

# **Submission to the ACMA CB Radio Class Licence 2025 Review**

*Feedback on the Use of Telemetry and Telecommand Channels — Support for Narrowbanding and Inclusion of Audio-Tone/CW Beacons for Radiodetermination*

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By David Hall



To the ACMA Consultation Team,

Thank you for the opportunity to provide feedback on the proposed changes to CB radio arrangements, particularly the future of telemetry and telecommand (TTC) channels on UHF CB.

This submission outlines how these channels are currently used by the community, supports the proposed transition to narrowband FM, and recommends the explicit inclusion of audio-tone/CW beacons for radiodetermination as a permissible and valuable new use case.

## **How Telemetry and Telecommand Channels Are Currently Used**

The CB telemetry and telecommand channels (CH22 and CH23: 476.950 MHz and 476.975 MHz) are designed for short-range, low-data-rate applications, including:

- Industrial and agricultural remote switch control (e.g. pumps, gates, irrigation)
- Security systems or alarm notifications

These applications often use low power and relatively short transmissions and vary widely in their technical implementation. However, current ambiguity around permitted formats and extremely limiting duty cycles or signal types limits innovation and deployment of modern technology.

Furthermore, devices using channel 22 and 23 have been replaced over time by devices using frequencies such as those covered in the LIPD Class Licence (433MHz, 915MHz, 2.4GHz) for compatibility with Bluetooth standards and more suitable duty cycles for legal operation.

## **How Narrowbanding Can Improve Utility and Spectrum Efficiency**

I support the proposal to narrowband the TTC channels (from 25 kHz to 12.5 kHz), as it offers significant technical and regulatory benefits:

- Potential to safely and significantly increase permitted duty cycles and power levels, given reduced spectral impact
- Supports more modern, digital or analog narrowband equipment
- Open the door to additional use cases while preserving existing ones
- Align Australia with other countries and their power limits for products that implement radiodetermination equipment.

This reform creates an ideal opportunity to expand permitted use types, provided they meet low-interference criteria.

## Proposal: Include Audio-Tone Radio Beacons for Radiodetermination

With the efficiency gains of narrowbanding, I propose the ACMA explicitly include short-duration, low-power audio-tone or CW radio beacons under the definition of telemetry and telecommand use specifically for radiodetermination (e.g., direction finding, location marking).

### Key Features:

- Signal Type: FM modulated audio tone or on/off keyed carrier (CW), for radiodetermination, not messaging
- Use Cases:
  - Direction-finding (“fox hunting”) training
  - Equipment/asset location
  - Search and rescue simulation
- **Transmission Pattern:** Short tone bursts (e.g., 300–500 ms) at configurable intervals (2–15 seconds typical)
- **Modulation Bandwidth:** ≤8 kHz (fits comfortably within 12.5 kHz)
- **Proposed Power Limit:** ≤500 mW EIRP to account for high attenuation conditions (e.g., metal enclosures, vegetation, rugged terrain)
- **Duty Cycle:** Can remain low (<5%) to ensure compatibility with shared use

This type of signal is widely used in amateur radio and civil sectors internationally, and aligns with telemetry in function: it's a machine-originated, non-voice, low-rate signal conveying the presence or location of an object in space.

## Benefits of Explicit Inclusion

Adding radiodetermination beacons under TTC would:

- Promote community innovation and experimentation with direction finding without the need for an amateur radio licence
- Enable educational and training activities (SAR, navigation)
- Support public safety and bush-use equipment marking
- Align Australia with international best practice (e.g., ETSI, FCC low-power beacon provisions)
- Fully leverage the new spectral headroom created by narrowbanding

Critically, this can be done without risk of congestion, provided channels are clearly allocated (e.g., TTC channels only, with informal etiquette).

## Justification for Power and Duty Cycle Increases

In support of the proposal to formally allow radiodetermination beacons on the narrowband telemetry and telecommand channels, I recommend the ACMA also consider:

- Raising the allowable power output to 500mW EIRP
- Allowing a modest increase in duty cycle, where appropriate (e.g., up to 10%)

Radiodetermination beacons are rarely used in ideal RF conditions. Unlike voice communications between handheld radios in open air, these beacons are often:

- Mounted inside vehicles, heavy machinery, containers, or equipment cases
- Buried partially or enclosed in plastic or metal enclosures
- Used in urban environments with dense multipath and building attenuation
- Operated in remote bushland, gullies, or mountainous terrain
- Located under canopy, debris, or inside radio-unfriendly enclosures

These conditions can attenuate signal strength by **20–40 dB or more**, making even modest transmission distances unachievable without additional power.

In effect, a 500mW beacon in an obstructed environment may emit less real-world radiated power to the outside world than a 50mW beacon in open air.

## Why UHF CB is Preferred over 915 MHz or 2.4 GHz

While radiodetermination beacons do exist in 915 MHz and 2.4 GHz ISM bands, there are significant limitations that make UHF CB a uniquely suitable platform:

Band	Limitation
915 MHz	Low power limit, high attenuation/poor signal propagation in challenging environments; high noise floor
2.4 GHz	Very poor building/tree penetration; limited outdoor range; high noise floor
UHF CB	Better wall/foilage penetration; coordinated public band; lower frequency is better for signal propagation in challenging environments.

## Differentiated Power Rules

Computer controlled transmissions allow for unique rules. I suggest the ACMA consider differentiated power rules for radiodetermination beacons based on:

Context	Suggested EIRP Limit	Notes
Exposed/open-air installations	$\leq 100$ mW	Less attenuation; smaller safety margin needed; in line with international standards
Enclosed/attenuated use cases	$\leq 500$ mW	Needed to overcome RF loss; real-world emissions much lower; accounts for unique/vast Australian terrain
Duty Cycle limitations on high power settings		Limit 500mW output to 0.1% duty cycle while allowing a higher 10% duty cycle for 100mW power settings to limit potential interference

## Recommendation

I recommend that the CB Class Licence 2025:

- Maintain the existing TTC allocations (CH22 and CH23)
- Narrowband these channels to 12.5 kHz
- Explicitly permit audio-tone or CW beacons for radiodetermination under TTC use
- Increase maximum duty cycle and EIRP to  $< 500$  mW on these channels to support practical use in attenuated environments (significantly lower than that allowed for voice)

Clarify that permitted TTC uses may include:

*“Short-duration tone or CW beacon transmissions used for radiodetermination, direction finding, or location marking.”*

## Conclusion

ACMA's proposed changes to CB telemetry channels present a timely opportunity to modernise, clarify, and extend their practical utility. Including tone-based beacons under TTC is a safe, efficient, and globally consistent step that will serve community, and recreational purposes without compromising shared spectrum integrity.

Thank you for your consideration.  
David — A CB radio enthusiast