

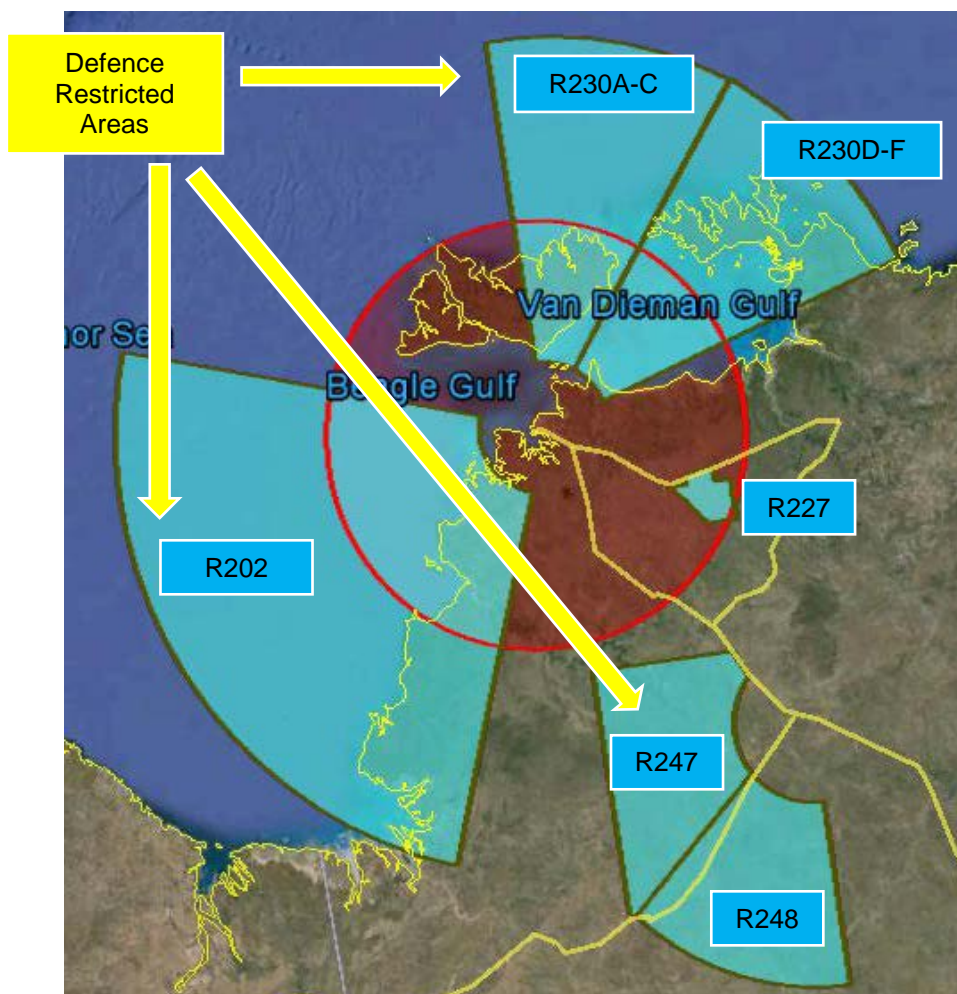
## 1. SCOPE

Free TV Operational Practice OP 68 is a guideline for use of radio frequency spectrum bands for the application of electronic news gathering (ENG) and television outside broadcast (TVOB) in the Darwin area.

This Operational Practice has been developed to assist all those involved in ENG and TVOB operations in the Darwin area with relevant instructions for access to and coordination of the bands assigned by the Australian Communications and Media Authority for ENG and TVOB operations as specified in ACMA's Radiocommunications Advisory Licensing instruction (RALI) FX 21.

## 2. FREQUENCY BAND ASSIGNED and LICENSED to ENG and TVOB

This Operational Practice applies in the Darwin and surrounding area as defined by the area of the red line in Figure 1 (hereafter referred to as the "red zone"). This zone is an area 150km radius from the Darwin CBD.

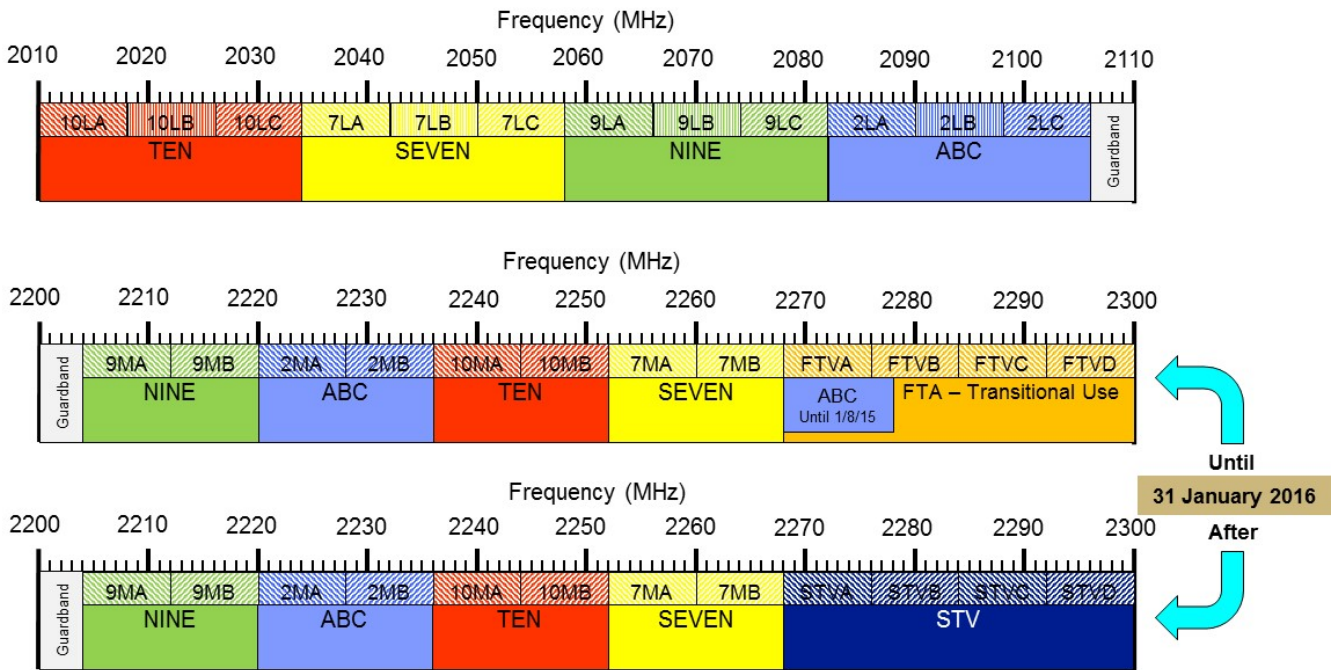


**Figure 1 Darwin Area Definition**

Channel arrangements for TOB services in the frequency bands 2010 - 2110 MHz and 2200 - 2300 MHz are to be implemented in a phased approach across Australia. For the Darwin area this re-allocation period commenced November 2013 and will conclude on 31 January 2016. These arrangements are illustrated in Figure 2, showing the major change being the allocation of the band 2268 – 2300 MHz to free to air broadcasters for transition until 31 January 2016 and to subscription television thereafter. Each channel in the raster is identified by a three or four character code used by broadcasters for coordination and planning.

In the sub-band 2268 – 2300 MHz, until 31 January 2016, the prime objective is to facilitate the transition of ABC, Seven Network, Nine Network Australia and the Network Ten TOB operations from the 2.5 GHz band. However, it should be noted that the ABC have licenced 2268 – 2278 MHz until 1st August 2015.

After 31 January 2016, the sub-band 2268-2300 MHz will be available for use by FOX Sports who will coordinate the subscription television (STV) use of this sub-band.



**Figure 2: 2 GHz and 2.2 GHz TOB channelling arrangements**

### 3. PERMISSABLE EQUIPMENT SPECIFICATIONS FOR ENG and TVOB OPERATIONS

Across the 3 bands in which TVOB and ENG are permitted to operate, there are a range of power, height and equipment type limits that apply in various band segments. These are shown in Table 1. The figures provide for effective isotropic radiated power (EIRP) radiated within an 8 MHz channel. Wireless cameras are nominally operated at 2 metres above the local ground height.

**Table 1 TOB Equipment Permitted in the 2 GHz and 2.2 GHz Bands**

Frequency Range (MHz)	Wireless Cameras	TVOB Vans and Temporary Links	Helicopters and other airborne links
	EIRP	EIRP	EIRP
2010 -2110	26 dBm	62.5 dBm	62.5 dBm
2200 -2268	26 dBm	62.5 dBm	<b>Not permitted</b>
2268 - 2300	26 dBm	62.5 dBm	<b>Not permitted</b>

### 4. FREQUENCY COORDINATION

#### 4.1 Interference to ENG and TVOB receivers

In the 2 GHz band, all fixed microwave links are cleared within the red zone and there are no satellite uplinks so no interference should be encountered. The upper edge of the band may encounter some interference from public telecommunications services in the adjacent band, so guardbands have been assigned in the TVOB / ENG channel plans to cater for this interference.

In the 2.2 GHz band, all fixed microwave links are cleared within the red zone and there are no satellite downlinks so no interference should be encountered from these services. The Department of Defence occasionally operates aeronautical mobile telemetry (AMT) systems in the band 2200 - 2300 MHz in the Northern Territory in Restricted Areas R202, R227, R230A to R230C, R230D to R230F (all within the red zone), R247, and R248 (outside of the red zone) as shown in cyan in Figure 1. Licensed frequencies are at 2255 MHz, 2265 MHz and 2275 MHz, each with a 2 MHz bandwidth.

AMT transmissions shall occur only while within the restricted areas.

The restricted zones cover large parts of the Darwin area. As the interference will be from airborne systems, it is likely to impact on most of the Darwin area. Therefore, before deploying links in the 2.2 GHz band, broadcasters should check the advice from Defence to assess if the link will suffer any interference.

The upper edge of the bands may encounter some interference from public telecommunications services in the adjacent band, but a 2 MHz guardband exists immediately above 2300 MHz, so the likelihood of interference is reduced.

## 4.2 Interference from ENG and TVOB transmitters

In the 2 GHz or 2.2 GHz bands in the Darwin area, operation of TVOB / ENG services will not interfere with other services.

## 4.3 Summary

Table 2 summarises the types of equipment that may be used in different segments of the 2 GHz and 2.2 GHz bands and co-ordination with other services. If a band segment row is all green, no co-ordination is required.

**Table 2 Co-ordination / Spectrum Sharing Summary - 2 GHz and 2.2 GHz Bands**

Frequency Range (MHz)	Typical TOB Equipment	Interferors			Co-ordination Requirements	
		Fixed Links	Earth Stations	Defence	Where TOB may be the victim	Where TOB may be the interferor
2010 - 2110	All types of TOB links					
2200 - 2268	All types of TOB links except helicopters				Defence to advise broadcasters of AMT operations	
2268 - 2300	All types of TOB links except helicopters.				Defence to advise TOB operators of AMT operations	Co-ordinate as required with other TOB operations

### Legend

	No TOB operations allowed, so not applicable
	No spectrum sharing so no co-ordination required
	Spectrum Sharing with low interference impact, to TOB / ENG, no co-ordination required by broadcasters or TOB operators check advice provided by other users of the spectrum
	Spectrum sharing with low interference impact from TOB / ENG, co-ordination required by broadcasters with other spectrum users

## 5. REFERENCES FOR SPECTRUM USAGE FOR ENG AND TVOB OPERATIONS

RALI FX-21 Television Outside Broadcasting Services in the Bands 1980-2110 MHz and 2170-2300 MHz.

Go to [www.acma.gov.au](http://www.acma.gov.au) and search for RALI FX 21