO REQUEST FROM RAG RELATED TO ARRANGEMENT OF RECOMMENDATIONS |

# Introduction

During the June 2012 RAG meeting, a proposal from Study Group 1 to arrange the Recommendations by frequency bands of Article 5 was proposed.

The RAG indicated that this arrangement should also be by radio service and if available by application and by actual frequency range rather than by frequency bands in Article 5.

The RAG then invited the Study Groups to identify the Recommendations for which this classification is applicable and inform RAG in May 2013 on progress related to these activities.

# Review of Recommendations

In SG 7, WP 7B is responsible for the ITU-R SA series Recommendations (see Appendix 1) that encompasses four radio services.

All of the SA Recommendations can be classified by radio service; a majority of the SA Recommendations can be classified by application and/or by frequency bands/ranges (see Figure 1 & Figure 2). Some of the SA Recommendations addresses a specific function applicable for multiple frequency bands/ranges (e.g. SA. 1811), or over a single frequency range for multiple SA radio services (e.g. SA.1154, SA.1272), as well as some Recommendations which only addresses system characteristics of the service vs. being frequency specific (e.g. SA.364-5, SA.1014-2).

In SG 7, WP 7C is responsible for the ITU-R RS series Recommendations (see Appendix 2). The RS series of Recommendation encompasses five radio services: Earth explorations-satellite service (active), space research service (active), Earth exploration-satellite service (passive), space research service (passive), and the meteorological aids service.

All of the RS Recommendations can be classified by radio service; many of the RS Recommendations can be classified by application and/or by frequency bands/ranges (Figure 3 & Figure 4). Some of the RS Recommendations addresses a specific function by applicable for multiple frequency bands/ranges (e.g., RS.1263-1), while other Recommendations only address system characteristics of the service vs. being frequency specific (e.g. RS.515-5, RS.577-7).

# Conclusion

A review of SA and RS series Recommendations concluded that classification by radio service, by application and by frequency bands/ranges is possible for all SA Recommendations.

Figure 1 : SA Recommendations by Radio Service and applications

Figure 2 : SA Series Recommendations by Frequency Bands/Ranges and Functions

Figure 3 : RS Recommendations by Radio Service and applications

Figure 4 : RS Series Recommendations by Frequency Bands/Ranges and Functions

APPENDIX 1

Current list of ITU-R SA Recommendations

| Rec. ITU-R | Recommendation title | ITU-R Questions | Revision(M/Y) |
| --- | --- | --- | --- |
| **SA.363-5** | Space operation systems. Frequencies, bandwidths and protection criteria | N/A | 03/94 |
| **SA.364-5** | Preferred frequencies and bandwidths for manned and unmanned near-Earth research satellites | 132/7 | 03/92 |
| **SA.509-2** | Space research earth station and radio astronomy antenna radiation pattern for use in interference calculations, including coordination procedures | 127/7 | 09/11PDRR |
| **SA.510-2** | Feasibility of frequency sharing between the space research service and other services in bands near 14 and 15 GHz – Potential interference from data relay satellite systems | 118/7 | 10/97 |
| **SA.514-3** | Interference criteria for command and data transmission systems operating in the Earth exploration-satellite and meteorological‑satellite services | 139/7141/7 | 10/97 |
| **SA.609-2** | Protection criteria for radiocommunication links for manned and unmanned near-Earth research satellites | N/A | 03/06 |
| **SA.1014-2** | Telecommunication requirements for manned and unmanned deep‑space research | N/A | 02/11 |
| **SA.1015-1** | Bandwidth requirements for deep-space research | 209/7 | 06/07 |
| **SA.1016** | Sharing considerations relating to deep-space research | 210/7 | 03/94 |
| **SA.1018** | Hypothetical reference system for systems comprising data relay satellites in the geostationary orbit and user spacecraft in low Earth‑orbits | 117/7 | 03/94 |
| **SA.1019** | Preferred frequency bands and transmission directions for data relay satellite systems | 118/7 | 03/94 |
| **SA.1020** | Hypothetical reference system for the Earth exploration-satellite and meteorological-satellite services | 138/7 | 03/94 |
| **SA.1021** | Methodology for determining performance objectives for systems in the Earth exploration-satellite and meteorological-satellite services | 138/7 | 03/94 |
| **SA.1022-1** | Methodology for determining interference criteria for systems in the Earth exploration-satellite and meteorological-satellite services | 138/7 | 10/99 |
| **SA.1023** | Methodology for determining sharing and coordination criteria for systems in the Earth exploration-satellite and meteorological‑satellite services | 138/7 | 03/94 |
| **SA.1024-1** | Necessary bandwidths and preferred frequency bands for data transmission from Earth exploration satellites (not including meteorological satellites) | 139/7 | 06/97 |
| **SA.1025-3** | Performance criteria for space-to-Earth data transmission systems operating in the Earth exploration-satellite and meteorological‑satellite services using satellites in low‑Earth orbit | 139/7141/7 | 10/99 |
| **SA.1026-4** | Aggregate interference criteria for space-to-Earth data transmission systems operating in the Earth exploration-satellite and meteorological-satellite services using satellites in low‑Earth orbit | 139/7141/7 | 02/09 |
| **SA.1027-4** | Sharing criteria for space-to-Earth data transmission systems in the Earth exploration-satellite and meteorological-satellite services using satellites in low‑Earth orbit | 139/7141/7 | 02/09 |
| **SA.1030** | Telecommunication requirements of satellite systems for geodesy and geodynamics | 143/7 | 03/94 |
| **SA.1154** | Provisions to protect the space research (SR), space operations (SO) and Earth exploration-satellite services (EESS) and to facilitate sharing with the mobile service in the 2 025-2 110 and 2 200-2 290 MHz bands | N/A | 10/95 |
| **SA.1155** | Protection criteria related to the operation of data relay satellite systems | N/A | 10/95 |
| **SA.1157-1** | Protection criteria for deep-space research | N/A | 03/06 |
| **SA.1158-3** | Feasibility in frequency sharing in the 1 670-1 710 MHz band between the meteorological-satellite service (space-to-Earth) and the mobile-satellite service (Earth-to-space) | 204/7 | 05/03 |
| **SA.1159-3** | Performance criteria for data dissemination, data collection and direct data readout systems in the Earth exploration-satellite service and meteorological-satellite services | 141/7 | 03/06 |
| **SA.1160-2** | Interference criteria for data dissemination and direct data readout systems in the Earth exploration-satellite and meteorological‑satellite services using satellites in the geostationary orbit | 141/7 | 10/99 |
| **SA.1161-1** | Sharing and coordination criteria for data dissemination and direct data readout systems in the Earth exploration-satellite and meteorological-satellite services using satellites in geostationary orbit | 141/7 | 10/99 |
| **SA.1162-2** | Performance criteria for service links in data collection and platform location systems in the Earth exploration- and meteorological-satellite services | 142/7 | 05/03 |
| **SA.1163-2** | Interference criteria for service links in data collection systems in the Earth exploration-satellite and meteorological-satellite services | 142/7 | 02/09PDRR 7B/121-3 |
| **SA.1164-2** | Sharing and coordination criteria for service links in data collection systems in the Earth exploration-satellite and meteorological-satellite services | 142/7 | 02/09PDRR 7B/121-2 |
| **SA.1258-1** | Sharing of the frequency band 401-403 MHz between the meteorological-satellite service, Earth exploration-satellite service and meteorological aids service | 217/7 | 10/99 |
| **SA.1273** | Power flux-density levels from the space research, space operation and Earth exploration-satellite services at the surface of the Earth required to protect the fixed service in the bands 2 025-2 110 MHz and 2 200-2 290 MHz | 118/7113/9 | 10/97 |
| **SA.1274** | Criteria for data relay satellite networks to facilitate sharing with systems in the fixed service in the bands 2 025-2 110 MHz and 2 200-2 290 MHz | 118/7113/9 | 10/97 |
| **SA.1275-3** | Orbital locations of data relay satellites to be protected from the emissions of fixed service systems operating in the band 2 200‑2 290 MHz | 118/7 | 02/11 |
| **SA.1276-3** | Orbital locations of data relay satellites to be protected from the emissions of fixed service systems operating in the band 25.25‑27.5 GHz | 118/7 | 02/11 |
| **SA.1277** | Sharing in the 8 025-8 400 MHz frequency band between the Earth exploration-satellite service and the fixed, fixed‑satellite, meteorological-satellite and mobile services in Regions 1, 2 and 3 | 214/7 | 10/97 |
| **SA.1344-1** | Preferred frequency bands and bandwidths for the transmission of space VLBI data within existing space research service (SRS) allocations | 203/7 | 02/09 |
| **SA.1345-1** | Methods for predicting radiation patterns of large antennas used for space research and radio astronomy | 127/7 | 01/10 |
| **SA.1396** | Protection criteria for the space research service in the 37‑38 and 40-40.5 GHz bands | 211/7 | 04/99 |
| **SA.1414** | Characteristics of data relay satellite systems | 117/7118/7135/7 | 10/99 |
| **SA.1415** | Sharing between inter-satellite service systems in the frequency band 25.25-27.5 GHz | 225/7 | 10/99 |
| **SA.1626** | Feasibility of sharing between the space research service (space‑to‑Earth) and the fixed and mobile services in the band 14.8‑15.35 GHz | N/A | 05/03 |
| **SA.1627** | Telecommunication requirements and characteristics of EESS and MetSat service systems for data collection and platform location | N/A | 02/09PDRR 7B/121-1 |
| **SA.1629** | Sharing between command links in the space research and space operation services with the fixed, mobile and mobile‑satellite services in the frequency band 257‑262 MHz | N/A | 05/03 |
| **SA.1742** | Technical and operational characteristics of interplanetary and deep-space systems operating in the space-to-Earth direction around 283 THz | 235/7 | 03/06 |
| **SA.1743** | Maximum allowable degradation to radiocommunication links of the space research and space operation services arising from interference from emissions and radiations from other radio sources | 129/7 | 03/06 |
| **SA.1745** | Use of the band 1 668.4-1 710 MHz by the meteorological aids service and meteorological-satellite service (space-to-Earth) |  | RS.1745 |
| **SA.1805** | Technical and operational characteristics of space-to-space telecommunication systems operating around 354 and 366 THz | 235/7 | 06/07 |
| **SA.1807** | System characteristics and interference criteria for meteorological satellite systems operating around 18 GHz | N/A | 06/07 |
| **SA.1810** | System design guidelines for Earth exploration-satellites operating in the band 8 025-8 400 MHz | 139/7 | 06/07 |
| **SA.1811** | Reference antenna patterns of large-aperture space research service earth stations to be used for compatibility analyses involving a large number of distributed interference entries in the bands 31.8‑32.3 GHz and 37.0-38.0 GHz | N/A | 06/07 |
| **SA.1862** | Guidelines for efficient use of the band 25.5-27.0 GHz by the Earth exploration‑satellite service (space-to-Earth) and space research service (space-to-Earth) | N/A | 01/10 |
| **SA.1863** | Radiocommunications used for emergency in manned space flight | 247/7 | 01/10 |
| **SA.1882** | Technical and operational characteristics of space research service (Earth-to-space) systems for use in the 22.55-23.15 GHz band | N/A | 02/11 |

APPENDIX 2

List of ITU-R RS Recommendations Currently In Force

| **Recommendations ITU-R** | **Title** | **Approved on** |
| --- | --- | --- |
| **RS.515-5** | Frequency bands and bandwidths used for satellite passive remote sensing   | 08/2012 |
| **RS.577-7** | Frequency bands and required bandwidths used for spaceborne active sensors operating in the Earth exploration-satellite (active) and space research (active) service | 02/2009 |
| **RS.1165-2** | Technical characteristics and performance criteria for systems in the meteorological aids service in the 403 MHz and 1 680 MHz band | 03/2006 |
| **RS.1166-4** | Performance and interference criteria for active spaceborne sensors | 02/2009 |
| **RS.1259** | Feasibility of sharing between spaceborne passive sensors and the fixed service from 50 to 60 GHz | 06/1997 |
| **RS.1260-1** | Feasibility of sharing between active spaceborne sensors and other services in the range 420-470 MHz | 05/2003 |
| **RS.1261** | Feasibility of sharing between spaceborne cloud radars and other services in the range of 92-95 GHz | 06/1997 |
| **RS.1263-1** | Interference criteria for meteorological aids operated in the 400.15‑406 MHz and 1 668.4-1 700 MHz bands | 01/2010 |
| **RS.1264-1** | Feasibility of frequency sharing between the meteorological aids service and the mobile-satellite service (Earth-to-space) in the 1 668.4‑1 700 MHz band | 05/2003 |
| **RS.1279** | Spectrum sharing between spaceborne passive sensors and inter-satellite links in the range 50.2-59.3 GHz | 10/1997 |
| **RS.1280** | Selection of active spaceborne sensor emission characteristics to mitigate the potential for interference to terrestrial radars operating in frequency bands 1‑10 GHz | 10/1997 |
| **RS.1281** | Protection of stations in the radiolocation service from emissions from active spaceborne sensors in the band 13.4-13.75 GHz | 10/1997 |
| **RS.1282** | Feasibility of sharing between wind profiler radars and active spaceborne sensors in the vicinity of 1 260 MHz | 10/1997 |
| **RS.1346** | Sharing between the meteorological aids service and medical implant communication systems (MICS) operating in the mobile service in the frequency band 401-406 MHz | 02/1998 |
| **RS.1347** | Feasibility of sharing between radionavigation-satellite service receivers and the Earth exploration-satellite (active) and space research (active) services in the 1 215-1 260 MHz band | 02/1998 |
| **RS.1416** | Sharing between spaceborne passive sensors and the inter-satellite service operating near 118 and 183 GHz | 10/1999 |
| **RS.1449** | Feasibility of sharing between the FSS (space-to-earth) and the Earth exploration-satellite (passive) and space research (passive) services in the band 18.6-18.8 GHz | 05/2000 |
| **RS.1624** | Sharing between the Earth exploration satellite (passive) and airborne altimeters in the aeronautical radionavigation service in the band 4 200‑4 400 MHz | 05/2003 |
| **RS.1628** | Feasibility of sharing in the band 35.5-36 GHz between the Earth exploration‑satellite service (active) and space research service (active), and other services allocated in this band | 05/2003 |
| **RS.1632** | Sharing in the band 5 250-5 350 MHz between the Earth exploration‑satellite service (active) and wireless access systems (including radio local area networks) in the mobile service | 06/2003 |
| **RS.1744** | Technical and operational characteristics of ground-based meteorological aids systems operating in the frequency range 272-750 THz | 03/2006 |
| **RS.1745** | Use of the band 1 668.4 1 710 MHz by the meteorological aids service and meteorological-satellite service (space-to-Earth) NOTE - Identical to Rec. ITU-R SA.1745 | 03/2006 |
| **RS.1749** | Mitigation technique to facilitate the use of the 1 215-1 300 MHz band by the Earth exploration-satellite service (active) and the space research service (active) | 03/2006 |
| **RS.1803** | Technical and operational characteristics for passive sensors in the Earth exploration-satellite (passive) service to facilitate sharing of the 10.6‑10.68 GHz and 36-37 GHz bands with the fixed and mobile services | 06/2007 |
| **RS.1804** | Technical and operational characteristics of Earth exploration-satellite service (EESS) systems operating above 3 000 GHz | 06/2007 |
| **RS.1813-1** | Reference antenna pattern for passive sensors operating in the Earth exploration-satellite service (passive) to be used in compatibility analyses in the frequency range 1.4-100 GHz | 02/2011 |
| **RS.1858** | Characterization and assessment of aggregate interference to the Earth exploration-satellite service (passive) sensor operations from multiple sources of man-made emissions | 01/2010 |
| **RS.1859** | Use of remote sensing systems for data collection to be used in the event of natural disasters and similar emergencies  | 01/2010 |
| **RS.1861** | Typical technical and operational characteristics of Earth exploration-satellite service (passive) systems using allocations between 1.4 and 275 GHz | 01/2010 |
| **RS.1881** | Protection criteria for arrival time difference receivers operating in the meteorological aids service in the frequency band 9-11.3 kHz | 02/2011 |
| **RS.1883** | Use of remote sensing systems in the study of climate change and the effects thereof   | 02/2011 |
| **RS.1884** | Methodology for determining terrestrial and space-to-Earth sharing and coordination criteria for meteorological aids in the 400.15-406 MHz and 1 668‑1 700 MHz bands | 02/2011 |
| **RS.2017** | Performance and interference criteria for satellite passive remote sensing  | 02/2012 |

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