



FCC Updates

Martin Perrine

With excerpts from other FCC employees TCB training slides

Federal Communications Commission
Office of Engineering and Technology
Laboratory Division

(301) 362 -3025 martin.perrine@fcc.gov

Knowledge Database



- ❑ The KDB Website is: www.fcc.gov/labhelp
 - ❑ Detail Criteria Search
 - ❑ Frequently Asked Questions (FAQ)
 - ❑ Interpretations
 - ❑ Measurement techniques
 - ❑ Submission of inquiries
 - ❑ Response tracking
- ❑ LABHELP email system is being phased out

Measurement Techniques



- Webpage List -
<http://www.fcc.gov/oet/ea/eameasurements.html>
- New DTS measurement procedure posted on FCC KDB Publication 558074
- C63.4-2003 referenced in Part 15 FCC 03-201
- See later slides for Public Notices and other Rule makings

FCC and C63



- FCC rules now reference C63.4-2003 FCC 03-201
- Pulse Desensitization – Request C63 to update references and description in C63.4

Scope B2 Part 90 – Public Safety 800 MHz



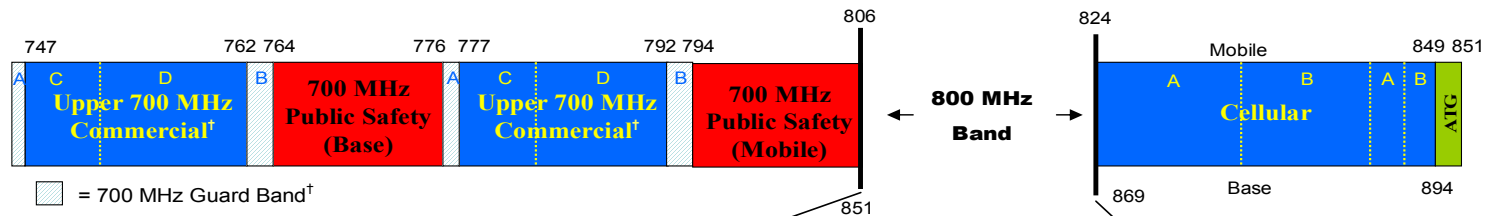
- FCC 04-168 (Docket 02-55) – Improving Public Safety Communications in the 800 MHz Band

http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-168A1.pdf

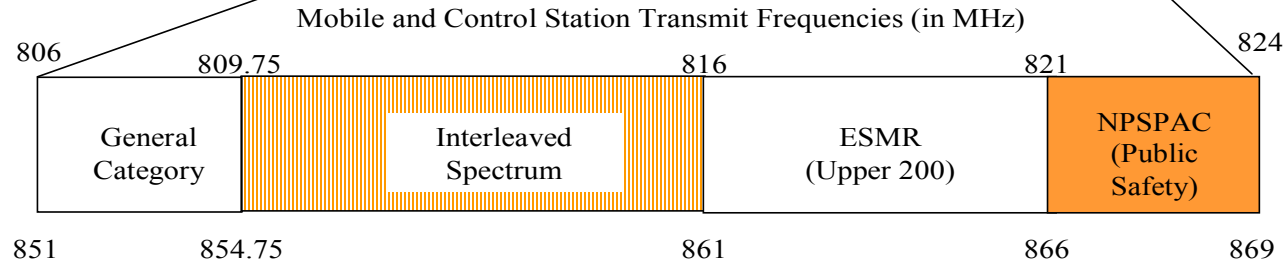
- Nextel Re-banding to 1.9 GHz
- Nextel is still negotiating with the FCC over issues raised by this R&O
- ISDN Grants can still be issued

Scope B2 Part 90 - Public Safety 800 MHz

Current Band Plan



†700 MHz Commercial and 700 MHz Guard Band do not have specified Base and Mobile channels



General Category - 7.5 MHz

150 Channels

Licensed by EA Blocks of 25 channels (SMR)
Some Incumbent Operators Remain

ESMR/Upper 200 – 10 MHz

200 Channels

Licensed by EA

Non EA incumbents are currently undergoing mandatory relocation

NPSPAC - 6 MHz

225 Channels @ 12.5 kHz spacing

5 Channels @ 25 kHz spacing

5 Mutual Aid Channels

Interleaved Spectrum - 12.5 MHz

250 Channels

80 SMR Channels

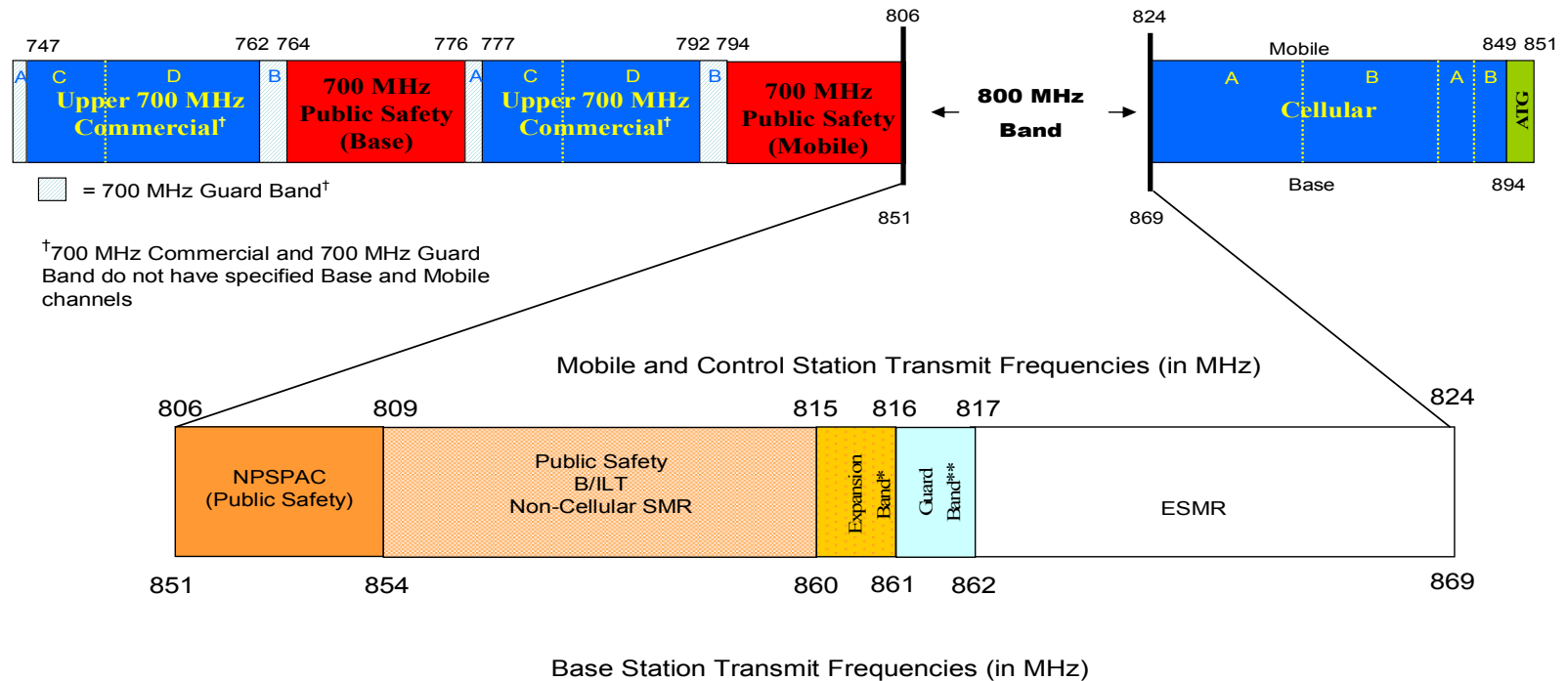
(Licensed by EA, Some Incumbent Operators Remain)

70 Public Safety Channels

50 Business Channels

50 Industrial Land Transportation Channels

Scope B2 Part 90 - Public Safety 800 MHz New Band Plan



*No public safety system will be required to remain in or relocate to the Expansion Band; although they may do so if they choose.

**No public safety or CII licensee may be involuntarily relocated to occupy the Guard Band.

Part 15 Updates



■ Rulemaking updates

- Modification of Parts 2 and 15 of the Commission's Rules for unlicensed devices and equipment approval. FCC 04-165 (ET Docket No: 03-201)
 - Smart Antenna Systems (Advanced antenna technologies)
 - C63.4-2003
 - Updated references to ISO/IEC Std 17025 (2 year reassessment)
- Third R&O Review of Part 15 and other Parts of the Commission's Rules
 - 433 MHz RF ID systems raising power

Part 15 Updates



- Rulemaking updates (continued)
 - R&O UNII with DFS devices 5.4 GHz band
 - Broadband over Power line (BPL) (ET Docket No. 04-37)
 - Report and Order – October 14, 2004 Commission Meeting
 - Text of order to be released soon
- Implant transmitters: radiated EMC only at 900 MHz use:
 - ANSI C63.4 tabletop test in open air, OR Part-95-like in-liquid phantom setup.
 - Maximum 2 cm from phantom wall at closest points.
 - Phantom. i.e. Human torso simulator (phantom). § 95.639(2)(i) cites a 30 cm inside-diameter (circular) by 76 cm height liquid-filled (6.35 cm thick Plexiglas).

HAC --FCC Update/Actions



- Follow C63.19 proceedings. FCC may need to approve use of revised standard.
- Developing test capability for all C63.19 tests.
- No HAC submissions to date.
- Will develop appropriate TCB procedures.

MRA_s



- Asian activity
 - Japan
 - Korea
 - Hong Kong
- Europe activity
 - Agreement with EFTA close
- South American activity
 - Agreement with Brazil close



Measurement techniques
and rule making details
for licensed and
unlicensed devices
follow.

Measurement Techniques in Knowledge Database



- Frequently Asked Questions (FAQ) regarding Ultra Wide Band Compliance Measurements
- Millimeter Wave Test Procedures
- Guidance on Measurements for Digital Transmission Systems 15.247
- Radar detector measurement procedures
- New DTS procedure will be posted.
- New RF exposure procedures from IDB posting.

Measurement Techniques in Report and Orders



- The text of a Report and Order may provide measurement techniques:
 - Ultra Wideband Transmission Systems (ET Docket 98-153)
 - See Knowledge Database for further guidance on UWB measurements
 - Interim Measurement Procedures For DFS-Equipped U-NII Devices (ET Docket No. 03-122)

Measurement Techniques in Public Notices



- Measurement techniques have been released by Public Notice:
 - DA 02-2138 - Measurement Procedure Updated for Peak Transmit Power in the Unlicensed National Information Infrastructure (U-NII) Bands
 - DA-02-2850 - FCC Clarifies Equipment Certification Procedures For “Learned Mode” or “Trainable” Transmitters
 - DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
 - DA-02-1097 - FCC Lab Provides Guidance On Certification Of Linear Power Amplifiers Used With Cellular And PCS Transmitters
 - DA 00-1407 - Part 15 Unlicensed Modular Transmitter Approval

Scope B1 – Cellular Rulemakings

Part 25 CMPCS Satellite Phones



- Second R&O FCC 03-283 (Docket 99-67)
http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-283A1.pdf
- Previously, Certification was optional
- Part 25 - Section 25.129 appears in the Federal Register on Feb. 6, 2004 and requires Certification of portable Satellite phones
- New Technical Parameters (Reference October 2002 TCB training)

Scope B2 – Part 90 Narrowbanding Review



- FCC 03-34 Released 2/25/03
 - Promotion of Spectrum Efficient Technologies
 - For applications received after 12/31/04 no new grants will be issued with 25 kHz “wideband” channel spacing
 - Permissive Changes:
 - Class I pc’s may not be used to add a narrowband listing
 - Class II changes may add a narrowband listing before 1/1/05 if no hardware changes are made
 - Class II changes for wideband only equipment may not be made after 12/31/04
 - Class II changes for multimode equipment after 12/31/04 are allowed but the wideband won’t be listed
- A more detailed policy description was previously presented (Reference February 04 TCB Training).

Scope B3 – Maritime Services

Universal Ship borne Automatic Identification System (AIS)



- Equipment Class – Automatic Identification Systems (AIS)
- TCBs Can Issue Grants for AIS devices
- US Coast Guard AIS background material:
<http://www.navcen.uscg.gov/enav/ais/default.htm>
- DA 02-1363 AIS Frequency Usage
http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-02-1362A1.pdf
- DA 02-1499 AIS Applicable International Standards (Footnote 2) – STANDARDS MUST BE PURCHASED to Certify AIS devices
http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-02-1499A1.pdf

Scope B3 – Maritime Services

AIS Issues



- NPRM – FCC 04-171 (Docket 04-257)
- Defines Automated Maritime Telecommunications System (AMTS)
- Defines the scope of ATMS – private land use permitted
- Emergency and distress – ship stations have priority
- Will not effect equipment authorization of AIS devices if adopted

Scope B3 – Maritime Services

AIS Issues (con't)



- Order on Reconsideration – FCC 04-109 (Docket 92-257)
- Requests extension of the July 1, 2004 Coast Guard carriage requirement
- Extension to 60 days after date published in the Federal Register
- Will not effect equipment authorization of AIS devices

Scope B3 – Maritime Services

New Rules



- Second R&O, Sixth R&O, and Second FNPRM (FCC 04-3)
 - redesignate Channels 75 and 76 for communications related to port operations, and establish requirements for equipment to operate on the channels with reduced carrier power;
 - authorize domestic use of INMARSAT-E emergency position indicating radio beacons (EPIRBs) and establish standards for such devices
 - establish a new emission mask in Part 80 to accommodate a wide range of data services

Scope B3 – Maritime Services

New Rules (Con't)



- § 80.207 **Classes of emission**
 - updated chart of Part 80 emissions designators
- § 80.213 **Modulation requirements**
 - 156-162 and 216-220 MHz bands freq. deviation cannot exceed +/- 5 kHz
- § 80.215 **Transmitter power**
 - non portable ship station in the 156-162 MHz band must be between 8 and 25 Watts
- § 80.275 **AIS US Coast Guard**
 - approval requirements defined
- § 80.373 **Private communications frequencies**
 - updated frequency use table for 156–162 MHz Band

Scope B3 – Maritime Services

Emergency Position Indicating Radio Beacon (EPIRBs)



- Inmarsat E-EPIRB (1.4 GHz) to discontinue operation after December 1, 2004
 - After 8 years of service only 100 L-Band EPIRBs fitted to GMDSS ships and less than 1300 L-Band EPIRBs fitted worldwide
 - Inmarsat L-Band maintenance contracts expire
 - Other Inmarsat service not affected
- EPIRB training – review check list or training sheet on how to process EPIRB applications by next TCB training session
- All EPIRBs require US Coast Guard approval letter

Scope B3 – Aviation Services

Part 87 New Rules



- R&O and FNPRM - FCC 03-238 (Docket 01-289) – in effect as of 9/13/04
http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-238A1.pdf
- Requires FAA Coordination Prior to FCC Filing
- Removes waiver requirement for equipment with 8.33 KHz channel spacing
- Allows for dual spacing transceivers (i.e. 25/8.33 KHz)
 - 8.33 KHz operation not allowed in US
- FNPRM concerning HF Data link Emission J2D
 - Currently requires Waiver - TCB cannot issue Certification
 - 16 QAM Modulation

Scope B4 – Rulemakings



- Part 101 FCC 04-135 (Docket 03-66)
 - § 101.147 is amended by deleting the reference to the 2150-2160 MHz frequency band in paragraph (a), and by deleting and reserving paragraphs (e) and (g).
- Part 101 FCC 03-248 (Docket 02-146)
 - Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands
 - This is not considered to be a new technology but an extension of mature technology into new frequency bands. TCBs can Certify these devices.

RO&O Modification of Parts 2 and 15



- New Rules in ET Docket No.03-201
 - http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-165A1.doc
Effective date October 7, 2004
- 1) Smart Antenna Systems, i.e. Advanced antenna technologies
 - Sectorized antennas. Switched beam devices.
 - Beam-forming phased array systems.
 - MIMO systems. Short for Multiple Input Multiple Output. Communication systems with multiple antennas at the transmitter or receiver side.
 - Space time coding. Transmitted signals from different antennas at different times.
- Not designated as point-to-point (P2P) or point-to-multipoint (P2MP)
 - Allows point to point power in any direction
 - Allows communications with mobile units

Smart Antenna Systems



- TCB's cannot approve systems such as MIMO and Space time coding.
 - Need new testing and filing guidance.
- TCB's can only approve Phased array systems and Sectorized systems **ONLY** with prior guidance from FCC.
 - TCB must contact and provide FCC with operational description. Include description of compliance with the rules.
 - Guidance on testing and filing requirements will be provided.

Smart Antenna Systems



- Applies ONLY to Section 15.247 devices in the 2.4 GHz band. i.e. Does not apply to 5 GHz devices!
- Must comply with all requirements in Section 15.247(c)2i-iv.
 - Different information to each receiver
 - Aggregate power to antenna/array for a Single Beam must not exceed appropriate limit for single system.
 - Array gain needs to be calculated
 - Aggregate power to antenna/array for simultaneous beams must not exceed single-beam limit by >8 dB
 - Overlapping beams cannot exceed appropriate limit for a single system.

Smart Antenna Systems



- Beams
 - Beam width not specified.
 - Multiple beams allowed.
 - Each beam cannot exceed limits for single P2P system.
 - Each beam must send different information to different receivers.
 - Broadcasting not allowed. i.e. Communicating the same information intended for multiple receivers at the same time. *Broadcast of incidental control messages (e.g., ARP) to multiple receivers simultaneously is permitted.*
 - Aggregate power on all beams ≤ 8 dB above limit.
 - 6 beams at full power can be formed
 - Overlapping beams cannot exceed P2P limit.

Smart Antenna Systems



- Examples (must satisfy all requirements, e.g., no broadcasting)
 - Multi-beam system with up to 6 sectors—same or different channels
 - P2P limit for each beam. (Less if beams overlap and can transmit simultaneously)
 - Multi-beam system with more than 6 sectors—same or different channels
 - P2P limit for each beam. (Less if beams overlap and can transmit simultaneously)
 - In addition, aggregate power is limited to P2P limit + 8 dB
- A system with a single antenna or a single transmit beam falls under the old rules

RO&O Modification of Parts 2 and 15 (continued)



- 2) Replacement of Part 15 antennas
 - Second Party (i.e. end user or second manufacturer) can replace equal or lower gain antennas of the same type that was authorized
 - No testing or filing is required.
 - Antenna must be the same type
 - Similar in-band and out-of-band patterns
 - List of antenna types must be in filing
 - Compliance tested with highest gain of each type.
 - Test at maximum output power.
 - Section 15.15 still applies.
- Integral antenna requirement in Section 15.407(d) removed.
 - Devices in 5.2 GHz band still restricted to indoor use

RO&O Modification of Parts 2 and 15 (continued)



- 3) Marketing of Part 15 amplifiers
 - Certain amplifiers can now be sold separately if authorized with specific system(s).
 - Applies only to amplifiers in 900 MHz, 2.4 GHz and 5.8 GHz devices in Section 15.247 and 5.8 GHz in Section 15.407.
 - Designed to connect only to authorized system.
 - FCC identifier of authorized system is listed on outside packaging.

RO&O Modification of Parts 2 and 15 (continued)



- 4) New Digital Modulation Transmission Systems test procedures for devices in Section 15.247
 - Power Output
 - Power Spectral Density
 - Website.....

RO&O Modification of Parts 2 and 15 (continued)



- 5) Modify the channel spacing requirements for
hoppers in the 2.4 GHz band to allow wider bandwidth
hoppers.
 - 25 kHz or Two-thirds of 20 dB BW
 - Power limited to 125 mW
- 6) Partitioned modular approval requirements
 - Will be addressed in future commission action

RO&O Modification of Parts 2 and 15 (continued)



- 7) Make other changes to update or correct Parts 2 and 15 of our rules.
 - Delete STA provisions under 15.7
 - Need is met via Part 5 experimental license
 - Mandatory Electronic filing of applications or Grantee code.
 - Reassess test labs every two years by Accrediting Body.
 - Re-accredit and Reassess TCB's every two years.

Third R&O Review of Part 15 and other Parts of the Commission's Rules



- New rules ET Docket No. 01-278
 - http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-98A1.doc
- Effective date June 23, 2004
- RF ID systems in 433.5-434.5 MHz band.
 - Restricted RF ID systems that identify contents of commercial shipping containers
 - Increased maximum field strength
 - 11,000 uV/m Average, 55,000 uV/m Peak
 - Increased transmission duration
 - From 5 seconds to 60 seconds

Third R&O Review of Part 15 and other Parts of the Commission's Rules (continued)



- Associated powered tags may be approved with system (one FCC identifier, one fee, two separate measurement data) or separately authorized.
- One way and two way communications allowed.
- May not operate within 40 km of DoD Radar sites
- User manual must inform user of operational restrictions
- Grantee must furnish Experimental Licensing Branch, OET with location of installations.

R&O UNII devices



- New Rules in ET Docket No. 03-122,
 - Effective date, February 19, 2004
 - http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-287A1.doc
- New technology
 - TCB cannot approve any device operating under the new rules.
- Test procedures will be updated in the near future
- Transition dates; equipment operating in 5.25-5.35 GHz
 - Will be addressed once test procedure is finalized.