

Before the  
Federal Communications Commission  
Washington, D.C. 20554

**In the Matter of** )  
 )  
**Improving Public Safety Communications** )  
**in the 800 MHz Band** )  
  
**Consolidating the 900 MHz Industrial/Land** )  
**Transportation and Business Pool Channels** )

**WT Docket No. 02-55**

**REPLY COMMENTS  
& PETITION  
OF  
MT COMMUNICATIONS**

MT Communications hereby submits its Reply Comments relative to the proposed Rulemaking that is initiated as part of the FCC Notice of Proposed Rulemaking for solving the interference problems that public safety agencies are experiencing all over the country in using an 800 MHz trunked digital and analog systems.

**I. Introduction and Summary**

MT Communications hereafter referred to as MTC is small independent company that

design, installs, and services Public Safety Radio Systems in the Washington, D. C. area. Its past or present customers include Baltimore City Police, Montgomery County

Maryland, Prince William County Virginia Police, State of Maryland, Gaithersburg City Police, US Marshals and the Chevy Chase Maryland Police Department. MTC has on its staff a graduate electrical engineer with over 30 years of land mobile experience in the Baltimore/ Washington, D. C. area. While we did not initially file comments we were driven to do so after reading many comments already submitted and particularly the Region 20 Public Safety agencies stating that they had major inference problems. Also, in

the last several weeks articles were published in the Washington Post<sup>1</sup> and the New Times<sup>2</sup> about the massive failure of the public safety radio systems at the Pentagon and at

the World Trade Center in New York. We believe we have somewhat of an unique view and recommendations that weren't provided by the Nextel, the Associations, Public Safety Agencies or from suppliers. Since we best know the Baltimore/Washington area, we plan to use it to illustrate problems and our recommended solutions. We would urge the Commission to move quickly on it decision as to this NPRM and do so in phases which will be outlined. We would also urge that decisions be piloted in Washington, D. C. and New York since both areas are likely to be repeat targets of terrorist attacks.

After reading the comments from the many responders to the NPRM there are several clear conclusions. Interference caused by Nextel and the cellular carriers that surrounds Public Safety spectrum at 800 MHz is a clear and present danger and may have contributed to the communications failures in Washington and New York on September

---

<sup>1</sup> Washington Post - July 24, 2002 Page B8

<sup>2</sup> New York Times – July 7, 2002 – Front Page

11<sup>th</sup>. Public safety needs to be quickly moved from the mid to upper 800 MHz band to the

lower 800 MHz or to 700 MHz in the areas where there is currently open spectrum.

According a Motorola Homeland Security Briefing to the Commission and a ranking by the Commission of the top 50 urban areas, 9 out of the top 20 markets have either Channels 63/68 and/or 64/69 available. Washington , D. C. is one of those markets and should be open up immediately. Since Motorola has most of the state and local 800 MHz

public safety market in the U. S., all in the D. C. area and they are the sole source supplier

to and a major stockholder of Nextel, they should be made to pay for this migration by furnishing new equipment and services. Motorola stands to financially benefit the most from funds spent to relocated public safety users.

After reading and understanding the technical papers submitted in this NPRM, it clear that

the inference and problems being created particularly in the NPSPAC channels are not the

fault of the CRMS firms but due to physics which are now better understood. Motorola has filed several papers with the Commission stating that they are unable to design and build a better portable receiver in the currents bands that will solve these interference problems. This is despite the fact that the Motorola Astro digital trunking radios sell for over \$3,000 vs. only \$1, 000 for a LTR 800 MHz trunking or a UHF radio. A Nextel Portable with more function than a public safety unit is sold by Motorola for \$300 without

service. If there were a competitive market then other firms might develop a receiver with higher IM rejection and longer battery life. This is the case in the UHF market where

we are more active. We request that the Commission bring the Department of Justice and Federal Trade Commission in to look at Motorola's position in the State and Local Public

Safety 800 MHz Trunked Market. Part of this review should be their role as the sole supplier to Nextel and a major stockholder of Nextel.

These problems are exacerbated by trunking channels and the digital modulation, which

Motorola covers in their submission<sup>3</sup>. We recommend that current 800 MHz users stop trunking and use their channels as conventional analog radios until the interference problems are solved.

We Petition the Commission to temporarily suspend the licenses and construction permits of licensees who are in the process of building out and testing new systems but who are not on line or who still have their older system in operation. It will be far easier and less expensive to make the move before going on line. Particularly those in the NPSPAC channels who are surrounded on both sides by Nextel and the A side cellular carriers. In the Washington, D. C. area Montgomery County, Howard County, Prince William, Fauquier, and Somerset Counties are all candidates to have their licenses put on hold for the time needed by the Commission to take action. Alexandria, Baltimore County, Anne Arundel, Washington D. C. Fire and Frederick, Md. are in various forms of upgrade and they should be notified that they should do so at their own risk. As a minimum, they should be notified that if they proceed in deployment or upgrades they will not be eligible

for Nextel, Federal Grants, or other funds to relocate. They are at their own risk!

---

<sup>3</sup> Comments of Motorola – May 6, 2002 – Page 16

Fairfax

County stated in their comments that a major relocation could cost them as much as \$30M. which is approximately 50% of their initial cost. Many Cities and Counties that we

have dealt with have a very limited technical staff and may not even employ a graduate engineer. Many are not even aware of this NPRM or its consequences. Somehow the Commission needs to get them to focus on this issue.

In conclusion, the Commission must take a series of bold actions that are at the clearly in

the public interest to solve the 800 MHz Public Safety problems that threaten lives every day.

**II. A Review of the Filed Comments and Other Documentation Indicate that there are serious problems at 800 MHz – Now and in the Future**

As stated in the above summary, MTC is going to focus it comments on the region of the country that it has experience – the Baltimore/Washington Area. Baltimore City, Baltimore County, Washington, D. C. Fire, and Fairfax County who are major 800 MHz trunked radio users filed comments stating that they are experiencing major problems such

as dead spots and interference which busies out some of their channels. Anne Arundel

County, Maryland did not file comments but its problems have been featured in stories in

the Washington Post . In addition to the comments from the local public safety agencies, we reviewed those under APCO Project 39 and those filed by Motorola. It is very clear from the WCCCA<sup>4</sup> tests that the interference problems are caused when a portable is within a 1/3 mile radius of a Nextel Site. While WCCCA is not using NPSAC channels,

---

<sup>4</sup> From APCO Project 39 – Mr. Joe Kuran – WCCCA Beaverton Oregon

their usage would appear to present even greater problems because Nextel is on the lower

side and the A side cellular carrier is on the upper side. Using the Commissions materials

send to Congress that is posted on their filed comments web site, Nextel has all channels from 401 to 600 in the Washington, D. C. area which abuts the NPSAC channels.

NPSAC is from channels 600 to 830. This should create even greater problems. As others have pointed out, Nextel and the A carriers(Cingular in the Washington area) are constantly adding sites most of which are lower in height which will create even greater problems.

### **III. September 11 Communications Problems at the Pentagon and in New York City Add Urgency for Immediate Action by the Commission.**

Recently the Washington Post and New York times published major articles on the breakdown of communications that the Pentagon and the World Trade Center. The Post Article referenced a report contracted for by Alexandria City and funded by a Federal Grant. “In the first few hours, foot messengers and bullhorns proved to be the most reliable form of communications”. In the report<sup>5</sup> there is a quote “Where line of sight could be achieved, talk around was minimally effective.” Arlington County was using a Motorola 800 MHz trunked radio system. The report does not go into enough depth to determine whether the breakdown was cause by interference, overload, etc. In “talk around” mode where two units can communicate directly over a short line of sight distance, one can only conclude that some external factor such as interference caused the failure to communicate at the Pentagon.

---

<sup>5</sup> Arlington County Report written by Titan Systems Report at Page A-36

A front page article in the New York Times<sup>6</sup> states that the Fire Department issued evacuation orders for the North Tower just after the collapse of the South Tower which gave firefighters 21 minutes of warning. “Yet most of the firefighter never heard those warnings”. “Their radio system failed frequently that morning”. “Cut off from critical information, at least 121 firefighters, most in striking distance of safety, died when the north tower fell”. It is not clear where the Fire Department was using their new 2,700 Motorola Digital Astro Portables or had fallen back to their older system because of earlier failures of their Motorola 800 MHz trunked system. McKinsey Consulting has been hired by NYFD to study the problem.

We do not believe that the either the Pentagon or World Trade incidents represent a major stressing of Public Safety Communications. A far larger problem could arise following the explosion of a “dirty bomb” in the downtown area of Washington, D. C. where thousands of Police and Fire would be trying to communicate over many days. Public Safety does not need a “wild card” problem created by interference from CRMS systems which will also be at maximum usage.

**IV. MTC recommends that any solution be piloted in several areas such and Washington and New York before a Nationwide rule change.**

We believe that any solution that the Commission decides on to the 800 MHz interference problem should be piloted in the Washington and New York areas. Montgomery County, Maryland and the NYFD would be representative of areas to see if the interference problem can be completely solved. A Rule Making without testing might create worse

---

<sup>6</sup> See n. 2 supra

problems so pilots should be used. It might be appropriate for the New Homeland Defense Department to fund and manage such projects.

**V. The Best Solution is to relocate existing 800 MHz Public Safety Users in the Washington Area to new available spectrum at 700MHz or where not available to the low 800 MHz band.**

We believe that the best location for Public Safety is the new 700 MHz band where there are thousands of new channels surrounded by a guard band. Motorola in a Homeland Defense<sup>7</sup> presentation to the Commission shows a map that indicates that channels 63/68 or 64/69 are current available in 9 out of 20 of the top US markets including Washington,

D. C. . For other markets and should Motorola's analysis of the UHF TV station clearing not be correct, we favor Nextel's proposal to move Public Safety down away from cellular and Nextel and closest to the new 700 band. This should provide the maximum protection and allow public safety radio to operate with the lowest noise floor and minimum interference.

**VI. None of the Comments state that Nextel is violating the Commission Rules and should be made to Fund the Relocation.**

While many of the comments focused on requesting the Commission to force Nextel to pay for relocation, none that we read proved that Nextel was in violation of Commission rules in causing the interference. We understand Nextel's play for more spectrum and desire to lower their costs in responding to interference problems. However, we don't believe that Nextel should be required to pay for relocating Public Safety Agencies. Instead they should pay for any spectrum above and beyond any they swap. We just solve

---

<sup>7</sup> Motorola Presentation to the Commission on May 15, 2002 by Mr. Gary W. Grube

a recent intermodulation problem at one of our customers repeater sites but we had to do so by installing filters at our own expense because the offending part was likely within specification. Intermodulation is a natural byproduct of communications.

**VII. Motorola should be required to help fund these moves since they are basically the Sole Source Supplier to Nextel and State/Local Public Safety Agencies and Stand to Profit from such a move. In addition, we believe the Commission should request that the DOJ and FTC agencies review the Marketing Practices and Market Share of Motorola in the Public Safety Market.**

In an article in Mobile Radio Technology titled “Battling Bat Wings”<sup>8</sup> Mr. Schwaninger reports that Motorola manufactures all of the Nextel base station equipment and subscriber units. They are also a major stockholder in Nextel. He also correctly points out that they are the leading supplier of Public Safety Equipment and have known for years that IDEN technology causes harmful interference. In the Baltimore/Washington area all of the 800 MHz Public Safety trunking systems are Motorola. There was little or token competition for these large contracts. Montgomery County is spending over \$160M for a new public safety system that is under construction. He points out that they should pay for part or all of the cost of relocation since they created the problem. In the Motorola design system they have failed to follow their own Best Practices Design Guide.

They have located towers and sites in Germantown and North Rockville to serve the 2<sup>nd</sup> largest city in Maryland – Gaithersburg. Nextel has one of their largest sites on the Asbury Methodist home in the central Gaithersburg. This is a classical Near-Far Scenario

which Motorola recommends avoiding. If taxpayers pay for the cost to solve the problem then Motorola will profit from a mess they created. They should be held

---

<sup>8</sup> Mobile Radio Technology - May 1, 2002 - by Robert H. Schwaninger, Jr. <http://www.mrtmag.com>

accountable.

In a memo from the County Attorney<sup>9</sup> of Fauquier County regarding the negotiations with Motorola for a new 800 MHz trunking systems he states that “Negotiations, however, have not been without issue and Motorola, **in its capacity as a near monopoly,** has often refused to negotiate on specific language.” Also published on the county web site is the County’s failed attempted to negotiate Motorola into a positions to hold Fauquier County harmless should there be the type of interference covered by Docket 02-55.

Were there competition in this market from other radio vendors, then we believe that there

would be other equipment vendors who might have a different receiver that would work with the Motorola systems but have a higher or a non-linear intermodulation rating.

However all of the Baltimore/Washington Trunked 800 MHz bids that we are familiar with have been bundled contracts. Motorola has successfully convinced the cities and counties who have bought system to buy the consoles, tower, base stations, microwave, portables and mobiles all in one long term contract(3 to 5 years). This means that a competitor who could develop a better portable or mobile that might have interference protection will find no market for it since Motorola has a lock on the marketplace. We are focusing on the portables since this is the chief device that Motorola claims can’t be improved because of battery life. Currently Motorola is delivering to the local public safety user the XTS 3000 which is a 5 to 7 year old technology. In the competitive cellular marketplace, Motorola announces new products every 6 months. The radios that

---

<sup>9</sup> Memo from Paul S. McCulla, Fauquier County Virginia – January 11, 2002 to Board of Supervisors

Motorola is current delivering to the Baltimore/Washington area have a proprietary interface that they control through patents and royalties. The radio systems are not APCO

Project 25 compliant. The only true reported APCO 25 system being installed is the Michigan State Police<sup>10</sup>. They are Motorola's Astro products, which uses their Smartnet II

3,600 baud control channel architecture. Smartnet trunking is a 15 year old technology built on an analog base. Tyco/Amp is installing for the Pennsylvania State Police on 800 MHz a modern all digital technology that uses Voice over Internet Protocol. One major component of an economic monopoly is lack of technical innovation and open standards which is clearly present here.

A second indicator is higher prices. In the early 1990's we competitively won the Prince William County, Virginia Police UHF Portable Radio Contract against Motorola. Their initial bid was over \$2,000 per portable versus our \$1,000 bid using a Bendix King radio.

This contract has been rebid four times in three year options and we have won each time. In fact, they have not bid directly in the last nine years since they know that they are not competitive. Aside from price, Prince William tested and found that the Bendix King battery lasted 50% longer than Motorola's permitting a 12 hour Police shift! This shows that when there is competition there is technical innovation at lower prices. Motorola has

recently sold the XTS 3000 to all of the local public safety agencies for a discounted price

of approximately \$3,000! This is three times the price of our 800 MHz trunked portable and our UHF radio sold to Prince William, Baltimore City, etc. While the Motorola

---

<sup>10</sup> Trunkedradio.net Web Site

digital Astro radio has some additional circuitry, it does not have 3 times the factory cost. One can purchase, without a tie in to a Nextel subscription, a Motorola IDEN handheld for \$300 with far more function such as paging, browser, and a 3 day battery life. In fact the IDEN product is full duplex which could be done on the current 800 MHz channel which would allow policemen and firemen to tell if their voice message is being heard because they would hear themselves. All other communications including landline and cellular is full duplex.

One can only conclude that Motorola is making a huge profit and has a monopoly in the 800 MHz Public Safety State and Local market! We believe the Commission should refer all

of the comments in this proceeding to the Department of Justice and Federal Trade

Commission to see if they believe Motorola has done anything illegal or unfair. If there is

a finding against Motorola, then they could be forced to pay for relocation expenses.

**IX. We recommend that the Commission Instruct Public Safety Agencies to Cease Trunking and Use Analog Modulation to Temporally Reduce Problems.**

In Motorola's comments<sup>11</sup>, they correctly point out trunking requires at least two interference free channels. One is for the control channel to decode or originate a call and a second random voice call to carry the conversation. If there is a pause in the reply conversation to the next message could be assigned to a third channel. One way to temporarily minimize interference is to assign fixed frequencies for police users since all police departments have fixed districts. By eliminating the need for multiple interference free channels, a single channel for each Police district can be found. This can be done by

---

<sup>11</sup> Docket 02-55 May 6, 2002 - Page 16

using a spectrum analyzer, intermodulation calculations, and experience via usage. This would eliminate the randomness of the interference problem. This will not be difficult for

Motorola to implement since this is the fail-safe mode that is part of their trunking systems. In Baltimore City, the police who have 80% of the radios have only eleven talkgroups<sup>12</sup> out of a thirty-five channel system. Nine talkgroups or channels are for nine district and there are two citywide channels. The rest are for the fire department, mutual aid, the mayor, etc. which only have a few hundred radios. Montgomery County is installing a 20 channel systems but cannot staff more than five police and one fire dispatch. Local TV channels reported last week that they are twenty people short out of one hundred slots. There is a 6<sup>th</sup> police district/channel/talkgroup/repeater active and we programmed this UHF channel into the Gaithersburg City Police radios over two years ago while awaiting a dispatcher which on indefinite hold. In summary, Montgomery and Baltimore are typical of other public safety agencies that have plenty of fireground and tactical channels to use given a simple manual process that has worked for 50 years.

Because the digital radio systems are basically analog with a digital vocoder, we recommend that the digital systems be programmed into the analog mode. As Motorola states in same section “interference to analog conventional radios usually results in audible

static noises”. We agree and recently solved a very troubling intermodulation problem by

identifying the voice of the offending party. This can’t be done with a digital system. In fact the Boston Fire Department has a 150 page report that express a “clear and unambiguous preference for the analog radios. This is an easy task since all Motorola

---

<sup>12</sup> Web Site Trunkedradio.net

radios can be easily reprogrammed into the analog mode and the trunked system can have mixed digital and analog at the same time.

**IIX. We Petition the Commission to Temporally Suspend the Construction and Licenses of Public Safety Agencies in 800 MHz that have not Fully Cut Over until the Commission publishes their Rules on this NPRM.**

Given the overwhelming reports of problems, it seems “like pouring more gasoline on the fire” to continue to permit more public safety agencies to build out their systems to create

more interference, cost and schedule problems. Fairfax County had a relocation cost estimate of up to \$30M. Public Safety Systems are 24 X 7 and so it will be difficult and take a lot of planning to move. In the Washington Area counties such as Montgomery, Howard, Prince William , Fauquier and Somerset are all area candidates to have their licenses and construction authorization put on hold. Alexandria, Baltimore County, Anne Arundel, Washington D. C. Fire and Frederick, Md. are all in upgrade modes and should be advised to pause until some decision or direction is decided on this NPRM. We have contracts with some of these agencies and have seen some the Motorola contracts. They all contain a clause to either cancel or put on hold any radio project because of a FCC rule change or problem. These effected agencies should not lose money or have any contract issues because of a hold.

In the event, the Commission chooses not to place licenses on hold, then they should not permit agencies that are not currently on line to obtain Nextel monies or any Federal Grant

should this the one of the outcomes.

Most counties do not have a graduate engineer or a person who closely follow the Commissions rules. This is usually done by a consultant or Motorola. To gain the

attention of public safety agencies, we believe the Commission should send letters to the Mayors, Governors, or County Executives advising them of this NPRM and possible relocation.

## **X. Conclusion**

Given the large number of 800 MHz problems documented in this NPRM and in the press, the events of September 11 and the Commission's role of protecting the public interest, we believe this NPRM should be fast tracked. We believe that a series of actions should be taken by the Commission and not one single set of rules that might take six months or a year to compile. They include:

1. Notification of the top executive of each government agency that hold a construction or operational license that there will likely be major rule changes including relocation.
2. Suspensions for 90 days of any construction or license where there has not been a full change over.
3. Create a list of technical recommendations for current users such as ceasing trunking and revert to analog from digital to mitigate interference.
4. Pilot solutions or rule changes in the Washington and New York areas.
5. Move users to 700 MHz in the many areas where there are no active television stations.
6. For all others move them to the lower 800 MHz band.
7. With the help of DOJ and FTC, create more competition and innovation in the equipment area for 800 MHz which includes requiring the use of an open standard.

Due to the urgency of this issue we would happy to meet with the Wireless Bureau to further explain our proposals.

Respectfully submitted,

August 7, 2002

M. Heavener  
MT Communications  
Box 2171  
Gaithersburg, Maryland 20886  
301 926-1891 x2  
Mtcomm@erols.com