MOTOROLA

Narrowbanding Requirements

What You Need To Know

The Federal Communications Commission (FCC) started the narrowbanding proceedings, also known as refarming, almost twenty years ago in an effort to promote more efficient spectrum use in the 150-174 MHz (VHF) and 421-512 MHz (UHF) Part 90 radio frequency bands. The FCC has released numerous rulings during this time defining the requirements and mandating specific deadlines.

As a trusted leader in two-way communications, Motorola has been preparing for 12.5 kHz technology for over decade and offers the broadest choice of two-way radio equipment with close to 60 models capable of operating in 12.5 kHz efficiency. The purpose of this document is to provide you with the narrowbanding facts, starting with the key dates and requirements you need to know, followed by exemptions and additional information, how Motorola products meet the requirements, and steps licensees should take starting now.

KEY DATES AND REQUIREMENTS:

The FCC is mandating all Public Safety and Industrial/Business licensees convert existing 25 kHz efficiency operations in the VHF and UHF bands to minimum 12.5 kHz efficiency analog or digital operation, and that going forward they implement no more 25 kHz efficiency systems. To implement this mandate, the FCC developed rules and deadlines that impact both radio users and equipment providers.

Key narrowbanding deadlines for radio users (licensees):

January 1, 2011 Applications for new licenses must specify at least 12.5 kHz efficiency. The FCC will no longer accept applications for systems operating at 25 kHz efficiency.[1]

January 1, 2011 Applications for modifications of existing licenses to expand the authorized interference contour (19 dBu VHF, 21 dBu UHF) must specify at least 12.5 kHz efficiency. The FCC will no longer accept modifications for expansion of service areas to systems operating at 25 kHz efficiency.[2] Changes that can trigger such expansion include increasing the antenna height, transmitter power, or adding or moving a transmitter site.

January 1, 2013 All licensees must convert to and operate in at least 12.5 kHz efficiency.[3]

Note: The FCC has NOT set any date by which licensees must operate in 6.25 kHz efficiency in these bands.

Key requirements for equipment providers/ manufacturers:

February 14, 1997 Radio equipment submitted for certification must include a 12.5 kHz efficiency mode. Can be dual mode 25/12.5 kHz efficiency.[4] *See Appendix 1 for list of Motorola radios that meet this requirement.*

January 1, 2011 Manufacturers can no longer certify equipment that is capable of operating at 25 kHz efficiency.

January 1, 2013 Manufacturers can no longer manufacture, import, or market equipment that is capable of operating at 25 kHz efficiency.[5]

January 1, 2013 Radio equipment submitted for certification must include a 6.25 kHz efficiency mode. Can be dual mode 12.5/6.25 kHz efficiency.[6]

Note: The above reflects the FCC order, released June 30, 2010, granting relief on some of the interim date requirements.

Federal Regulations Rule Number:

[1] *CFR 90.209(b)(6)(i)*
[2] *CFR 90.209(b)(6)(ii)*
[3] *CFR 90.209(b)(5)*
[4] *CFR 90.203(j)(3)*
[5] *CFR 90.203(j)(10)*
[6] *CFR 90.203(j)(4) and CFR 90.203(j)(5)*

MOTOTRBO XPR 6550

Technology Equivalency

A common source of confusion is use of the terms "efficiency" and "equivalent efficiency" in various FCC narrowbanding rulings. The FCC does not mandate channel width, it mandates spectrum efficiency. The rules require 12.5 kHz or equivalent efficiency. Any one of the following meets this FCC requirement:

- One voice path in a 12.5 kHz channel
- Two voice paths in a 25 kHz channel
- Data rates of 4800 bps per 6.25 kHz of channel bandwidth (9.6 kbps in 12.5 kHz channels or 19.2 kbps in 25 kHz channels)

Similarly, the certification rules noted above require a 6.25 kHz or equivalent efficiency mode. Any of the following meets this requirement:

- One voice path in a 6.25 kHz channel
- Two voice paths in a 12.5 kHz channel
- Four voice paths in a 25 kHz channel
- Data rates of 4800 bps per 6.25 kHz of channel bandwidth (9.6 kbps in 12.5 kHz channels or 19.2 kbps in 25 kHz channels)

EXEMPTIONS AND ADDITIONAL GUIDELINES

Paging Only Channels Exemption

Paging operations on the Part 90 "paging only" frequencies are exempt from the above narrowbanding requirements, and licensees can continue to operate at 25 kHz efficiency after 1/1/2013. The "paging only" frequencies are:

Public safety

- 152.0075
- 157.450

Business/Industrial

- 152.480
- 157.740
- 158.460
- 462.750
- 462.775
- 462.800
- 462.825
- 462.850
- 462.875
- 462.900
- 462.925

Many systems operate pagers on two-way voice channels as an adjunct to voice operations. Paging on any Part 90 channel other than the above is subject to narrowbanding requirements.

Low Power Portables Exemption

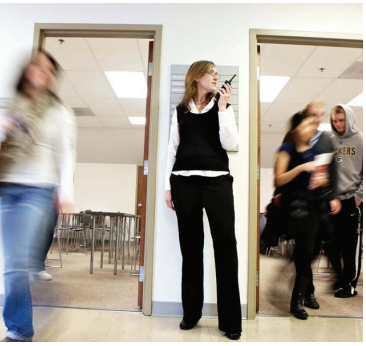
Equipment certification applications submitted by manufacturers as of January 1, 2013 for hand-held transmitters with an output power of 2 watts or less are exempt from the requirement that the equipment includes a 6.25 kHz efficiency mode.

There is no FCC narrowbanding exemption for licensees operating low power equipment or operating on low power channels.

Narrowbanding Compliance

1. The FCC will consider any radio equipment that does not meet the 12.5 kHz efficiency requirement by January 1, 2013 to be operating in violation of the FCC rules. Licensees cannot operate radio equipment in 25 kHz efficiency on a secondary basis after that date. All violations are subject to FCC enforcement action, which may include FCC admonishment, monetary fines, and loss of license. The FCC can require licensees to verify that they are operating in compliance with the narrowbanding rules.
2. Licensees of dual mode 25 kHz/12.5 kHz and multi-mode radio equipment, operating in multiple authorized bandwidths, must ensure that the 25 kHz efficiency mode is disabled prior to January 1, 2013. Newer Motorola radios enable modes of operation primarily through software, rather than firmware or hardware. The FCC will consider licensees to be in compliance if the 25 kHz efficiency mode is disabled via software and the radio user cannot reactivate the 25 kHz efficiency mode. Licensees should check with their Motorola representative to determine how best to ensure that the equipment is operating in the 12.5 kHz mode.
3. Similarly, manufacturers can continue to manufacture, import, or market dual/multi-mode radio equipment after January 1, 2013 only if the modes of operation are enabled primarily through software and radio users are not provided the programming software necessary to activate the 25 kHz efficiency mode.
4. Licensees already operating at 12.5 kHz efficiency do not need to take any action to notify the FCC that their radio equipment already meets the narrowbanding requirement.
5. Licensees of dual/multi-mode radio equipment that are migrating from 25 kHz efficiency to 12.5 kHz efficiency must file a modification application to either add a 12.5 kHz emission designator or change the 25 kHz emission designator to a 12.5 kHz emission designator. Licensees must file applications for adding or modifying a licensed emission designator through a certified frequency coordinator. Contact your preferred frequency coordinator for fee schedules. Adding or changing an emission designator does not require licensees to file a new construction modification.

RDX Radio



6. Licensees of dual/multi-mode radio equipment that are authorized to operate on their assigned frequencies with multiple authorized bandwidths, including both 25 kHz emissions and 12.5 kHz emissions, do not need to modify the license to delete the 25 kHz emission to demonstrate narrowbanding compliance. Licensees must ensure that the 25 kHz efficiency mode is disabled prior to the deadline. (See #2 above)
7. Licensees operating or planning to operate 12.5 kHz equivalent equipment on channel widths exceeding 12.5 kHz must file a narrowband compliance certification to certify that they comply or plan to comply with the January 1, 2013 deadline. The FCC will further define this certification requirement.
8. Licensees must replace by January 1, 2013 all radio equipment that is only capable of operating at 25 kHz efficiency (i.e., equipment that is not capable of operating at 12.5 kHz or greater efficiency).

MOTOROLA PRODUCTS MEET THE NARROWBANDING MANDATE

12.5 kHz Efficiency

All Motorola radios certified by the FCC after February 14, 1997 meet the 12.5 kHz capability requirement. See Appendix 1 for a list of all radios capable of operating in 12.5 kHz efficiency. Some additional radio equipment may meet or be modified to meet the 12.5 kHz efficiency requirement. Licensees should check with their Motorola representative.

6.25 kHz Efficiency

The FCC has NOT set any date by which licensees must operate in 6.25 kHz efficiency in these bands. Considering the FCC allowed over 15 years between 12.5 kHz efficiency equipment certification and mandated licensee use, and licensees are still migrating to 12.5 kHz efficiency, we believe the FCC will not set a deadline mandating licensee use of 6.25 kHz efficiency for many years. Any FUTURE 6.25 kHz efficiency deadline will include a 6.25 kHz equivalent efficiency option just as the 12.5 kHz efficiency deadline includes a 12.5 kHz equivalent efficiency option today.

The FCC has encouraged licensees to consider the feasibility of migrating directly from 25 kHz technology to 6.25 kHz efficiency systems prior to January 1, 2013. For those users that want to implement even greater efficiency than the 12.5 kHz efficiency required by the FCC, Motorola is currently shipping two complete product families that already meet any FUTURE FCC decision for licensees to operate in a 6.25 kHz equivalent efficiency mode. The Motorola ASTRO® 25 product line for the mission critical public safety market and the MOTOTRBO product line for the commerce and enterprise markets are 6.25 kHz efficiency capable today. In addition, these products meet the current FCC requirements for licensees to operate in a 12.5 kHz efficiency mode by January 1, 2013, and the manufacturer deadline requiring all new products certified after January 1, 2013 to include a 6.25 kHz efficiency mode.

Both can operate at two voice paths in a 12.5 kHz channel, using a Time Division Multiple Access (TDMA) protocol, and have been certified by the FCC. This technology allows licensees to double the capacity of their existing 12.5 kHz channel. Licensees must file a modification application through a certified frequency coordinator to change their emission designator to indicate 2 slot on 12.5 kHz TDMA (similar to the above instructions for converting to 12.5 kHz efficiency). Contact your preferred frequency coordinator for fee schedules.

PREPARING TO MEET THE NARROWBANDING MANDATE

The 12.5 kHz deadline for new applications or existing license modifications is a few months away. The deadline for all licensees operating in at least 12.5 kHz efficiency is a little over two years away. Here are some suggested preparations licensees should start right now.

- Take an inventory of your radios. Equipment purchased during the last ten years likely is dual mode 25/12.5 kHz so converting should be a simple process of disabling the 25 kHz mode. Older equipment will likely need replacement. *See Appendix 1 for list of Motorola radios that meet this requirement.*
- If you have pagers on your system, verify whether or not they are operating on "paging only" channels. (see above exemption)
- Develop budget requirements and explore funding options.
- Establish a conversion and implementation schedule.
- Coordinate your conversion with neighboring public safety agencies to facilitate continued interoperability among your agencies
- Conduct tests during conversion to ensure your system continues to provide similar coverage. Determine if transmitter site changes or additions will be required to compensate for possible coverage changes.
- Contact your Motorola representative for further information and assistance to ensure that your radios system meets the FCC narrowbanding deadlines and requirements.

APX™ 7000

APX™ 7500

Appendix 1:

*Motorola Subscriber Radios and Stations Capable of Migrating to 12.5 kHz Efficiency. Those listed in red are DISCONTINUED Motorola Subscriber Radios and Stations that **may be** capable of Migrating to 12.5 kHz Efficiency. Please contact your sales representative for details.*

Model
Portables:
APX 7000
BPR40
CLP 1010
CLP 1040
CLS 1110
CLS 1410
CP110
CP185
CP200
CP200•XLS
EX500
EX560•XLS
EX600•XLS
HT1250
HT1250•LS+
HT750
MT 1500
PR1500
PR400
PR860
RDU2020
RDV2020
RDU2080d
RDV2080d
RDU4100
RDV5100
RDU4160d
VL50
XPR 6350
XPR 6550
XTS 1500
XTS 2500
XTS 4000
XTS 5000

Model
Mobiles:
APX 7500
CDM1250
CDM1550
CDM1550•LS+
CDM750
CM200
CM300
PM1500
PM400
XPR 4350
XPR 4550
XTL 1500
XTL 2500
XTL 5000
XTL 5000 Consolette

Model
Stations:
Quantar
GTR 8000
MTR2000
MTR3000
XPR 8300
RPU 2160

Model
Pagers:
Advisor II
MINITOR V

Discontinued Model
Portables:
AXU4100
AXV5100
CP100
CP125
CP150
HT1000
HT1550 XLS
JT 1000
MT 2000
MTS 2000
ASTRO Saber
Spirit GT
SPIRIT M
XPR6300
XPR6500
XTN
XTS 3000
XTS 3500

Discontinued Model
Mobiles:
ASTRO Spectra Consolette
ASTRO Spectra
ASTRO Spectra Plus
LCS 2000
MCS 2000
XPR4300
XPR4500

Note: The list of current and cancelled products may not be complete. Contact your sales representative if you have a product that is not on the list.

MTR3000

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