



CSIRO Response on
“Radiocommunications Bill 2017: a platform for the future, May 2017”
and
Exposure Draft of Radiocommunications Bill 2017
July 2017

Introduction

CSIRO welcomes this opportunity to comment on the information paper and exposure draft in relation to a new Radiocommunications Bill.

CSIRO Astronomy and Space Science builds and operates national facilities for radio astronomy and for the space research service, which are recognised, for the purposes of spectrum management, as radiocommunication services by the ITU and the Radiocommunications Act 1992. A number of other business units of CSIRO use radio equipment, under apparatus or class licences, for research measurements such as meteorological radar, and for day-to-day operation of facilities including safety of staff. For the most part, this submission focuses on the radio astronomy and space research activities; other licences held by CSIRO are the same as those used in the private sector and do not need special consideration.

In particular, the radio astronomy and space research facilities operated by CSIRO represent substantial national and international investment and involve international commitments and obligations in spectrum management. Research in support of technology for these services has led to new technologies such as WiFi and improved antenna designs for the wider radiocommunications industry. We therefore have an interest not only in protecting our existing facilities but in facilitating the introduction of technologies which are more efficient in their use of spectrum. We appreciate the need to manage spectrum efficiently, as well as the challenge in finding the right balance between flexibility and certainty for incumbents.

Spectrum management issues of concern for radio astronomy

Recognition of radio astronomy as a radio service

Radio astronomy, although formally recognised as a radiocommunication service in spectrum management both internationally and nationally, has unusual requirements which are not always obvious to the wider spectrum management community. As a passive (non-transmitting) service with extremely sensitive receivers, operating at frequencies determined by natural processes, radio astronomy is particularly vulnerable to interference from active (transmitting) radio systems.

The exposure draft of the Radiocommunications Bill (using text based on the current Radiocommunications Act) identifies radio astronomy in somewhat confusing terms with the potential for misinterpretation. For example, (with emphasis added)

215 Radio transmissions for the purpose of measurement

(1) Without limiting its effect apart from this subsection, this Act also applies in relation to:

(a) a measurement **transmission** made in the course of, or in relation to:

...

(vi) the **making of an astronomical** or meteorological **observation**; or

...

(2) Without limiting its effect apart from this subsection, this Act also applies in relation to:

(a) a measurement **transmitter** used in the course of, or in relation to:

...

(vi) the **making of an astronomical or meteorological observation**; ...

and

216 Astronomical and meteorological observations

Without limiting its effect apart from this subsection, this Act also applies to a **radio emission in connection with making an astronomical or meteorological observation** in the same way as it applies to a radiocommunication.

Radio astronomy is certainly “the making of an astronomical observation” but radio telescopes are not transmitters and do not make transmissions (or “emissions” which is synonymous). The “transmitters” in radio astronomy are distant natural objects in space, such as stars or gas clouds. The emissions are natural by-products of the chemical reactions in these objects, which will occur regardless of any terrestrial legislation.

The wording “measurement transmission” (or “transmitter”) in relation to the making of astronomical observations” is therefore an inaccurate way of conveying the intention that radio astronomy receivers should be protected in the Bill as radiocommunication systems are protected. However, the text in the Bill does not make any reference to radio astronomy receivers. Protection of such emissions (which is unnecessary) does not necessarily equate to protection of the radio telescope receivers (which is necessary).

CSIRO notes that the ITU Radio Regulations expresses the concept more clearly in 4.6: “For the purpose of resolving cases of harmful interference, the radio astronomy service shall be treated as a radiocommunication service.”

Meteorology, which is mentioned in close association with radio astronomy in the sections above, is more complicated. Some meteorological observations are, like radio astronomy, passive (receive only) while others are active (both transmitting and receiving). It may therefore be appropriate to replace “astronomical and meteorological observations” in section 214 and 216 with “active meteorological observations”, and provide a new section(s) for “radio astronomy and passive meteorological observations.”

CASS requests that the description of radio astronomy observations be clearer in identifying that the radio astronomy service is considered a radiocommunications service for the purposes of the Bill. We propose that the references to “astronomical observations” be moved from sections 215 and 216 to new sections which address “measurement receivers” and “measurement reception” in relation to radio astronomy and passive meteorological observations. The wording of Radio Regulations 4.6 would serve as a useful model.

The Exposure Draft Section 3 “Object” includes at 3 (a) (ii) “provision of spectrum for defence, public and community purposes.” Science services, including radio astronomy, space tracking, and meteorology, are important users of spectrum but may not be immediately recognised as “public or community services”.

CASS requests that the current object of “provision of spectrum for defence, public and community purposes” be expanded to include, as a minimum, “science services”

Continuity of protection for the radio astronomy service in Australia

Radio astronomy is currently protected in Australia through a number of mechanisms. One is the allocation, in the Australian Radiofrequency Spectrum Plan, of particular frequency bands related to specific chemical signatures. These allocations are based on the international framework in the ITU Radio Regulations and, while important, do not cover the full range of frequencies used for radio astronomy.

Further protection for radio telescopes in New South Wales, South Australia, Tasmania and the ACT is provided in the ACMA Radiocommunications Assignment and Licensing Instruction (RALI) MS 31 (2006).

Radio telescopes (including the SKA) at the Murchison Radio astronomy Observatory (MRO) in Western Australia are protected by ACMA Radiocommunications Assignment and Licensing Instruction (RALI) MS 32 (2014), the Radiocommunications (Mid-West Radio Quiet Zone) Frequency Band Plan 2011 as well as

conditions on certain class licences and spectrum licences. These are essential not only for protection of current telescopes on the MRO, but to Australia's role in hosting the international SKA project.

It is vital that the protections currently afforded to radio astronomy continue under the new Radiocommunications Bill without interruption or revision. In relation to the MRO, this is particularly important so that Australia can meet its commitments to the international community and gain the full benefit of the investment in SKA scientific infrastructure. In practice, this requires not only that the ACMA continues to have the authority to prepare frequency band plans (section 24), the authority to place conditions on transmitter licences (section 51), and the authority to place conditions on the spectrum authorisations. It is not clear that this last point is covered in the Draft Bill. It will also require that the technical limits (frequency, geographic, power spectral density, etc.) of the RALI MS 31 and MS 32 are maintained in appropriate regulatory instruments.

The ACMA protection measures described above were subject to extensive public consultation in the past five years, and it would be impractical and inconsistent with our international commitments to require another consultation process in this transition.

CASS requests that the regulation and policy protecting radio astronomy, with the current technical limits, be maintained in the transition to the new spectrum management regime. CASS further requests that these measures be transferred to equivalent instruments as an administrative process, rather than being treated as new regulation or policy.

Policy guidance

Policy guidance needs to continue to be provided to the ACMA on radio astronomy, particularly in the ARQZWA, reflecting Australia's national and international commitments to protect radio astronomy. It is understood that, within the framework of the new Bill, policy guidance may be provided through Ministerial Policy Statements. CSIRO would welcome early visibility of this guidance.

CASS requests that relevant Policy Statements are available during the transitional period so that CSIRO and the ACMA can make informed decisions about any changes which might affect radio astronomy.

Spectrum management issues of concern for the space research service

Many of the issues discussed above are also of concern to the space research service.

Continuity of protection for the SRS in Australia

The SRS is currently protected in Australia through a number of mechanisms. One is the allocation, in the Australian Radiofrequency Spectrum Plan, of particular frequency bands to the SRS for communications with space vehicles for scientific or technological research. These allocations are based on the international framework in the ITU Radio Regulations and may include additional Australian footnotes. Additional protection procedures for SRS facilities operating in Australia are specified in several ACMA documents including the Television Outside Broadcast (1980-2110 MHz and 2170-2300 MHz) Frequency Band Plan 2012 and in ACMA RALI FX21 (2015), RALI MS33 (2015), RALI MS37 (2013), RALI MS38 (2015) and RALI MS43 (2016). Various class licences also contain conditions related to the protection of SRS facilities.

CASS is responsible for the management and operation of the Canberra Deep Space Communication Complex (CDSCC) under a government to government treaty between Australia and the USA which specifies that the "Australian Government shall take all reasonable steps to protect the radio receiving facilities of the stations from harmful radio frequency interference from sources outside the stations". It is vital that protections currently afforded to the SRS continue under the new framework. CDSCC is an integral part of NASA's Deep Space Network (DSN) providing invaluable contributions to international space exploration including tracking of dozens of international Near-Earth and Deep-Space missions representing spacecraft assets in excess of \$35 billion dollars. SRS facilities in Australia have also been critical to safety of life issues related to manned space missions and this is expected to increase in future with multiple plans for international manned space missions.

CASS requests that the regulation and policy protecting SRS, with the current technical limits, be maintained in the transition to the new spectrum management regime. CASS further requests that these measures be transferred to equivalent instruments as an administrative process, rather than being treated as new regulation or policy.

Conclusion

CSIRO values the opportunity to provide input to the consultation process and the development of the revised Bill. We thank the Department and the ACMA for their hard work to date and look forward to continued opportunities for consultation and feedback during the detailed development of the new Bill and associated documents.

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