



Submission

**Mobile Phone Jammer Prohibition
Review**

ACMA IFC 02/2010

Revision Table			
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Background to Stakeholder

R F Industries Pty Ltd (RFI) is an Australian manufacturer of radio communications equipment and a potential manufacturer of mobile phone jamming equipment.

Our company, in addition to our manufacturing heritage and skills, has an extensive team of specialist Distributed Antenna System design engineers who provide design, installation and commissioning services for mobile phone carriers to reticulate cellular (and public safety) coverage in public and private buildings.

As a field design group, our company sees significant commercial opportunity in the design and installation of appropriate, carrier grade jamming networks for mobile phones and feel that our expertise in both cellular and public safety applications would place us in a strong commercial position if the appropriate regulatory environment existed for the allowing of jamming equipment in corrective services applications.

As a device design and manufacturing group, our business sees a significant local market for an appropriately specified, designed and delivered device and further, sees significant export opportunities which might be available for such devices if we were able to bring these products to market.

As a supplier to the Australian and international carriers RFI has a unique, holistic insight into the technical challenges in design, implementation and the impact on carrier networks of an appropriate solution.

RFI are well informed on the technologies, the competitive landscape nationally and internationally and the requirements and technical challenges which apply not only to device design but also the impact to carrier networks and the impacts of a poorly executed jamming environment on the effective disabling of all devices without impacting on the community use of spectrum.

RFI believe that:

- The demand for an appropriate jamming solution is well recognised
- The legal and community rights of the carriers to unfettered use of their spectrum must not be compromised in enabling such devices
- There are no current jamming networks available nationally or internationally which will provide an appropriate jamming environment without compromising the rights of the carriers and the community at large
- The ACMA review provides a unique opportunity to establish an appropriate regulatory environment which can be supported technically without compromising the rights of the carriers and the community
- Should such an environment be created in Australia, RFI can enter into a commercially viable development programme to deliver an appropriate solution
- That the technical review of such a regulatory regime will require significant investment by all stakeholder parties to mature to an appropriate level
- That the proposed trial of "Smart Jamming" in NSW as noted should proceed but that the results are likely to be confounded by the (justifiably) conflicting viewpoints of the corrective services community and carriers
- That technical standards, rather than field trials, will provide the most appropriate regulatory outcome, removing the subjectivity from further siting proposals and create a commercially viable marketplace for suitably qualified manufacturers and network implementation teams

Introduction

R F Industries Pty Ltd (RFI) is an Australian manufacturer of radio communications equipment and a supplier of this equipment to the Australian and international marketplace.

RFI was established in 1979 and it's manufactured products include radio communications antennas, antenna systems and advanced repeater and amplifier equipment for the cellular, public safety, military and industrial radio marketplaces.

RFI distributes this product to the Australian market directly to carriers, network operators, strategic government and original equipment manufacturer accounts and serves an extensive reseller network across the country.

RFI employs 200 staff, of which more than 50 are professional engineers and more than 100 in research and development and manufacturing roles. RFI is an active exporter with offices in the USA and UK, and export sales to more than 70 countries.

RFI total revenues in 2009-2010 will reach \$100M. Our company is profitable, growing at an annual compound rate of more than 20% over the past five years and is privately owned.

The skills in the RFI design team include the following specialties which are specifically relevant to the review on jamming:

- Advanced single and multi-band amplifier design
- Software Defined Radio (computer derived, broad-band radio systems)
- Advanced reporting and control of remote devices by RF, fibre and Ethernet connectivity
- Transmitter and receiver hardware design
- RF propagation mapping and network analysis
- Distributed Antenna System (DAS) design, installation and commissioning resources
- Field support services for DAS and other RF Systems
- Interference Control and mitigation services (desktop and on-site)
- RF Field measurement services (desktop and on-site)
- SAR, EME and EMI planning an mitigation services
- Project management services

Conceptual product specification (Superseded)

In 2005, Long distance Technologies Pty Ltd (LDT, which became a subsidiary of RFI in 2006) worked with one of the Australian carriers to develop a conceptual product for the smart RF Jamming of mobile phones in correctional services facilities.

A copy of this (now outdated) concept specification is available as a commercial in confidence. The concept product included:

- Central server control
- Remote heads with appropriate jamming amplifiers
- Recommendations for Detect only or Detect and Jam functionality
- Multi-band coverage
- Local (server based) reporting and remote logging externally

Since this specification was prepared we have found significant changes and significant knowledge gaps which have emerged such as:

- The requirements of the corrective services community were only considered superficially
- Cost rather than effective jamming had been a priority in the design approach considered

- The bands considered were those in place at the time (800, 900 and 2100 MHz predominantly)
- Non mobile phone applications (such as WiFi) had not been considered
- The interests of the carriers were not guaranteed

Smart Jamming Considerations

The concept of a smart jamming network is one which will be contained within the facility and in many cases, use a detect and jam approach.

The alternative to a detect and jam is to provide all-band, 24/7 jamming.

Given the current environment and that which is “visible” we note the following technical and practical considerations.

1. To prevent network interference the emissions from any jamming network must be contained within the facility of interest and the power levels must fall below the level which would be delivered to devices on the “approved jamming perimeter” of the facility.
2. The design of a network to meet these emission requirements follows a similar approach to that required for the design of a sophisticated DAS system as used by the carriers to cover shopping centres, car parks and significant buildings
3. Jamming need only be provided in either the uplink or the downlink, provided it is delivered appropriately. Technically it is more appropriate to jam in the downlink, thus preventing the mobile from interacting (logging on) to the base to initiate communications
4. Jamming must be accomplished in the facility within the ARPANSA defined EME standards. This is particularly important as both inmates and staff are to be subjected to the emissions environment which is provided
5. Jamming must, to be totally effective, secure communications in all of the possible networks which could be delivered to inmates. These services may include cellular networks but equally, with the proliferation of broadband applications supporting IP based telephony inmates could potentially communicate with any licensed or unlicensed band capable of delivering an appropriate data stream and the issue is not restricted to the current public telephone networks.
6. The bands and technologies which must be considered for exclusion therefore include:
 - a. 900 MHz GSM – (Existing)
 - b. 900 MHz UMTS (Existing)
 - c. 850 MHz CDMA (Obsolete)
 - d. 850 MHz UMTS (Existing)
 - e. 1800 MHz GSM (Existing)
 - f. 1800 MHz UMTS (Potential)
 - g. 2100 MHz UMTS (Existing)
 - h. 700 MHz to - 4 GHz LTE and Wimax (Future)
 - i. 2.4 GHz WiFi
 - j. 5.8 GHz WiFi
 - k. Potentially other WiFi and similar bands 400-6 GHz
7. The detection of all of these bands is possible but the implementation of broadband jamming, 24/7 across this range of frequencies and applications will require significant power levels, such that the rights of the carriers and the community to the unfettered use of their spectrum must almost certainly be compromised or, alternatively, the power must be delivered to individual “heads” which would be placed in areas where, to provide broadband jamming, meeting ARPANSA emission requirements is likely to be impossible.
8. To cover only the current commercial cellular bands with a per channel blocking power level of only +10dBm (which we consider is likely to be the minimum level required for effective jamming of carrier connection), we have estimated that the total composite

- power level requirements for each jamming head, located a maximum of 3 metres from the mobile user, would be approximately 60 watts of RF power.
9. Such a composite power level is almost certain to exceed ARPANSA mandated emission levels for users on a 24/7 exposure basis. Attempts to utilise less power or to restrict the bands which are effectively jammed is likely to lead to "dead spots" where communications are possible. With queued messaging and emails, a user can therefore construct a message and transmit the message only when they are in a known dead spot, this negating the effort and expense of the jamming network in the first place
 10. A more likely scenario which is technically supported is a detect and jam approach. In a detect and jam approach the mobile is detected (and notification provided) and jamming commences. "Most" transmissions could thus be prevented although a notification would be provided if the appropriate detection network were in place.
 11. RFI believe there is an appropriate mechanism and have a conceptual product plan which would provide effective jamming in all of the required frequency bands at an appropriate power level, without exceeding ARPANSA based emissions. Such a product solution would meet all of the operational requirements for jamming indoors and in external areas, would meet the carriers interests as the emissions could be contained within the facility and would provide detect and blocking with central and remote system management.

Conclusions and Recommendations

- a) With the need for jamming well recognised and the carriers committed to supporting trials, RFI supports the current proposal of a feasibility study through the implementation of a trial system as is currently planned.
- b) The current prohibition of jammers ensures appropriate nuisance jamming activity is prohibited but that the advances possible in jamming and mobile phone detection systems, correctly designed and implemented, can provide an excellent, manageable alternative to a blanket ban on all jamming devices and therefore regulatory relief should be available on a licensed, appropriately regulated basis.
- c) RFI believe that the product currently available on the global market is unlikely to provide adequate secure jamming facilities while meeting ARPANSA EME emission requirements and urges that the trial should include appropriate checks and balances against these issues
- d) RFI believe that the global market for jamming equipment has been universally suppressed for investment due to the stringent regulatory environment and that the construction of an appropriate and technically informed regime for the use of jamming equipment can provide the platform for the development of appropriate equipment which can be supported by manufacturers such as RFI and others.
- e) The regulatory plan for jamming equipment, when established, should attempt inasmuch is as possible, to anticipate the growth in IP based telephony in other bands and broadband technologies to ensure the ongoing effectiveness of the jamming networks which are installed.
- f) RFI supports the development of appropriate technical standards to meet the requirements which the corrective services community have for effective jamming without impinging on the rights of spectrum licensees and the community at large
- g) Jamming is an appropriate and important tool in correctional facilities, but equally important in is the detection of mobile phones in such facilities. Jamming of mobile phones prevents the unlawful operation of such devices but the detection of the unauthorised users of these devices, the confiscation of the devices and the prosecution of the unauthorised users is a critical requirement.

Review Questionnaire

Q1. Is the Mobile Phone Jammer Prohibition a necessary regulatory measure to prevent the general use of mobile phone jammers?

Yes. It is appropriate and necessary.

Q2. Should the Mobile Phone Jammer Prohibition's scope be extended to include frequency ranges that are used by other wireless access services such as Wi-Fi and WiMAX?

Yes. These and other broadband applications will increasingly require protection, but likewise will continue to be of concern in correctional facilities.

Q3. How can the ACMA best approach regulation of emerging technologies that utilise devices that may be unnecessarily prohibited?

No opinion

Q4. If the Mobile Phone Jammer Prohibition were re-made to provide a general exemption for tests/trials, what measures would be required to ensure the accountability and transparency of each decision?

Each individual site trial must be a technical experiment rather than provided for under a general exemption and appropriate measures must be put in place to ensure the interests of carriers, the community are met, along with the interests of inmates and correctional facility staff. Such exemptions should also preferably require Ministerial approval and endorsement by the Mobile Carriers Forum.

Q5. Bearing in mind that the Radiocommunications Act provides that some spectrum users may be exempted from such standards, what approach should the ACMA take to the issue of EME standards in relation to the exempted use of mobile phone jammers?

The ACMA should mandate, in the interests of the safety of inmates (most of whom will never attempt to use a mobile) and correctional services staff, that EME standards are not compromised. There is no valid technical requirement to exceed the current emissions standards with an appropriately implemented system

Q6. Do the reasons underpinning in the Mobile Phone Jammer Prohibition remain relevant?

Yes. The reasons for seeking exemptions has been magnified, and these should be considered, but the reasons underpinning the prohibition remain relevant and important.

Q7. Are there other significant reasons for prohibition which should be included?

No opinion

Q8. What criteria should the ACMA use to assess requests for exemptions under section 27 of the Radiocommunications Act?

No opinion

Q9. What other performance indicators would best inform evaluation of the success of the trial?

The performance indicators are appropriate, but the technical parameters must be defined and validated numerically.

Q10. What sort of technology (including design and distribution of devices) could facilitate an effective jamming solution without causing harmful interference to radiocommunications services outside of the trial facility?

Such a solution is described on Page 6, Item 11 of our submission and further technical detail can be provided on a "Commercial in Confidence" basis to appropriate parties

Q11. Are there other matters that the ACMA should take into account in considering a section 27 exemption to enable a trial of mobile phone jammers at Lithgow Correctional Centre?

The performance indicators are appropriate, but the technical parameters must be defined and validated numerically.

Q12. Does the existing Mobile Phone Jammer Prohibition provide adequate protection from the supply, possession or operation of mobile phone jammers?

No opinion

Q13. Does the existing approach to the regulation of mobile phone jammers constitute an appropriate combination of *ex ante* and *ex post* regulation? If not, what kind or combination of regulation is most appropriate for mobile phone jammers?

No opinion

Q14. Should all mobile telephony bands be included in the Mobile Phone Jammer Prohibition? If so, should the bands be provided for specifically by reference to frequency range or described in more general terms so as to automatically include bands allocated for mobile telephony services in the future?

There is little reason for a jammer to be used in any communications band and an extension of the Mobile Phone Jammer Prohibition so as to automatically include bands allocated for mobile telephony and other applications seems quite appropriate notwithstanding that the ACMA may have knowledge of some devices which could be inadvertently and unnecessarily prohibited. The current exclusion of 2.4 GHz and similar bands seems counterintuitive.

Q15. Are there other responsible bodies that should be considered for this kind of limited exemption in the Mobile Phone Jammer Prohibition?

No. The use of mobile phone jammers may, at some time in the future, become appropriate when an appropriate technology emerges which will not compromise the interests of all stakeholders but at this point any attempt to include other bodies is likely to cause conflict which is currently easily resolved with the simple fact that the Mobile Phone Jammer Prohibition prevents the use of such devices.

Q16. Should Option 2D apply:

a) generally; or

b) at the ACMA's discretion; or

c) is it more appropriate to limit such an exemption to specified parties?

b) and c) jointly.

Q17. Should the ACMA formalise and publish its decision-making process for assessment of the status of devices in relation to the Mobile Phone Jammer Prohibition or section 27 exemptions?

For devices, yes. The transparency of device requirements will facilitate the development of appropriate devices.

For exemptions, no. Exemptions should be made without the necessity to announce installations are being considered.

Q18. Are the current criteria appropriate for this decision-making process? Are there other criteria that should be considered?

No Opinion

END