

# CBRS RELEASE 2 STANDARDS

**Andrew Clegg**

**Chair**

**Spectrum Sharing Committee Working Group 1**

# Release 2 Functional and Operational Requirements

- Release 1 requirements are in WInnForum Technical Specification [TS-0112](#)
- Spectrum Access Systems (SASs) were certified by FCC against Release 1 standards
- Release 2 requirements are contained in [TS-1001](#)
- Release 2 represents the innovation and evolution of SAS control of shared spectrum in CBRS
- **The Release 2 TS is designed to be easily extensible**
  - All Release 2 features (except for capability exchange) are implemented as separate Annexes to the document, and can therefore be added and balloted separately from the remainder of the contents
- **Some applications of some Release 2 features could impact protection of protected entities**
  - Regulatory certification of such applications of such features is TBD
  - Many applications of Release 2 features do not have regulatory impacts
- **The following is a high-level overview of Release 2 features that have been adopted in the current version of Release 2 (v 1.2.0)**

# Capability Exchange (required)

- **Capability exchange allows SASs and CBSDs to understand which (if any) Release 2 features are mutually supported**
- **Currently, capability exchange is the only required feature under Release 2**
- **If any Release 2 feature (including capability exchange itself) is not understood by either the SAS or the CBSD, then SAS management of the CBSD defaults to Release 1**
  - In any geographic area with a mix of Release 1 and Release 2 SASs, the SAS operators shall cooperate as needed, with the default being Release 1
  - “[A]ny Release 2 entity must support backward compatibility to Release 1 entities using SAS-CBSD and SAS-SAS protocols, and any feature requiring coordination among SASs.”

# Grouping

- **Many Release 2 features are related to support for “groups” of CBSDs**
  - Groups allow multiple CBSDs to identify themselves to a SAS as being as being related (or grouped) with other CBSDs to enable implementation of certain use cases
  - The SAS can use grouping information to handle those CBSDs belonging to a particular group in a coordinated manner when needed
- **Release 2 Feature: Enhanced CBSD Group Handling**
  - This Release 2 feature implements the necessary hooks to allow CBSDs to identify themselves to a SAS as a member of one or more groups
- **Release 2 Feature: Principal-Subordinate Single Frequency Group (SFG)**
  - Supports one or more instances of CBSDs that are connected as BTS-CBSD/CPE-CBSD pairs (for example, a central hub CBSD providing Internet backhaul to one or more CPE CBSDs in a rural broadband deployment)
  - The SAS attempts to move all members of the group to the same frequency when a frequency change is needed, although it’s possible that not all CPE-CBSDs may be accommodated
- **Release 2 Feature: Interdependent Single Frequency Group**
  - An interdependent SFG is a set of CBSDs that are required by their hardware to operate on a single frequency
  - If all members cannot be accommodated, then no members receive a grant
- **Release 2 Feature: Separable Frequency Group**
  - Similar to Interdependent Frequency Group, but individual members can be denied grants
- **A member of a group is not afforded any special treatment by SASs in calculation of protection of protected entities**

# Enhanced Antenna Patterns

- **Enhanced antenna patterns refers to the SAS using both azimuth and elevation in its determination of antenna gain for the purpose of co-existence, incumbent protection, etc.**
  - Note: Many entities incorrectly refer to such patterns as “3D antenna patterns.” The proper term is 2D, since *two* dimensions are taken into account (azimuth and elevation)
- **Release 2 provides methods for estimating the antenna gain at an arbitrary azimuth and elevation when only the principal-plane horizontal and vertical antenna patterns are available**
  - The algorithm also provides for estimation when a nominal mechanical downtilt is used. Equations to support large mechanical downtilt scenarios are for future study.
- **Release 2 provides methods for interpolating antenna gain at an arbitrary azimuth and elevation when a gridded 2D pattern is available to the SAS, and the desired azimuth and elevation do not correspond to specific data points in the provided pattern**
- **Enhanced antenna pattern implementation is currently being reviewed by FCC. Changes may be forthcoming.**

# CPE-CBSD Indicator

- **Enables a CBSD to identify itself to a SAS as a CPE-CBSD**
- **The CBSD must meet the Release 1 requirements of a CPE-CBSD**
  - A CPE-CBSD may “bootstrap” its registration through another CBSD
- **A CPE-CBSD is not afforded any special treatment by SASs in calculation of protection of protected entities**

# Passive DAS

- **Release 2 supports a passive DAS architecture in which a central radio unit provides signals to multiple transmission points via splitters, etc.**
  - Each TP is considered an individual CBSD
- **Members of the passive DAS chain declare their association to the DAS using the Release 2 Enhanced Group Handling feature**
- **All CBSDs in a passive DAS group must be professionally installed regardless of Category**
- **All members of a passive DAS group must be granted the same frequency(s)**
- **If one member of a passive DAS is not authorized to transmit, the other CBSDs must cease transmission within 60 seconds**

# Grant Update (in progress)

- **Provide ability to update certain parameters of a grant without requesting a new grant**
  - Enables SASs to replace a CBSD's existing grant by a new grant with the same frequency range without a grant relinquishment process.
  - An example use case is reduction of EIRP due to need to protect incumbent from aggregate interference.



# More Info on WinnForum Release 2 Standards

**Please visit:**

<https://cbrs.wirelessinnovation.org/enhancements-to-baseline-specifications>

**Thank you!**