

Narrowbanding Requirements

What You Need To Know

The purpose of this paper is to provide you with the narrowbanding facts, starting with the key requirements you need to know, followed by exemptions and additional information, how Motorola products meet the requirements, and steps licensees should take starting now.

The 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 and 421-512 MHz Part 90 radio frequency bands, also known as the VHF and UHF land mobile bands. The FCC has released numerous rulings during this time defining the requirements and mandating specific deadlines. On December 11, 2009, the FCC released a Public Notice reiterating the narrowbanding deadlines and clarifying a number of questions being asked of the FCC for some time. There is still confusion among LMR users and even equipment providers of what exactly the FCC requires and what happens if those requirements are not met. Licensees who fail to meet these requirements may not be able to communicate within the next one to three years, and will be subject to the FCC enforcement procedures.

KEY REQUIREMENTS:

The FCC is mandating all 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. (Footnotes reference respective Code of Federal Regulations rule number)

There are three 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

There are three 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 Radio equipment submitted for certification must include a 6.25 kHz efficiency mode. Can be dual mode 12.5/6.25 kHz efficiency.⁵

January 1, 2011 Can no longer certify, manufacture or import equipment that is capable of operating at 25 kHz efficiency.⁶

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

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)(4) and CFR 90.203(j)(5)

⁶ CFR 90.203(j)(10)



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)

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, 2011 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.

Additional Information and Clarification

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 or import dual/multi-mode radio equipment after January 1, 2011 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.

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





RDX Radio

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.
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).

NPSTC Petition

As of January 2010, an FCC decision is still pending on a Petition for Stay of the above 1/1/2011 interim dates filed by the National Public Safety Telecommunications Council. NPSTC believes a Stay of these dates is needed primarily to maintain interoperability during the transition. Filed Comments were inconsistent - some supported the 2011 delay and others opposed it. The 19 member associations of the Land Mobile Communications Council don't agree on the delay of the 2011 interim date either. However, both NPSTC and LMCC remain united in support of adherence to the 2013 final deadline. There is also support for consistency across Public Safety and Business/Industrial users. While no one can predict an FCC decision, we believe it unlikely that the FCC will delay the 1/1/2011 interim dates. Since the Petition does not request a delay of the 1/1/2013 end date, this date will certainly remain unchanged.

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 January 1, 2011 manufacturer deadline requiring all new products certified after that date 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.

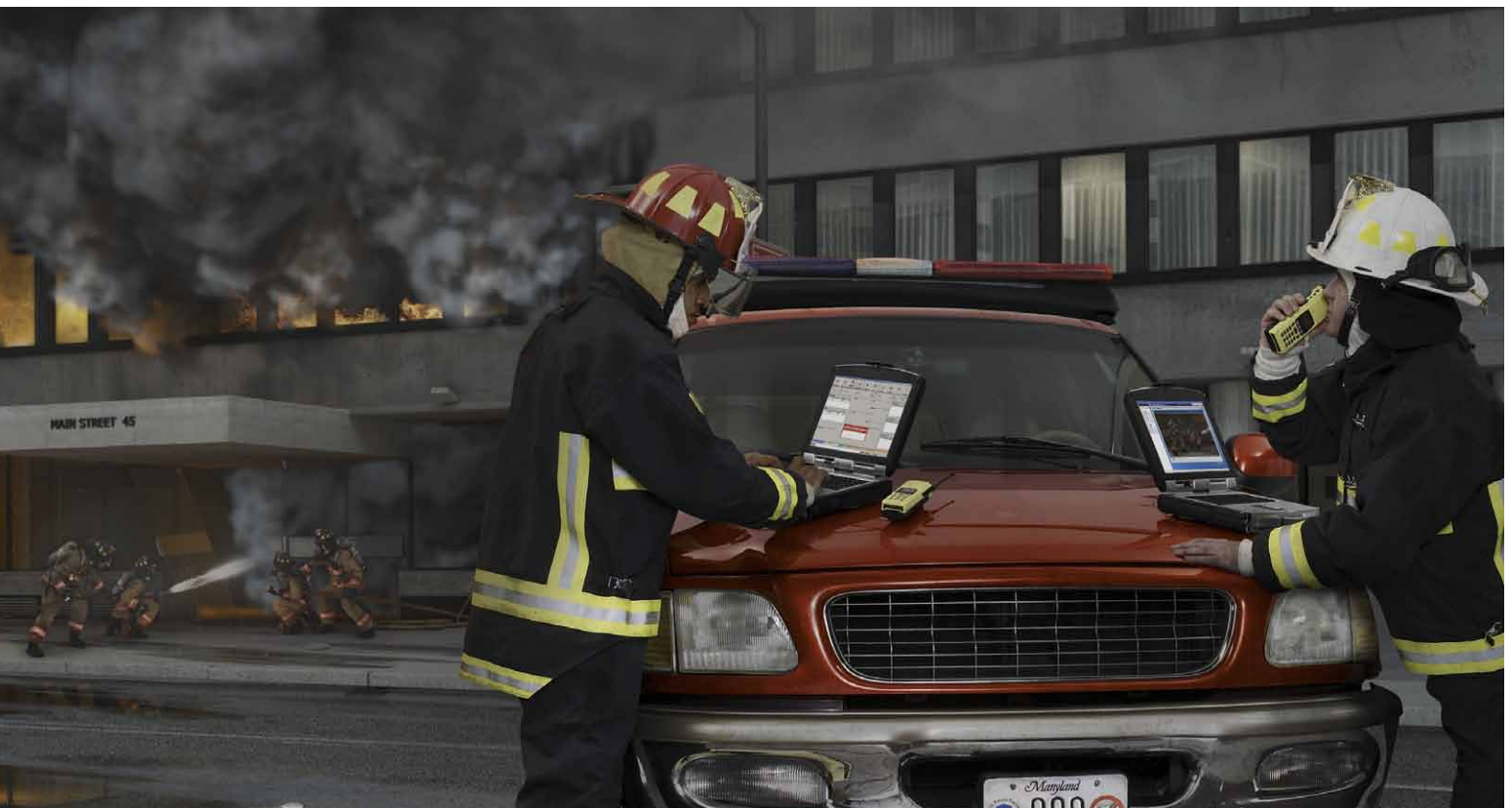
PREPARING TO MEET THE NARROWBANDING MANDATE

The 12.5 kHz deadline for new applications or existing license modifications is less than one year away. The deadline for all licensees operating in at least 12.5 kHz efficiency is less than three 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.

Any questions: contact Al Ittner, Sr. Manager, Spectrum and Regulatory Strategy, at al.ittner@motorola.com or 847-576-3536.



Appendix 1:

Motorola Subscriber Radios and Stations Capable of Migrating to 12.5 kHz Efficiency



APX 7000



APX 7500

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

Stations:
Quantar
GTR 8000
MTR2000
MTR3000
XPR 8300
RPX

Pagers:
Advisor II
MINITOR V



MTR3000

Appendix 2:



PUBLIC NOTICE

Federal Communications Commission
445 12th St., S.W.
Washington, D.C. 20554

News Media Information 202 / 418-0500
Internet: <http://www.fcc.gov>
TTY: 1-888-835-5322

DA 09-2589

Released: December 11, 2009

LICENSEES, FREQUENCY COORDINATORS, AND EQUIPMENT MANUFACTURERS REMIND OF NARROWBAND MIGRATION DEADLINES IN THE 150-174 MHz AND 421- 512 MHz BANDS

This *Public Notice* reminds interested parties of the Commission's deadlines for private land mobile radio services in the 150-174 MHz and 421-512 MHz bands to migrate to narrowband (12.5 kHz or narrower) technology.¹ The Commission directed that a *Public Notice* be issued by December 31, 2009 reminding licensees and frequency coordinators of the approaching deadlines.² This *Public Notice* also provides additional information regarding the transition to narrowbanding technology.

Key Deadlines

Licensees and frequency coordinators should be aware of the following deadlines:

(1) beginning **January 1, 2011**,³ the Commission will no longer accept applications for

-new wideband 25 kHz (*i.e.*, operating with only one voice path per 25 kHz of spectrum) operations, and

-modification of existing wideband 25 kHz stations that expands the authorized interference contour (19 dBu VHF, 21 dBu UHF); and

(2) by **January 1, 2013**, Industrial/Business and Public Safety Radio Pool licensees must

- operate on 12.5 kHz (11.25 kHz occupied bandwidth) or narrower channels, or

- employ a technology that achieves the narrowband equivalent of one channel per 12.5 kHz of channel bandwidth (voice) or 4800 bits per second per 6.25 kHz (data).

¹ See Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended; Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies, *Second Report and Order and Second Further Notice of Proposed Rulemaking*, WT Docket No. 99-87, RM-9332, 18 FCC Rcd 3034 (2003); Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended; Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies, *Third Memorandum Opinion and Order, Third Further Notice of Proposed Rule Making and Order*, WT Docket No. 99-87, RM-9332, 19 FCC Rcd 25045 (2004) (*Narrowbanding Third Memorandum Opinion and Order*); see also 47 C.F.R. §§ 90.203(j), 90.209(b).

² See *Narrowbanding Third Memorandum Opinion and Order*, 19 FCC Rcd at 25057 ¶ 26.

³ A petition seeking a stay of the January 1, 2011 deadlines, filed by the National Public Safety Telecommunications Council (NPSTC) on September 29, 2009, is pending. See Wireless Telecommunications Bureau and Public Safety and Homeland Security Bureau Seek Comment on National Public Safety Telecommunications Council Petition for Stay of Interim Narrowband Implementation Dates, *Public Notice*, WT Docket No. 99-87, DA 09-2364 (WTB/PSHSB rel. Nov. 2, 2009).

Equipment manufacturers should be aware that, beginning **January 1, 2011**, the manufacture, importation, or certification of any 150-174 MHz or 421-512 MHz band equipment capable of operating with only one voice path per 25 kHz of spectrum will be prohibited; and applications for equipment certification must specify 6.25 kHz capability.⁴

Additional Information

How should licensees notify the Commission that they are in compliance with the January 1, 2013 deadline to migrate to narrowband or narrowband-equivalent technology?

The answer to this question depends on how and when the station came into compliance.

Licensees of stations that already satisfy the narrowbanding requirements because their authorized bandwidth does not exceed 12.5 kHz do not need to take any action to notify the Commission that the station has met the narrowbanding deadline.

Licensees of stations that currently are authorized to operate with a bandwidth exceeding 12.5 kHz that are transitioning to 12.5 kHz or narrower operation must file a modification application to either add a narrowband emission designator or change the wideband emission designator to a narrowband emission designator.⁵ The licensee will not need to take any additional action to notify the Commission that the station has met the narrowbanding deadline. Adding or changing an emission designator for an existing frequency does not trigger a new construction requirement, so the licensee will not need to file a new construction notification.

Note: Many stations are or will be authorized to operate on their assigned frequencies with multiple authorized bandwidths, including both wideband 25 kHz emissions and 12.5 kHz or narrower emissions. It is not necessary for licensees of such stations to delete the wideband 25 kHz emission designator in order to demonstrate compliance with the January 1, 2013 deadline. Instead, absent information to the contrary, stations that were authorized to operate with both wideband and narrowband emissions prior to January 1, 2013 will initially be presumed to be operating only with narrowband emissions (i.e., that the wideband mode has been disabled) after January 1, 2013. (All equipment certified since 1997 has been required to have a 12.5 kHz operational mode. Licensees should check with their radio equipment vendor to determine how to ensure that the equipment is operating in the 12.5 kHz mode.) The Commission also will have discretion to inquire of licensees to verify that they are operating in compliance with the Commission's rules.

Licensees of stations that currently are authorized to operate with a bandwidth exceeding 12.5 kHz that have complied or will comply with the narrowbanding deadline by adopting narrowband-equivalent equipment will be required to certify compliance with the deadline. This is necessary because it will not always be apparent from the license's technical parameters whether a 25 kHz station is a non-compliant wideband station or a compliant narrowband-equivalent station. We plan to implement this

⁴ These 2011 deadlines applicable to manufacturers also are subject of the NPSTC petition for stay. The 6.25 kHz requirement does not apply to hand-held transmitters with an output power of two watts or less. See 47 C.F.R. § 90.203(j)(4).

⁵ Currently, the Commission's rules require frequency coordination for a modification application that proposes to reduce the authorized bandwidth on the licensed center frequencies, see 47 C.F.R. § 90.175, but the Commission has sought comment on exempting such applications from this requirement. See Amendment of Part 90 of the Commission's Rules, *Notice of Proposed Rulemaking and Order*, WP Docket No. 07-100, 22 FCC Rcd 9595, 9596-97 ¶ 3 (2007).

certification requirement by revising a future version of the relevant application form for new, renewed, and modified station licenses to require licensees subject to the narrowbanding mandate to indicate whether or not the requested operations comply with the narrowbanding requirements. The Commission also will have discretion to inquire of licensees regarding existing licenses for which no such certification is received because the license was not renewed or modified before January 1, 2013.

Will the Commission take any other action to remind licensees of the upcoming narrowbanding deadlines?

Yes. In addition to this *Public Notice* and the measures discussed above, the Commission will in the near future begin placing a special condition on all new, renewed, and modified licenses for stations in the radio services and frequencies subject to the narrowbanding mandate to remind licensees of the January 1, 2013 deadline. The special condition will be removed from the license at some point after the licensee notifies the Commission that the station is in compliance with the narrowbanding deadline, as discussed above.

May a station that does not meet the January 1, 2013 narrowbanding deadline operate after that date on a secondary basis?

No. As of January 1, 2013, the Commission's rules will prohibit Industrial/Business and Public Safety Radio Pool licensees in the 150-174 MHz and 421-512 MHz bands from operating with wideband channels (unless their equipment meets the narrowband efficiency standard), even if the license still lists a wideband emission designator. Operation in violation of the Commission's rules may subject licensees to enforcement action, including admonishments, monetary forfeitures, and/or license revocation, as appropriate.

Can previously certified multimode equipment be manufactured or imported after January 1, 2011?

Yes, under certain circumstances. The equipment certification for previously certified multimode equipment containing a wideband 25 kHz mode will continue to be valid, and such equipment may continue to be manufactured and imported, only if the modes of operation are enabled primarily through software rather than firmware or hardware, and users are not provided with the programming software necessary to activate the wideband 25 kHz mode.

For further information, licensees and frequency coordinators may contact Mr. Melvin Spann of the Wireless Telecommunications Bureau, Mobility Division, (202) 418-1333, Melvin.Spann@fcc.gov, or Mr. Zenji Nakazawa of the Public Safety and Homeland Security Bureau, Policy Division, (202) 418-7949, Zenji.Nakazawa@fcc.gov; and equipment manufacturers may contact Mr. Andy Leimer of the Office of Engineering and Technology, (301) 362-3049, Andrew.Leimer@fcc.gov.

-FCC-



Sharp Communication, Inc.
3403 Governors Drive
Huntsville, AL 35805
256.533.2484
www.SharpCom.com