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AMTA Submission

Australian Communications & Media Authority

Discussion Paper—Automatic Frequency Coordination-assisted spectrum sharing in the 6 GHz band



About AMTA

The Australian Mobile Telecommunications Association (AMTA) is the peak industry body representing Australia's mobile telecommunications industry. Its mission is to promote an environmentally, socially and economically responsible, successful and sustainable mobile telecommunications industry in Australia, with members including the mobile network operators and service providers, handset manufacturers, network equipment suppliers, retail outlets and other suppliers to the industry. For more details about AMTA, see <http://www.amta.org.au>.



Executive Summary

AMTA thanks the ACMA for its Discussion Paper “*Automatic Frequency Coordination-assisted spectrum sharing in the 6 GHz band*”, and appreciates the opportunity to provide its views in response. The discussion paper seeks industry’s views on the introduction of “Standard Power” (SP) Radio Local Area Network (RLAN) outdoor devices in 5925-6585 MHz.

AMTA concerns: The following are the primary concerns for AMTA:

1. In-band interference (both co- and adjacent-channel) to microwave fixed point to point (P-P) links in the 6 and 6.7 GHz bands.
2. Adjacent-band interference to Upper 6 GHz (“U6”) IMT networks inside the defined population areas.
3. In-band interference from U6 SP RLAN devices outside of the defined population areas, for which the ACMA flags “*AFC Possible Consideration in non-WBB areas*” on pg 11 of the discussion paper.
4. Degradation of WiFi services overall due to higher-power operation of SP RLAN devices (compared to “Very Low Power” (VLP) and “Low Power Indoor” (LPI) devices).

Limitations on provisions for RLAN: To address the concerns listed in #2 and #3 above, AMTA’s position is that:

- AMTA does not support the introduction of SP RLAN (including via AFC) in 6425-6585 MHz. Keeping SP RLAN out of this range effectively establishes a guard band of (at least) 160 MHz between SP RLAN and IMT.
- AMTA does not support arrangements for RLAN devices operating above 6585 MHz in Australia (SP or otherwise).

SP RLAN in L6 must be AFC-enabled: The above points clearly set out AMTA’s position on frequencies above 6425 MHz. With respect to the “Lower 6 GHz band” (L6), 5925-6425 MHz, AMTA has some concerns with respect to the potential risks associated with the introduction of SP RLAN devices in L6—as per points #1 through #3 above—and urges the ACMA to exercise caution. However, if SP RLAN devices are indeed to be authorised in L6, then adequate guardrails must be put in place. We consider that a well-functioning AFC system could serve as such a safeguard—in combination with the appropriate coordination criteria and levels of protection for incumbent services—if the system works as intended in theory and the practical implementation challenges are duly addressed. At this stage, our position is that any SP RLAN operation in the 6 GHz band **must** use and comply with an AFC system.

Licensing & record-keeping: AMTA considers apparatus licensing arrangements to be unsuitable for the deployment and operation of SP RLAN. As VLP/LPI devices are class licenced, it follows that the class licencing framework is more aligned for SP RLAN than apparatus licences or AWLs. AMTA considers mandatory record-keeping in a centralised database—that is either publicly-available or (at a minimum) available to fixed link licensees, to assist with interference tracing—is essential. For now we leave it to the ACMA to consider whether adjustments to existing licence types or creation of new licence types are required.

Protected segment for VLP/LPI: AMTA is concerned that introduction of SP RLAN devices—operating at power levels up to 12 dB higher than LPI devices and up to 22 dB higher than VLP devices—could lead to a degradation in the performance of WiFi services overall, particularly in congestion scenarios (i.e. where there are many WiFi networks within a particular location). As such, we believe that AFC-enabled SP RLAN devices should be contained within a specified segment at the bottom of L6. In other words, under this requested segmentation, AFC-enabled SP RLAN devices can operate in the range 5925 MHz to $f_{boundary}$ MHz, while the range $f_{boundary}$ MHz to 6585 MHz is reserved for VLP/LPI devices. $f_{boundary}$ must be below 6425 MHz. Although we don't have a firm view of exactly where this should be for the time being, as an example, a value of $f_{boundary}$ like 6265 MHz would provide 320 MHz for each use case.

Other requirements: Furthermore, AMTA stresses that:

- any approved AFC system must include adequate coordination requirements to ensure protection of licensed microwave fixed link receivers;
- practical implementation challenges must be addressed (see relevant section in the body of this document); and
- any tests or trials seeking to demonstrate the viability of AFC in general, or any particular AFC system, needs to be carried out in conjunction with the licensee of the existing microwave link(s) that would be interfered with by the SP RLAN device (were it not for correct functioning of the AFC system).

AMTA support for AFC strictly limited to L6: Lastly, we stress that the AMTA views stated in response are strictly in the context of AFC-enabled SP RLAN devices *in the Lower 6 GHz band only*, and that our comments should in no way be taken to indicate support for such systems in any other band or context.

AMTA views on AFC in the 6 GHz range

Coordination requirements

AMTA stresses that any approved AFC system must include adequate coordination requirements to ensure protection of microwave fixed link receivers. The ACMA is seeking views on this from industry (see Q8 of the discussion paper). We believe that the coordination requirements should be set by the ACMA. These could, for example, be conservative (e.g. based on an I/N-based threshold), or aim to facilitate greater use of the spectrum at the cost of complexity (e.g. based on C/I-based threshold, e.g. like the coordination procedures of RALI FX 3). These need careful consideration, and should be the subject of a future consultation process (either publicly or with a targeted group like a Technical Liaison Group).

To ensure that these coordination requirements are adequate, it may be necessary for the ACMA to implement an approval/accreditation process for AFC systems, so that only approved AFC systems can be used by devices operating in Australia. However, at this time, we don't have any further comments on what that approval process should consist of.

Practical implementation challenges

We believe that there are a number of practical implementation challenges or things that could go wrong with AFC-enabled SP devices, especially if widespread. These include but are not limited to:

- **Hacked devices:** RLAN devices are hacked to bypass the AFC (although this may already be a risk e.g. for devices imported from the US/Canada).
- **Antenna details & configuration:** For a particular AFC-enabled device seeking to operate at SP, there is a question about how the AFC system would reliably know the characteristics (including gain, radiation pattern, pointing angles and height above ground) of the antenna connected to the device making the access request. Would these parameters need to be input into the AFC by accredited installers? If so, how would this be enforced?
- **Tx and Rx in close proximity:** Particularly when the RLAN device is located in close proximity to the fixed P-P link receiver, any inconsistencies in the device geolocation coordinates, in the antenna height, and/or the digital terrain model, may lead to the coordination considering a different geometric configuration than what is actually the case. This applies to either/both the RLAN device-side parameters being incorrect, and/or the RRL data (for the fixed P-P link receiver) being incorrect.

Licensing

In the USA, eight (8) AFC providers were approved by the FCC. Each of these has been authorised to operate anywhere in the country, with users and device manufacturers able to select an AFC provider based on the AFC provider's service offering, as opposed to having to engage the sole AFC provider which is licensed in the particular spectrum space of interest to the user.

Our understanding about AFC is that its only purpose is to prevent transmission at a particular location, channel and power level that would otherwise cause interference to an incumbent

licensed receiver (i.e. microwave fixed P-P link receiver). It is not about managing interference between the AFC subscribers themselves. AFC subscribers themselves are managed in the same way they are currently, i.e. via the WiFi contention protocols (as well as likely some channel planning by professional network designers and installers).

Based on information on pages 13 and 15 of the consultation paper, it appears that the ACMA is consulting on potential licensing models which would involve the following: that an AFC provider could act as the band manager within a particular area (and potentially within a frequency ‘slice’ of the broader AFC-enabled band), such that only one AFC system is used within a particular “spectrum space”. Under such a model (a) the AFC system manages/coordinates the use of its managed spectrum space by its various AFC subscribers, and (b) that different AFC systems / band managers don’t need to coordinate with each other because they are segregated in the geographical and frequency domains.

We understand that this is one potential approach as to how AFC-enabled SP RLAN could be introduced and licensed in Australia that the ACMA is seeking views on, but not necessarily advocating for or promoting. While AMTA does not oppose the localised band managers approach in principle, we do not agree with SP RLAN devices being authorised by apparatus licences or AWLs.

AMTA’s position is that AFC-enabled SP RLAN devices should be operated via an AFC system with records available to incumbent users—these records are discussed in further detail in the following section. Class licensing is currently the closest form of licence which would support arrangements where any AFC provider can provide service to any device (i.e. AFC subscriber) anywhere in the country—as is the case with the US arrangements introduced at the beginning of this section.

Recording of AFC-enabled SP RLAN devices

For the purposes of interference-tracing, AMTA requests that any AFC system be required to pass back key information about AFC-enabled devices operating at SP to the ACMA, for recording of that information in a centralised database administered by the ACMA, that is either publicly-available or (at a minimum) available to fixed P-P link licensees. This will assist fixed microwave P-P link licensees to consider the operation of nearby SP devices if they experience interference or degradation of system performance. For this purpose, ideally the following parameters would be provided for the SP RLAN device: some kind of user or device identifier, real-time geographical location, the assigned WiFi channel (unique combination of centre frequency & bandwidth), the power level authorised by the AFC system (for the particular device/location/channel combination) and antenna details (noting the concerns discussed under “*Practical implementation challenges*” above).

Operation in 6425-6585 MHz

AMTA does not support the introduction of arrangements for SP RLAN devices (including via AFC) in the portion 6425-6585 MHz.

Note: We are not opposed to the ACMA reviewing this in the future, but only after the following has occurred:

- Outside defined areas:
 - Potentially SP RLAN devices could be permitted to operate outside defined areas, but only after those defined areas have been established.
- Inside defined areas:
 - AFC should be tried and tested and shown to work in L6 (or a portion thereof),
 - the lower edge of the IMT band allocation has been decided, and
 - the adjacent-band compatibility issues between SP and IMT have been thoroughly studied and resolved.

We take this opportunity to stress that, in its band planning activities for U6, that the lower frequency edge of spectrum to be allocated for IMT in defined areas should be based on same-area, adjacent-band compatibility between IMT on one hand, and VLP/LPI systems only (i.e. those which have already been authorised) on the other. SP devices should not be taken into account when determining the RLAN/IMT guard band above 6425 MHz. Rather, adjacent-band compatibility between SP devices and IMT should only impact the determination of the upper edge of the segment within which SP devices can operate.

That said, and as addressed in the following section, coexistence between SP and VLP/LPI RLAN might mean that SP RLAN devices should not operate above 6425 MHz anyway.

Segmentation of SP and VLP/LPI

AMTA is concerned that introduction of SP RLAN devices—operating at power levels up to 12 dB higher than LPI devices and up to 22 dB higher than VLP devices—could lead to a degradation in the performance of WiFi services overall, particularly in congestion scenarios (i.e. where there are many WiFi networks within a particular area). As such, we believe that AFC-enabled SP RLAN devices should be contained within a defined segment at the bottom of L6. For example, AFC-enabled SP RLAN devices can operate in the range 5925 MHz to $f_{boundary}$ MHz, while the remaining spectrum below 6585 MHz is reserved for VLP/LPI devices. $f_{boundary}$ must be below 6425 MHz. Although we don't have a firm view of exactly where this should be for the time being, as an example, a value of $f_{boundary}$ like 6265 MHz would provide 320 MHz for each use case. We suggest that studies on potential use cases and demand will provide further guidance on the amount of SP RLAN spectrum that is required to support the SP-reliant use cases, versus how much spectrum needs to be reserved for VLP/LPI to preserve the utility of the band for those services.

We note that the ACMA touches on this issue. On pg 13 of the consultation, under “Spectrum planning considerations”, the ACMA writes: *“while all of 5925–6585 MHz has been authorised for VLP/LPI use in Australia, allowing access to only part of that range for AFC-enabled higher (up to*

standard) power use may mean that, in areas of intensive higher power use, VLP/LPI RLAN devices operating under dynamic frequency selection (DFS) protocols would retain some ‘clean’ channels to switch to, preserving the utility of the band for all of its intended (VLP, LPI and standard power) purposes”.

AFC possible consideration in non-WBB areas

In its Five-Year Spectrum Outlook (FYSO) 2025-30¹, the ACMA flags the following future consultation: *“Q1 2026 (at the earliest): consult on apparatus-licensed WBB arrangements in 6585-7100 MHz (exact timing may depend on when we commence implementation of WA WBB arrangements inside defined areas)”*. In the diagram on pg 11 of the AFC consultation paper, it says, for the range 6585-7100 MHz: *“AFC possible consideration in non-WBB areas”*. WA WBB stands for “wide-area wireless broadband”, and in this context refers to the future IMT networks, using 3GPP technologies like 5G/6G, to which the band 6585-7100 MHz band has been allocated in certain, yet-to-be-defined populated areas (known as ‘defined population areas’).

We take this to mean that the ACMA is flagging an intent to make the band 6585-7100 MHz available—outside of the ‘defined population areas’—for RLAN-type services using AFC, rather than for 3GPP-based networks (incl. Private 5G/6G) using AWLs (as is the case in 3.4-4.0 GHz range in Remote areas).

While not the subject of this AFC consultation (this issue will be discussed in the future, separate consultation of H1 2026 as flagged in the FYSO), we wish to flag our opposition to this early: **AMTA opposes arrangements for WiFi devices operating above 6585 MHz in Australia**. To preserve the utility of U6, it is important to avoid the proliferation of devices with front-ends receiving frequencies above 6585 MHz in Australia to the greatest extent possible. Remote Australia has ample WiFi bandwidth in 5925-6585 MHz (a total of 660 MHz, although not all of this should be made available for SP devices, as per the two previous sections above). Rather, we believe that a similar approach to what was adopted in the 3400-4000 MHz band for remote areas should be adopted in U6 above 6585 MHz, i.e. licensing arrangements optimised for 3GPP-based technologies including 5G/6G networks and Private 5G/6G enterprise systems.

Trials

Lastly, we note that testing/trialling of any system—automated or otherwise—needs both parties—potential interfering device under test and the potential victim receiver—to be active participants in the trial. The potential victim needs to be monitoring the performance of a receiving device in a relevant geographical area.

¹ ACMA October 2025, *Five-year spectrum outlook 2025-30*, available here: <https://www.acma.gov.au/publications/2025-10/plan/five-year-spectrum-outlook-2025-30>

AMTA responses to Issues for Comment

We invite comments on the issues set out in this paper, particularly in relation to the following:

1. Do you support the adoption of an AFC framework in Australia to enable outdoor standard-power operation in the 6 GHz band? What are the key benefits and concerns? In particular, who would the main beneficiaries be, and what would be the implications for consumers in the telecommunications market?

The following are the primary concerns for AMTA:

1. In-band interference (both co- and adjacent-channel) to microwave fixed P-P links in the 6 and 6.7 GHz bands.
2. Adjacent-band interference to U6 IMT networks inside the defined population areas.
3. In-band interference from U6 SP RLAN devices outside of the defined population areas, for which the ACMA flags “AFC Possible Consideration in non-WBB areas” on pg 11 of the consultation paper.
4. Degradation of WiFi services overall due to higher-power operation of SP RLAN devices (compared to VLP and LPI devices).

AMTA does not support *any* RLAN operation (SP or otherwise) above 6585 MHz.

We also submit that SP RLAN (via AFC or otherwise) devices should not be permitted within 6425-6585 MHz. Keeping SP RLAN out of this range effectively establishes a guard band of (at least) 160 MHz between SP RLAN and potential IMT services above 6585 MHz.

Furthermore, we believe that any SP RLAN operation should be limited to a specified frequency segment at the bottom of L6, with a view to preserving dedicated spectrum utility for VLP/LPI WiFi services. Further detail on this segmentation is provided in the body of the response.²

However, in whichever segment of L6 the ACMA *does* decide to authorise SP RLAN devices (if any), we believe that this **must** be required to use and comply with a properly-functioning AFC system.

2. How might AFC change the way WISPs and other communications service providers operate, particularly in terms of supporting greater spectrum efficiency or service innovation?

No AMTA view.

² Pivotal supports the use of AFC and SP operation up to 6585 MHz, subject to appropriate safeguards and prior industry consultation on the detailed implementation framework.

3. Are there any alternatives to AFC that could support dynamic and efficient frequency assignments in the 6 GHz band?

AMTA does not offer any alternative methods to support *dynamic* frequency assignment specifically. However, we note that most of the use cases presented as justifying the need for more spectrum for SP RLAN operation—namely WISPs and enterprise settings like universities—are not dynamic use cases. They need the spectrum in particular, fixed locations. So, while these use cases may justify the need to facilitate SP, they do not justify the need for the associated frequency assignment process to be dynamic. However, we acknowledge that this situation may evolve in the future.

4. Would established models in other jurisdictions such as the US and Canada, or aspects of these models, be appropriate for the Australian radiocommunications environment?

We do not have a comprehensive response to this question. However, and noting our comments under the “*Coordination requirements*” section above, we believe that it may be necessary for the ACMA to set up an approval/accreditation process for AFC systems, similar to what the FCC did in the USA (although this should be able to be tailored to Australia). At first glance, this appears to be the most obvious way for the ACMA to ensure that the AFC system’s coordination calculations/process are adequate to protect fixed link receivers in Australia.

5. How much spectrum should be made available under AFC, and what bandwidths should be allocated to support individual AFC service offerings? Should part or all of the 6 GHz spectrum available for RLAN use be made available for AFC-enabled access by standard power devices, or is there a case for arrangements supporting a range of power levels above VLP/LPI and below/including standard power?

We believe that any SP RLAN operation should be limited to a specified segment at the bottom of L6, with a view to preserving spectrum utility for VLP/LPI WiFi services. Further detail on this segmentation is provided in the body of the response.³

6. What degrees of geographic and spectrum segmentation should be considered when planning for individual AFC system deployments? For example, would planning for localised, self-contained areas or multiple sub-bands foster competition in the market for the provision of AFC services, or would that come at too much of a cost to spectrum efficiency (through the need for guard bands/spaces)?

Given that only eight (8) AFC providers were approved in the USA, it is our understanding that each of these would be authorised to operate anywhere in the country, with users and device manufacturers able to select an AFC provider based on its service offering, as opposed to having

³ Pivotal supports the use of AFC and SP operation up to 6585 MHz, subject to appropriate safeguards and prior industry consultation on the detailed implementation framework.

to engage the sole AFC provider licensed within the particular spectrum space of interest to the user.

The ACMA's reference to geographical and/or band segmentation for particular AFC services alludes to a model which would be quite different to the US model described above, and seems to be related to the concept of "localised band managers" discussed in the discussion paper. While we don't oppose this concept in principle, we don't support SP RLAN devices being authorised by apparatus licences.

While not actively advocating for one model or another, at this stage we think that the way to avoid SP RLAN device users having to apply for apparatus licences is to have them operate under something more like the US model described above (as opposed to a localised band manager approach).

7. What are the respective roles and responsibilities for industry and government in realising an AFC regime? Should AFC be operated by industry under government-set rules or should government play a more direct role in providing AFC services?

No AMTA view on this, apart from a request to the ACMA that it require any AFC system to have to report back its device details to assist with interference tracing. See response to Q8 below.

8. What role should databases such as the ACMA's RRL or other coordination mechanisms, such as those administered by the ACMA but used by accredited assigners, play in the process?

We request that the ACMA require any AFC system to have to report certain data back to a centralised database that is administered by the ACMA, and that is either publicly-available or (at a minimum) available to fixed link licensees. This is to assist with interference tracing. For this purpose, ideally the following parameters would be provided for the SP RLAN device: the device identifier, real-time geographical location, the channel (unique combination of centre frequency & bandwidth), power level, and antenna details.

AMTA stresses that any approved AFC system must include adequate coordination requirements to ensure protection of microwave fixed link receivers. The coordination requirements to protect microwave fixed link receivers need careful consideration, and should be the subject of a future consultation process (either public or a targeted group like a Technical Liaison Group).

9. What is the need for, and potential structure of, a tiered access model for incorporating standard power RLAN devices in the 6 GHz band?

We don't have a view on tiers between users of AFC system(s). However, we stress that—whatever arrangements the ACMA ends up adopting—SP RLAN devices must always have a lower priority/tier than microwave fixed P-P links, regardless of whether or not they were "first in time". This lower-priority status must be both **legal** (e.g. *no interference, no protection* (NINP) condition specified in the licence conditions) and **perceived** (i.e. the ACMA has to communicate clearly to

the potentially large user community that they only operate on an opportunistic basis, under a NINP condition with respect to fixed P-P links).

10. With respect to licensing, should individual AFC-coordinated devices be registered on the RRL or covered by broader system-wide licensing arrangements, or are there other authorisation models that we should consider?

Our view is that AFC-enabled RLAN devices should be authorised by a licence which allows operation within a defined frequency range, provided that the SP RLAN device uses (and complies with) an approved AFC system. Class licensing is currently the form of licence which most closely aligns to this. However, we also seek that the ACMA require SP RLAN device details to be recorded in a database (see response to Q8 above), so perhaps this may impact on the licensing approach adopted.

11. What processes and safeguards would need to be established to accredit, audit and ensure ongoing compliance of industry-led AFC operators? What type of rules should be imposed on prospective AFC operators and how should those rules be codified?

No AMTA view, apart from the comments under the “Coordination requirements” and “Practical implementation challenges” sections above.

12. What technical or administrative features (e.g., real-time geolocation, exclusion zones, device registration, database accuracy and latency) will be critical to the successful implementation of AFC?

No AMTA view, apart from the comments under the “Coordination requirements” and “Practical implementation challenges” sections above.

13. How should data integrity, ownership, and update mechanisms be managed in AFC systems? Are ACMA’s existing systems (such as the RRL) sufficient, or would changes or new systems be required to support real-time coordination?

AFC is mostly about AFC-enabled RLAN devices being prevented from operating in a manner which would cause interference to a microwave fixed link receiver, based on information about that microwave fixed link receiver that is recorded in the RRL. Microwave fixed links, especially in the 6 GHz and 6.7 GHz bands, represent significant infrastructure investments which are carefully designed, planned, licensed and procured well in advance of commencing operation. Therefore, the RF environment to which the AFC system needs to have due regard—with respect to the microwave fixed link incumbents—is relatively static. Requiring AFC systems to refer to the RRL data, which is updated and can be downloaded daily, would appear to be sufficiently frequent in most cases.

If AFC systems wish to use data about other AFC-enabled RLAN devices, then perhaps data which is updated on a basis closer to real-time may indeed be needed. In this regard, our request for AFC-enabled SP RLAN devices to be recorded in a centralised database—a request which is focussed on addressing the needs of fixed link licensees to be able to trace interference—could also fortuitously benefit AFC-enabled WiFi services, since the AFC systems could use this data to effectively coordinate amongst themselves to a degree and optimise spectrum utilisation. To be used in this manner, such a database would need to be a live database, updated at very frequent intervals, and would also need to be made available to AFC systems as well as fixed link licensees (or be publicly-available).

14. What is the expected market for the provision of AFC services in Australia?

No AMTA view.

15. What standards or other mandatory specifications should be prescribed to ensure AFC-enabled devices comply with operational rules (for example, GPS accuracy, firmware requirements, revalidation intervals)? What are the implications for manufacturers and operators?

No AMTA view, apart from the comments under “*Practical implementation challenges*” above.

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