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Radiocommunications Assignment and Licensing Instruction

TRUNKED LAND MOBILE SERVICES

AUSTRALIAN COMMUNICATIONS AUTHORITY
SPECTRUM PLANNING AND STANDARDS GROUP
CANBERRA

RADIOCOMMUNICATIONS ASSIGNMENT AND LICENSING INSTRUCTIONS

DISCLAIMER

The Australian Communications Authority (ACA) advises that these instructions reflect the current policies of the ACA.

Prospective applicants for licences should, however, on their own responsibility, take whatever steps necessary to ensure that they have access to appropriate technical or other specialist advice independently of the ACA concerning their applications, the operation of radiocommunications equipment and services, or any other matters relevant to the operation of transmitters and services under the licences in question.

The policies of the ACA, and the laws of the Commonwealth, may change from time to time, and prospective licensees should ensure that they have informed themselves of the current policies of the ACA and of any relevant legislation. Furthermore, prospective applicants for licences should not rely on statements made in these instructions about the policies that may be followed by other authorities, nor about the effect of legislation.

Radiocommunications Assignment and Licensing Instructions are subject to periodic review and are amended as necessary. To keep abreast of developments, it is important that users ensure that they are in possession of the latest edition.

No liability is or will be accepted by the Minister for Communications, Information Technology and the Arts, the ACA, the Commonwealth of Australia, or its officers, servants or agents for any loss suffered, whether arising directly or indirectly, due to reliance on the accuracy or contents of these instructions.

Suggestions for improvements to Radiocommunications Assignment and Licensing Instructions may be addressed to the ACA at PO Box 78, Belconnen, ACT, 2616. It would be appreciated if notification to the ACA of any inaccuracy or ambiguity found, be made without delay in order that the matter may be investigated and appropriate action taken.

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Trunked Land Mobile Services

1.0 Introduction

1.1 Purpose

The purpose of this Radiocommunications Assignment and Licensing Instruction (RALI) is to facilitate the apparatus licensing of trunked land mobile services (TLMS) by the Australian Communications Authority (ACA). This RALI replaces RALI LM 3, dated 13 August 1992, sequence number 5.

The information in this document reflects the ACA's statement of current policy in relation to licensing TLMS. In making decisions, ACA officers should take all relevant factors into account and decide each case on its merits. If an issue related to this document appears to fall outside the enunciated policy, please consult the Manager, Compliance and Licensing Team, Central Office, unless otherwise indicated in the following text.

1.2 Trunking Concept

Trunking is the generally accepted term to describe the automatic sharing of several communication channels by a number of users. A trunked radio system is a system in which many users share the use of a common pool of radio channels. Channels are assigned on demand for the duration of a call and, as calls are completed, the channels are returned to the pool for assignment to other users. The important principle behind this concept is that any user has access to any free channel within the pool giving temporary exclusive use of a channel. This has the advantage that more mobiles per channel can be accommodated for a given grade of service, resulting in an overall improvement in spectrum efficiency when compared with an equivalent number of single channel systems. TLMS systems can function as single site operations or as wide area (multiple site) systems and can carry voice and/or data.

1.3 Scope of RALI

This RALI applies only to services using the bands allocated for TLMS, as noted in section 2.0 of this RALI. The limited amount of trunking spectrum, the need for operators to have multiple channels for trunking operation and the need to support the development of competitive services mean that special attention is necessary for the management of this limited resource. Two policy principles apply in support of this objective:

- support of high efficiency technology - the trunking bands are to be used for high efficiency technologies such as trunking systems carrying voice or data or non-trunked systems carrying data only. Trunking bands are not to be used for single channel conventional voice systems. Conversely, trunking systems or data systems may operate in any of the conventional single channel mobile radio bands; and
- equitable access - in assigning multiple channels to applicants, a balance needs to be struck between preserving capacity to accommodate future operators and supporting expansion of existing operators.

Accredited persons intending to undertake assignment work in trunking spectrum should discuss channel availability with the relevant ACA Area Manager before undertaking that work.

Nothing in these instructions precludes the holding of licences in more than one TLMS band. Each band or TLMS system is to be treated separately and in accordance with this RALI, particularly with regard to loading criteria.

1.4 TLMS Spectrum Obtained Through a Price-based Allocation Process

TLMS Apparatus licences allocated through a price-based process are not subject to the provisions of Section 4.1 of this RALI.

Any existing holding of TLMS, including quantity of channels held and their status in terms of loading criteria requirements, is irrelevant in the decision to issue apparatus licences through a price-based allocation process. The total holding of TLMS, including channels authorised under apparatus licences issued as a result of a price-based allocation process, will be subject to loading criteria requirements in any decision to issue additional apparatus licences authorising TLMS in circumstances other than following a price-based allocation process (see Sections 4.2 and 6.0 of this RALI).

2.0 Frequency Bands and Channelling Structures

There are a number of bands designated for TLMS use in Australia; they are within the VHF High Band, the 400 MHz band and the 800 MHz band. The basic trunking assignment unit is the **group** which consists of five specified channels. A specified number of groups comprise a **block**. Trunking channels are arranged, by combination, in a systematic order of blocks and groups, designed to minimise interference and enable maximum efficiency of use. These arrangements are typically established through international or major regional standards processes.

For the 400 MHz and 800 MHz bands, four groups comprise a block. In the VHF High Band, two groups comprise a block. Detailed arrangements for each of these bands are set out in the RALI entitled 'Frequency Assignment Requirements for the Land Mobile Service' (LM 8).

3.0 The TLMS System

A TLMS system may be located at a single site or at multiple sites. A TLMS system comprises those TLMS channels, in a particular TLMS band, assigned to a licensee in any one '**operational area**', where:

- in the cities of Sydney, Melbourne, Brisbane, Adelaide and Perth, an operational area is defined as having a 100 kilometres (km) radius centred on the General Post Office;
- in areas outside those cities, an operational area is defined as having a 100 km radius centred on any one site operated by a particular licensee.

The above area is defined for channel entitlement purposes (ie, an area within which loading criteria for system expansion apply). It is not an area for assignment purposes. Channel entitlements are detailed in section 4.0 of this RALI.

The term 'operational area' should not be confused with the term 'notional service areas', which is used in other documentation about land mobile services.

There is no limit on the number of sites and no restriction on their distribution within an operator's operational area, provided that trunking operations are maintained in compliance with this RALI.

4.0 Channel Entitlements

4.1 Initial Entitlement

The number of channels to be licensed initially to an operator in an **operational area** (see section 3.0 of this RALI) is a maximum of 20 channels for a single site system, or a maximum of 30 for a multi-site system, subject to spectrum availability.

TLMS spectrum is subject to high and increasing demand in most bands in the cities listed in section 3.0 of this RALI, to the extent that, in some cases, demand is unable to be met.

It is generally considered that there is little spectrum efficiency to be gained by implementing a trunking system on fewer than five channels. This is the minimum number for which an applicant should be initially licensed in the city operational areas specified in section 3.0 of this RALI. A smaller unspecified number of channels is allowable for data systems (high capacity only).

In operational areas outside the cities listed in section 3.0 of this RALI, fewer than the standard five channels may be assigned initially by the ACA. However, the principles detailed in section 1.3 of this RALI should be observed.

4.2 System Expansion

A licensee of a TLMS system may seek licences for a maximum of a further five channels at a time.

Applications seeking the assignment of additional channels to an existing TLMS system should be assessed on a case-by-case basis. Assignment of additional channels is dependent on the licensee demonstrating that loading criteria applicable to the system have been reached.

In those instances where expansion of the trunking system does not require a full group of five channels, fewer channels may be licensed. For example, some systems may reach final capacity with eight channels. In these instances, the unused channels of a particular group are then available to other system operators. In all cases, the preferred option is to assign in such a manner as to protect the integrity of the group structure as much as possible.

Applications for licences that comprise fewer than five channels at sites used to geographically extend the operational capability of an established TLMS systems beyond an operational area are to be considered on a case-by-case basis.

5.0 Licensing Arrangements

In considering the initial issue of a licence the ACA will pay regard to the channel entitlements detailed in section 4.0 of this RALI. In addition, the ACA will:

- regard the efficient use of the spectrum as a higher priority than other considerations;
- seek to ensure equity of access to the spectrum for all users; and
- take into account competing demand for TLMS channels.

Each TLMS channel is required to be covered by a separate licence for each channel (frequency pair) and for each site, as appropriate.

5.1 Land Mobile Licence Type

The Land Mobile licence type is defined in the *Radiocommunications (Definitions) Determination No. 2 of 1993* as:

A Land Mobile licence means a licence issued for a radiocommunications service that:

- (a) comprises 1 or more land stations or land mobile stations; and
- (b) is used for communications between:
 - (i) land stations and land mobile stations; or
 - (ii) land mobile stations; or
 - (iii) land mobile stations through another land station; or
 - (iv) land stations through another land station; and
- (c) may communicate with:
 - (i) an aircraft station, but not on an aeronautical frequency; or
 - (ii) a maritime ship station, but not on a maritime frequency.

5.2 Land Mobile System

A Land Mobile System station is defined in the *Radiocommunications (Definitions) Determination No. 2 of 1993* as:

A Land Mobile System means a system comprising 1 or more land stations, and 1 or more land mobile stations, that:

- (a) are operated under a land mobile licence; and
- (b) are established for the principal purpose of two-way communications.

The policy approach adopted for the Land Mobile System station licensing option is that the licence authorises operation of the base station, supplementary base station(s), mobiles, overlay paging receivers, remote control stations and bi-directional amplifier systems. It should be noted, however, that supplementary base stations should be separately recorded as additional devices under the base station access record. These arrangements are authorised through the Licence Conditions Determination.

Note: Supplementary base stations are further described in section 5.3 of the RALI entitled 'Frequency Assignment Requirements for the Land Mobile Service' (LM 8).

Note: Separate arrangements apply to the use of bi-directional amplifiers. These arrangements are detailed in the RALI entitled 'Management of Bi-directional Amplifiers in the Land Mobile Service in the Frequency Range 29.7 MHz to 520 MHz' (LM 6).

5.3 Licence Conditions

The operation of radiocommunications equipment authorised by a Land Mobile licence is subject to:

- conditions specified in the Act, including an obligation to comply with the Act;
- a condition that any radiocommunication device operated under the licence must comply with all the standards applicable to it;
- conditions specified in the *Radiocommunications (Apparatus Licence) Determination No. 1 of 1997*, and any other determinations made by the ACA under paragraph 107(1)(f) of the Act;
- conditions specified in the licence; and
- any further conditions imposed by the ACA under section 111 of the Act.

5.4 Licence Conditions Determinations

Under paragraph 107(1)(f) of the Act, the ACA may determine, by written instrument, conditions relating to a particular type of apparatus licence. These conditions are known as Licence Conditions Determinations (LCDs). LCDs contain the generic conditions particular to various radiocommunications licence types and licensing options, including detail of assigned frequencies, or frequency bands, and permitted power levels.

The LCD for the Land Mobile licence type is entitled *Radiocommunications Licence Conditions (Land Mobile Licence) Determination No. 1 of 1997*.

5.5 Special Conditions

Special conditions may be applied to the licence as required. A special condition that is inconsistent with an LCD may only be applied after consultation with the Area Manager.

If licensees wish to use mobile to mobile communications, special condition LV must be attached to Land Mobile licences authorising Land Mobile Systems operating in TLMS spectrum. Details about special condition LV are provided in section 7.0 of this RALI.

Accredited persons may recommend the attachment of special conditions to licences.

5.6 Advisory Notes

Advisory notes, providing information that may be of interest to a licensee, are to be printed on the licence under the heading 'Advisory Notes'.

Advisory Note LU, must appear on all Land Mobile licences authorising Land Mobile Systems operating in trunking spectrum. LU states:

'The availability of additional channels in this Trunked Land Mobile Service system is dependent on the licensee demonstrating that loading criteria appropriate to the system have been reached. Information about appropriate loading criteria may be obtained from the Australian Communications Authority.'

For information about appropriate loading criteria see section 6.0 of this RALI.

5.7 Transfer of Licences

Nothing in this RALI precludes the transfer of Land Mobile licences authorising Land Mobile Systems operating in trunking spectrum. Information about transfers of apparatus licences is provided in the RALI entitled 'Transfer of Apparatus Licences' (MS 18).

5.8 Licence Fees

General information about licence fees is available in section 8.0 of the RALI entitled 'Overview of Apparatus Licences' (MS 16) and in the ACA brochure entitled *Apparatus Licence Fee Schedule*.

Information about licence fee exemptions, concessions and discounts is available in section 8.0 of the RALI entitled 'Overview of Apparatus Licences' (MS 16), as well as in the RALI entitled 'Apparatus Licence Fees: Exemptions, Concessions and Discounts' (MS 17), and in the similarly titled ACA policy information paper on the Internet.

In the Land Mobile licence type, all services require an individual frequency to be assigned so the fee is calculated individually.

5.9 For How Long May Land Mobile Licences be Issued?

Clients have the option of taking out an apparatus licence for any period up to five years. Further information about multi-year licences may be found in the RALI entitled 'Apparatus Licence Periods' (MS 24).

6.0 Loading Criteria Assessment

In order not to prejudice opportunities for future operators, Area Managers are to take appropriate steps to satisfy themselves that existing systems are at least approaching full loading before additional channels are assigned to those systems.

When considering applications for additional channels, Area Offices should gather relevant information upon which to make informed judgements about the level of loading of an applicant's existing system. Some approaches might be:

- seeking, from an applicant for additional channels, written information about the loading of the existing system; and
- monitoring the level of activity in the applicant's existing Land Mobile System.

Note: Mobile to mobile communications is not considered in 'channel-loading' calculations.

The trunking bands are typically used for voice despatch applications and the figure of 100 mobiles per channel is a reasonable measure of efficient channel loading for systems comprising at least 15 channels. Typical loadings for fewer than 15 channels are 850 mobiles for ten channels and 350 mobiles for five channels. However, where the systems are carrying data, or have significant levels of PTN interconnect, then different figures would apply. That is, criteria for measuring channel loadings depend on the traffic mix.

For example, while a channel used for voice despatch purposes may be fully loaded at 100 mobiles; it might be fully loaded at, say, 30 mobiles, if used mainly for PTN interconnect. Channels used for data systems may be able to support many hundreds of mobiles before becoming fully loaded.

Advice about the principles supporting the imposition of loading criteria may be obtained from the Manager, Spectrum Planning Team, Spectrum Planning and Standards Group.

7.0 Intermobile Communication

Mobile-to-mobile communications (talk-around or intermobile communication) is supported on TLMS channels, provided that:

- the channel used comprises part of a licensed group and is maintained primarily for base/mobile trunked communications; and
- operation is:
 - on a 'no interference, no protection' basis. Special Condition LV must be attached to the relevant licence:
 - ‘Mobile to mobile communications authorised under this licence must not cause interference to any radiocommunication station or service and no protection from interference to mobile to mobile communications by such stations or services shall be afforded.’
 - This provision is to be incorporated into the *Radiocommunications Licence Conditions (Land Mobile Licence) Determination No. 1 of 1997*, in due course; and
 - performed on the base transmit (mobile receive) frequency.

8.0 Frequency Assignment Requirements

The frequency assignment requirements for TLMS are detailed in the RALI entitled 'Frequency Assignment Requirements for the Land Mobile Service' (LM 8).

RALI Authorisation



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