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Radiocommunications Assignment and Licensing Instruction

**STUDIO TO TRANSMITTER LINKS AND
SOUND OUTSIDE BROADCASTING SERVICES
IN THE 900 MHz BAND**

AUSTRALIAN COMMUNICATIONS AND MEDIA AUTHORITY
RADIOFREQUENCY PLANNING GROUP
CANBERRA

RADIOCOMMUNICATIONS ASSIGNMENT AND LICENSING INSTRUCTIONS

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

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 ACMA 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 ACMA, 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 ACMA 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, ACMA, 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 ACMA at PO Box 78, Belconnen, ACT, 2616. It would be appreciated if notification to ACMA of any inaccuracy or ambiguity found, be made without delay in order that the matter may be investigated and appropriate action taken.


Amendment Authorisation

The following amendments to RALI FX11 are authorised:

Date of Effect	Page Date*	Description of Amendments
10 October 2005	October 2005	Sections 2.1, 4.1, 5.0 and 5.1 were modified to include the new licence category created for 900 MHz Studio to Transmitter links.

* The Page Date appears at the bottom of each page and indicates the date that the page was last updated.

AMENDMENT AUTHORISATION



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Studio to Transmitter Links and Sound Outside Broadcasting Services in the 900 MHz Band

1.0 Introduction

This Radiocommunications Assignment and Licensing Instruction (RALI) replaces FX 11, dated 9 February 1999, sequence number 144 (104).

1.1 Purpose

The purpose of this RALI is to provide licensing procedures for:

- fixed service low capacity¹ single frequency services, used mainly by broadcast services for studio to transmitter links (STLs); and
- sound outside broadcast links (SOBs);

allocated in the segment 845-852 MHz of the *900 MHz Band Plan*². This Statutory Rule is referred to in the remainder of this RALI as the Band Plan.

The information in this document reflects the Australian Communications and Media Authority's statement of current policy in relation to licensing and frequency coordination for STLs and SOBs in the 900 MHz band. In making decisions, ACMA officers and accredited persons should take all relevant matters 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, National Licensing and Enquiries Centre, ACMA Central Office, Benjamin Offices Belconnen ACT.

1.2 Related RALIs

General information about licensing arrangements is provided in the RALI entitled 'Overview of Apparatus Licence System' (MS 16). Information about licensing arrangements for Fixed services will be provided in the RALI entitled 'Issuing Fixed Licences' (FX 13). General information about Fixed services is contained in the RALI entitled 'Microwave Fixed Services: Frequency Co-ordination' (FX 3).

¹ 'Low Capacity' is defined in the 900 MHz Band Plan as a bandwidth of greater than 25 kHz, but not exceeding 400 kHz.

² The 900 MHz Band Plan is Statutory Rules 1992, No 47.

1.3 Background

The Band Plan made a primary allocation to the fixed service (low capacity, single frequency links), referred to in the remainder of this document as STLs³, within the segment 845-852 MHz. This replaced the previous allocation at 952-960 MHz which was allocated to the digital CMTS (cellular mobile telephone service).

SOBs are allocated on a shared primary basis with STLs in the segments 845-846.5 MHz and 850.5-852 MHz. Secondary allocations are made to SOBs in the segment 846.5-850.5 MHz and to radiolocation services in the segment 850-852 MHz⁴.

A diagram of the 900 MHz Band Plan is included at Attachment A.

1.4 Existing Two Frequency Fixed Links

There are a number of low capacity two frequency and wideband⁵ fixed links operating in the segment 845-852 MHz that are generally located in remote areas. These links, which have secondary status in accordance with clause 9 of the Band Plan⁶, are permitted to continue operating in these bands, unless spectrum is required for STLs and/or SOBs. The requirement for the clearance of any of these fixed links is to be referred to Customer Services Coordination, Communication Operations and Service Branch in Central Office where it will be considered, on a case by case basis, as part of Band Plan implementation.

2.0 Licence Structure

In order to facilitate the development and implementation of appropriate licensing procedures, including the application of licence conditions and fees, different kinds of radiocommunications applications are separately identified within the various licence types as individual licensing options; usually related to kinds of service or stations or uses.

³ The majority of fixed service low capacity single frequency services are STLs.

⁴ This is part of an overall radiolocation allocation in the segment 850-942 MHz of the 900 MHz Band Plan, normally restricted to Defence usage only.

⁵ Wideband is defined in the Band Plan as a bandwidth greater than 200 kHz, but not exceeding 2 MHz.

⁶ Services operating prior to the making of the 900 MHz Band Plan may continue to operate on a secondary basis.

2.1 Fixed Licence Type

The Fixed licence type is defined in Radiocommunications (Interpretation) Determination 2000. A Fixed licence means a licence issued for one or more stations that:

- (a) are located principally:
 - (i) at fixed points specified in the transmitter licence that relates to the station; or
 - (ii) in an area specified in the licence; and
- (b) are operated principally for communications with stations located:
 - (i) at 1 or more other fixed points specified in the licence; or
 - (ii) in an area specified in the licence; and
- (c) if permitted by the transmitter licence that relates to the station, may communicate with:
 - (i) an aircraft station, but not on an aeronautical frequency; and
 - (ii) a ship station but not on a maritime frequency; and
 - (iii) a land mobile station but not on a land mobile frequency.

Within the Fixed licence type, there are eight licensing options authorising operation for one of the following purposes:

- 900 MHz studio to transmitter link;
- Point to Multipoint;
- Point to Multipoint System;
- Private CTS (Fixed);
- Television Outside Broadcast;
- Television Outside Broadcast Network;
- Television Outside Broadcast System; and
- Sound Outside Broadcast.

STLs are licensed under a Fixed licence authorising a 900 MHz studio to transmitter link station. SOBs are licensed under a Fixed licence authorising a Sound Outside Broadcast station.

A 900 MHz studio to transmitter link station is defined in the Radiocommunications (Interpretation) Determination 2000

A 900 MHz studio to transmitter link station means a point to point station that:

- (a) is operated only within frequency range greater than 820 MHz and less than or equal to 960 MHz; and
- (b) transmits sound broadcasting program material from a broadcasting studio to a broadcasting transmitter.

A SOB station is defined in the Radiocommunications (Interpretation) Determination 2000

A sound outside broadcast station means a fixed station that:

- (a) is operated under a fixed licence; and
- (b) is established for the purpose of providing a temporary broadcasting coverage of an event.

3.0 Licence Conditions

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

- conditions specified in the *Radiocommunications Act 1992* (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 Licence Conditions (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.

3.1 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 radiocommunications licence types and licensing options, including detail of assigned frequencies, or frequency bands, and permitted power levels.

The *Radiocommunications Licence Conditions (Apparatus Licence) Determination No. 1 of 1997* contains licence conditions that are common to all apparatus licences.

The *Radiocommunications Licence Conditions (Fixed Licence) Determination No. 1 of 1997* (the Fixed LCD), currently contains the conditions applicable to the Point to Point and Point to Multipoint licensing options only. Conditions in respect of the other fixed licensing options will be progressively added to this LCD.

3.2 Special Conditions

Any other conditions of operation which apply to an individual licence but are not included in the LCD, will be printed on the licence under the heading 'Special Conditions'. A special condition that is inconsistent with an LCD may only be applied after consultation with the Area Manager.

An accredited frequency assigner may ask the ACA to impose one or more special condition on the licence according to the circumstances in which the frequency assignment for the licence is made.

4.0 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 System' (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.

4.1 Licence Fees for STLs

For radiocommunications services that require an individual frequency to be assigned, the fee will be calculated individually.

As the Fixed licence authorising a 900 MHz studio to transmitter link station requires an individual frequency assignment, the total licence fee is individually calculated in RADCOM. The tax for a Fixed 900 MHz studio to transmitter link station is determined by RADCOM on the basis of the spectrum access record attached to the licence. The tax will be calculated on the necessary bandwidth of the transmission subject to a minimum of 200kHz. The administrative charge covers either the actual cost of the initial specific licence issue or the cost of renewing the licence.

4.2 Licence Fees for SOBs

Radiocommunications services where groups of frequencies have been set aside for common use have a set fee.

The set fee for a Fixed Sound Outside Broadcast station combines a tax component and an administrative charge in a single annual fee for each licence, with a discount for multi-year licences paid up-front.

5.0 900 MHz Studio to Transmitter Links

STL licensing arrangements are based on Spectrum Planning Report SP 29/91: 'Frequency Assignment Rules for STL Services Operating in the Segment 845-852 MHz (Part One)', issued December 1991.

A 'Studio to Transmitter Link' is defined in the Band Plan as:

'a fixed service which transmits radio broadcasting programme material from a broadcasting studio to a broadcasting transmitter.'

5.1 STL Conditions Contained in the Fixed LCD

Part 2 of the Fixed LCD contains technical licence conditions that apply to all Fixed licences authorising 900 MHz studio to transmitter link stations. These conditions facilitate communications between two fixed stations.

5.2 Frequency Assignment for STLs

5.2.1 Channelling Arrangements

Channelling arrangements for STLs provide 17 main channels spaced 400 kHz apart with the centre frequency of the first channel at 845.4 MHz and 17 interleaved channels offset by 200 kHz, ie, spaced 400 kHz apart beginning at 845.2 MHz. A diagram of the channelling arrangements is provided at Attachment B.

STLs may utilise a variety of channel bandwidths greater than 25 kHz, to a maximum of 400 kHz, depending on the application, the mode of operation and the number of control or program subcarriers used. Typical STL channel bandwidths are 250 kHz for equipment using digital modulation and range from 60 kHz to 400 kHz for analogue equipment.

5.2.2 Frequency Coordination Procedure

The frequency coordination procedure involves calculating the wanted to unwanted (W/U) signal level ratio for the proposed service and each existing service in the coordination area. The calculated W/U ratios are compared with the required protection ratios for the services involved. Refer to the RALI entitled 'Microwave Fixed Services: Frequency Co-ordination' (FX 3) for a more detailed explanation of the fixed link coordination procedure.

Discussed below are those aspects of the frequency coordination procedure specific to STLs including spatial cull range, and protection ratios.

5.2.2.1 Spatial Cull

The spatial cull for STLs should include all stations within a radius of 200 km around the centre point of the proposed new link. Where necessary, this range may be extended to take account of special circumstances, such as stations on very high sites.

5.2.2.2 Protection Ratios

The protection ratio values required to protect an STL from unacceptable interference from another STL, SOB and other links are based on criteria developed in other countries and consultations with the broadcast industry. They are listed in Table 1.

Table 1: Protection Ratios

Relationship	Protection Ratio ⁷
Co-channel *	50 dB
Adjacent channel **	0 dB

* Overlapping emissions are considered as co-channel.

** Two systems are deemed to be adjacent if their emissions do not overlap. For example, two 330 kHz systems assigned channels 400 kHz apart would be considered as adjacent. Similarly, two 150 kHz systems assigned channels 200 kHz apart would also be considered as adjacent.

Methods that may be considered for achieving the required W/U signal level ratio include:

⁷ These protection ratios were established in Spectrum Planning Report SP 29/91.

- adjustments to antenna polarisation and directivity;
- geographical separation and terrain features; and
- the use of filters.

5.2.3 Operation Adjacent to a Spectrum Licensed Space

The STL band edge at 845 MHz is directly adjacent to frequencies that are spectrum licensed. Protection for the fixed services (STL and SOB) operating in bands adjacent to the 800 MHz spectrum licence band is specified in the '*Radiocommunications Advisory Guidelines (Protection of Apparatus-licensed Receivers - 800 MHz Band) 1998*'.

Out of band protection requirements for interference from STLs or SOBs operating in bands adjacent to a spectrum licensed band are set out in the '*Radiocommunications Advisory Guidelines (Managing Interference from Apparatus-licensed Transmitters - 800 MHz Band) 1998*'.

These guidelines are available from the ACA website under 'PCS Spectrum Auction'.⁸

5.2.4 Assignment Priority

Channels from the main pattern (refer to Attachment B) should be used for larger bandwidth systems. Channels should be assigned to STLs according to the priority shown in Table 2, in order to optimise the scope for sharing between SOBs and STLs.

Table 2: STL Channel Selection Priority

Priority	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Main Channel Number	4	5	6	7	8	9	10	11	12	13	14	3	15	2	16	17	1

Note: Assignments to STLs on channels 1, 2, 3, 14, 15, 16 and 17 should not be made unless absolutely necessary, allowing clear primary spectrum for SOB use. SOB channel assignment strategies have been developed in consultation with the broadcast industry and are given in Section 6.

Channels from the 'interleaved' pattern may be used where appropriate, for example, for smaller bandwidth systems including mono and 'dual mono'⁹ systems. Interleaved channels 1-4 and 15-17 should not be assigned to an STL unless all other channels are used.

5.2.5 Dual Frequency Use Not Permitted

The use of two links operating on different frequencies and carrying the same program over the same path is not permitted. System back-up (redundancy) can be achieved by using hot standby configurations. Note that 'dual mono' STL use is permitted, provided each transmitter carries different information (for example, one transmits the left channel and the other the right channel of a stereo audio signal).

5.2.6 STL Antennas

The notional antenna for this service is specified as that having technical characteristics similar

⁸ www.aca.gov.au

⁹ 'Dual mono' STL systems comprise two transmitters and two receivers.

to a two metre grid parabolic (refer to special condition AV in section 5.2.7 of this RALI). The notional antenna should be used in high spectral density areas and in all other areas where STL usage is high.

STL operators who were required to change frequency as part of the implementation of the Band Plan, were permitted initially to use their existing antenna systems in the new band. It may be necessary for these operators to upgrade their antenna systems to the notional antenna specifications if:

- their use of a lower performance antenna prevents an assignment being made that would have been possible if the notional antenna was in use; or
- there is a possibility of interference to or from other services.

Refer to section 5.2.7 of this RALI for special conditions that may be applied.

5.2.7 Band Edge Considerations

The STL allocation in the segment 845-852 MHz is adjacent to a previous allocation for wideband fixed services (subject to reallocation), an allocation to single channel two frequency fixed services and a spectrum licensed band. Because of this, special consideration should be given to the avoidance of mutual interference occurring between STL services on channels 1 and 17 and services operating in adjacent band segments. Note that channels 1 and 17 are not to be assigned if alternative channels are available (see section 5.2.3 of this RALI).

Assignment of frequencies within 400 kHz from single channel two frequency services that use 25 kHz channels should be avoided, where practicable. This restriction affects the assignment of both channel 17 main and channel 17 interleaved and is required because of the large differences in bandwidth between STL and single channel two frequency services. The assignment of channel 17 would severely limit the number of channels available for single channel two frequency services in any area, as many single channel two frequency services could otherwise be assigned in the spectrum adjacent to channel 17. The potential for mutual interference is also increased due to the large number of single channel two frequency services that could be considered as being adjacent to an STL service on channel 17.

Assignment of frequencies separated by less than 400 kHz from the spectrum licensed band should be avoided. This will restrict assignment of channel 1 main and channel 1 interleave.

It was not considered necessary to observe the same 400 kHz constraint between STLs and wideband fixed links in the 835-845 MHz band segment as these services are similar and will be considered in the normal frequency assignment coordination process.

5.2.8 Special Condition and Advisory Note - Antenna Use

Special condition AV¹⁰ may be applied to Fixed licences authorising Point to Point (STL) stations. It may be used on licences for re-issue where the poor performance of the existing antenna is preventing assignments to other STLs.

The wording of special condition AV is as follows:

This station must employ an antenna with performance characteristics equivalent to or better than a two metre diameter grid parabolic. Typical specifications - mid band gain 22 dBi, 3 dB beamwidth 13 degrees, FB ratio 24 dB and cross polar discrimination 28 dB.

¹⁰

For further information about special conditions and advisory notes refer to the RALI entitled 'Licence Text in RADCOM (Incorporating Special Conditions and Advisory Notes)' (MS 11).

Advisory note AW should be applied to all Fixed licences authorising Point to Point (STL) stations in areas where the proposed antenna has performance specifications below that of the notional antenna (refer to section 5.2.5 of this RALI).

The wording of advisory note AW is as follows:

The licensee may be required to replace the antenna with another having a higher performance in order to facilitate efficient spectrum usage.

6.0 Sound Outside Broadcasting Links

This section of the RALI covers licensing of SOBs in the segments 845-846.5 MHz and 850.5-852 MHz, allocated to SOBs and STLs on a co-primary basis. The assignment priority for STLs that are referred to in section 5.2.3 of this RALI, has been formulated to allow maximum scope for SOB use in these shared segments.

Note: The segment 846.5-850.5 MHz is allocated for SOB use on a secondary basis. The arrangements for SOB use in this segment have not been prescribed. Applications for SOB operation in this segment are to be referred to Satellite and Technical Coordination, Customer Services Group in Central Office for consideration.

SOB spectrum arrangements are summarised at Attachment C of this RALI.

SOBs are effectively 'temporary fixed links' used for relatively short periods within an area defined on the licence. The licensing arrangements are different from those applicable to Fixed Point to Point stations.

SOBs are a non assigned licence category and a group of frequencies is assigned for use in a given area. These frequencies must be shared by all SOB users in the area. The number of channels provided for SOB use in an area will depend on industry requirements for SOB channels.

6.1 SOB Conditions Contained in the Fixed LCD

The technical licence conditions that apply to all Fixed licences authorising Sound Outside Broadcast stations are being incorporated into the Fixed LCD. These conditions are for the operation of temporary radio link relaying program material to a fixed receiver normally located at the licensee's studio or transmitter site.

Until SOB licence conditions are included in the Fixed LCD, special condition ZU 53 should be applied to such licences. See section 6.3.2 of this RALI for more information.

6.2 Frequency Assignment for SOBs

6.2.1 Frequency Coordination

Fixed licences authorising SOB stations will be issued to any applicant subject to spectrum availability, ie, SOB bands are available on a fully shared basis to all users in an area, on a no-protection from interference by other SOB users basis. The only frequency coordination to be conducted by the ACA will be to determine if SOB spectrum is not available due to the use of the bands by STLs and in accordance with limitations detailed at section 6.2.2 of this RALI. This will necessitate a user defined special condition being applied to the licence (refer to section 6.3.1 of this RALI). This arrangement is consistent with the pseudo-assigned, low fee licence

structure applicable to SOBs.

SOB licensees are encouraged to coordinate the use of the SOB bands on an industry consultation basis, in order to optimise the use of the frequencies and to minimise the risk of interference.

6.2.2 Frequencies

SOBs may be authorised to operate on any suitable frequencies within the SOB frequency range specified on the licence (subject to availability of specified frequencies).

It is recommended that on each licence:

- a minimum of two SOB frequencies should be assigned in low spectrum demand areas (preferably one from each SOB segment); and
- the number of frequencies assigned to SOBs in high spectrum demand areas be in accordance with the usage pattern for SOBs, and in line with spectrum availability (paying regard to assignment issues at section 6.2.8 of this RALI). The assignment of multiple frequencies in high spectrum demand areas allows licensees greater choice, as particular frequencies may not be usable in parts of the licensed area due to the presence of other services such as STLs and restrictions imposed through operation adjacent to a spectrum licensed band.

The frequencies available for selection in line with section 6.2.8 of this RALI are listed in Table 3.

Table 3: SOB Frequency List (in MHz).

Main Pattern	845.4	845.8	846.2	850.6 *	851.0	851.4	851.8 *
Interleave Pattern	845.2 **	845.6	846.0	846.4 *	850.8	851.2	851.6

* These frequencies are not normally available for wide band emission assignments.

** This frequency is not available for wide band emission assignments.

The frequencies will be stated on the licence by a user defined special condition, see section 6.3.1 of this RALI.

This approach is recommended for equipment that is based on STL parameters. Alternative frequency proposals for SOB equipments with narrower spacings or other frequencies should be referred to Satellite and Technical Coordination, Customer Services Group in Central Office.

6.2.3 Spectrum Access

For coordination with STL and other fixed services, each channel assigned for SOB use in a given area should have a pre-assigned spectrum access record. Only a single record for each channel in a given area is required.

6.2.4 Transmit Power

The maximum transmitter power is to be limited to 5 watts into the antenna. See section 6.3.1 of this RALI for the user defined special condition.

6.2.5 Emission Limits of SOBs

SOBs may employ an emission bandwidth greater than 25 kHz to a maximum of 400 kHz. As

the assignment of narrow bandwidth services may be made on the interleave channels, the emission bandwidth needs to be referred to on the licence by a user defined special condition for coordination purposes, see section 6.3.1 of this RALI.

6.2.6 SOB Antennas

It is recognised that, for outside broadcasting, it may be more convenient to use a Yagi antenna, than the two metre grid parabolic specified as the notional antenna for STLs (refer to section 5.2.6 of this RALI). However, it should be noted that the poorer side lobe performance of a Yagi antenna presents a higher risk of mutual interference with other services, particularly in the same geographic location. Therefore, it is recommended that a two metre grid parabolic should be used whenever practicable (for example, for SOBs established on a semi-permanent basis).

6.2.7 Service Area

Although Fixed licences authorising SOB stations are non assigned, the service area is restricted to enable coordination with STLs. Usually this area will be defined as being within 50 km of a central coordinate for all SOB licences in a particular area (for example, the GPO of a Capital City), see section 6.3.1 of this RALI for the user defined special condition.

Applications to operate SOBs in regions of larger radius than 50 km for example, for State-wide networks, are to be referred to Satellite and Technical Coordination, Customer Services Group in Central Office for consideration

6.2.8 Band Edge Considerations for SOBs

Services using spectrum adjacent to the SOB segments include wideband fixed links, single channel two frequency services and a spectrum licensed band. In order to avoid interference to these services SOBs should not normally be assigned frequencies within 400 kHz of the following services operating within the SOB coordination area:

- single channel two frequency fixed links in the adjacent band above 852 MHz (potentially restricting assignments in the range 851.6-852 MHz);
- wideband fixed links in the adjacent band below 845 MHz (potentially restricting assignments in the range 845-845.4 MHz); and
- 800 MHz spectrum licensed services.

Out of band protection for STLs operating in bands adjacent to a spectrum licensed band is set out in the '*Radiocommunications Advisory Guideline (Protection of Apparatus-licensed Receivers - 800 MHz Band) 1998*'. A copy of this guideline is available from the ACA website. As detailed in the guideline, SOBs operate on a no protection basis, although some protection may be afforded fortuitously through the protection of STLs.

6.2.9 Wideband Links

Existing wideband fixed links using SOB spectrum operate on a secondary basis and may be required to move if spectrum is required for a primary service (refer to section 1.4 of this RALI for details). However, as these links are mainly located in remote areas, it should be possible to avoid clearance action by specifying alternative frequencies for the SOB station within the SOB segments.

6.3 Special Conditions

6.3.1 User Defined

Fixed licences authorising SOB stations are non assigned and do not have an individual spectrum access. RADCOM will be upgraded to allow non assigned licences to have spectrum access records which will then allow the technical details to be automatically printed on the licence. Until this facility is provided, the technical details must be specified on the licence by user defined special conditions. The wording should be:

This licence authorises the licensee to operate:
 on the frequency channels with a centre frequency of {select the applicable frequency/frequencies from the above list} MHz;
 with a maximum bandwidth of { } kHz;
 a maximum transmitter power of 5 watts; and
 within {xx} kilometres of the {name} with the following co-ordinates { Z; E; N }.


6.3.2 User Selected

The shared spectrum arrangements applying to the SOB service necessitate that operations are subject to no interference, no protection licence condition. This is necessary in order to afford protection to fixed, coordinated stations operating on a primary basis (for example, wideband and narrowband fixed links, and STLs). The transient nature of a SOB station means the actual location and times of operation are unknown to the ACA's frequency assigners, so it is not practical to afford protection to SOBs when making new assignments in spectrum adjacent to them.

Until the LCD commences, all SOBs should have a user selected special condition ZU 53 applied. The special condition is as follows:

'The station authorised by this licence can only be used for sound outside broadcasting (SOB) purposes. The allocated bands are subject to sharing arrangements with other SOB services. No interference shall be caused to any radiocommunication station or service operating on a primary basis and no protection from such stations is able to be afforded.'

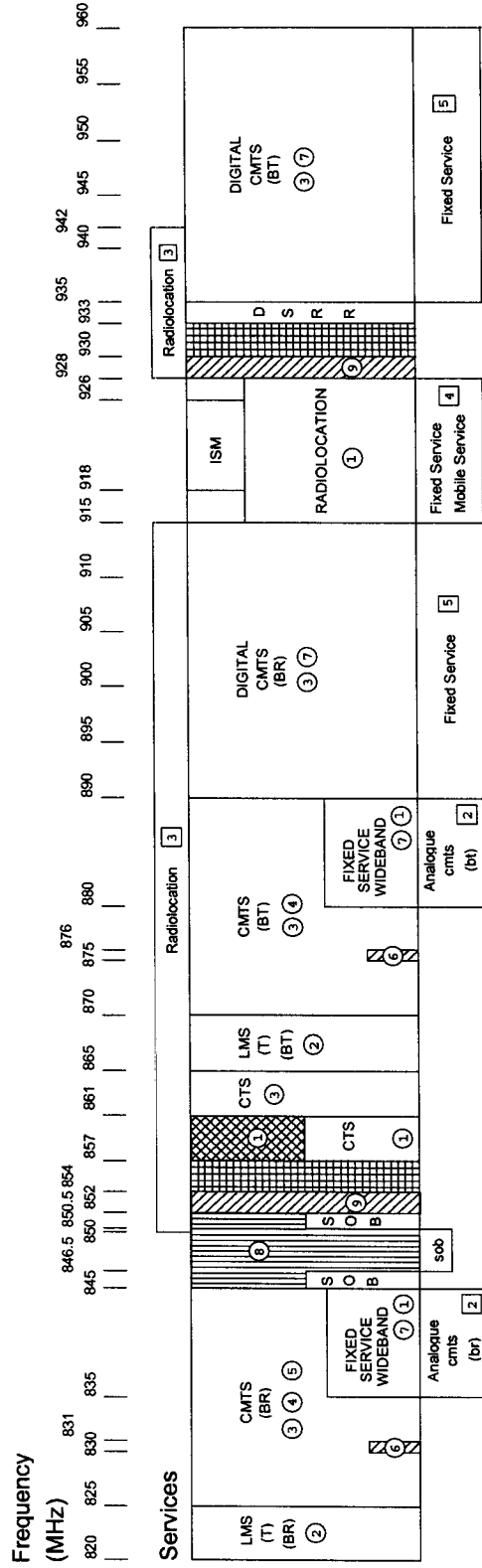
RALI Authorisation



Barry Matson
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Attachment A - 900 MHz Band Plan Diagram

900 MHz BAND PLAN DIAGRAM



ABBREVIATIONS:

BR	Base Receive
BT	Base Transmit
CMTS	Cellular Mobile Telephone Service
CTS	Cordless Telephone Service
DSRR	Digital Short Range Radio
ISM	Industrial, Scientific and Medical Applications
LMS(T)	Land Mobile Service (Trunked)
SOB	Sound Outside Broadcast Link

LEGEND

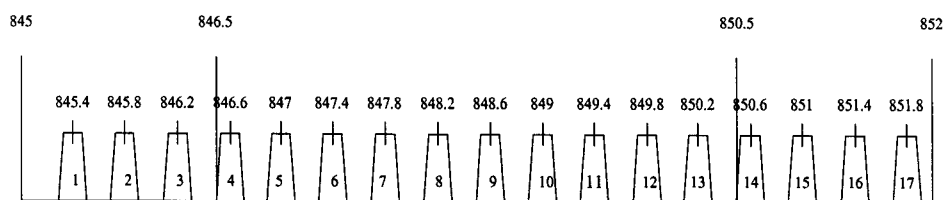
Services, the names of which are printed in 'CAPITALS' are called 'primary' services. See Table 1 of the 900 MHz Band Plan.

Services, the names of which are printed in 'normal characters' are called 'secondary' services. See Table 2 of the 900 MHz Band Plan.

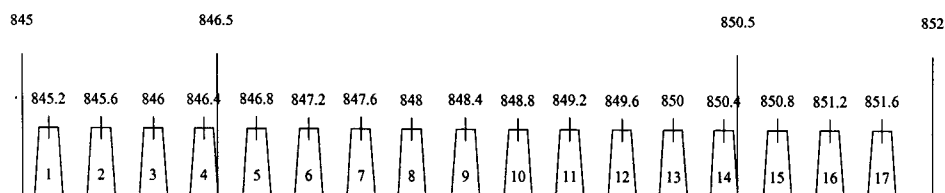
(N) = see note N in Table 1 of the 900 MHz Band Plan.
 [N] = see note N in Table 2 of the 900 MHz Band Plan.

	FIXED SERVICE SINGLE CHANNEL SINGLE FREQUENCY
	FIXED SERVICE SINGLE CHANNEL TWO FREQUENCY
	FIXED SERVICE LOW CAPACITY SINGLE FREQUENCY
	FIXED SERVICE LOW CAPACITY TWO FREQUENCY

Attachment B - Channelling Arrangements for STLs (845-852 MHz)



MAIN PATTERN



INTERLEAVED PATTERN

All frequencies are in MHz

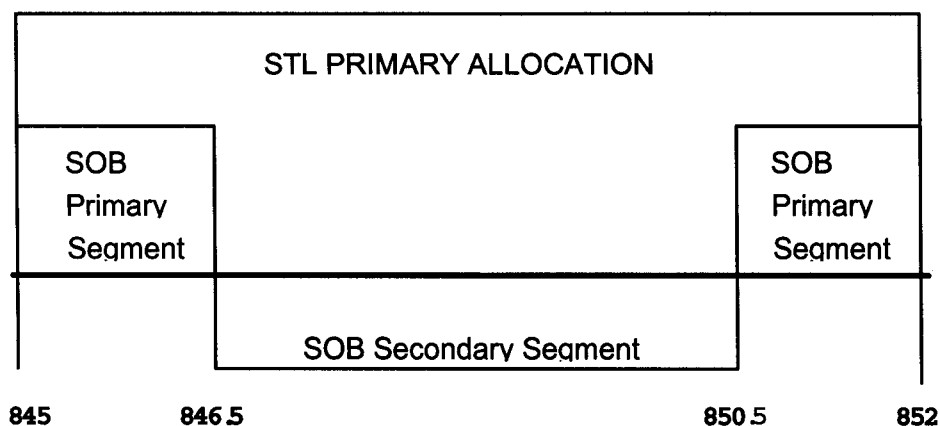
NOTES:

1. This band is allocated for use by low capacity, single frequency, fixed point to point services such as Studio to Transmitter Links (STLs). The allocation is shared with Sound Outside Broadcast (SOB) links (refer to section 6 of the RALI and Attachment C).
2. Notional Antenna :two metre grid parabolic
3. Emission Bandwidth :greater than 25 kHz to a maximum of 400 kHz
4. Minimum Path Length :none specified
5. Typical Uses :digital STL of 250 kHz bandwidth
:analogue STL of bandwidths ranging from 60 kHz to 400 kHz
6. The use of dual frequencies over a single path for redundancy/diversity purposes is not permitted. (Refer to section 5.2.4 of the RALI)
7. Channel Assignment Priorities and Restrictions:
 - * Assignments to STLs should be made in the following sequence:

Priority	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Main Channel	4	5	6	7	8	9	10	11	12	13	14	3	15	2	16	17	1

- * Channels from the 'interleaved' pattern may be used where appropriate, for example, for smaller bandwidth systems including mono and 'dual mono' systems.
- * Assignments to STLs on main channels 1, 2, 3, 14, 15, 16 and 17 or interleave channels 1, 2, 3, 4, 15, 16 and 17 should not be made unless absolutely necessary; this will allow clear primary spectrum for SOBs.
- * Avoid channel 17 main and 17 interleave assignments in areas where single channel two frequency systems operate in the adjacent band.
- * Avoid channel 1 main and 1 interleave assignments which are adjacent to a spectrum licensed band.

Attachment C - Spectrum Arrangements for SOBs (845-852 MHz)



All frequencies are in MHz

NOTES:

1. SOBs operate on assigned channels shared basis by all users in an area. SOBs must not cause interference to other primary services and are not able to be afforded protection from such services.
2. The STL channel plan may be used for SOBs (refer to Attachment B)
3. Antenna :Yagi antennas may be used. However it is recommended that a two metre grid parabolic be used whenever practicable.
4. Emission Bandwidth :greater than 25 kHz to a maximum of 400 kHz
5. Minimum Path Length :none specified
6. An SOB is authorised to operate within an agreed distance of a designated coordinate, usually within 50 km of a specified post office.
7. Typical Uses :digital SOB of 250 kHz bandwidth
:analogue SOB of bandwidths ranging from 60 kHz to 400 kHz
8. Channel Assignment Restrictions:
 - * Use of frequencies within 400 kHz of single channel two frequency fixed links should be avoided (potentially restricting assignments in the range 851.6-852 MHz);
 - * Use of frequencies within 400 kHz of the adjacent band below 845 MHz should be avoided (potentially restricting assignments in the range 845-845.4 MHz).