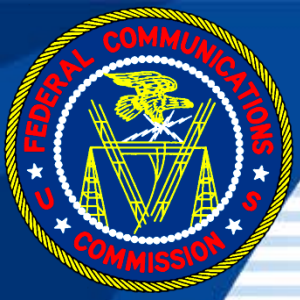


# **Review of Selected Part 90 PLMRS Review and Approval Items**

Office of Engineering and Technology  
Laboratory Division

April 18, 2016: Updates following April 13, 2016  
conference session shown in BLUE.



# Outline

- Part 90 PLMRS allowed channels
- Part 90 VHF/lower-UHF narrowbanding
- Part 90 other requirements and review and approval items



# Allowed Channels Part 90 PLMRS

- § 2.106 and the radio service rules applicable for a device must be consulted to confirm actual frequencies routinely licensable for U.S. non-Federal operations thus associated equipment authorizations
- Test data must use actual frequencies available in subpart and/or section [e.g., §§ 90.20, 90.35, 90.531(g)]
- Generally frequencies requested for part 90 station licensing (thus associated equipment authorization) other than those listed in 90B (PS) and 90C (B/ILT) must not be **those** available in any other rule part, per § 90.173(j)(2)
- See summary tables and figures of available frequencies in KDB Pub. 634817 D02 v01r01
  - Other resources include FCC Spectrum Dashboard, NTIA Fed. Gov. Spectrum Compendium
- Reasonable expectation should be established that device qualifies for FCC licensing at listed and tested frequencies

(<http://reboot.fcc.gov/reform/systems/spectrum-dashboard>),

(<https://www.ntia.doc.gov/other-publication/2015/federal-government-spectrum-compendium>),

(<https://www.ntia.doc.gov/page/federal-government-spectrum-use-reports-225mhz-5ghz>)



# Narrowbanding § 90.203(j)

- Single channel-bandwidth mode devices with emission symbols F3E and necessary bandwidth greater than 6K00 (i.e., 6 kHz authorized bandwidth) allowed only if device also has other modes complying with § 90.203(j)(5) spectrum efficiency requirements (i.e., additional Form 731 line entries, with associated test data and supporting information in the application filing)
  - Reiterating the preceding, single channel-bandwidth mode devices with only, for example, 11K2F3E or 20K0F3E emissions (authorized bandwidths of 11.25 kHz and 20 kHz, for channel bandwidths of 12.5 kHz and 25 kHz, respectively) are not allowed [§§ 90.203(j)(4)(i), 90.209(b)(5)]
- Basic exceptions are as follows (see further information in KDB Pub. 579009)
  - Hand-held transmitters with output power of 2 W or less
  - Data-only transmitters with output power of 500 mW or less
  - In the 450-470 MHz band, devices with authorized bandwidth of 22 kHz or less (22K0) are allowed if compliance is demonstrated for § 90.221 ACP
  - In the 470-512 MHz band, single channel-bandwidth mode devices with 20K0F3E (20 kHz or less authorized bandwidth) are allowed (DA 12-1743)



# Other Requirements Part 90

- Nationwide public safety interoperability calling channel [§§ 90.203(j)(1), 90.20(d)(83)]—For each supported band show compliance that mobile and portable voice-mode transmitters are capable of operating on (tuning increments, etc.) channels:
  - 150-174 MHz: 155.7525 MHz base/mobile; (VCALL10)
  - 450-470 MHz: 453.2125 MHz base/mobile, 458.2125 MHz mobile; (UCALL40)
- NPSPAC public safety channels [806-809 / 851-854 MHz, § 90.617(a)(1)]—Applications must demonstrate that equipment:
  - Conforms to Emission Mask H [§ 90.210(h)] when operating on NPSPAC public safety channels; and
  - Is capable of operating with analog FM modulation on the NPSPAC mutual aid channels [§ 90.203(i)]

NPSPAC = National Public Safety Planning Advisory Committee



# Other Requirements 90R

- 700 MHz Public Safety Broadband (PS BB)
  - 758-769/788-789 MHz: Part 90 gives service rules only for PS BB operations
  - New grants in PS BB spectrum generally should support LTE operations \*
    - Form-731 line entries for PS-BB modes should include PF grant note
- 700 MHz Public Safety Narrowband (PS NB)
  - 769-775/799-805 MHz: Part 90 gives service rules only for PS NB operations, e.g., P25 or other "legacy" narrowband (BW < 25 kHz) emissions
  - Regardless, grant listing of PS NB modes in the 763-769/793-799 MHz portion of the PS BB spectrum is presently allowed
    - Form-731 line entries for PS NB modes in 763-769/793-799 MHz (PS BB spectrum range) should address KDB Pub. 634817 (e.g., EF grant note)
    - Form-731 grant comments field should include:
      - “This filing contains compliance information and test data for incumbent/duly-authorized public safety narrowband operations in Public Safety Broadband (FirstNet) spectrum.”

\* Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. 112–96



# Other Requirements Multi-rule

– Part 90 grants with multi-rule line entries –

- § 2.1033(e) allows grants of devices subject to multiple rule parts (see also KDB Pub. 149672)
  - Per § 2.911(c), multi-rule applications must explicitly document compliance for all technical requirements in each individual rule part (along with part 2 subpart J information and test data)
  - For example, a letter exhibit simply stating “part 90 rules are similar to and more stringent than part 22” generally is insufficient
    - At minimum an ancillary exhibit is needed explaining how test data for each specific part 90 rule section [e.g., § 90.210(b)] demonstrates compliance for which specific part 22 rule section [e.g., § 22.359(a)]
    - Preferably, for all Form 731 listed rule parts, at each set of test results, the test report should identify specific rule section and paragraph number(s) and how compliance is demonstrated
- Example: TETRA 450-470 MHz 20 kHz emission may comply with § 90.221(b) ACP, but may not comply with § 22.359(a)  $43+10\log P$  for § 22.561 allowed 20 kHz channels



# Other Requirements Cross-rule

## – Contiguous Parts 90 ESMR and 22H Cell. –

- 3GPP E-UTRA Band 26 has 814-849 MHz uplink paired with 859-894 MHz downlink
  - § 22.905 (a) & (b): 824-849 MHz / 869-894 MHz
  - § 90.614(b): 817-824 MHz / 862-869 MHz [§ 90.613 ch. nos. 551-830]
  - § 90.614(c): 813.5-824 MHz / 858.5-869 MHz [§ 90.613 ch. nos. 411-830]
- For equipment authorization EMC and radio parameter purposes, 90S ESMR and 22H differ individually mainly by:
  - output power limit quantity [§ 90.635(b) conducted, § 22.913(a)(2) ERP]
  - unwanted emissions limits (§§ 90.691, 22.917)
- Along with the basic KDB Pub. 634817 test frequency provisions and test data for the outer edges of the device overall transmit band, applications should contain EMC/radio test data for:
  - Upper band edge for emission bandwidths contained in 90S band (adjacent to 22H lower band edge); lower band edge for emission bandwidths contained in 22H band (adjacent to 90S upper band edge)
  - Emissions **with** bandwidths centered at the allocation boundary, i.e., spanning both rule parts (unless demonstrated in application that device does not support cross-rule channels)
    - List maximum ERP on grant line for 22H, 90S multi-rule line entry, and § 90.635(b) conducted power in grant comments
  - For § 90.691(a), RBW=300 Hz for offset less than 37.5 kHz from channel edge and RBW=100 kHz for offsets greater than 37.5 kHz is allowed





# Other Requirements Part 90

Erratum 47 CFR 90.209(b)(6):

Per 77 FR 61537 (Oct. 10, 2012; docket no. 11-69; RO FCC-12-114), the 406-512 MHz and 809-824/854-869 rows have a superscript 6 cross-reference to footnote 6

**Federal Register /**  
 Vol. 77, No. 196 /  
 Wednesday, October 10, 2012  
**61537**

■ 2. Section 90.209 is amended by adding footnote 6 to the table in paragraph (b)(5) to read as follows:

**§ 90.209 Bandwidth limitations.**

\* \* \* \* \*

(b) \* \* \*

(5) \* \* \*

STANDARD CHANNEL SPACING/BANDWIDTH

Frequency band (MHz)	Channel spacing (kHz)	Authorized bandwidth (kHz)
406-512 <sup>2</sup> .....	16.25	13 <sup>6</sup> 20/11.25/6
809-824/854-869 .....	25	<sup>6</sup> 20

<sup>6</sup> Operations using equipment designed to operate with a 25 kHz channel bandwidth may be authorized up to a 22 kHz bandwidth if the equipment meets the Adjacent Channel Power limits of § 90.221.



# BACKUP



# Allowed Channels Basics

KDB Pub. 634817 D02 v01r01:

- If frequency or band has been allocated to a radio service in the § 2.106 “Non-Federal Table” (i.e., FCC) column, rightmost table column might list a rule part
  - Rule part(s) listed in right column are for informational purposes only and are not formal band allocations
  - Specific FCC rule part(s) must be consulted to find allowed frequency or band use (e.g., channeling plans, allowed emissions, etc.)
- If a radio service or footnote is not listed for a band of frequencies in the § 2.106 “Non-Federal Table” column:
  - The non-Federal sector (i.e., FCC licensing and equipment authorization) generally has no access to that band (except as provided by § 2.102)
  - Listing of that band on a Form 731 requires appropriate justifications within an equipment application



# Narrowbanding § 90.203(j)

- Effective dates and expiration dates of prior blanket waiver orders and stay-of-rule orders have passed
- §§ 90.203(j)(4) (physical channel bandwidths) and 90.203(j)(5) (voice and data spectrum efficiency) apply for bands:
  - 150.8-162.0125 MHz; 173.2-173.4 MHz
  - 421-512 MHz
    - The 430-450 MHz band (part 97) is not allocated nor routinely licensable for 90B (PS) and 90C (B/ILT), and should be excluded
    - Part 95 GMRS and FRS frequencies within the 460-470 MHz band are not available for part 90
    - Policies and procedures in KDB Pub. 634817 apply
- § 90.265 (12.5 kHz) applies for the bands:
  - 150.05-150.8 MHz; 162.0125-173.2 MHz; 173.4-174 MHz
  - 406.1-420 MHz
- Narrowbanding requirements for 700 MHz PS NB (769-775 / 799-805 MHz, 90R) systems have separate track [§ 90.203(m); see e.g., FCC-14-172]
  - NOT subject to §§ 90.203(j)(4) and 90.203(j)(5)