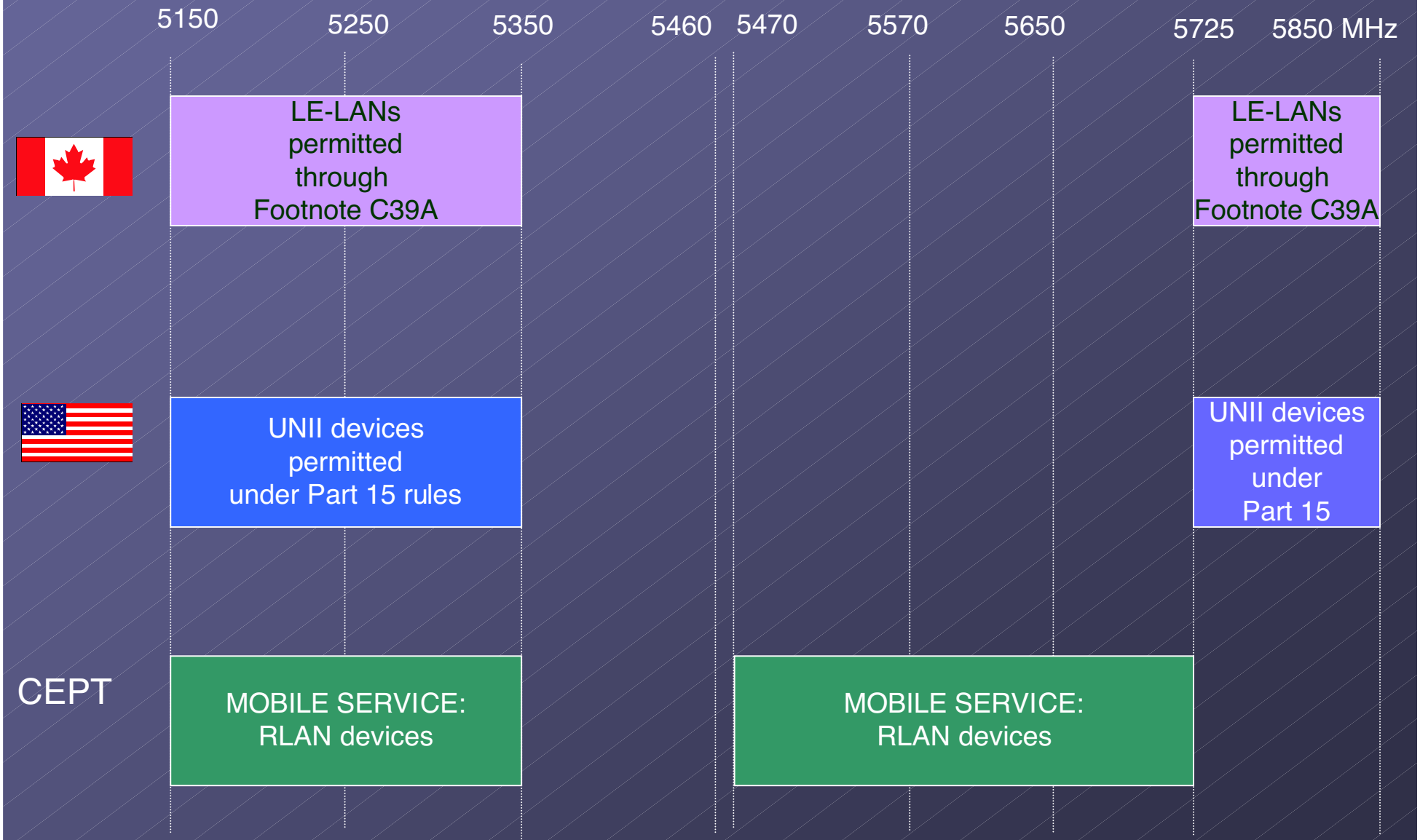
Canadian Proposals for the WRC-03 on 5GHz RLAN issues

Spectrum Engineering Branch
Industry Canada

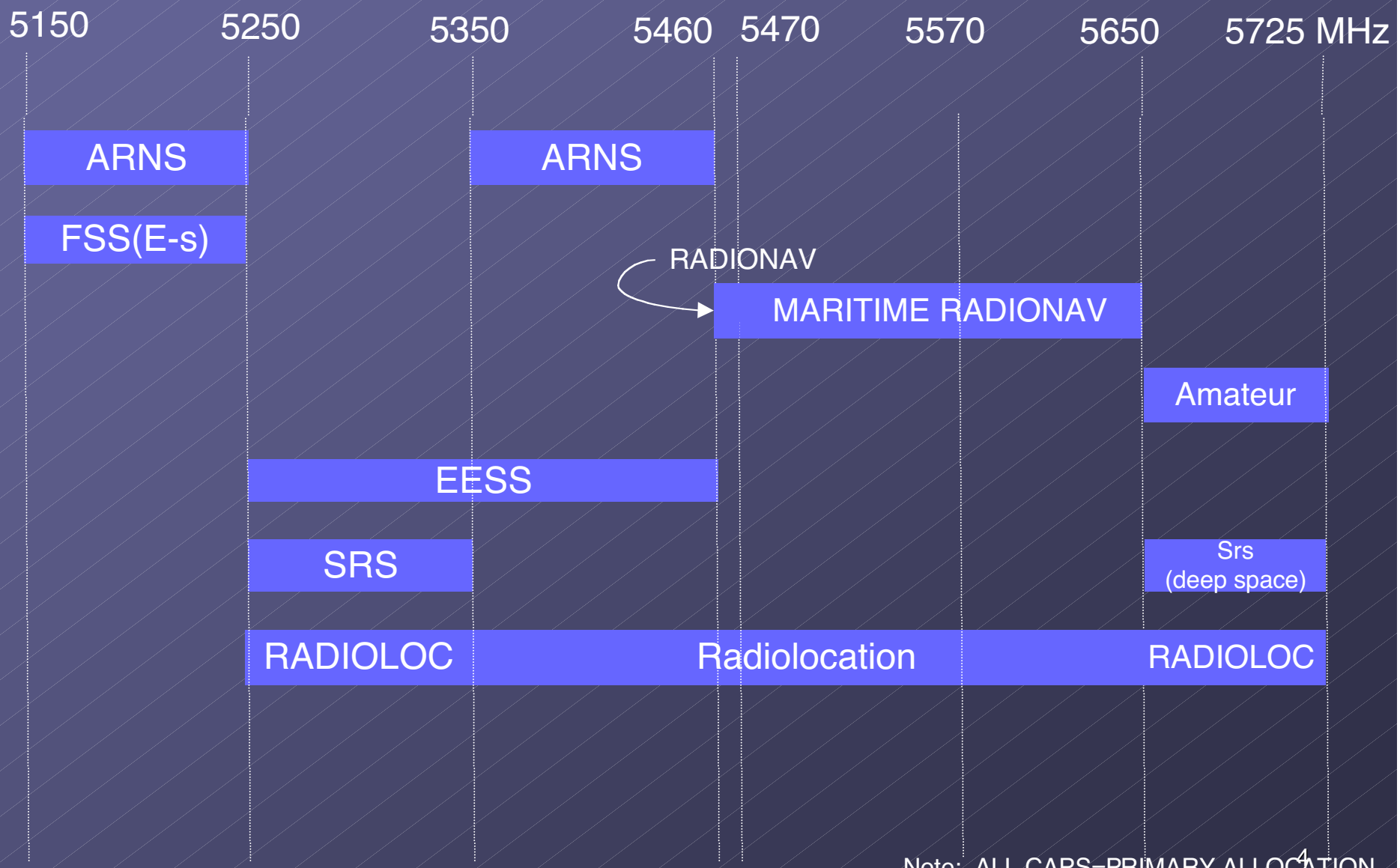
March, 2002

BACKGROUND

Current Canada/United States/CEPT provisions for RLAN applications

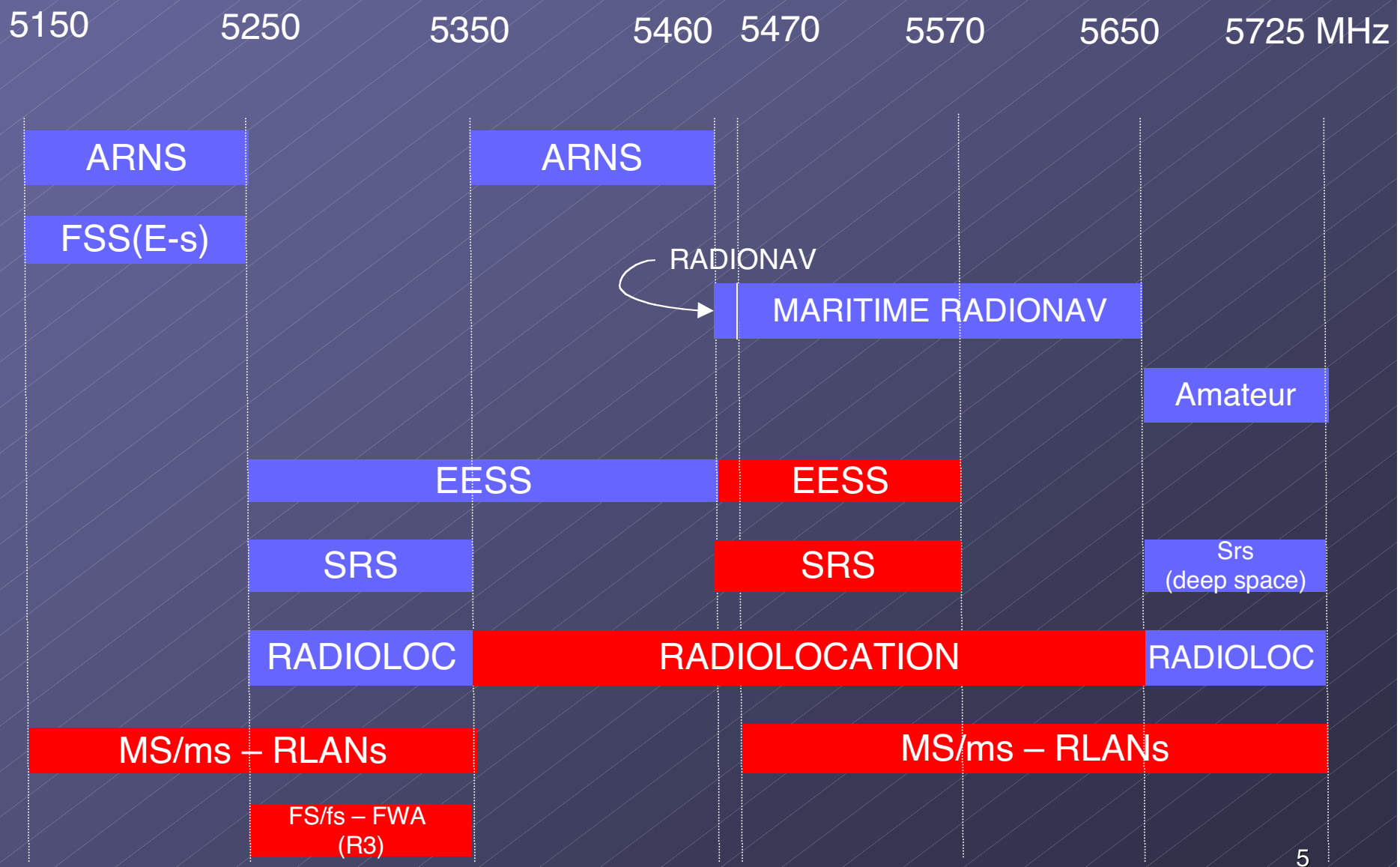


Current ITU Allocation

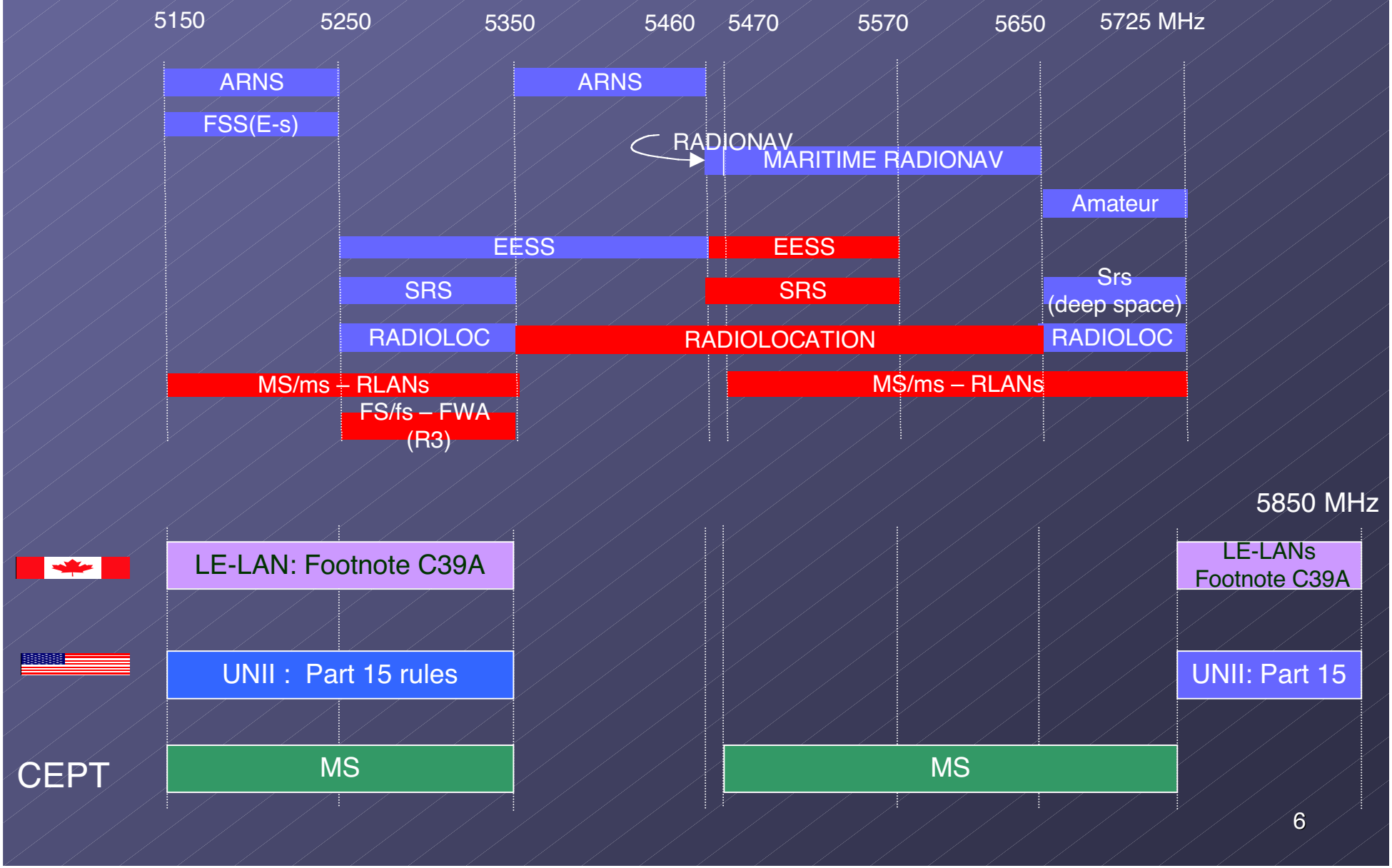


Note: ALL CAPS=PRIMARY ALLOCATION

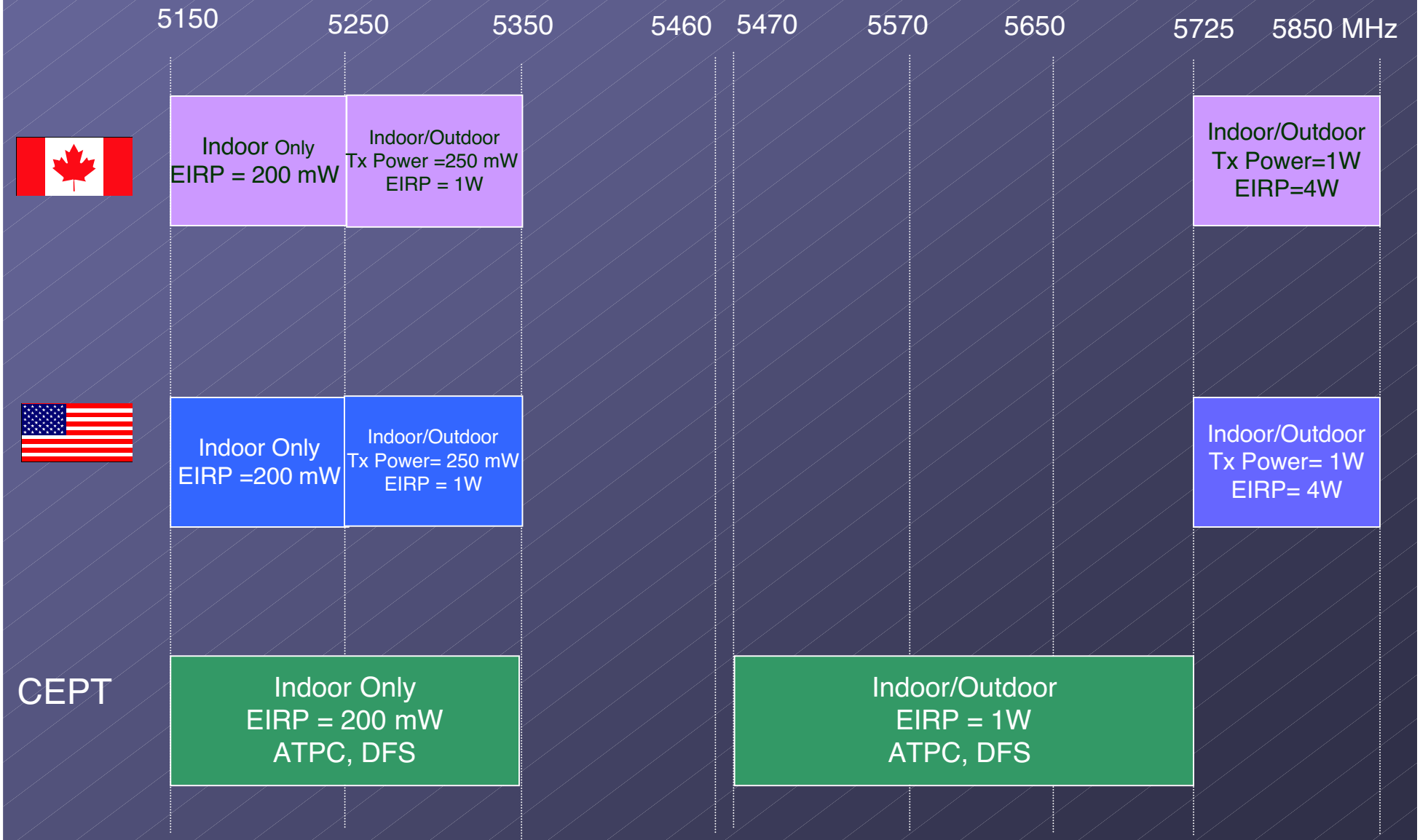
WRC-03 consideration



Overall Comparison of Allocations and provisions for RLANs and other services in the 5GHz range



Current Canada/United States/CEPT technical rules for RLAN applications

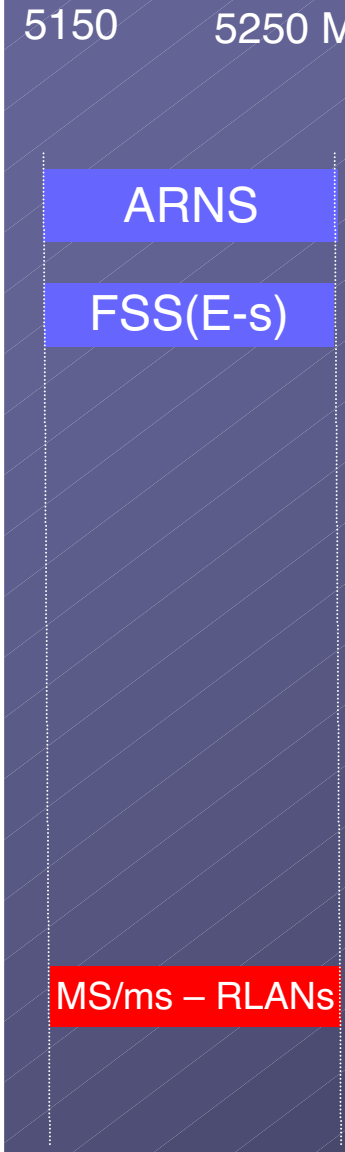


Options to allow the operation of RLANs

- Option 1: Primary Allocation
  - With/without footnotes
  - MS and/or FS
- Option 2: Secondary Allocation
  - With/without footnotes
  - MS and/or FS
- Option 3: No allocation
  - With footnote to allow the RLANs to operate
- Option 4: No allocation/no footnote
  - Status quo
  - Domestic rules would continue to allow RLANs to operate in Canada and in the US

5150 – 5250 MHz

5150 – 5250 MHz ITU-R Status



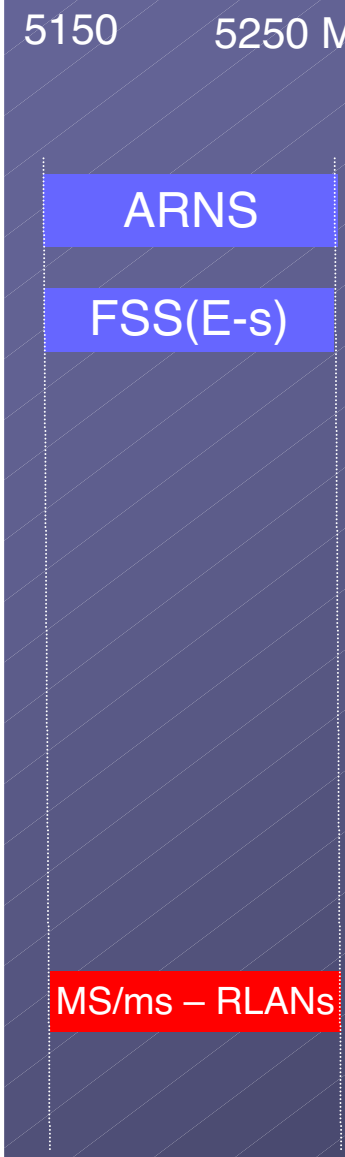
- Sharing studies within the ITU-R are complete
  - Recommendation ITU-R M.1454

    (EIRP limit and operational restrictions on RLANs)
  - Recommendation ITU-R S.1426

    (Aggregate power flux-density limits at the FSS for RLANs)
  - Recommendation ITU-R S.1247

    (Methodology and criterion to assess interference from RLANs to NGSO MSS feederlinks)

5150 – 5250 MHz Canadian Proposal



- Secondary fixed and mobile allocation
  - To protect primary services
  - To allow for flexibility in different countries: transportable devices are classified under fixed or mobile services in different countries
- Limit the usage to wireless access systems including RLANs only.
  - Systems fitting the description of M.1450 (Characteristics of RLANs)
- Through footnote in the allocation table, technical constraints on RLANs:
  - Indoor use only
  - Max EIRP = 200 mW and -20dBW/MHz
  - Aggregate pfd from RLANs into NGSO shall not exceed

  $-124 - 20 \log(h_{sat}/1414)$ dBW/m^2/MHz

5150 – 5250 MHz
Comparison of position/proposal

5150 5250 MHz

ARNS

FSS(E-s)

MS/ms – RLANs

	Canada	CEPT
Service	ADD Fixed and Mobile	ADD Mobile
Allocation status	Secondary	Primary
Operational constraints	Indoor only	
EIRP	200 mW	
Further restrictions	-	Dynamic Frequency Selection
	-	ATPC

5250 – 5350 MHz

5250 – 5350 MHz ITU-R Status

- Sharing studies on going
- RLANs vs EESS (and SRS)
  - WP 7C, JRG 8A-9B
  - CEPT countries believe that outdoor RLAN operation is not feasible
    - Difficult to enforce EIRP mask
  - Canadian studies show that given certain technical constraints, sharing between indoor/outdoor RLANs with EESS is feasible

5250 – 5350 MHz
ITU-R Status

- RLANs vs RADIOLOCATION
  - WP 8B, JRG 8A-9B (next meeting: April/May 2002)
  - Studies are required to confirm the feasibility of dynamic frequency selection as an effective technique to mitigate interference to/from RLANs to/from Radiolocation service

5250 – 5350 MHz
Canadian proposal

- Secondary fixed and mobile allocation
  - Protection of primary services
  - Canada operates RADARSat program under EESS
  - flexibility for administration
- Limit the usage to wireless access systems including RLANs only.
  - Rec. ITU-R M.1450 only
- Through footnote, technical constraints on RLANs:
  - Indoor and outdoor use
  - Max transmitter power = 250 mW or -10 dBW/MHz
  - Max EIRP 1W or -13 dBW/MHz
  - Max EIRP for outdoor systems should not exceed the following values for elevation angle θ above the local horizontal plane:

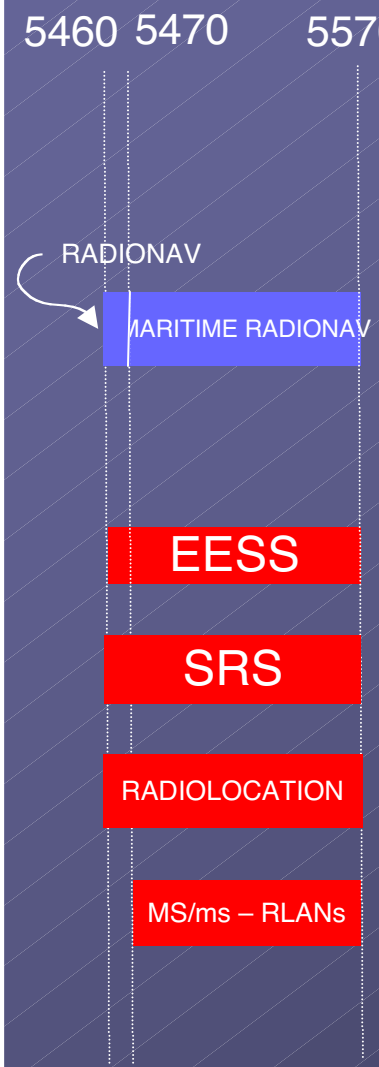
-13 dBW/MHz	for 0¡ † θ < 5 ¡
-13 -0.711 (θ -5) dBW/MHz	for 5¡ † θ < 40 ¡
-35.9 -1.222(θ-40) dBW/MHz	for 40¡ † θ < 45 ¡
-42 dBW/MHz	for θ > 45 ¡

5250 – 5350 MHz
Comparison of position/proposal

	Canada	CEPT
Service	ADD Fixed and Mobile	ADD Mobile
Allocation status	Secondary	Primary
Operational constraints	Indoor and outdoor	Indoor only
Tx power	250 mW	-
EIRP	1W	250 mW
Further restrictions	EIRP mask on outdoor systems	Outdoor systems are not allowed
	-	Dynamic Frequency Selection
	-	ATPC

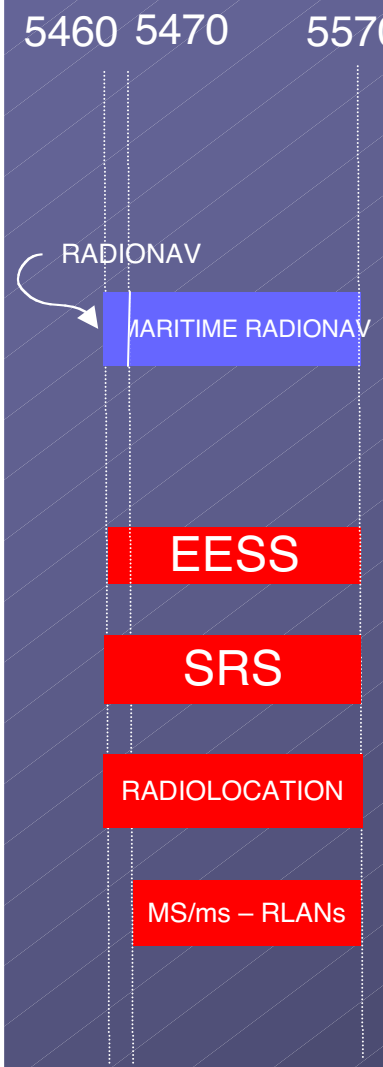
5460 - 5725 MHz

5460 - 5570 MHz
ITU-R Status – Allocation to allow the operation of RLANs



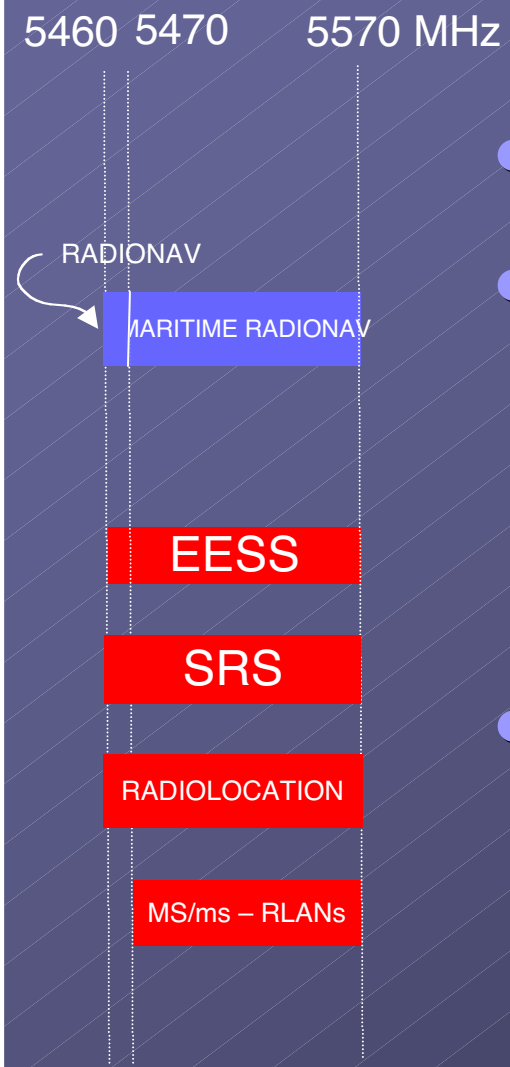
- Sharing studies ongoing
- Similar sharing environment, but "sharing with" as opposed to "protection" of EESS
- RLANs vs EESS (and SRS)
  - WP 7C, JRG 8A-9B
  - CEPT countries believe that outdoor RLAN operation is feasible with 1W EIRP
  - Canadian studies show that given certain technical constraints, sharing between indoor/outdoor RLANs with EESS is feasible. Without the EIRP mask, EESS service will receive significant interference from RLANs

5460 - 5570 MHz
ITU-R Status – Allocation to allow the operation of RLANs



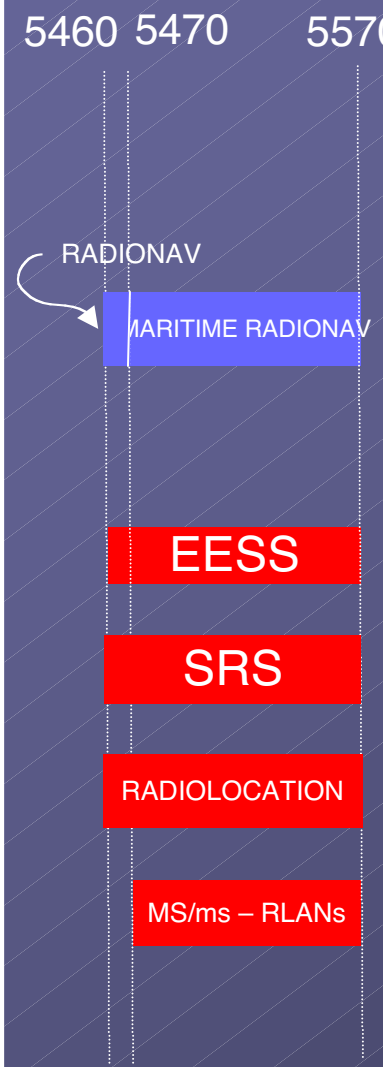
- Sharing studies ongoing
- RLANs vs RADIOLOCATION
  - JRG 8A-9B, WP 8B (next meeting: April/May, 2002)
  - CEPT countries believe that outdoor RLAN operation is feasible with 1W EIRP
  - Sharing is dependent on the feasibility of DFS as a mitigation technique

5460 - 5570 MHz
ITU-R Status – Extension of EESS



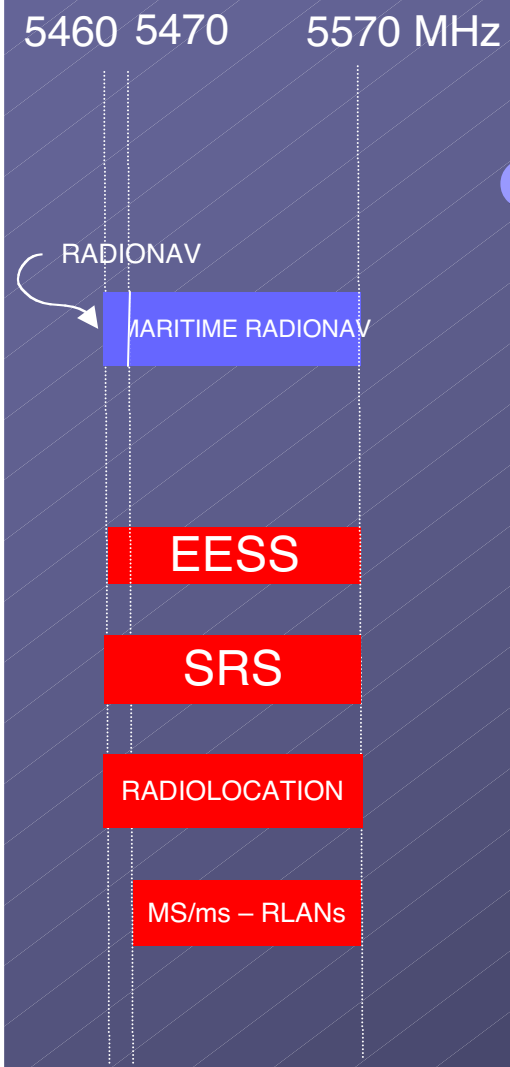
- CEPT countries could support EESS
- "1W HIPERLAN operation would not be compatible with the EESS which have similar protection requirements as those within the existing EESS allocations." "Within Europe, the main interest in this allocation is for measurements over oceans and so the parallel proposals for EESS and MS allocations may not conflict"
- Canadian studies show that given certain technical constraints, sharing between indoor/outdoor RLANs with EESS is feasible. Without the EIRP mask on the outdoor RLANs, EESS service will receive significant interference from RLANs

5460 - 5570 MHz
ITU-R Status – Upgrade of Radiolocation to Primary



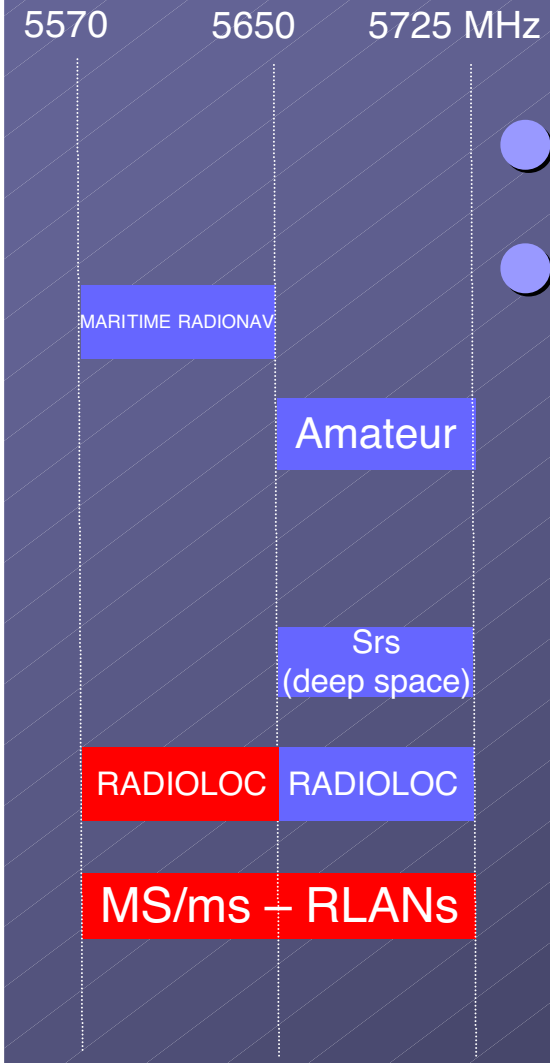
- Canadian position:
  - Upgrade to primary can be supported
  - Conditional upon protection of EESS and ARNS

5460 - 5570 MHz
Canadian Proposals



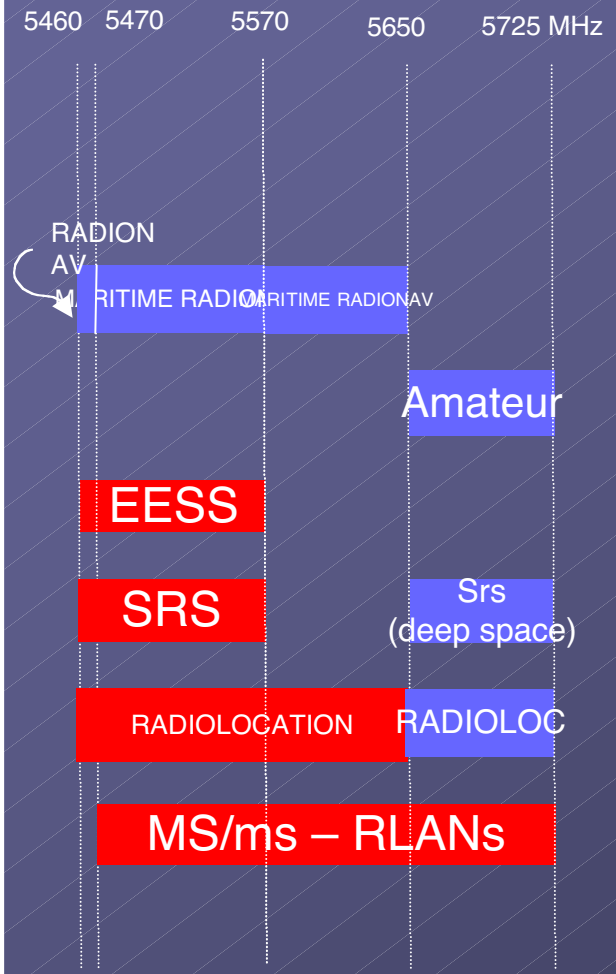
- Pending
  - EESS vs RLANs
    - EIRP mask for outdoor RLANs similar to 5250-5350 MHz to protect same EESS system
    - More studies required for other EESS systems (wideband SARs)
  - RLANs vs RADIOLOCATION
    - Studies on-going – DFS as a mitigation technique

5570 – 5725 MHz
Canadian proposal



- Pending
- RLANs vs RADIOLOCATION
  - Studies ongoing – DFS as a mitigation technique

5460 - 5725 MHz
Comparison of positions/proposal pertaining to RLANs



	Canada	CEPT
Service	TBD	ADD Mobile
Allocation status	TBD	Primary
Operational constraints	TBD	Indoor and outdoor
Tx power	TBD	-
EIRP	TBD	1W
Further restrictions	TBD	Dynamic Frequency Selection
	TBD	ATPC

CONCLUSION

Conclusion

- Further work to be done:
  - RLANs vs EESS in the 5470 MHz range
    - Wideband SARs vs RLANs
    - Feasibility of EIRP mask in a regulatory context
    - Next JRG 8A-9B: April, 2002
  - RLANs vs RADIOLOCATION in the 5 GHz range
    - Feasibility of DFS in mitigating interference
    - Next JRG 8A-9B: April 2002
    - Next WP 8B: May, 2002
  - Canadian proposals for WRC-03 for the 5470 MHz range
    - Next CITEL meeting: July, 2002
  - Consultation with industry on the above
    - Canadian WRC preparatory group
    - National study groups