

4. Spectrum Licensing

In this Chapter ...

- **information about spectrum licensing**
- **an introduction to the concept of “spectrum space” and standard trading units (STUs) of spectrum space**
- **information for people wanting to use spectrum space themselves**
- **information about authorising others to use spectrum space**
- **information about trading spectrum space**
- **other important information about licence conditions, spectrum licence tax, and regulatory compliance.**

Spectrum licensing is a form of licensing introduced in Australia by the *Radiocommunications Act 1992*. Spectrum licences are a tradable, technology neutral spectrum access right for a fixed non-renewable term. Instead of authorising the use of a specific device, spectrum licences authorise the use of spectrum space and give licensees the freedom to deploy any device from any site within their spectrum space, provided that the operation of the device is compatible with the core conditions of the licence, and other conditions imposed by the ACA on the licence, and the technical framework for the band (see **Chapter 5 - Technical Framework**). Compliance with the core conditions is undertaken in accordance with a set engineering framework for interference management.

Spectrum licences offer a new way of managing the radiofrequency spectrum. Licensees have greater flexibility than under apparatus licensing to manage the deployment of devices within the spectrum space authorised by the licence for a fixed term of up to fifteen (15) years.

Within the bounds of spectrum space and the technical framework, licensees may be able to operate whatever type of communications service they choose, and be able to change that service in response to technical improvements or changes in consumer demand.

Spectrum licences are tradable. Licensees are free to seek to buy and sell spectrum space in the open market as the need arises, or to authorise other people to operate devices in their spectrum space, including under commercial arrangements. Spectrum licences can be aggregated or sub-divided to form new licences.

Spectrum Space

The concept of “spectrum space” is fundamental to the ACA’s approach to spectrum licensing. Spectrum space is conceptually like other types of multi-dimensional space. It covers an area and it has a height in terms of radiofrequency bandwidth. Spectrum space, if thought of as a cube, covers a geographic area authorised by a licence. The *geographic area* is like the floor of the cube. The radiofrequency *bandwidth* is represented by the height of the cube.

Standard Trading Units

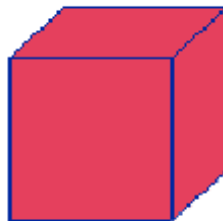
The challenge in developing spectrum licensing was the need to have a licensing and management system that was capable of dealing with a medium which is effectively a multi-dimensional continuum including dimensions of latitude, longitude, frequency and time.

The solution to this problem was to commoditise the spectrum subject to spectrum licensing; that is, to create finite indivisible three-dimensional units of spectrum space that can be aggregated into useful configurations. These finite indivisible units of spectrum space are called *standard trading units*, or STUs (Figure 1).

Figure 1

Concept of standard trading unit of spectrum space

Standard Trading Units are like cubes of spectrum space. They cover an area in the horizontal plane, and they have height, representing bandwidth.



STUs are like building blocks, or house bricks. By themselves, they may be too small to have much utility, but because of their regular shape, and their referential relationship with their immediate neighbours, they can be stacked vertically, or horizontally with neighbouring STUs to form larger bodies of spectrum space that do have utility (Figure 2 — following page).

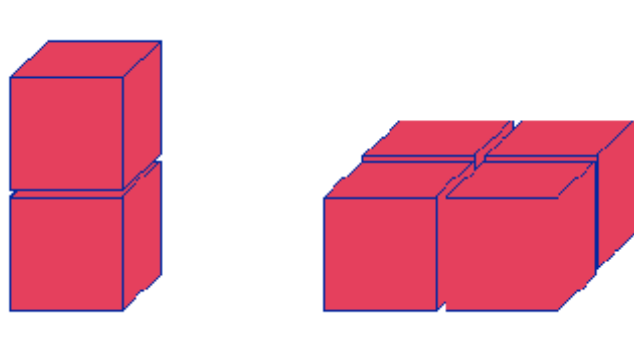
The main use of the STU concept is in trading spectrum space. The ACA permits spectrum space to be bought and sold in terms of STUs. Licensees who wish to trade

part of a licence can disaggregate the licence into its component STUs and offer them for sale individually or in multiples. A single STU is the smallest unit of spectrum space for which the ACA will issue a licence or register trading.

The frequency bandwidth of STUs may vary in size depending on the spectrum band in which licences are being issued, but the minimum areas that may be traded will be constant for all bands. For the purposes of spectrum licensing in the 2 GHz band the frequency bandwidth of each STU will be 0.25 MHz. The technical framework (see **Chapter 5 - Technical Framework**) for spectrum licensing in this band has been predicated on these STU sizes.

Figure 2

STUs can be aggregated



STUs can be stacked vertically (left) to provide increased bandwidth, or horizontally (right) to cover a larger area.

Geographic area

In the geographic dimension, STUs follow the spectrum map grid (SMG) published by the ACA. The SMG has three resolutions related to population density. In outback Australia the resolution is 3 degrees of arc. In rural Australia, it is one degree of arc and in the metropolitan and regional parts of Australia where the bulk of the people live, and where the need for efficient spectrum use is highest, the resolution is 5 minutes of arc. It should be noted that the size and shape of STUs varies with latitude, but the sides of an area covered by an STU will be approximately 330 km, 110 km, and 9 km respectively.

The ACA reserves the right to vary the areas where each resolution applies. It may need to do this, for example, in response to shifts in population density identified from an Australian census, or because there is a demonstrated need to do this to facilitate trading. In general terms the ACA expects that any change in resolution will tend to facilitate trading at a finer resolution. (It should be noted that areas for the purposes of STUs are not the same as the areas described in the Marketing Plan.)

Using Spectrum for Communications Systems

Under spectrum licensing, licensees are responsible for planning the use of equipment within their own spectrum subject to the core conditions of the licence and the technical framework described in the various determinations and guidelines (see **Chapter 5 - Technical Framework**). The core conditions specify for each licence:

- the part or parts of the spectrum in which the operation of devices is authorised under the licence;
- the area within which the operation of devices is authorised;
- the maximum emission levels outside the bandwidth of the licence; and
- the maximum emission levels outside the area of the licence.

In addition to the core conditions, and the conditions required by the Act to be included, there may be licence conditions included by the ACA under section 71 of the Act (see also **Chapter 5 - Technical Framework**). Examples of the licence conditions that the ACA will impose are set out in the sample licence included in the Marketing Plan at **Attachment 3**. Most of these are related to interference management. These conditions are very important, as they relate to the management of interference that may be experienced or caused by devices operated under the licence. They are also important because some conditions impose **responsibilities** on spectrum licensees, especially responsibility for the management of interference, and responsibilities to negotiate with other licensees (or site managers) in relation to co-sited devices.

Before a device will be registered for use under a licence, the ACA may need to be satisfied that use of the device has been properly planned and that it will not cause unacceptable interference to other spectrum users. The registration requirements may include a requirement that the licensee present a certificate (an *interference impact certificate (IIC)*) issued by an accredited person (see below - **The Role of Accredited Persons**) stating that operation of the device under the licence will not cause unacceptable interference. The ACA has made a determination regarding the issue of certificates — see **Attachment 12**.

The procedure for checking whether or not there is a probability that a device will cause unacceptable interference is set out by the ACA (see **Chapter 5 - Technical Framework**).

The ACA will accept an IIC issued by an accredited person as evidence that a device will not cause unacceptable interference. Licensees may engage an accredited person to conduct an engineering assessment of the proposed transmitter, and if satisfied that the device will not cause unacceptable interference, the accredited person may issue such a certificate.

In certain circumstances the ACA may accept an application to register a device without a certificate being furnished, for example, where there is an agreement between adjacent licensees or where there is sufficient internal guard space (see **Chapter 5**). If an IIC is not furnished, the onus will be on the licensee to notify the ACA of transmitter details.

Once details of a device have been registered, the licensee or person authorised by the licensee will need to comply with those details in operating the device until such time as the registration is varied. Operation of a device will not be authorised under a licence if it is operated in a manner that is not in accordance with the details in the Register.

If a licensee seeks registration of a device directly from the ACA and does not have an IIC, the ACA will charge for the work necessary to be satisfied that the device will not have an unacceptably high probability of causing interference. The ACA will charge for work done on a time and materials basis. The ACA's current standard charging rate for consultancy work is \$168.30 (including \$15.30 GST) per hour.

Registered devices must be identified with a label carrying their registration number (see below).

The Radiocommunications (Unacceptable Levels of Interference) Determination

A determination relating to unacceptable levels of interference has been made under section 145 of the *Radiocommunications Act 1992* for this auction (**Attachment 6**). This determination applies to all devices to be registered under a spectrum licence in the band being allocated, irrespective of the type of service that a licensee proposes to operate.

The determination (see **Chapter 5 - Technical Framework**) sets out procedures that licensees should follow to ensure that their systems satisfy the core conditions of the licence relating to emission limits both outside the geographic area and outside the frequency band of the licence. The emission limit outside the band establishes an emission buffer zone along the frequency boundaries of the licence. The emission limit outside the area supports the management of inter-modulation interference. The Determination also requires the calculation of a 'device boundary' for the device. The device boundary check establishes an emission buffer zone along the area boundaries of the licence.

Compulsory Registration of Certain Devices

It will be a condition of all spectrum licences issued in this band that licensees must not operate transmitters under those licences unless the transmitters are registered with the ACA, or have been exempted from the registration requirements.

Registration Exemptions

Cellular mobile telephone handsets are exempt from device registration.

The Role of Accredited Persons

An accredited person is someone who has been accredited by the ACA to perform engineering work traditionally undertaken by the ACA and its predecessors. Under the Act, only an accredited person can issue the IIC that may be required before a

transmitter can be registered for operation under a spectrum licence. Anyone with the appropriate qualifications and experience can apply to the ACA for accreditation.

The ACA proposes to facilitate access to RADCOM for accredited persons to perform a range of on-line transactions, including searches of the register, notification of trading, requests for new antenna IDs and so on. All of these facilities are expected to be released over the next two years.

The ACA proposes to allow 'on-line' device registration. The first stage, which has been implemented, enables people to apply 'on-line' to register transmitters by providing all the necessary details. The ACA's spectrum management information system, RADCOM, will perform certain checks on the information upon receiving an application for registration, and, if it passes those checks, the ACA will be able to register the device, and RADCOM will confirm that the transmitter has been registered.

Hard copy applications for device registration will also be accepted, but they may take a little longer to process than automated transactions.

The ACA will be able to provide licensees with contact details for existing accredited persons where those persons have consented to the release of those details.

Labelling Requirements for Transmitters

The ACA requires that licensees label all transmitters with the Registration Number provided when the transmitter is registered.

There are some exemptions to the requirement for labelling. The exemptions apply to devices that have low interference potential, for example, low power mobile transmitters. For further details contact the ACA for a copy of the *Radiocommunications (Labelling) Determination 1997*.

Authorising Third Parties

There is nothing to prevent a spectrum licensee from authorising other people to operate devices in its spectrum space under a commercial arrangement. However, the *Radiocommunications (Third Party Use- Spectrum Licence) Rules 2000 (No.2)* (**Attachment 7**) requires that an authorisation under section 68 of the *Radiocommunications Act 1992* be given in such a way that it is revocable at will, and that its revocation cannot be prevented by an injunction or other court order. The purpose of these provisions is to avoid the ACA becoming involved in contractual disputes surrounding the giving and revocation of third party authorisations. The effect of these provisions is that the remedy for a breach of an agreement in relation to an authorization will be an action for damages.

The ACA recommends that spectrum licensees carefully consider the arrangements under which they make third party authorisations, and seek their own legal advice on how the requirements of the Act and the abovementioned Determination might be met in relation to the authorisation of the use of devices under spectrum licences.

All devices operated within the spectrum space, including those operated by third parties, have to be registered with the ACA (unless exempt) and the spectrum licensee is responsible for ensuring that devices are registered.

Spectrum licences will include a condition that operation of devices by a person other than the licensee must comply with any rules made by the ACA about third party use (section 68(2)(a) of the Act).

Spectrum licences will also include a condition that the licensee must notify any authorised third parties under the licence of their obligations under the Act, in particular, registration requirements for devices and any rules made by the ACA (section 68(2)(b)).

IMPORTANT NOTE

A device cannot be operated unless authorised directly by a licence, or by the licensee issuing an authorisation to another person to operate the device. At present, licensees operating a mobile telephone service, in order to comply with this requirement, would need to individually authorise every handset that operates in their spectrum space. This is a separate issue from the exemption from device registration extended to mobile telephone handsets.

The ACA presently intends to issue a class licence to authorize the operation of such handsets in the spectrum that is the subject of this allocation. A class licence is a standing authority for the operation of certain devices in specified spectrum, subject to the conditions contained in the licence. It is not necessary to apply for a class licence, and there are no fees. However, the ACA cannot give an assurance that such a class licence will necessarily be made, or remain in force. Applicants are advised to obtain such legal and other specialist advice in relation to this issue as they consider necessary.

Applicants should also note that for the purposes of certain sections of the *Trade Practices Act 1974*, authorisation to operate devices under a spectrum licence is taken to be an acquisition of an asset by the authorised third party.

Trading in Spectrum Space

Spectrum licensees will be able to seek to negotiate the purchase of additional spectrum space if a market place were to develop, to cover larger areas, or more bandwidth, or both. Licensees will also be able to subdivide their licences and offer to sell spectrum space as, for example, a number of narrower bandwidth channels, or a number of smaller areas subject to the requirements as to STUs (see below). It will be up to licensees to find their own buyers and sellers of spectrum space, and the ACA will not have a role in facilitating such trading, other than to make available through the Register of Spectrum Licences (see below) the contact details of all spectrum licensees.

An important rule regarding trading is that the transfer of spectrum space made under a trade does not have effect until new licences, or variations to existing licences, to reflect the changed ownership arrangements are issued (see below), and the Register is amended to reflect those changes. This means that as soon as practicable after any transaction involving spectrum space is concluded, the seller and the buyer should

jointly register the trade with the ACA. There is a form for this available from the ACA.

Spectrum licences may not be transferred for the purpose of securing loans. This restriction is necessary to ensure that the ACA is not involved in registering transactions that result only from the legal form of a security, and where there is no ‘real’ change either in the licensee or the relevant spectrum space.

Trading of spectrum space can only take place in terms of whole STUs of spectrum space defined by the ACA. The area and the bandwidth of each spectrum licence can be subdivided and sold, or the licences can also be sold in their entirety.

The ACA has also introduced an amendment to the *Radiocommunications (Trading Rules for Spectrum Licence) Determination 1998* called the *Radiocommunications (Trading Rules for Spectrum Licence) Amendment Determination (No. 2) 2000* (**Attachment 8**). The amendment provides for a concept of a “minimum contiguous bandwidth” when trading licences. The minimum contiguous bandwidth for the 2 GHz band has been set at 5 MHz. This means that while licences may be traded in the 2 GHz band in STUs of 250 kHz (the STU Bandwidth in the Marketing Plan), the licences that result from any trading *must* be for a minimum bandwidth of 5 MHz or the trade will not be registered by the ACA.

Registration of Trading

Both parties to a trade, or an assignment, should notify the ACA as soon as practicable after a trade has been agreed so that the ACA can vary, issue or cancel licences as appropriate to give effect to the change, and amend the Register of Spectrum Licences to reflect those changes. The parties to a trade must complete a ‘Notice of Trading’ Form setting out the new ownership details and send it to the ACA for registration.

The ACA will register assignments as soon as practicable after receiving a Notice of Trading Form. A trade does not take effect until the Register has been changed by the ACA. There will be a fee charged to recover the ACA’s costs in making any necessary changes to the Register, and for varying, issuing or canceling any licence(s).

The Register of Spectrum Licences

The Register of Radiocommunications Licences is a public reference source containing information about the use of spectrum by radiocommunications licensees (section 143-144 of the Act). The ACA has established a Register of Spectrum Licences in an electronic form. It includes at least the following information in respect of each spectrum licence:

- the name and postal address of the licensee;
- the date of issue and expiry of the licence; and
- details about the conditions of spectrum licences.

These details are similar to the registration requirements for apparatus licences.

The ACA is also required to keep in the Register a record of transmitters, above a certain power, operated under spectrum licences so that users can co-ordinate spectrum use with other licensees. Each licence will include a condition that transmitters are not to be operated under the licence unless the registration requirements of the ACA have been met (section 69 of the Act). The condition may exempt transmitters of particular kinds (for example, small transceivers) from meeting the requirements for registration. The details that the ACA records relate to issues including:

- date of registration;
- location;
- radiated power as a function of frequency; and
- antenna details (height).

The registration requirements may include a requirement that the licensee present a certificate (an *interference impact certificate* [IIC]) issued by an accredited person stating that operation of the device under the licence will not cause unacceptable interference (see **Chapter 5 - Technical Framework**). In certain circumstances the ACA may accept an application to register a device without a certificate being furnished, for example, to allow the operation on an experimental basis of a new type of transmitter. (See **Attachment 9—Radiocommunications Advisory Guidelines (Registration of Devices under Spectrum Licences without an Interference Impact Certificate) 1998.**)

If an interference impact certificate is not furnished, the onus will be on the licensee to notify the ACA of transmitter details. Once details of a device have been registered, the licensee or person authorised by the licensee will need to comply with those details in operating the device until such time as the registration is varied. Operation of a device will not be authorised under a licence if it is operated in a manner that is not in accordance with the details in the Register.

The ACA will update the Register as soon as practicable if a spectrum licence is varied, suspended, cancelled or surrendered, or if the licence or part of the licence is assigned to another person, or resumed by the ACA (section 146 of the Act).

Transmitters that are part of a group of transmitters may be registered individually or as a group.

Low powered handsets used under spectrum licences are not required to be registered with the ACA (see Licence Schedule 3 of the sample licence in the Marketing Plan). However, spectrum licensees intending to use spectrum for mobile telecommunications will be required to authorise the use of third party operated handsets under the licence in accordance with section 68 of the Act, unless the ACA issues a class licence in relation to those handsets (see **Authorising Third Parties** above).

Spectrum Licence Conditions

A spectrum licence authorises the licensee, or a person authorised by the licensee, to operate radiocommunications devices in accordance with the conditions contained in the licence. Each spectrum licence will include core conditions (section 66 of the Act) that specify:

- the part or parts of the spectrum in which the operation of radiocommunications devices is authorised under the licence;
- the area of Australia within which the operation of radiocommunication devices is authorised; and
- the maximum permitted level of radio emissions outside these spectrum and area boundaries.

Effectively the core conditions define the spectrum space within which the licensee is authorised to operate radiocommunications devices under the licence.

The licence will also include conditions about:

- payment of charges (section 67);
- use by third parties, especially in relation to handsets (section 68);
- registration of transmitters (section 69);
- residency (section 69A); and
- any other matters that the ACA may need to include in the licence to provide for efficient administration of the Act, for example, to require proper co-ordination with other devices or to manage devices in a way that does not compromise Australia's international treaty obligations.

Spectrum Licence Tax

The ACA will recover from all licensees a share of the overhead costs of maintaining the spectrum through an annual fee or 'spectrum licence tax'. Apparatus licensees contribute towards these costs through the spectrum maintenance component in their annual licence fees. The other two components paid annually by apparatus licensees are the spectrum access tax and a cost recovery charge for licence issue or renewal. Spectrum licensees will not pay a spectrum access tax component as part of a spectrum licence tax.

However, spectrum licensees are subject to an annual tax to cover their contribution towards the ACA's overhead costs for spectrum maintenance. The taxation arrangements and the method for calculating each licensee's contribution to the base amount are contained in the *Radiocommunications (Spectrum Licence Tax) Act 1997* and the *Radiocommunications (Spectrum Licence Tax) Determination 2000* [effective from 1 July 2000], both of which are available from the ACA and on the ACA web site at:

<http://www.aca.gov.au/legal/legislation.htm>

The aggregate amount for the 2 GHz band set under *the Radiocommunications (Spectrum Licence Tax) Determination 2000* is \$60,929 per annum. A particular spectrum licence attracts a proportion of this amount, based on the licence's relative spectrum and population coverage.

Licence Term

The licences issued will be offered for terms of fifteen (15) years. The ACA will publish information regarding licences that are due to expire (see below).

Spectrum licences are issued with no automatic right of renewal. At the end of the licence period, replacement licences will generally be re-allocated following a price-based procedure (section 81 of the Act). This provision does not prevent a spectrum licence being reissued to a person to whom it was previously issued.

A spectrum licence may be reissued to the same licensee without participating in a price based allocation process where this is in accord with a determination by the Minister (section 82(3) of the Act), or where the ACA is satisfied that special circumstances exist as a result of which it is in the public interest for that person to continue to hold the licence (section 82(1)(b) of the Act). The ACA does not envisage these provisions being used for licences issued in this allocation.

The Act does not exempt the licensee from paying a spectrum access charge in these circumstances.

Licence Sanctions

Suspending and Cancelling Spectrum Licences

If the ACA is satisfied that a licensee, or an authorised third party has:

- breached a licence condition or the Act, or
- has operated a device in breach of any other Commonwealth, State or Territory law whether statutory or unwritten, such as the common law, or
- operated the device in the course of contravening such a law,

the ACA may, by written notice giving reasons, suspend a spectrum licence (section 75 of the Act). The suspension will cease within 28 days unless proceedings for an offence against the Act are instituted. The ACA may revoke the suspension at any time.

The ACA may also take action to cancel a spectrum licence (section 77 of the Act).

Application may be made to the ACA for reconsideration of a decision to suspend or cancel a spectrum licence (section 285 of the Act).

It should also be noted that in the event that licence conditions are breached by a licensee or an authorised third party, other spectrum licensees who suffer interference as

a result may also be able to pursue a remedy through the courts by undertaking civil proceedings (section 50 of the Act).

Licence Resumption

The ACA is empowered to resume spectrum licences by agreement, or by compulsory process subject to payment of just compensation (sections 89-95 of the Act). The ACA may exercise its powers to compulsorily resume spectrum licences only where the Minister has given written approval (section 91(2)(a) of the Act).

Charging for ACA Services

Under its enabling legislation, the ACA may recover its costs. Any services provided by the ACA to spectrum licensees will be charged at the ACA's normal charging schedule which will include GST.

In many instances, the ACA has set a standard charge for services offered, including registration of devices and registration of trading of spectrum space.

Each spectrum licence will include a condition that the licensee meets its obligations to pay any cost recovery charges levied by the ACA (section 67 of the Act).

Licences that are about to expire

The ACA will periodically publish notices in the Commonwealth Gazette stating where information can be obtained about spectrum licences that are due to expire within the next two years (section 78 of the Act). These publications will also invite expressions of interest from members of the public who would like a spectrum licence to be issued to them. This information can also be obtained from any of the ACA's area offices.

The ACA also proposes to send regular expiry reminders to licensees during the last two years of their licence. Notices arising from this allocation will be issued in 2015.