

Working Group 3**Agenda Item 1.13*****Part A: Description***

To consider a possible upgrade of the allocation of the frequency band 14.8-15.35 GHz to the space research service, in accordance with Resolution 661 (WRC-19).

Resolution 661 (WRC-19) – Examination of a possible upgrade to primary status of the secondary allocation to the space research service in the frequency band 14.8-15.35 GHz.

Part B: Key Elements – the notables

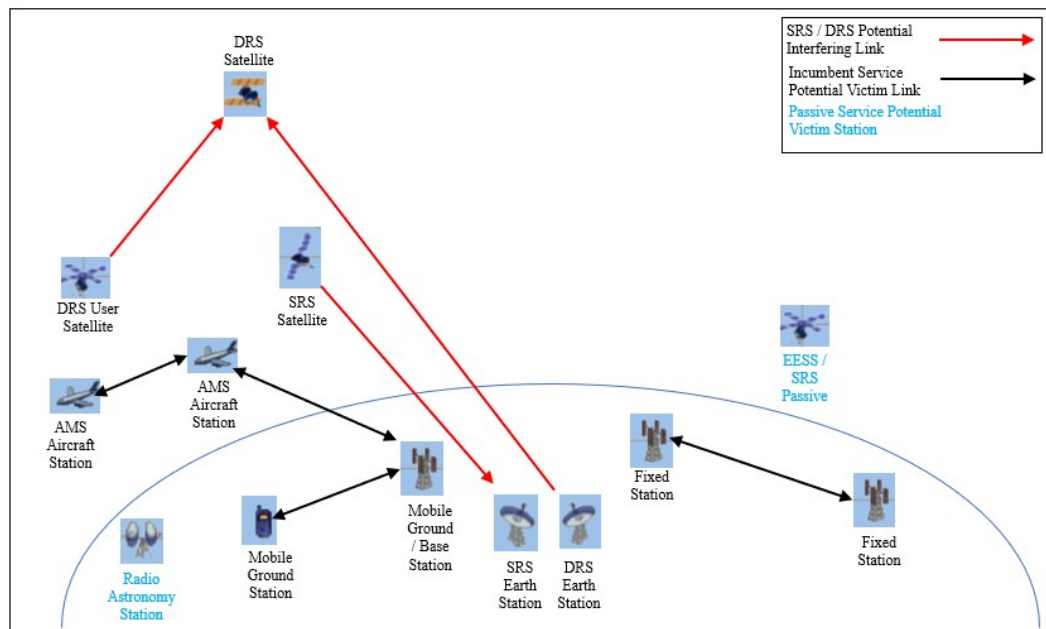
There is a need for broadband communication downlinks in the SRS for the purpose of transmitting future scientific data at high data transmission speeds, this will require to examine, on the basis of the results of studies by the ITU-R, the possibility of upgrading the secondary status of the allocation to the SRS to primary status in the frequency band 14.8-15.35 GHz, taking into account the studies referred to in resolves to invite the ITU Radiocommunication Sector below;

1. To investigate and identify all relevant scenarios that need to be considered in compatibility and sharing studies, taking into account the latest relevant ITU Radiocommunication Sector (ITU-R) Recommendations.
2. to conduct studies on spectrum to conduct and complete in time for WRC-23 sharing and compatibility studies in order to determine the feasibility of upgrading the SRS allocation to primary status in the frequency band 14.8-15.35 GHz, with a view to ensuring protection of the primary services.
3. To determine the technical and regulatory conditions according to the results of the studies

A number of space agencies are already considering the possibility of using this frequency band for next-generation SRS satellites. SRS operators must have stable regulatory certainty in order

to be able to ensure long-term operation of systems in this service of public interest, and that operating on the basis of a secondary allocation conflicts with this objective. Space programmes represent long-term effort and investment that span across decades, from the time when the programme is officially decided, through the development period and the launch phase to the time when the corresponding satellites are in operation.

Overview of the Architecture of a DRS satellite



Space Research Service (SRS) systems use the 14.8-15.35 GHz band is for the following applications:

1. Direct data downlinks from SRS missions (using a variety of orbit types) to earth stations located globally.
2. Earth-to-space feeder uplinks from Data Relay Satellite (DRS) system earth stations to GSO data relay system satellites.
3. Space-to-space inter-orbit links from the user spacecraft to the GSO DRS satellites

However, upgrading to primary status the allocation of the frequency band 14.8-15.35 GHz for the SRS should not impose constraints on existing systems of primary services in the frequency band 14.8-15.35 GHz and the allocation of passive services in the band 15.35 – 15.4 GHz should be taken into account for protection.

Part C: Current Status of Band(s) or Issue(s)

Part A RR article 5:

The frequency band 14.8-15.35 GHz is allocated on a primary basis to the fixed and mobile services, and on a secondary basis to the SRS without qualification as to the direction of transmission also The SRS (passive) and Earth exploration-satellite service (EESS) (passive) are allocated on a secondary basis in the The frequency band 15.20-15.35 GHz.

Regarding the allocations to services in adjacent bands, there is a possibility of out-of-band interference. In the 15.35-15.4 GHz upper adjacent band, there are primary allocations to the EEES (passive), SRS (passive), and radio astronomy services, also in the 14.75-14.8 GHz lower adjacent band there are primary allocations to the FS, MS, and the FSS in the Earth-to-space direction, The band also includes a secondary allocation to the SRS.

The frequency band 14.8-15.35 GHz is currently used by data relay satellites in inter-satellite links, which permits the establishment of communications with satellites in non-geostationary orbits (non-GSO), including manned flights in the SRS. The frequency band is also used by existing high-speed data links from non-GSO satellites within the SRS and is planned for use in future systems. These satellites are needed for the operation of telescopes and other passive instruments used for measuring such phenomena as the Earth's magnetosphere and solar flares.

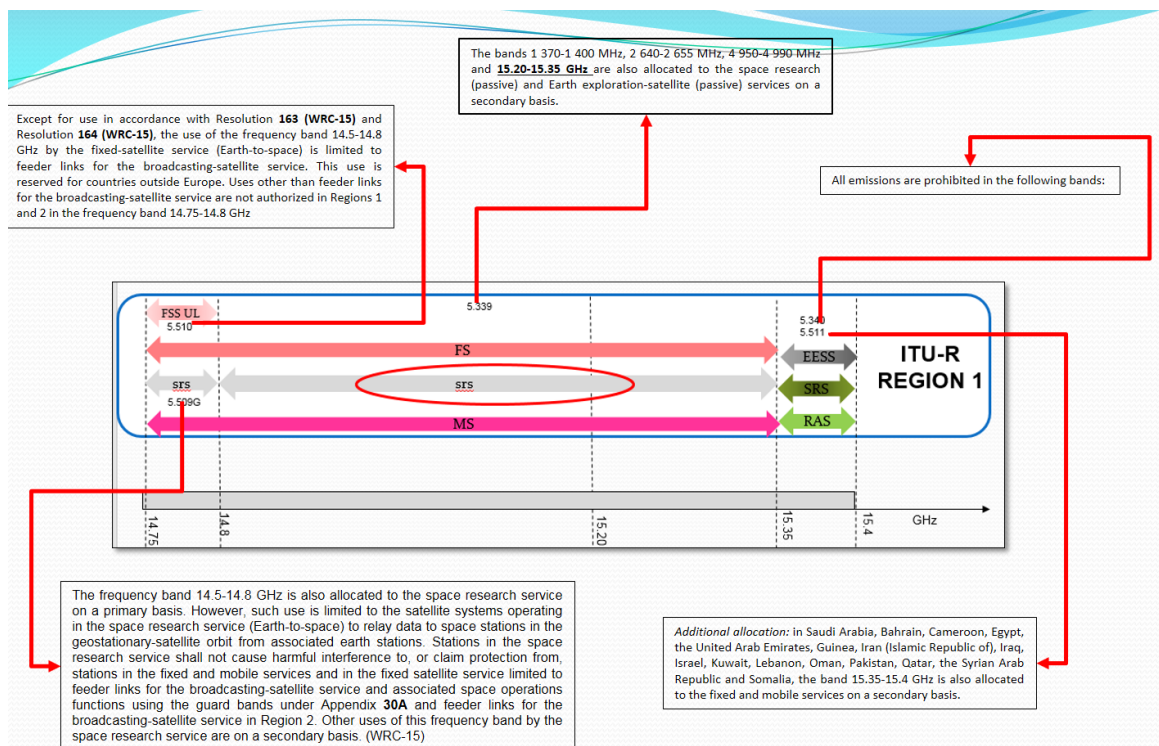


Figure 1: The current and proposed allocations in the band 14.8 - 15.35

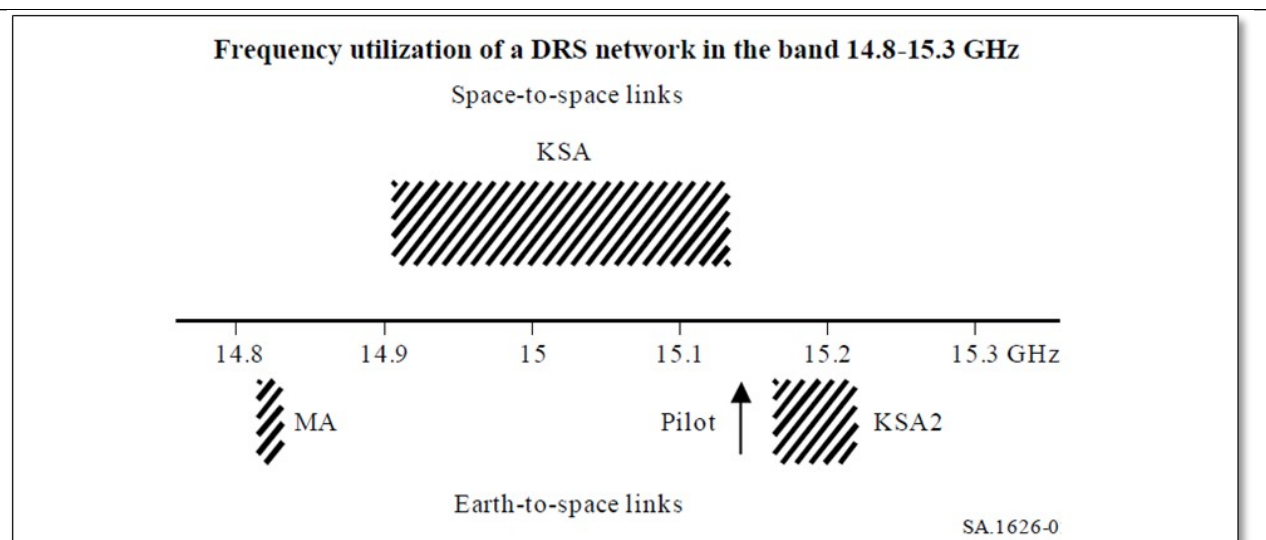


Figure 2: Frequency utilization of a DRS network in the band 14.8 – 15.3 GHz

Allocations in the band 14.8-15.35 GHz and adjacent bands

Allocation to services		
Region 1	Region 2	Region 3
14.75-14.8 FIXED FIXED-SATELLITE (Earth-to-space) 5.510 MOBILE Space research 5.509G		14.75-14.8 FIXED FIXED-SATELLITE (Earth-to-space) 5.509B 5.509C 5.509D 5.509E 5.509F 5.510 MOBILE Space research 5.509G
14.8-15.35	FIXED MOBILE Space research 5.339	
15.35-15.4	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.511	

Figure 3: Allocations in the band 14.8-15.35 and adjacent bands

PART B – Draft AfriSAP:

Many African countries use the frequency band 14.8-15.35 GHz for backhaul networks.

Considering that there is no sufficient fiber deployment in Africa, microwave links are critical for the predominantly mobile communication networks in the region. High speed wireless networks require sufficient spectrum for backhaul networks in areas that do not have fiber networks.

ITU Region 1 allocations and footnotes	Africa common allocation(s) and footnote	Typical Applications	Additional information
14.75-14.8 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.510 MOBILE Space research 5.509G	14.75-14.8 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.510 MOBILE Space research 5.509G	Fixed links - 15 GHz (14.5-15.35 GHz)	Channelling plan for 15 GHz band in accordance with ITU-R Rec. F.636 The band 14.5-14.8 GHz is part of the APP30A Plan (Feeder Links for BSS) for some countries. Refer to Annex C.
14.8-15.35 GHz FIXED MOBILE Space research 5.339	14.8-15.35 GHz FIXED MOBILE Space research 5.339	Fixed links - 15 GHz (14.5-15.35 GHz)	Channelling plan for 15 GHz band in accordance with ITU-R Rec. F.636
15.35-15.4 GHz EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.511	15.35-15.4 GHz EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.511[AddA4]	Radio Astronomy (for observation of non-thermal synchrotron sources and quasars)	

Figure 4: The African common allocation(s), footnotes and typical applications

Part D: Conclusion of the results of studies, or Summary of the ongoing study work

ITU-R WP 7B is developing two new documents to support the studies relating to the examination of a possible upgrade to primary status of the secondary allocation to the space research service in the frequency band 14.8-15.35 GHz.

1. Working Party (WP) 7B completed development of a new Recommendation **Recommendation ITU-R SA. [15 GHZ SRS CHARACTERISTICS]** documenting the expected typical characteristics of SRS systems operating in this band for each of the applications/links listed

above. This was forwarded to SG 7 for review at its subsequent meetings

2. Sharing and compatibility studies are currently in process in WP 7B with the interim results highlighted in the Working Document towards a Preliminary Draft New Report ITU-R SA.[15 GHz SRS SHARING] captured in the WP 7B Chairman's Report (see Doc: 7B/158 (Annex

2)

✓ Sharing studies between the FS and the SRS (s-E),(s-s) are complete;

✓ Studies between the LMS and the SRS (s-E) are largely complete;

✓ Sharing studies between the LMS and SRS DRS (s-s) are in process.

✓ Sharing studies between the AMS and SRS (s-E) and (s-s) are also in process

✓ Out-of-band compatibility studies for the radio astronomy service in the 15.35 – 15.4 GHz band have also been identified in the Report and are expected to be submitted to the April 2022 WP 7B meeting,

✓ No characteristics have been identified for EESS (passive) or SRS (passive) systems operating on a secondary basis in-band in the 15.2 – 15.35 GHz band or on a primary basis in the adjacent 15.35 – 15.4 GHz band,

✓ Development of CPM text was initiated at the September 2021 WP 7B meeting,

✓ Sharing studies and the CPM report are expected to be finalized at the September 2022 meeting

Part E: Options and Associated Implications

Upon completion of studies, by April -May 2022.

Part F: Proposed African Common View and/or Position

WG3 invites EACO members to:

Support the studies under this Agenda Item to upgrade the use of SRS in the band 14.8 – 15.35 GHz without imposing constraints on existing systems of primary allocation in-band and adjacent bands. Specifically ensuring the protection of Radio Astronomy, Earth Exploration and SRS passive in the band 15.35 – 15.4 GHz.

Part G: Recommendations and Way Forward

WG3 invites EACO administrations to:

1. **Follow-up** the studies under this agenda item to examine the possible upgrade of SRS services in the 14.8 – 15.35 GHz band.
2. **Ensure** that in terms No. 5.340, all emissions are prohibited in the 15.35 – 15.4 GHz to

ensure the protection of Radio Astronomy Services, Earth Exploration and SRS passive.

Part H: Other Regional Groups and international organizations preliminary positions or positions

RCC, CEPT, CITEL, ASMG, APT, ATU: as of the IR workshop on WRC-23 Preparation, 15-December 2021

Supports the upgrade of SRS allocation from secondary to primary while ensuring protection for in-band FS/MS and passive services in adjacent bands.