

ICAO WG-F

**AFC Spring 2014 Meeting
Vancouver, BC.**

Working Group - Frequency

- To develop recommendations for the ICAO Air Navigation Panel on issues related to spectrum management and frequencies
- Meets twice a year
 - Held in conjunction with ICAO updates to regions on WRC-15 work

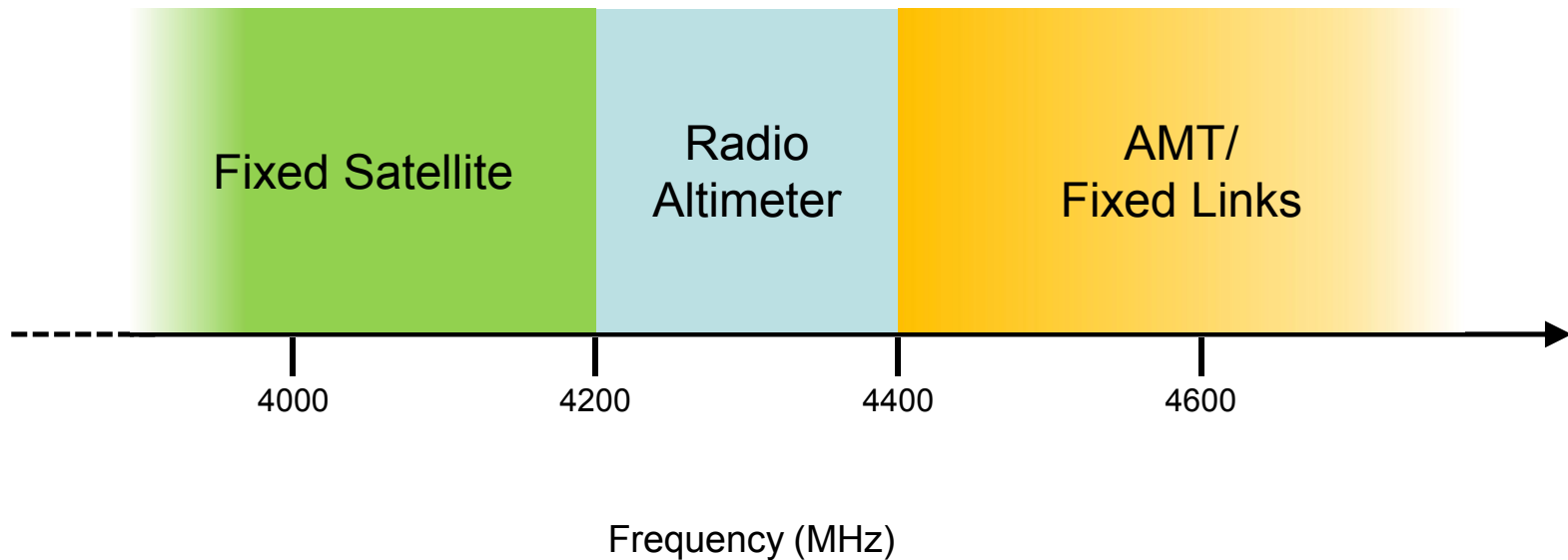
Activity since the last AFC in June 2013

- One meeting in Pattaya
 - Mar 2014
- Covered a range of topics
 - ADS-B over satellite for oceanic routes
 - UAS
 - WAIC
 - Commercial space aircraft
 - Whitespace systems
 - Radio altimeter compatibility with IMT

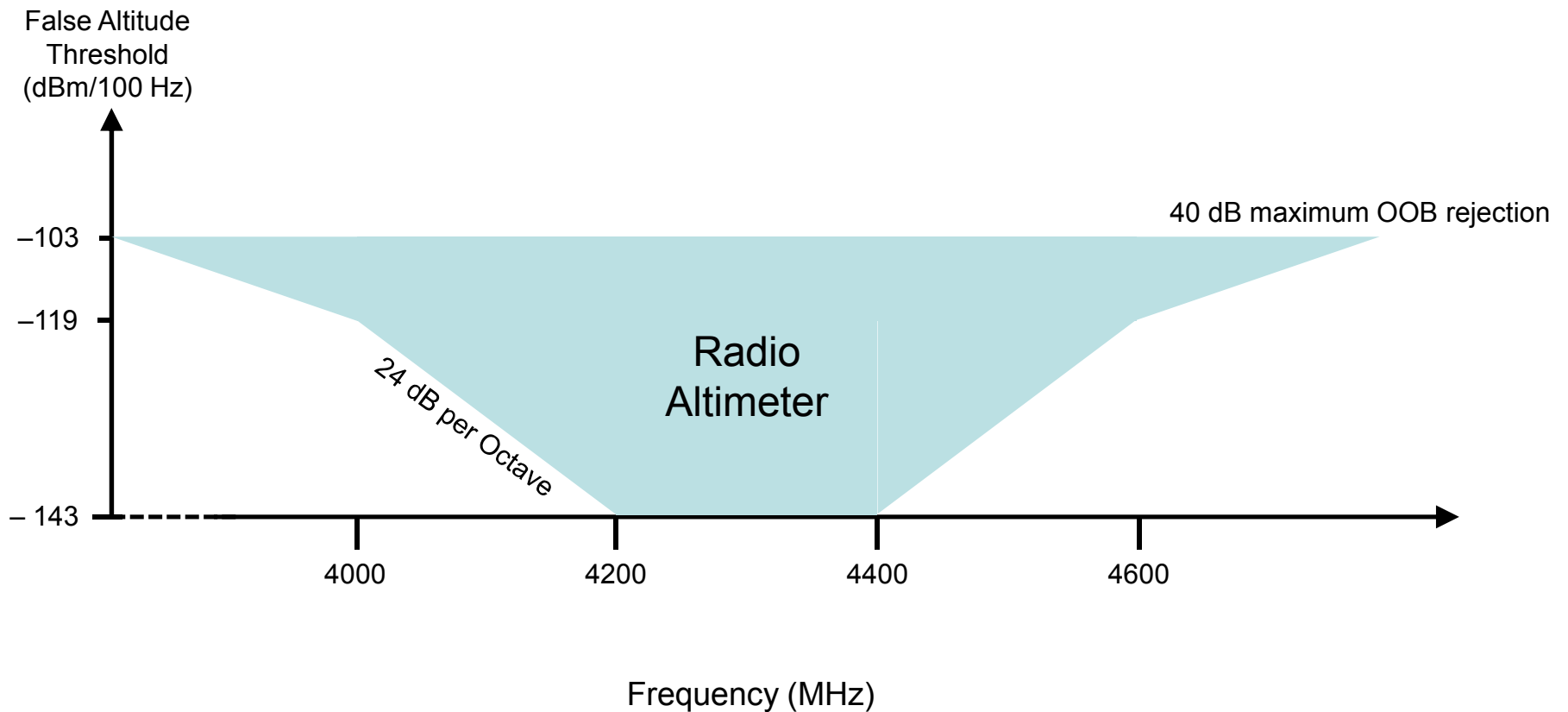
Radio Altimeter Study

- Radio altimeter characteristics introduced in the ITU-R in 2013
 - To assist with compatibility with new WAIC system
 - Detailed an OOB filter response
- ITU-R JTG has identified 3.4-4.2 GHz and 4.4-4.9 GHz as candidate bands for new IMT allocations
- Initial concerns discussed at WG-F in Sept 2013
 - Led to further study by ASRI and UK CAA

Spectrum View



Receiver False Altitude Filter Response



Study

- To investigate OOB rejection level requirements for IMT into a civilian FMCW receiver
 - Assumed scenario for closest possible interaction

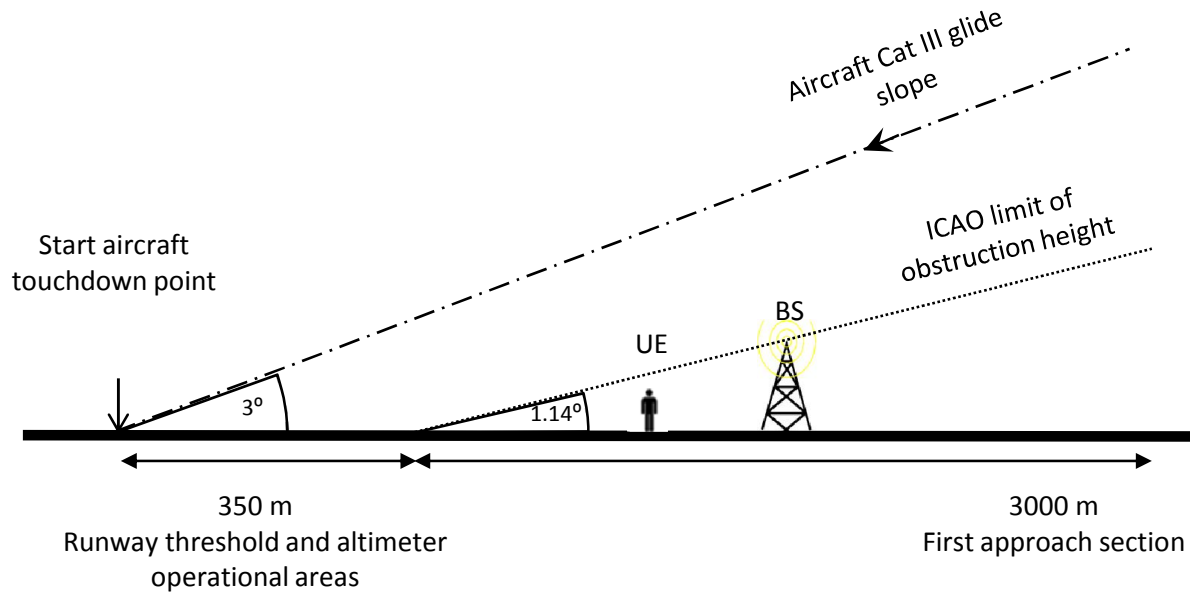


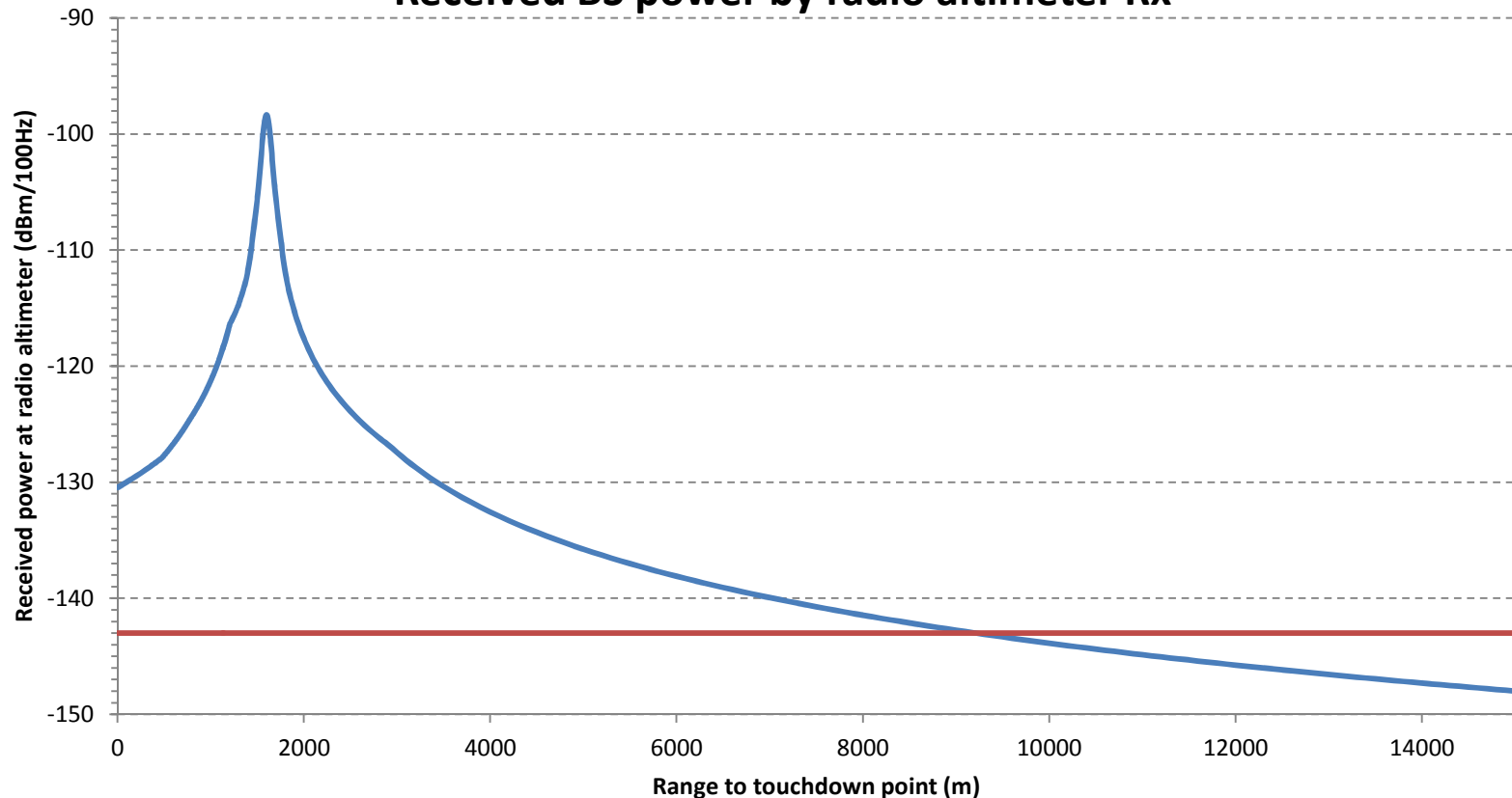
Figure 1

Study parameters

- Assessed against false altitude detection limit of -143 dBm/100 Hz
 - Most likely to be exceeded due to 15 kHz IMT sub-carriers for OFDM signal
 - Instantaneous signal can cause error
- No limit placed on IMT allocation
 - Operates up to band edge in 20 MHz channel
 - Down- and up-link
 - Operate under aircraft approach path for a Cat III landing
 - Within ICAO annex 14 obstruction limits

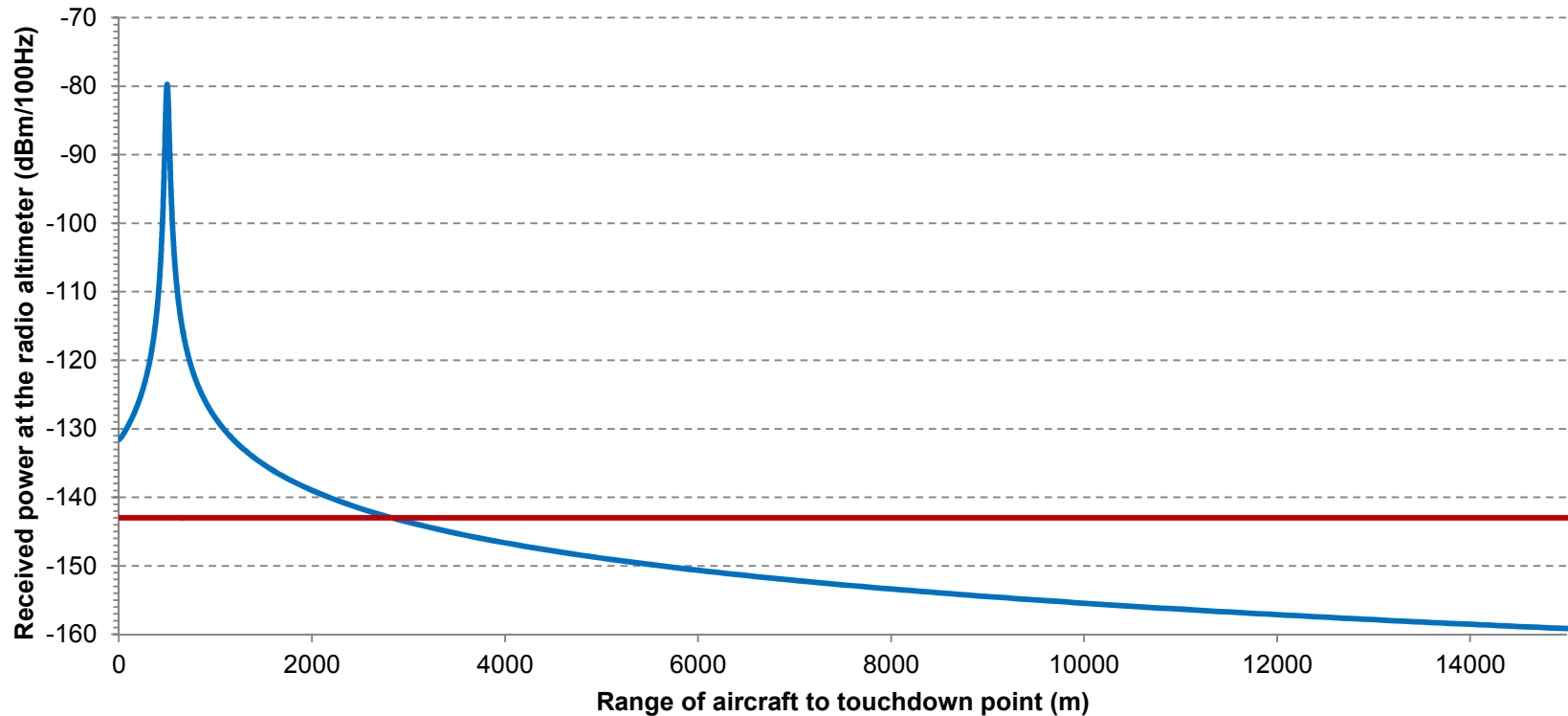
Study Results – Base Station

Received BS power by radio altimeter Rx



Study Results – User Equipment

Received UE power by radio altimeter Rx



Going Forward

- Contact altimeter manufacturers to discuss issue
 - Is it actually a problem?
 - IF filtering?
 - Power averaging?
- Oppose adjacent band allocation of IMT
 - Last meeting of JTG in Jul
 - Now a political game
 - Incumbent services are not compatible

Next WG-F meeting in Sept 2014

- Expected in North America for 1 week
- ASRI considering papers on:
 - Protection of aviation systems in the ITU-R
 - HF ground station protection (WRC-15 1.4)
- Any AFC requests for the meeting?

ASRI

Aviation
Spectrum
Resources, Inc.

Questions