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4 Feb 2021

Review of non-assigned amateur and outpost regulatory arrangements – consultation 01/2021

Thank you for the opportunity to comment on this review.

With respect to amateur licences, I agree in principle with the ACMA's proposal to implement *Option C: transition to class licensing arrangements for amateur stations operating on common frequencies (non-assigned amateur stations)*.

I propose a number of minor changes to the draft amateur class licence relating to station identification and beacons and repeaters. These proposed changes are detailed below.

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Station identification

Recommendation:

Station identification requirements should be relaxed to require identification at the beginning of a **series** of transmissions (rather than each transmission), and at least once every 10 minutes during a series of transmissions.

Justification:

Section 8 of the draft class licence requires that the station callsign be transmitted at the beginning of **each** transmission, at the end of **each** transmission; and if the transmission lasts more than 10 minutes, at least once every 10 minutes during the transmission.

This requirement is unwieldy for voice communication, and impossible to meet for any known packet-based digital protocol.

While some amateur-specific digital protocols such as AX.25[1] (one of the most popular amateur protocols) provide for callsigns to be encoded in the frame header ("at the beginning of each transmission"), no known packet-based protocols also provides for callsigns to also be encoded at the end of the frame ("at the end of each transmission.") An AX.25 transmission consisting of a single frame could not comply with the identification requirements of the draft class licence.

Amateurs also routinely use digital modes which were originally developed for non-amateur uses. Well known examples of these modes include IEEE 802.11a/b/g (wifi), APCO Project 25 and ETSI DMR, as well as emerging IoT technologies such as 802.15.4. Unlike amateur-specific modes such as AX.25, these modes do not provide for callsigns to be encoded at the protocol layers, as these modes specify their own addressing mechanisms.

When using these modes, amateurs typically identify their stations by transmitting an application-layer packet containing the station's callsign at least once every ten minutes while the station is involved in transmitting traffic. This method is easy to implement, it has a negligible cost in terms of energy consumption and channel capacity, and is widely accepted (or at least tolerated) by regulatory authorities overseas. While a good faith effort to identify this way would probably not invite enforcement action from the ACMA, it would nonetheless not be compliant with the wording of the draft class licence.

Relaxing the requirement to transmit the station callsign with every transmission also allows amateur operators to employ more efficient network-layer protocols than would otherwise be possible if callsigns were to be included in each transmission.

An example of such a protocol is the Cubesat Space Protocol[2] (CSP), a network protocol used aboard a number of amateur radio cubesat satellites. CSP provides most of the essential services of TCP/IP, while employing an efficient 32-bit long protocol header that provides source, destination, application identification and priority information in less space than that required for an amateur callsign alone.

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[1] http://www.ax25.net/AX25.2.2-Jul%2098-2.pdf
[2] https://en.wikipedia.org/wiki/Cubesat_Space_Protocol

Repeaters and beacons

Recommendation:

Temporary repeaters and beacons should be explicitly permitted under the amateur class licence.

Justification:

Amateur repeater and beacon stations (whether permanently sited services or temporary stations) are currently authorised under their own apparatus licences. This enables effective management of interference, particularly at shared communications sites. For permanent beacons and repeaters with fixed frequency assignments, this requirement should be retained as the ACMA has proposed.

However, temporary and portable beacons and repeaters, which do not have dedicated frequency assignments and which do not operate from fixed locations for extended periods should be explicitly permitted under the class licence.

Authorising temporary beacons and repeaters under the class licence would save the ACMA some administrative overhead in maintaining licences for existing portable amateur repeaters. It would also clarify the legal status of digital voice hotspots, cross-band mobile repeaters and stations operating HF beacon modes, all of which are generally permitted overseas and are in common use within Australia.

With the growth in popularity of weak signal HF digital modes such as WSPR[3], home stations presently operate as *de facto* beacon stations; these modes have limited practical use beyond identifying propagation conditions. Users of digital voice "hotspots" effectively operate ad-hoc digital voice repeaters from their kitchen tables and hotel rooms. The current legal status of these stations (particularly full-duplex hotspots) in Australia is unclear.

Most popular amateur VHF/UHF mobile transceivers also provide a cross-band repeat function, which is useful mainly for allowing an amateur operator to communicate with a distant station from a low powered portable radio, via the more powerful transceiver in their vehicle. The use of cross-band repeaters appears to presently be illegal in Australia except under a repeater apparatus licence (at least if operated from a fixed location; the mobile situation is unclear), but there is no apparent practical reason for this to be the case. Cross-band repeat operations tend to occur on an intermittent and itinerant basis, and they present no greater risk of interference than ordinary mobile simplex operations.

The ACMA routinely issues area-wide two-frequency (repeater) land mobile apparatus licences on a "no interference, no protection" basis, with additional conditions designed to protect permanently sited services from interference. These conditions include prohibiting operation within a certain distance of existing licenced services (particularly VHF high band and 400MHz services), and restricting the amount of time that an area-wide service may continuously operate from any particular location. Similar conditions could help mitigate the risk of interference from temporary amateur repeaters and beacons.

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[3] https://physics.princeton.edu/pulsar/k1jt/wspr.html