Office of the Secretary
Federal Communications Commission
Marlene H. Dortch
Secretary
445 12th Street, SW
Washington, DC 20554

Subject: WTB Docket 02-378, Region 15 – 700 MHz Regional Plan

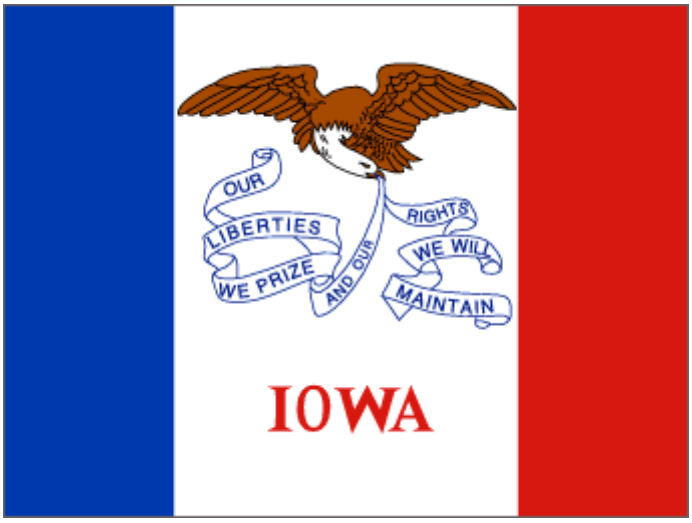
Attached please find the 746-776/796-806 MHz Regional Plan for Region 15 (Iowa). A copy of the Plan has also been forwarded to Jeannie Benfaida. If you have any questions, please contact the Regional Chairperson Leslie E. Fish at 515-281-8804.

Thank you,

03/15/2011

Leslie E. Fish
Iowa State Patrol Communications
5912 NW 2nd street
Des Moines, Iowa 50313-1307

Iowa



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700 MHz Regional Plan
Region 15

This is the 700 MHz Regional Plan for Iowa, Region 15.

1. General Information About the Regional Planning Committee

1.1 Current Regional Chair/Database Manager

Mr. Leslie E. Fish
Iowa State Patrol Communications
5912 NW 2nd St.
Des Moines, IA 50313-1307
515-323-4360
fish@dps.state.ia.us

1.2 Other RPC Officers

Vice Chair
Steven Gray
Iowa Department of Transportation
800 Lincoln Way, Building 6
Ames, IA 50010
515-239-1552
Steven.gray@dot.iowa.gov

Secretary/Treasurer
Eric Nevins
Des Moines Police Dept.
25 E. 1st St.
Des Moines, IA 50309
515-
ednevins@dmgov.org

1.3 RPC members

The members of Region 15, their contact information and voting status can be found in Appendix A.

1.4 Description of the Region

Region 15 consists of the state of Iowa. Iowa is situated between two rivers; the Mississippi River to the East and the Missouri River to the West. The topography of the state ranges from the Loess Hills in the west, the tallgrass prairie in central Iowa to the rolling hills and towering limestone bluffs in the east. There are seven

State Forests in Iowa. Federal installations include the FBI, Army Corps of Engineers, Fish and Wildlife, and Camp Dodge Army Base.

There is one federally recognized Native American Tribe in Iowa, the Sac & Fox Tribe of the Mississippi in Iowa/Meskwaki. The twelve mile Sac & Fox settlement covers 7000+ acres in two counties. Better known as the Meskwaki Indians, they have tribal schools, tribunal courts, and a police force on the settlement of about 800 people. Also on the land is the Meskwaki casino resort that provides gaming activities. The Sac & Fox tribe's police officers are dispatched by Tama County and Tama County provides fire and rescue support to manage tribal emergencies.

The population of the state is approximately 2,936,924 (2000 census) people which ranks it 30th in the nation. The urban population is some 65.3 percent and the rural population is 34.7 percent.

The major population areas are:

Des Moines Metropolitan Area
Cedar Rapids Metropolitan Area
Davenport
Sioux City
Waterloo
Iowa City
Council Bluffs
Dubuque
Ames

There are 99 counties in the state with a total land mass of 55,965 square miles.

As is shown above, the population of the state is unevenly distributed across the land area. This presents some problems in area coverage for radio systems in that the entire land area of any given jurisdiction must be covered. The population per square mile is somewhat sparse which generally indicates that the concentration of radio users for public safety activities is also sparse. The presence of federal facilities adds complexity to the public safety framework within Iowa. All of these items were taken under consideration in the allocation plan.

1.5 Major Elements of the Plan

The major elements of this Plan follow the National Coordination Committee (NCC) guidelines. Without the NCC Guidelines and document templates, it would have been much more difficult for the Region to develop its Plan. The Region would also like to express its appreciation for the Computer Assisted Pre-Coordination Resource and Database (CAPRAD) system which has been and will continue to be an invaluable tool.

The major elements of the Plan are these: 1) the declaration that this is the Region 15 Plan; 2) that Region 15 is comprised of the entire State of Iowa; 3) the administration and operation of the committee; 4) application requirements and an explanation of the process for requesting frequency assignments; 5) spectrum management, system design and efficiency standards; 6) Interoperability; 7) coordination with adjacent Regions 8) future planning; and 9) a list of spectrum allotments in Appendix H.

1.6 Development of the Plan

The Plan was developed over a seven and a half year period with input sought both at formal meetings and via email. A subcommittee was tasked with developing a draft Plan using the guidelines and document templates created by the National Coordination Committee (NCC) and provided to Regional Planning Committees for this purpose. The working draft plan was provided to members of Region 15 via email and at the annual meetings where input was sought and incorporated into a Final Draft which was then distributed to members via email, postings on the Iowa Statewide Interoperable Communications Systems Board website and on the CAPRAD database. Members and other eligible entities were notified through email that the Final Draft was available for review and vote. This meeting was also announced by the FCC in a Public Notice. At this meeting, members in attendance made suggestions to improve and clarify certain aspects of the plan. These suggestions were voted on and incorporated into the Final Draft after which the Final Draft was adopted on April 13, 2010. The Plan was then sent to all adjacent Regions for their review and approval. Signed concurrences from all adjacent Regions can be found in Appendix E; signed Inter-Regional Dispute Resolution Agreements from all adjacent Regions are included in Appendix F.

2. Notification Process/Operation of the Region

2.1 Notification

Richard Hester, Iowa State Patrol, was appointed the Region 15 Convener. The first Regional Planning Committee meeting was held on May 29, 2002. Interested parties were given 60 days advance notice of this meeting. Prior to the meeting, notices were sent to the FCC and to LEATAC mailing list.

There is one federally recognized Indian Tribe located within Iowa. Representatives of the Sac & Fox Tribe of the Mississippi in Iowa/Meskwaki were provided with a copy of the Regional Plan and added to the notification list for planning meetings.

A copy of the FCC Public Notices, copies of the notices posted on the state website and distributed through the state email are provided in Appendix C.

2.2 Operations of the Regional Planning Committee

Region 15 uses Roberts Rules of Order to conduct meetings. This method allows all members to have their voice heard. All decisions are made by clear consensus. If consensus cannot be achieved, action is taken by vote with each Public Safety Agency having one vote. Additional voting considerations are included in Region 15's Bylaws which are attached in Appendix B. The meetings are open to all interested persons and public input time is provided for anyone to express a viewpoint or to have input to the Regional Planning process.

A minimum of one full committee meeting will be held every twelve months, normally in the spring. Notice of the annual meeting will be provided as outlined in Region 15's Bylaws.

If the Chair is unable to serve a complete term, the Vice Chair will serve as Chair until the next 700 MHz Regional meeting. If both the Chair and Vice Chair are unable to serve their full terms, one or the other should make an effort to call a special meeting of the Committee to elect replacements. If for some reason, neither the Chair nor the Vice Chair can call the special meeting; the State or any County within the Region may call for a special meeting, giving at least 5 days notice, to elect replacements.

A chronological list of meetings, summary of minutes, meeting announcements and agendas outlining Region 15 progress in 700 MHz development is located in Appendix C of this document.

3. Regional Plan Administration

3.1 Procedure for Requesting Channels

Upon FCC approval of the Plan a Notice will be posted on the Iowa Statewide Interoperable Communications Board website announcing an initial 90-day application filing window. All applications received during the first 90 days after FCC approval of the Plan will be considered. After this initial filing window, applications will be reviewed and approved on a first-come, first-served basis. The general usage spectrum may be used by all Local government entities and by State agencies with a showing of need. The State of Iowa shall be eligible to apply for and be licensed for frequencies under this Plan with the submission of a showing proving that there are not sufficient state controlled frequencies (state license, applicable interoperability allocations) for use or reuse to build out the State of Iowa 700 MHz system within a particular county. All available methods will be used to notify public safety entities of channel availability in the Region. Region 15 supports the National Coordination Committee Pre-Assignment Rules and Recommendations listed in Appendix D, and will use these guidelines as a template to determine if an application submitted to the Regional Planning Committee meets Regional Planning standards. It is recommended that applicants familiarize themselves with these recommendations prior to submitting applications.

In general and unless otherwise noted, the Region 15 Regional Planning Committee will adhere to the published National Coordination Committee Implementation Guidelines for 700 MHz Public Safety Regional Planning Committees.

3.1.1 Spectrum Re-Use

Region 15 utilized the CAPRAD pre-coordination database system to maximize channel re-use in the 700 MHz band. Since the spectrum is reused, each system will use the minimum power necessary to meet their needs. If power and ERP seems excessive to the committee, a reduction in power or antenna gain may be requested to minimize interference and increase spectrum efficiency to other co-channel and adjacent channel users.

3.1.2 Application Submission

To request channels from Region 15, a full application package must be submitted to the Database Manager through the CAPRAD database at http://caprad.org. The application must include:

- The current FCC Form (currently the 601)
- A short description of the proposed system
- A justification for the additional spectrum
- A coverage prediction map using the current version of TIA/EIA TSB 88 guidelines. Coverage map must provide sufficient detail to effectively evaluate coverage.
- Maps showing all interference predicted in the proposed system. Interference maps must provide sufficient detail to effectively evaluate interference contours.
- Documents indicating agency-funding commitments sufficient to fund the development of the proposed system(s)
- A list of 'giveback' channels, if applicable.
- Self-scoring of the application using the Section 4 Priority Matrix

If an applicant has demonstrated a need for 700 MHz channels and cannot access the CAPRAD database, the Committee will accept hard copy applications.

3.1.3 Application Distribution / Coordination

The Database Manager will distribute the application request to the County Sheriff and County Emergency Management Director for dissemination to all other affected agencies with frequency allotments in the county for review and approval. Absent a protest, the Database Manager will approve the application and (if applicable), submit it, through the CAPRAD database, to the applicant's preferred FCC-certified frequency coordinator for processing.

The CAPRAD database will reflect the approved application and place the channels for the proposed system in "pre-license" status.

3.1.4 Give Up or Give Back Spectrum

When applying for new 700 MHz channels, the Regional Planning Committee encourages applicants to relinquish some amount of currently licensed spectrum ("give back channels") and make that spectrum again available for use within the Region. Agencies with existing licensed 800 MHz systems that are requesting 700 MHz channels for system expansion will not fall under this requirement. An

agency may retain channels that are used for paging, telemetry, microwave or other functions that the 700 MHz spectrum does not meet the agency's need.

When an applicant submits a request for 700 MHz spectrum, a "Give Back Plan" should accompany the application. This Plan should show what frequencies would be vacated, a time line for the transition and what channels are being retained. If an existing channel is being retained for interoperability purposes, please identify that channel in the "Give Back Plan".

Frequency "give back" requirements shall hold true for regional systems where system constituents maintain discrete licenses for their own internal operations. In this case, constituent political subdivisions or agencies are required to participate in the "give back" plan. Should a political subdivision or agency act as host of a regional system, both the host agency and the constituent agencies should participate in the "give back" Plan.

Frequencies used for non-voice critical infrastructure support functions [Supervisory Control and Data Acquisition (SCADA) systems] as well as frequencies that are used for interoperability with other regional, state or national agencies that rely on one certain frequency band for emergency operations, as well as other mutual aid or interoperable channels may be exempted by the Committee as candidates for "give back". Frequencies used by an applicant for such purposes, as well as the specific use and a network/ system diagram, must be specified in supportive documentation supplied with the application to enable the Regional Planning Committee to consider any possible exemption.

In cases of hardship or failure to implement, the Regional Planning Committee will consider, on a case-by-case basis, extensions not to exceed five years from date of license issuance, of the "give back" timetable. The dispute arbitration process in Section 3.6 of this document shall apply should there be a protest.

3.1.5 Allocation Disputes:

An agency may protest a proposed system within 30 calendar days of the original distribution. Protests will only be considered if the allocation does not conform to Plan criteria or the objecting agency or the Chairperson can show harmful interference is likely based on the information submitted by the agency requesting the new allocation. If an agency with pre-licensed/Region approved co-channel or adjacent channel allocations objects to a proposed allocation due to concerns about potential interference, the objecting agency may request field tests be done to confirm or refute interference potential. The completion of these field tests and the results will be required for Regional application approval. Coverage area service/interference contours of the proposed system(s) should meet values designated in Section 7.1 of this document. Any costs associated with field tests or any other requirements to obtain Region 15 Plan approval are the responsibility of the agency submitting application to Region 15.

The parties involved must resolve the allocation dispute and notify the Region Chair within 30 calendar days. If the parties involved cannot resolve the allocation dispute within that timeframe, then a meeting of the Iowa Statewide Interoperable Communications Systems Board will be scheduled to consider and vote on the protest. The burden of proof will be on the protesting party.

The protesting party may be liable for any costs associated with the protest if the complaint is unfounded. If approved, the application will be submitted through the CAPRAD database to the applicant's chosen FCC-certified frequency coordinator for processing.

3.2 Procedure for Frequency Coordination

Once an application for 700 MHz frequencies has been reviewed and approved, it will be submitted through the CAPRAD database, to the applicant's preferred FCC-certified frequency coordinator for processing. This process meets the requirements of FCC Rule 90.176 (c).

3.3 Method for Allocating Narrowband Voice Channels

The narrowband general use spectrum refers to the block of frequencies designated for local public safety users. The FCC has allocated six hundred and sixteen 6.25 kHz bandwidth channel pairs for narrowband general use. These 6.25 kHz channel pairs can be aggregated into bandwidths of 12.5 kHz or 25 kHz if FCC mandated spectrum efficiency standards are met.

Region 15 recommends that allocations be made on the basis of one 12.5 kHz channel for every voice channel request and one 25 kHz channel for each narrowband data channel request. Requests for 25 kHz data channels will require "trading" with adjacent counties and a plan amendment (see Section 3.4). This recommendation is approved by the full Committee and is part of this Plan. It is the eventual goal of the FCC and the public safety community for radio equipment to meet the spectrum efficiency requirement of one voice channel per 6.25 kHz. When applying for channels within Region 15, the applicants should acknowledge the deadline for converting all equipment to 6.25 kHz or 6.25 kHz equivalent technology is 12/31/2016.

All agencies requesting spectrum during the initial filing window (see Section 3.1) will be allocated channels if Plan requirements are met.

3.4 Orphan Channels / Spectrum Aggregation

The narrowband channels within Region 15 have been allotted in 12.5 kHz building blocks, each comprised of two 6.25 kHz channels. These allotments have been characterized as "Technology Neutral" and flexible enough to accommodate multiple technologies utilizing multiple bandwidths. If agencies choose a technology that requires more than 12.5 kHz channel bandwidth for their system, there is the potential for aggregating 12.5 kHz channels by "trading" with other counties' allotments and filing a

Plan amendment. If agencies choose a technology that requires less than 12.5 kHz channel bandwidth for their system, there is the potential for residual, "orphaned channels" of 6.25 kHz bandwidth immediately adjacent to the assigned channel within a given county area.

An orphan channel may (if possible) be used at another location within the county area where it was originally approved, if it meets co- and adjacent channel interference criteria. Region 15 will utilize "county areas" as guidelines for channel implementation with the area of Region 15. The definition of "county area" in this Plan is the geographical/political boundaries of a given county, plus a distance of up to 5 miles outside of the county or jurisdictional boundary.

If the channel, or a portion of a channel, is being moved into a "county area" that is within 30 miles of an adjacent Region, Region 15 will receive concurrence from the affected Region. By extending the "county area" by a designated distance, it is anticipated this will increase the possibility that orphaned channel remainders will still be able to be utilized within the "county area", and reduce the potential for channel remainders to be forced to lay dormant and used with a county channel allotment. These movements will be documented on the CAPRAD database.

If the "orphaned channel" remainder does not meet co-channel and adjacent channel interference criteria by moving it within the "county area" as listed above, and it is determined by the Region that the "orphaned channel" cannot be utilized in the Region without exceeding the distance described in the "county area" listed above, Region 15 will submit a Plan amendment to the FCC to repack the channel to a location where its potential use will maintain maximum spectral efficiency. This FCC Plan amendment will require affected Region concurrence.

When in the best interest of public safety communications and efficient spectrum use within the Region, the Region 15 Regional Planning Committee shall have the authority to move orphan channel allotments, and/or co-/adjacent-channel allotments affected by the movement of orphan channels, within its "county areas", which are defined above.

This is to retain spectrum efficiency and/or minimize co-channel or adjacent channel interference between existing allotments within the Region utilizing disparate bandwidths and technologies.

3.5 Low Power Pool Channels

The FCC in the 700 MHz band plan set aside channels 1 - 8 paired with 961 – 968 and 949 – 958 paired with 1909 – 1918 for low power use for on-scene incident response purposes using mobiles and portables subject to Commission-approved Regional Planning Committee Regional Plans. Transmitter power must not exceed 2 watts (ERP).

Channels 9 –12 paired with 969 – 972 and 959 – 960 paired with 1919 – 1920 are licensed nationwide for itinerant operation. Transmitter power must not exceed 2 watts

(ERP). These channels may operate using analog operation. To facilitate analog modulation, this Plan will allow aggregation of two 6.25 KHz low power pool channels for 12.5 kHz bandwidth.

On scene temporary base and mobile relay stations are allowed (to the extent FCC rules allow) antenna height limit of 6.1 meter (20 feet) AGL (Above Ground Level). Vehicular repeater operation (MO3) is also allowed. However, users are encouraged to operate in simplex mode with the least practical amount of power to reliably maintain communications whenever possible. This Plan does not limit use to analog only operations and channels are intended for use in a wide variety of applications that may require digital modulation types as well. The use of EIA/ TIA-102, Project 25 Common Air Interface is required when using a digital mode of operation.

In its dialog leading up to CFR §90.531 allocating the twenty-four low power 6.25 kHz frequency pairs (of which eighteen fall under RPC jurisdiction), the Federal Communications Commission (FCC) suggested that there is a potential for multiple low power applications, and absent a compelling showing, a sharing approach be employed rather than making exclusive assignments for each specific application as low power operations can co-exist [in relatively close proximity] on the same frequencies with minimal potential for interference due to the 2 watt power restriction.

Whereas advantages exist in not making assignments, the reverse is also true. If, for example, firefighters operate on a specific frequency or set of frequencies in one area, there is some logic in replicating that template throughout the Region for firefighter equipment. If there are no assignments, such a replication is unlikely.

In seeking the middle ground with positive attributes showing up both for assignments and no assignments, we recommend the following regarding assignments associated with the eighteen (18) low power channels for which the Regional Planning Committee has responsibility:

Generic - Channel #'s 1-4 and 949-952 are set aside as generic base channels for use by public safety agencies operating within Region 15, and the complementary mobile channels # 961-964 and 1909-1912 are set aside as generic mobile channels also for use by public safety agencies likewise operating within Region 15.

Fire/ EMS/ Consequence Management - Channel #'s 5-8 are designated as Fire Protection/ Emergency Medical and Consequence Management base channels for licensing and exclusive use by the Fire/Emergency Medical disciplines, and the complementary mobile channel #'s 965-968 are set aside as Fire/Emergency Medical and Consequence Management mobile channels also for licensing and exclusive use by the Fire/Emergency Medical disciplines.

Law Enforcement/ Crisis Management - Channel #'s 953-956 are set aside as Law Enforcement/Crisis Management base channels for licensing and exclusive use by the Law Enforcement discipline, and the complementary mobile channel #'s 1913-1916 are set aside as Law Enforcement/Crisis Management mobile channels also for licensing and exclusive use by the Law Enforcement discipline.

Multidisciplinary Joint Public Safety Operations - Channel #'s 957-958 are set aside as Multidisciplinary Joint Public Safety Operations base channels for licensing and the complementary mobile channel #'s 1917-1918 are also set aside as Multidisciplinary Joint Public Safety Operations Channels for use by political subdivisions and public safety agencies operating under a unified command at a common incident for the express mission of safety of life, property or environment.

Simplex operations may occur on either the base or mobile channels. Users are cautioned to coordinate on scene use among all agencies involved, particularly when the use of repeater modes is possible at or in proximity to a common incident. Users should license multiple channels and be prepared to operate on alternate channels at any given operational area.

A list of the Low Power Pool Channels is available in Appendix I.

3.6 Intra-Regional Dispute Resolution

In the event an agency disputes the implementation of this Plan or the Federal Communications Commission approval of this Plan or parts of this Plan, the agency must notify the Chair of the dispute in writing. This section does not apply to protests over new spectrum allocations (see Section 3.1.5). The Chair will attempt to resolve the dispute on an informal basis. If a party to the dispute employs the Chair, then the Vice Chair will attempt resolution. In such cases, the Chair shall be deemed to have a conflict of interest and will be precluded from voting on such matters. If after 30 days the dispute is not resolved, the Chair (or Vice Chair) will defer the matter to the Iowa Statewide Interoperable Communications Systems Board. That committee will select a Chair to head the committee and a secretary to document the proceedings.

The Regional Plan Chair (or Vice Chair) will represent the Region in presentations to the Iowa Statewide Interoperable Communications Systems Board. The Board will hear input from the disputing agency, any effected agencies and the Region Chair. The Board will then meet in executive session to prepare a recommendation to resolve the dispute. Should this recommendation not be acceptable to the disputing agency/agencies, the dispute and all written documentation from the dispute will be forwarded to the National Regional Planning Council (NRPC) for review. As a last resort, the dispute will be forwarded to the FCC for final resolution.

4. Priority Matrix

In the event that spectrum allocation requests conflict and cannot all be accommodated, Region 15 will use the following criteria to evaluate competing applications. This matrix will be used during the initial 90-day filing window and following that if two requests are received in the same time frame for the same number of channels. Otherwise, the first come first served procedure will be used.

• A matrix will be used to evaluate competing applications within the Region. The total point value totals 550 possible points. The application receiving the highest number of points will receive the channels. There are five scoring categories:

- Service (Maximum score 100 points)

Police	100 points
Fire	100 points
Combined/Multi-Agency Systems (e.g. Police, Fire and Local Government on a single system	100 points
Multi-jurisdictional systems (more than one county/town/etc.)	100 points
Local government	50 points

- Intersystem & Intrasystem interoperability (Maximum score 100 points)

  How well the proposed system will be able to communicate with other levels of government and services during an emergency on "regular" channels, not the I/O channels.

  Interoperability must exist among many agencies to successfully accomplish the highest level of service delivery to the public during a major incident, accident, natural disaster or terrorist attack. Applicants requesting 700 MHz spectrum shall inform the Region of how and with whom they have been achieving interoperability in their present system.

  The applicant shall stipulate how they will accomplish interoperability in their proposed system (gateway, switch, cross-band repeater, console cross patch, software defined radio, or other means) for each of the priorities listed below:

  1. Disaster and extreme emergency operation for mutual aid and interagency communications.
  2. Emergency or urgent operation involving imminent danger to life or property.
  3. Special event control, generally of a preplanned nature (including task force operations).
  4. Single agency secondary communications.
  5. Routine day-to-day non-emergency operations.

Provides automatic infrastructure gateways (other than the applicant's system)	40 points
Use of interoperability channels is supported (infrastructure)	30 points
Provides console patches to other systems (other than the applicant's system)	10 points
Communicates with other systems with which the Agency holds mutual aid agreements	10 points

All subscriber units have the tactical interoperability channels programmed within them	10 points
No interoperability or intersystem capability is provided	0 points

- Loading (Maximum score 150 points)

System's loading exceeds the loading outlined in Section 7.5.1	50 points
System's loading meets the loading outlined in Section 7.5.1	50 points
System is cooperative multi-organizational	50 points
Expansion of existing 700 and/or 800 MHz system	50 points

The maximum achievable score in this section is 150 points. (An applicant whose loading exceeds the loading tables in Section 7.5.1 will not also receive points for meeting the loading requirements.)

- Spectrum Efficient Technology (Maximum score 150 points)
  Points will be awarded upon the following criteria:

Trunked system	50 points
Integrated Voice & Data System	50 points
12.5 kHz/6.25 kHz efficiency	50 points

The FCC requires all applications filed after December 31, 2014 to meet 6.25 kHz efficiencies; points will be awarded only for 6.25 kHz efficiencies as of January 1, 2015

- Systems Implementation Factors (Maximum score 150 points)
  Applicants should demonstrate funding and system planning and provide a construction/implementation schedule. A document stipulating the system the agency is planning to implement signed by an official within the organization who handles the money is required.

Budget Commitment Demonstrated	50 points
System Plan provided	50 points
Construction Schedule provided	50 points

• Givebacks (Maximum score 100 points)
Consider the number of channels given back
Consider the extent of availability and usability of those channels to others.

5. Interoperability

The state of Iowa has formed an Iowa Statewide Interoperable Communications Systems Board (ISICSB). The ISICSB is developing an interoperability plan for the state. Members of the Region 15 Regional Planning Committee participate in and provide input to the ISICSB. The State of Iowa will hold any required licenses for the interoperability

system. The state will review and approve any such applications. Region 15 makes the following recommendations for 700 MHz equipment deployed within Iowa.

5.1 Standardized Nomenclature:
Standardized nomenclature is recommended nationwide. All 700 MHz public safety subscriber equipment using an alphanumeric display of at least eight digits should be programmed to show the recommended label from the Table in Appendix E when programmed to operate on the associated 700 MHz channel set. The Table shows the recommended label for equipment operating in the mobile relay (repeater) mode. When operating in direct (simplex) mode, the letter "D" should be appended to the end of the label.

5.2 Minimum Channel Quantity
All mobile and portable units operating under this Plan and utilizing 700 MHz channels must be programmed with the minimum number of channels called for by the Iowa Statewide Interoperable Communications Systems Board.

6. Coordination with Adjacent Regions

Region 15 is adjacent to the following 700 MHz Regions:

Region 13	Illinois
Region 22	Minnesota
Region 24	Missouri
Region 26	Nebraska
Region 38	South Dakota
Region 45	Wisconsin

Each of the listed Regions has reviewed and approved Region 15's 700 MHz Regional Plan. The signed concurrences from every adjacent Region can be found in Appendix G.

7. System Design/Efficiency Requirements

7.1 Interference Protection
The frequency allotment list will be based on an assumption that systems will be engineered on an interference-limited basis, not a noise floor-limited basis. Agencies are expected to design their systems for maximum signal levels within their coverage area and minimum levels in the coverage area of other co-channel users. Coverage area is normally the geographical boundaries of the Agency(s) served plus five miles area beyond.

Systems should be designed for minimum signal strength of 40 dBμ in the system coverage area while minimizing signal power out of the coverage area. TIA/EIA TSB88-A (or latest version) will be used to determine harmful interference assuming 40 dBμ, or greater, signal in all systems coverage areas. This may require patterned antennas and extra sites compared to a design that assumes noise limited coverage. Region 15 complies

with National Coordination Committee recommendations listed in the Regional Planning Committee Guidelines published by the National Coordination Committee (NCC).

7.2 Use of Frequencies in Aircraft

The degree to which these 700 MHz channels are to be "re-used within the Region and their assignments in adjacent Regions require that their use in aircraft be restricted. Limitations are:

1. A maximum ERP of 1.0 watt above 500 ft. AGL.
2. Avoid using the input frequency to the mobile relay station and use the "talk-around" mode whenever possible.

7.3 Spectrum Efficiency Standards

Initial allotments will be made on the basis of 12.5 kHz channels. To maximize spectrum utilization, prudent engineering practices and receivers of the highest quality must be used in all systems. Given a choice of radios to choose from in a given technology family, agencies should use the units with the best specifications. This Plan will not protect agencies from interference if their systems are under-constructed (i.e.; areas with the established service area having minimum signal strength below 40 dBu), or the systems utilize low quality receivers. The applicant's implementation of best engineering practices will be encouraged by the Regional Planning Committee at all times.

It is the eventual goal of the FCC and the public safety community for radio equipment to meet the spectrum efficiency requirement of one voice channel per 6.25 kHz. When applying for channels within Region 15, the applicants should acknowledge the deadline for converting all equipment to 6.25 kHz or 6.25 kHz equivalent technology is 12/31/2016.

For narrowband mobile data requests, one mobile data channel will consist of two (2) 12.5 kHz channels/one (1) 25 kHz channel. Narrowband 6.25 kHz channels can be aggregated for data or voice use to a maximum bandwidth of 25 KHz. A plan amendment will be required. As 6.25 KHz migration evolves, an agency that creates any "orphaned" 6.25 KHz channels should realize that these channels could be allocated to nearby agencies requesting channels to maintain consistent grouping and utilization of 12.5 KHz blocks within the Region. (See Section 3.4)

Region 15 encourages small agencies to partner with other agencies in multi-agency or regional systems as they promote spectrum efficiency and both small and large agency capacity needs can be met. Loading criteria can also be achieved in multi-agency systems that will allow greater throughput for all agencies involved than that which could be achieved individually.

7.4 System Implementation

There are no incumbent high power broadcast TV stations in Iowa; however there are several low power or translator TV stations across the state. These low power stations are secondary to primary public safety operations; therefore all agencies within the state can

immediately implement any 700 MHz spectrum for which they receive FCC authorizations.

Region 15 has informed the low power TV and TV translator licensees in the Region that the 700 MHz Regional Planning process has been finalized. The notification reiterates these stations' secondary status.

7.5 Channel Loading

7.5.1 Loading Tables Voice Channels

EMERGENCY		NON-EMERGENCY	
CHANNELS	UNITS/CHANNEL	CHANNELS	UNITS/CHANNEL
1 - 5	70	1 - 5	80
6 - 10	75	6 - 10	90
11 - 15	80	11 - 15	105
16 - 20	85	16 - 20	120

Agencies requesting additional frequencies must show loading of 100 percent or greater on their existing system. Should a demand for frequencies exist after assignable frequencies become exhausted, any system having frequencies assigned under this Plan four or more years previously and not loaded to at least seventy percent will lose operating authority on several frequencies to bring the system into compliance with the 70 percent loading standard. Frequencies lost in this manner will be reallocated to other agencies to help satisfy the demand for additional frequencies.

7.5.2 Traffic Loading Study for Narrowband Systems

Justification for adding frequencies, or retaining existing frequencies, may be provided by a traffic loading study instead of loading by number of transmitters per channel. It will be the responsibility of the requesting agency to provide a verifiable study showing sufficient airtime usage to merit additional frequencies. A showing of airtime usage, excluding telephone interconnect air time, during the peak busy hour greater than 70 percent per channel on three consecutive days will be required to satisfy loading criteria.

8. Future Planning

8.1 Database Maintenance

Region 15 will continue to use and maintain the CAPRAD database as a tool to perform spectrum allocations to Region 15 members and will update the database as allocations are made and FCC authorizations are granted. The Committee has the authority to change the original frequency allotment if necessary. To keep the most effective frequency allotments within Region 15, an annual review of the allotments will be made at the yearly full committee meeting. Recommended changes to the Plan will be voted on. If at any time a system is allocated channels within Region 15 and the system cannot be developed within the agreed upon guidelines (90.629, 90.631 or 90.633), the channels will be returned to the county pool allotments they originated from and again be available to other agencies in the Region. If Plan modifications are approved by the Region, the Chairperson will, if necessary, obtain adjacent Region approval and file a Plan amendment with the Federal Communications Commission indicating the approved changes.

8.2 Inter-Regional Dispute Resolution
Signed Inter-Regional Dispute Resolution Agreements from all adjacent Regions are attached as Appendix F.

8.3 Amendment Process
Amendments to the Region 15 Plan will be made at Region 15 RPC meetings. All amendments will be voted on and passed or rejected by a simple majority vote. The Chairman or his designee will make the appropriate changes to the Plan and notify the adjacent Regions for their concurrence. Once the concurrences are received from the adjacent Regions, the Plan will be filed, by the Chairperson, with the FCC for approval. Electronic filing will be the preferred method.

8.4 Meeting Announcements
Meeting announcements will be made per the Region 15 Bylaws. Region 15 will utilize its membership list, Public Notices issued by the FCC, fax notification, email to individual, associations, agencies and vendors, verbal announcements at meetings and/or appropriate publications.

9. Certification
I hereby certify that all planning committee meetings, including subcommittee or executive committee meetings were open to the public.

Mr. Leslie E. Fish
April 13, 2010
Chairman, Region 15
Iowa State Patrol Communications
5912 NW 2nd St.
Des Moines, IA 50313-1307

APPENDIX A

List of RPC members, their agencies/affiliations, business addresses, email addresses, and voting status.

RPC Officers

Chairperson	Mr. Leslie E. Fish Iowa State Patrol Communications 5912 NW 2nd St. Des Moines, IA 50313-1307 515-323-4360
Vice-Chair	Steven Gray Iowa State DOT 800 Lincoln Way, Building 6 Ames, Iowa 50010 515-239-1552
Secretary/Treasurer	Eric Nevins Des Moines Police Dept. 25 E. 1st St. Des Moines, IA 50309 515-237-1598
Database Manager	Mr. Leslie E. Fish Iowa State Patrol Communications 5912 Northwest 2nd St. Des Moines, IA 50313

RPC Membership

Name	Voting	Email Address	Agency/Affiliation	Address
Eric Nevins	Y	ednevins@dmgov.org	City of Des Moines	201 SE 4th St., Des Moines, IA 50309
Steve Holmes	N	Steve.holmes@racom.net	RACOM	201 W State St., Marshalltown, IA 50158
Jennifer Lancaste	Y	Jennifer.Lancaster@dnr@iow	IA DNR	22693 205th Ave., Manchester, IA 52057
Bud Duvall	N	n/a	DPS	5912 NW 2nd St., Des Moines, IA 50313
Terry Martinson	Y	n/a	City of Cedar Rapids	222 Third St NW, Cedar Rapids, IA 52405
Steven Gray	Y	Steven.gray@dot.iowa.gov	DOT	800 Lincoln Way, Ames, IA 50010
Randy Forsyth	Y	n/a	Benton County Sheriff	901 D Ave., Vinton, IA 52349
Randy Goddard	Y	Randy.goddard@iowa.gov	HLSEM	7105 NW 70th Ave., Johnston, IA 501311

Leslie Fish	Y	Leslie.fish@dps.ia.gov	DPS	5912 NW 2nd St., Des Moines, IA 50313
Chris Doyle	Y	Chris.a.doyle@us.army.mil	Iowa National Guard	Camp Dodge, 7105 NW 70th Ave., Johnston, IA
Terry L. Nixon	Y	n/a	Davenport Police	226 W 4th St., Davenport, IA 52801
Richard Hester	Y	n/a	DPS	56911 Whitepole Rd., Lewis, IA 51544
Terry Brennan	N	Terry.Brennan@racom.net	RACOM	201 W State St., Marshalltown, IA 50158
Bette Rinehart	N	C18923@email.mot.com	Motorola	28 Twin Lakes Dr., Gettysburg, PA 17325
Steve Ferraz	Y	ferraz@dps,state.ia.us	Iowa Dept. of Public Safe	5912 NW 2nd St., Des Moines, IA 50313
Jerry Remhof	Y	n/a	ISPC	5912 NW 2nd St., Des Moines, IA 50313
Glenn Sedivy	Y	gsedivy@siouxcity.org	Woodbury Co 911 Comm	620 Douglas St., Sioux City, 51101
Curtis Walser	Y	c.walser@cedar-rapids.org	City of Cedar Rapids	222 Third St NW, Cedar Rapids, IA 52405
Jeff Mortensen	N	jeff@electronicspecialtiesinc.(	Electronic Specialties Inc.	2103 US 169, Algona, IA 50511
Tom Briles	N	tom@electronicspecialtiesinc	Electronic Specialties Inc.	2103 US 169, Algona, IA 50511
Dave Gordon	N	dave.gordon@motorola.com	Motorola	315 Raven St., Iowa City, IA 52245

APPENDIX B

RPC BYLAWS

700 MHz Plan
Region 15

BYLAWS OF REGION 15

ARTICLE I

NAME & PURPOSE

1.1 Name and purpose. The name of this Region shall be Region 15. Its primary purpose is to foster cooperation, planning, development of regional plans and the implementation of these plans in the 700 MHz Public Safety Band.

ARTICLE II

MEMBERS

For purposes of this Article, the term “member,” unless otherwise specified, refers to both voting and non-voting members.

2.1 Number, Election and Qualification. The Regional Committee shall have two classes of members, “voting members” and “non-voting members.” New members may be added at annual, special, or regular meetings.

Voting Members. Voting members shall consist of one representative from any single agency engaged in public safety eligible to hold a license under 47 CFR 90.20, 47 CFR 90.523 or 47 CFR 2.103. Except that a single agency shall be allowed no more than one vote for each distinct eligibility category (e.g. police, fire, EMS, highway) within the agency’s organization or political jurisdiction. In voting on any issue the individual must identify himself/herself and the agency and eligibility category that he or she represents.

Non-Voting Members. Non-voting members are all others interested in furthering the goals of public safety communications.

2.2 Tenure. In general, each member shall hold MEMBERSHIP from the date of acceptance until resignation or removal.

2.3 Powers and Rights. In addition to such powers and rights as are vested in them by law, or these bylaws, the members shall have such other powers and rights as the membership may determine.

2.4 Suspension and Removal. A representative may be suspended or removed with cause by vote of a majority of members after reasonable notice and opportunity to be heard.

2.5 Resignation. A representative may resign by delivering written resignation to the chairman, vice-chairman, treasurer or secretary of the Regional Committee or to a meeting of the members.

2.6 Annual Meeting. The annual meeting of the members shall be held at a time and place in the spring of each year to be announced as provided in section 2.8. If an annual meeting is not held as herein provided, a special meeting of the members may be held in place thereof with the same force and effect as the annual meeting, and in such case all references in these bylaws, except in this Section 2.6, to the annual meeting of the members shall be deemed to refer to such special meeting. Any such special meeting shall be called and notice shall be given as provided in Section 2.7 and 2.8.

2.7 Special Meetings. Special meetings of the members may be held at any time and at any place within the Regional Committee area. Special meetings of the members may be called by the chairman or by the vice-chairman, or in case of death, absence, incapacity, by any other officer or, upon written application of two or more members.

2.8 Call and Notice.

A. Reasonable notice of the time and place of annual and/or special meetings of the members shall be given to each member.

B. Reasonable and sufficient notice. Except as otherwise expressly provided, it shall be reasonable and sufficient notice to a member to send notice by mail at least fifteen days or by e-mail/facsimile at least ten days before the meeting, addressed to such member at his or her usual or last known business address, or, to give notice to such member in person or by telephone at least ten days before the meeting.

2.9 Quorum. At any meeting of the members, 50% of the officers and 50% of the members shall constitute a quorum. Any meeting may be adjourned to such date or dates not more than ninety days after the first session of the meeting by a majority of the votes cast upon the question, whether or not a quorum is present, and the meeting may be held as adjourned without further notice.

2.10 Action by Vote. Each voting member, representing a particular agency (one vote per agency) shall have one vote; non-voting members have no right to vote. When a quorum is present at any meeting, a majority of the votes properly cast by voting members present shall decide any question, including election to any office, unless otherwise provided by law or these bylaws. Items not specifically listed on the agenda, may be acted on, but will not become final until minutes are published, distributed, and approved at the next meeting of the Committee.

2.11 Action by Writing. Any action required or permitted to be taken at any meeting of the members may be taken without a meeting if all members entitled to vote on the matter consent to the action in writing and the written consents are filed with the records of the meetings of the members. Such consents shall be treated for all purposes as a vote at a meeting.

2.12 Voting on One's Own Application. At no time can a voting member vote on his/her application.

2.13 Special Interest Voting. A voting member can not have a commercial interest in any of his/her region and/or adjacent regions application(s) on which he/she is reviewing, approving and/or voting.

ARTICLE III

OFFICERS AND AGENTS

3.1 Number and qualification. The officers of the Regional Committee shall be a chairman, vice-chairman, secretary/treasurer, database manager and such other officers, if any, as the voting members may determine. The officers must be members of the Regional Committee with no commercial interest.

3.2 Election. The officers shall be elected by the voting members at their first meeting and, thereafter, at the annual meeting of the members.

3.3 Tenure. The officers shall each hold office until the annual meeting of the members held within one year from the adoption of these bylaws, or until their successor, if any, is chosen, or in each case until he or she sooner dies, resigns, is removed or becomes disqualified.

3.4 Chairman and Vice Chairman. The chairman shall be the chief executive officer of the Regional Committee and, subject to the control of the voting members, shall have general charge and supervision of the affairs of the Regional Committee. The chairman shall preside at all meetings of the Regional Committee.
The Vice Chairman, if any, shall have such duties and powers, as the voting members shall determine. The vice-chairman shall have and may exercise all the powers and duties of the chairman during the absence of the chairman or in the event of his or her inability to act.

3.5 Secretary/ Treasurer. The secretary/ treasurer shall record and maintain records of all proceedings of the members in a file or series of files kept for that purpose, which file or files shall be kept within the Region and shall be open at all reasonable times to the inspection of any member. Such file or files shall also contain records of all meetings and the original, or attested copies, of bylaws and names of all members and the address (including e-mail address, if available) of each.

The secretary/treasurer shall be the chief financial officer and the chief accounting officer of the Regional Committee. The secretary/treasurer shall be in charge of its financial affairs, funds, and valuable papers and shall keep full and accurate records thereof.

If the secretary/ treasurer is absent from any meeting of members, a temporary secretary chosen at the meeting shall exercise the duties of the secretary/treasurer at the meeting.

3.6 Database Manager. The Data Base Manager is responsible to maintain the database as the applications are processed and granted by the commission. The Region 15 Regional Planning Committee and Database Manager will use the CAPRAD frequency allocation database, specifically designed for use in the 769-775/799-805 MHz public safety band.

3.7 Suspension or Removal. An officer may be suspended with cause by vote of a majority of the voting members.

3.8 Resignation. An officer may resign by delivering his or her written resignation to the chairman, vice-chairman, or secretary/treasurer of the Regional Committee. Such resignation shall be effective upon receipt (unless specified to be effective at some other time), and acceptance thereof shall not be necessary to make it effective unless it so states.

3.9 Vacancies. If the office of any officer becomes vacant, the voting members may elect a successor. Each such successor shall hold office for the remainder terms, and in the case of the chairman, vice chairman, secretary/treasurer until his or her successor is elected and qualified, or in

each case until he or she sooner dies, resigns, is removed or become disqualified.

ARTICLE IV

AMENDMENTS

These bylaws may be altered, amended or repealed in whole or in part by vote. The voting members in attendance may by a two-thirds vote, alter, amend, or repeal any bylaws adopted by the Regional Committee members or otherwise adopt, alter, amend or repeal any provision which FCC regulation or these bylaws requires action by the voting members. Members shall be given prior notice to any proposed change in the bylaws, and the changes shall be identified on the agenda.

ARTICLE V

DISSOLUTION

This Regional Committee may be dissolved by the consent of two-thirds of the representatives in good standing at a special meeting called for such purpose. The FCC shall be notified.

ARTICLE VI

RULES OF PROCEDURES

The Conduct of Regional Meetings including without limitation, debate and voting, shall be governed by Robert’s Rules of Order, newly revised 1990 edition, ninth edition, Sarah Corbin Robert, Henry M. Robert III, and William J. Evans.

APPENDIX C

MEETING NOTIFICATIONS

SUMMARY OF MEETING MINUTES

Summary of Minutes of May 29, 2002 Meeting

Summary of Minutes of September 23, 2003 Meeting

Region 15 700 MHZ Planning Meeting
Wednesday, September 24, 2003
Iowa State Patrol Post 1
Des Moines, IA

Present:

Glenn Sedivy	Woodbury Co. Communications	gsedivy@Sioux-city.org
Steve Homes	Racom	Steve.Holmes@Racom.net
Terry Brennar	Racom	Terry.brennar@racom.net
Eric Nevins	City of Des Moines	ednevins@dmgov.org
Terry Martinson	City of Cedar Rapids	T.Martinson@cedar-rapids.org
Leslie E. Fish	IADOT	Leslie.Fish@Dot.State.iaus
Jerry Remhof	ISPC	
Kirk Litynski	Motorola	Kirk.litynski.@motorola.com

Nancy Brady resigned from secretary and treasury. Vote was held to nominate and Elect new officers.

Rich Hester Chairman,
Terry Martinson, Vice Chairman,
Eric Nevins Secretary/Treasurer
Leslie E. Fish, Frequency Coordinator.

Our planned speaker was unable to attend.

Rich Hester provided a review of 700 MHZ allocation by FCC.

- NPSTC assisting the development of plans for 700 MHZ and CAPRAD.
- Review of CAPRAD. Frequency packing program that selected frequency for each county in the country. For general use of voice frequencies.

Login and password for CAPRAD = Guest.

Respectfully Submitted,

Eric Nevins, Secretary/Treasurer

Summary of Minutes of December 1, 2004 Meeting

Region 15 700 MHZ Planning Meeting
Wednesday, December 1, 2004
Cedar Rapids Police Department
505 1st Street SW
Cedar Rapids, Iowa

This meeting was held in Cedar Rapids, Iowa. 42 letters were sent out to counties in eastern Iowa inviting them to participate.

Present:

Eric Nevins	City of Des Moines	ednevins@dmgov.org
Terry Martinson	City of Cedar Rapids	T.Martinson@cedar-rapids.org
Richard Hester	DPS	hester@dps.state.ia.us
Jennifer Lancaster	IA Dept of Natural Resources	Jennifer.Lancaster@dnr.state.ia.us
Randy Goddard	HLSEM	randy.Goddard@hlsem.state.ia.us
Randy Forsyth	ISSDA	r.forsyth@dentonsheriff.com
Kirk Litynski	Motorola	Kirk.litynski.@motorola.com
Terry Brennan	Racom	Terry.brennar@racom.net

Meeting was called to order at 1306 Hrs December 1, 2004.

The minutes of the September 24, 2004 meeting were read and approved.

The treasures report was given and approved. There were no expenses since the September meeting. Balance on hand is $1,725.14.

Our database coordinator, Les Fish was unable to attend and there was no report.

Chairman Rich Hester presented a power point explaining the 700 MHz regional planning process. The presentation also demonstrated the information that can be obtained form the NPSTC and CAPRAD web sites.

There was a short discussion concerning the bylaws. No action was taken on the bylaws.

The meeting was adjourned at 1404 Hrs.

Respectfully Submitted,

Eric Nevins, Secretary/Treasurer

Summary of Minutes of March 30, 2005 Meeting

Region 15 700 MHZ Planning Meeting
Wednesday, March 30 2005
Des Moines Post 1
Des Moines, Iowa

Present:

Eric Nevins	City of Des Moines	ednevins@dmgov.org
Terry Martinson	City of Cedar Rapids	T.Martinson@cedar-rapids.org
Richard Hester	DPS	hester@dps.state.ia.us
Randy Forsyth	ISSDA	r.forsyth@dentonsheriff.com
Randy Goddard	HLSEM	randy.Goddard@hlsem.state.ia.us
Terry Brennan	Racom	Terry.brennar@racom.net
Leslie Fish	IADOT	Leslie.fish@dot.ia.gov
Bud Duvall	DPS	Garland.duvall@dps.state.is.us
Steve Irlbech	Dataradio	sirlbech@dataradio.com
Jeff Martensen	Electronic Specialties	jeff@electronicspecialtiesinc.com

Meeting was called to order at 1300 Hrs March 30, 2005.

Chairman Rich Hester presented a power point explaining the 700 MHz regional planning process. The presentation also demonstrated the information that can be obtained form the NPSTC and CAPRAD web sites.

Chairman Hester presented a generic copy of the bylaws for consideration. The bylaws were reviewed by section with open discussion by everyone in attendance. The secretary will prepare a final draft, which will be presented to the members for approval at the next meeting.

The minutes of the December 1, 2004 meeting were read and approved.

The treasures report was given and approved. There were no expenses since the December meeting. Balance on hand is $1,725.14.

The meeting was adjourned at 15:03 Hrs.

Respectfully Submitted,

Eric Nevins, Secretary/Treasurer

Region 15 700 MHZ Planning Meeting
January 31, 2007
Department of Transportation
Ames, Iowa

Meeting was called to order at 1334 Hrs.

Introduction:

Eric Nevins	City of Des Moines	ednevins@dmgov.org
Steve Holmes	RACOM	Steve.holmes@racom.net
Terry Martinson	City of Cedar Rapids	T.Martinson@cedar-rapids.org
Steven Gray	DOT	Steven.gray@dot.iowa.gov
Randy Goddard	HLSEM	randy.Goddard@hlsem.state.ia.us
Leslie Fish	DPS	Leslie.fish@dps.ia.gov
Terry L. Nixon	Davenport Police	P5444@ci.davenport.ia.us
Richard Hester	DPS	hester@dps.state.ia.us
Kirk Litynski	Motorola	

Reports
The minutes from the last meeting held on March 30, 2005 were read and approved.
Motion: Les Fish
2nd: Terry Martinson

Treasurers report was read and approved. There were no expenses since the last report. Balance on hand is $1,725.14. Motion to approve: Les Fish. 2nd: Terry Martinson

Bylaws
A draft copy of the proposed bylaws was presented. Les Fish made a motion to change the wording of the second sentence in section 3.1 to read "The officers must be members of the Regional Committee with no commercial interest". 2nd by Terry Martinson. Motion passed.

Les Fish made a motion to approve the bylaws with the approve change. 2nd by Terry Martinson. Motion passed.

Membership
Motion made to approve new member's new members by Les Fish, 2nd Terry Martinson. Motion Passed.

Les Fish replaces Jerry Remhof as the DPS representative.
Steve Gray replaces Les Fish as the DOT representative.

New Members
Terry Nixon, Davenport Police
Randy Goddard, IHSEMD

Commercial Members
Kirk Litynski
Steve Holmes

A discussion was held regarding the requirements for proper notification of a meeting. It was noted the FCC requires 60 days notice.

Rich Hester, Les Fish, Steve Gray and Eric Nevins will meet over the next several months to work on the language for the Iowa plan. A draft of the plan will be made available to all committee members when appropriate.

The committee was asked by Chairman Hester to review and approve the Illinois plan. Motion by Les Fish to approve, 2nd by Terry Martinson. Motion was approved.

Eric Nevins stated that the Iowa Chapter of APCO would assist our effort by making the Iowa APCO web site available for the committees use. The web site would allow dissemination of plans easier.

The meeting was adjourned at 15:00 Hrs.

Respectfully Submitted,

Eric Nevins, Secretary/Treasurer

Region 15 700 MHZ Planning Meeting
February 11, 2009

Location:	Iowa State Patrol Communications 5912 NW 2nd Ave. Des Moines, Iowa 50313

Meeting was called to order at 1340 Hrs.

Attendee's:

Richard Hester	DPS	hester@dps.state.ia.us
Eric Nevins	City of Des Moines	ednevins@dmgov.org
Terry Martinson	City of Cedar Rapids	T.Martinson@cedar-rapids.org
Leslie Fish	DPS	Leslie.fish@dps.ia.gov
Curtis Walser	City of Cedar Rapids	c.walser@cedar-rapids.org
Bette Rinehart	Motorola	C18923@mail.mot.com
Steve Holmes	RACOM	steve.holmes@racom.net

Reports

A brief review of the status of the Regional 15 (Iowa) Plan was given by Les Fish

New Business

A discussion was held regarding the merits of repacking the general pool and state frequencies to 12.5 KHz. No decision was made at this meeting.

The meeting was adjourned at 14:30 Hrs.

Respectfully Submitted,

Eric Nevins, Secretary/Treasurer RPC15

Region 15 700 MHZ Planning Meeting
April 13, 2010

Location: Iowa Department of Public Safety Building
215 East 7th Street
Des Moines, Iowa 50309

Meeting was called to order at 10:05 AM.

Attendee's:

Richard Hester	Iowa Dept of Public Safety	hester@dps.state.ia.us
Leslie Fish	Iowa Dept of Public Safety	Leslie.fish@dps.ia.gov
Steve Ferraz	Iowa Dept of Public Safety	ferraz@dps,state.ia.us
Chris Doyle	Iowa National Guard	Chris.a.doyle@us.army.mil
Steven Gray	Iowa Dept of Transportation	Steven.gray@dot.iowa.gov
Glenn Sedivy	Woodbury Co 911 Comm	gsedivy@siouxcity.org
Eric Nevins	City of Des Moines	ednevins@dmgov.org
Curtis Walser	City of Cedar Rapids	c.walser@cedar-rapids.org
Tom Briles	Electronic Specialties, Inc	tom@electronicspecialtiesinc.con
Jeff Mortensen	Electronic Specialties, Inc	jeff@electronicspecialtiesinc.com
Dave Gordon	Motorola	dave.gordon@motorola.com
Bette Rinehart	Motorola	C18923@mail.mot.com
Steve Holmes	RACOM	steve.holmes@racom.net

The minutes of February 11, 2009 were read.

Reports

Chairman Richard Hester reported the frequency allocations have been repacked in 12.5 KHz pairs. Four 25 KHz channels were allocated for Pottawattamie County. If other agencies choose a technology that requires more than 12.5 KHz bandwidth, they will need to request plan modification to obtain a frequency allocation from another county.

New Business

The 700 MHz plan was presented for approval. Several questions and request for clarification were discussed. The changes made to the plan at this meeting are as follows:

Section 1	Update membership roster, Chairman and Vice Chairman information after today's election.
Section 1.3	Remove telephone numbers and include only e-mail addresses.

Section 3.1.2	The CAPRAD web address has changed to www.caprad.org
Section 3.1.6	Changed from 3.1.6 to 3.1.5
Section 3.3	Second paragraph states an assigned data channel will be 25 KHz bandwidth. How does this fit with the new 12.5 KHz channel plan? Answer: If agencies choose a technology that requires more than 12.5 KHz bandwidth, they will need to request a plan modification in order to obtain a frequency allocation from another county (see Section 3.4).
Section 4	Fourth bullet under Loading. Change reference to Section 8.4.1 to 7.5.1.
Section 5	The paragraph was rewritten for clarification.
Section 7.3	How will the 25 KHz channel data channel assignment be accomplished? Same as Section 3.4
Appendix A	The membership roster, Chairman and Vice Chairman information has been updated after today's election.
Appendix H	There are no 25 KHz allocations in Counties other than Pottawattamie County. How will 25 KHz data channels referenced in Section 3.3 & 7.3 be allocated? See Sections 3.3 & 3.4

Chairman Hester requested a vote on approving the plan with modifications discussed today. The vote was approved, 5 votes Yes and 0 votes No.

Election of Officers

For office of Chairman, Eric Nevins nominated Les Fish and seconded by Steve Gray.

For office of Vice-Chairman, Rich Hester nominated Steven Gray and seconded by Curtis Walser.

Both approved unanimously.

Adjournment

The meeting was adjourned at 11:19 AM.

Respectfully Submitted,

Eric Nevins, Secretary/Treasurer RPC15

PUBLIC NOTICE

News media information 202 / 418-0500
Fax-On-Demand 202 / 418-2830
TTY 202 / 418-2555
Internet: http://www.fcc.gov
ftp.fcc.gov

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

DA 10-482

March 23, 2010

PUBLIC SAFETY AND HOMELAND SECURITY BUREAU ANNOUNCES

REGION 15 (IOWA) PUBLIC SAFETY REGIONAL PLANNING COMMITTEE TO HOLD 700 MHZ REGIONAL PUBLIC SAFETY PLANNING MEETING

The Region 15 (Iowa)[1] 700 MHz Public Safety Regional Planning Committee (RPC) will hold its next meeting on Tuesday, April 13, 2010, beginning at 10:00 a.m., at the Department of Public Safety Building, Room 125, Capitol Complex, 215 East 7th Street, Des Moines, Iowa.

The agenda for the 700 MHz meeting includes:

- Greetings and introductions
- Review and approval of the February 11, 2009 Meeting Minutes
- Chairperson's Report
- Database Manager Report
- Old Business
- New Business
  - Review and approve the proposed Region 15 700 MHz plan[2]
  - Election of RPC officers – Chairperson and Vice-Chairperson
- Opportunity for public comment
- Adjournment

[1] The Region 15 (Iowa) 700 MHz regional planning area consists of the entire state of Iowa.

[2] The draft plan is available for review on the Iowa Statewide Interoperable Communications System Board (ISICSB) website at http://isicsb.iowa.gov/index.html.

The Region 15 700 MHz RPC meeting is open to the public. It is essential that public safety agencies in all areas of government, including state, municipality, county, and Native American Tribal, and non-governmental organizations eligible under Section 90.523 of the Commission's rules, 47 C.F.R. § 90.523, be represented in order to ensure that each agency's future spectrum needs are considered in the allocation process. Administrators who are not oriented in the communications field should delegate someone with this knowledge to attend, participate, and represent their agency's needs.

All interested parties wishing to participate in the planning for the use of public safety spectrum in the 700 MHz band within Region 15 should plan to attend. For further information, please contact:

Richard Hester, Chairperson
700 MHz Public Safety RPC
Iowa State Patrol Communications
56911 Whitepole Road, Lewis, IA 51544
(712) 769-2395
hester@dps.state.ia.us

- FCC -

APPENDIX D

Simplified 700 MHz Pre-assignment Rules

Introduction

This paper describes a process for coordinating the initial block assignments of 700 MHz channels before details of actual system deployments is available. In this initial phase, there is little actual knowledge of the specific equipment to be deployed and the exact antenna sites locations. As a result, a simple, high-level method is proposed to establish guidelines for frequency coordination. When actual systems are deployed, additional details will be known and the system designers will be required to select specific sites and supporting hardware to control interference.

Overview

Assignments will be based on a defined service area for each applicant. This will normally be an area defined by geographical or political boundaries such as city, county or by a data file consisting of line segments creating a polygon that encloses the defined area. The service contour is normally allowed to extend slightly beyond the geo/political boundaries such that systems can be designed for maximum signal levels within the boundaries, or coverage area. Systems must also be designed to minimize signal levels outside their geo/political boundaries to avoid interference into the coverage area of other co-channel users.

For co-channel assignments, the 40 dBμ service contour will be allowed to extend beyond the defined service area by 3 to 5 miles, depending on the type of environment: urban, suburban or rural. The co-channel 5 dBμ interfering contour will be allowed to touch but not overlap the 40 dBμ service contour of the system being evaluated. All contours are (50,50).

For adjacent and alternate channels, the 60 dBμ interfering contour will be allowed to touch but not overlap the 40 dBμ service contour of the system being evaluated. All contours are (50,50).

Discussion

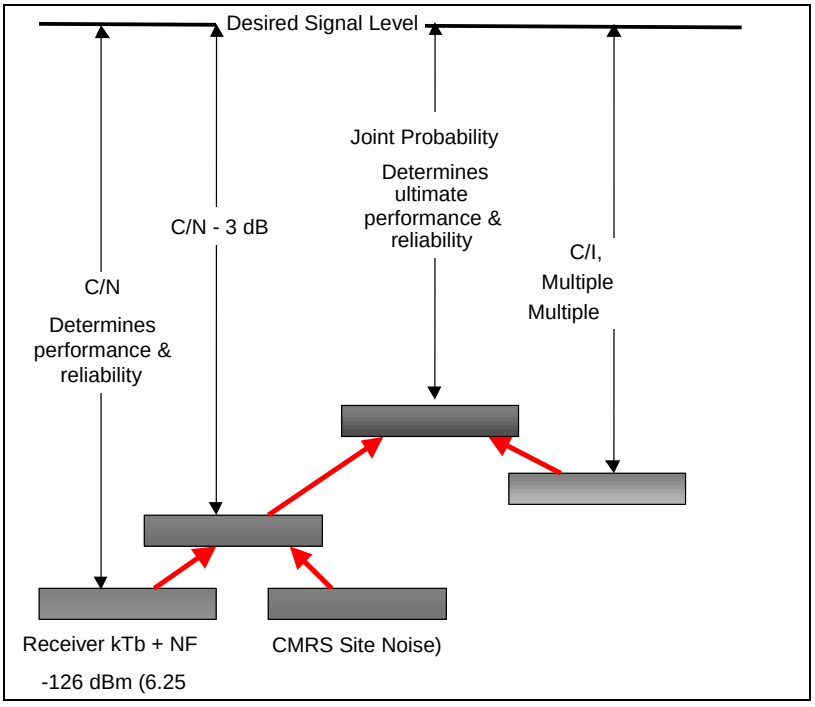
Based upon the ERP/HAAT limitations referenced in 47CFR ¶ 90.541(a), the maximum field strength will be limited to 40 dB relative to 1μV/m (customarily denoted as 40 dBμ). It is assumed that this limitation will be applied similar to the way it is applied in the 821-824/866-869 MHz band. That is, a 40 dBμ field strength can be deployed up to a defined distance beyond the edge of the service area, based on the size of the service area

or type of applicant, i.e. city, county or statewide system. This is important that public safety systems have adequate margins for reliability within their service area in the presence of interference, including the potential for interference from CMRS infrastructure in adjacent bands.

The value of 40 dBμ in the 700 MHz band corresponds to a signal of -92.7 dBm, received by a half-wavelength dipole (λ/2) antenna. The thermal noise floor for a 6.25 kHz bandwidth receiver would be in the range of -126 dBm, so there is a margin of approximately 33 dB available for "noise limited" reliability. Figure 1 shows show the various interfering sources and how they accumulate to form a composite noise floor that can be used to determine the "reliability" or probability of achieving the desired performance in the presence of various interfering sources with differing characteristics.

If CMRS out-of-band emissions (OOBE) noise is allowed to be equal to the original thermal noise floor, there is a 3 dB reduction[3] in the available margin. This lowers the reliability and/or the channel performance of Public Safety systems. The left side of Figure 1 shows that the original 33 dB margin is reduced by 3 dB to only 30 dB available to determine "noise + CMRS OOBE limited" performance and reliability.

There are also different technologies with various channel bandwidths and different performance criteria. C/N in the range of 17 – 20 dB is required to achieve channel performance.



[3] TIA TR8 made this 3 dB allowance for CMRS OOBE noise during the meetings in Mesa, AZ, January 2001.

Figure 1 - Interfering Sources Create A "Noise" Level Influencing Reliability

In addition, unknown adjacent and alternate channel assignments need to be accounted for. The co-channel and adjacent/alternate sources are shown in the right hand side of Figure 1. At the edge of the service area, there would normally be only a single co-channel source, but there could potentially be several adjacent or alternate channel sources involved. It is recommended that co-channel assignments limit interference to <1% at the edge of the service area (worst case mile). A C/I ratio of 26.4 dB plus the required capture value (~10 dB) is required to achieve this goal.[4].

The ultimate performance and reliability has to take into consideration both the noise sources (thermal & CMRS OOBE) and all the interference sources. The center of Figure 1 shows that the joint probability that the both performance criteria and interference criteria are met must be determined.

Table 1 shows estimated performance considering the 3 dB rise in the noise floor at the 40 dBμ signal level. Performance varies due to the different Cf/N requirements and noise floors of the different modulations and channel bandwidths.

Note that since little is known about the affects of terrain, an initial lognormal standard deviation of 8 dB is used.

Comparison of Joint Reliability for various				
Channel Bandwidth	6.25 kHz	12.5 kHz	12.5 kHz	25.0 kHz
Receiver ENBW (kHz)	6	6	9	18
Noise Figure(10 dB)	10	10	10	10
Receiver Noise Floor (dBm)	-126.22	-126.22	-124.46	-121.45
Rise in Noise Floor (dB)	3.00	3.00	3.00	3.00
New Receiver Noise Floor (dB)	-123.22	-123.22	-121.46	-118.45
40 dBu = -92.7 dBm	-92.7	-92.7	-92.7	-92.7
Receiver Capture (dB)	10.0	10.0	10.0	10.0
Noise Margin (dB)	30.52	30.52	28.76	25.75
C/N Required for DAQ = 3	17.0	17.0	18.0	20.0
C/N Margin (dB)	**13.52**	**13.52**	**10.76**	**5.75**
Standard deviation (8 dB)	8.0	8.0	8.0	8.0
Z	1.690	1.690	1.345	0.718
Noise Reliability (%)	**95.45%**	**95.45%**	**91.06%**	**76.37%**
C/I for <1% prob of capture	36.4	36.4	36.4	36.4
I (dBu)	3.7	3.7	3.7	3.7
I (dBm)	-129.0	-129.0	-129.0	-129.0
Joint Probability (C & I)	**94.7%**	**94.7%**	**90.4%**	**76.1%**
40 dBu = -92.7 dBm @ 770 MHz				

Table 1 Joint Probability For Project 25, 700 MHz Equipment Configurations.

[4] See Appendix A for an explanation of how the 1% interference value is defined and derived.

These values are appropriate for a mobile on the street, but are considerably short to provide reliable communications to portables inside buildings.

Portable In-Building Coverage

Most Public Safety communications systems, today, are designed for portable in-building[5] coverage and the requirement for >95 % reliable coverage. To analyze the impact of requiring portable in building coverage and designing to a 40 dBμ service contour, several scenarios are presented. The different scenarios involve a given separation from the desired sites. Whether simulcast or multi-cast is used in wide-area systems, the antenna sites must be placed near the service area boundary and directional antennas, directed into the service area, must be used. The impact of simulcast is included to show that the 40 dBμ service contour must be able to fall outside the edge of the service area in order to meet coverage requirements at the edge of the service area. From the analysis, recommendations are made on how far the 40 dBμ service contour should extend beyond the service area.

Table 2 estimates urban coverage where simulcast is required to achieve the desired portable in building coverage. Several assumptions are required to use this estimate.

- Distance from the location to each site. Equal distance is assumed.
- CMRS noise is reduced when entering buildings. This is not a guarantee as the type of deployments is unknown. It is possible that CMRS units may have transmitters inside buildings. This could be potentially a large contributor unless the CMRS OOBE is suppressed to TIA's most recent recommendation and the "site isolation" is maintained at 65 dB minimum.
- The 40 dBμ service contour is allowed to extend beyond the edge of the service area boundary.
- Other configurations may be deployed utilizing additional sites, lower tower heights, lower ERP and shorter site separations.

Estimated Performance at 2.5 miles from each site				
Channel Bandwidth	6.25 kHz	12.5 kHz	12.5 kHz	25.0 kHz
Receiver Noise Floor (dBm)	-126.20	-126.20	-124.50	-118.50
Signal at 2.5 miles (dBm)	-72.7	-72.7	-72.7	-72.7
Margin (dB)	53.50	53.50	51.80	45.80
C/N Required for DAQ = 3	17.0	17.0	18.0	20.0
Building Loss (dB)	20	20	20	20
Antenna Loss (dBd)	8	8	8	8
Reliability Margin	8.50	8.50	5.80	-2.20

[5] Building penetration losses typically required for urban = 20 dB, suburban = 15 dB, rural = 10 dB.

Z	1.0625	1.0625	0.725	-0.275
Single Site Noise Reliability (%)	**85.60%**	**85.60%**	**76.58%**	**39.17%**
Simulcast with 2 sites	97.93%	97.93%	94.51%	62.99%
Simulcast with 3 sites	99.70%	99.70%	98.71%	77.49%
Simulcast with 4 sites	99.96%	99.96%	99.70%	86.30%

Table 2, Estimated Performance From Site(s) 2.5 Miles From Typical Urban Buildings.

Table 2 shows for the example case of 2.5 miles a single site cannot provide >95% reliability. Either more sites must be used to reduce the distance or other system design techniques must be used to improve the reliability. For example, the table shows that simulcast can be used to achieve public safety levels of reliability at this distance. Table 2 also shows that the difference in performance margin requirements for wider bandwidth channels requires more sites and closer site-to-site separation.

Figures 2 and 3 show how the configurations would potentially be deployed for a typical site with 240 Watts ERP. This is based on:

- 75 Watt transmitter, 18.75 dBW
- 200 foot tower
- 10 dBd 180 degree sector antenna +10.0 dBd
- 5 dB of cable/filter loss. - 5.0 dB

23.75 dBW ≈ 240 Watts (ERPd)

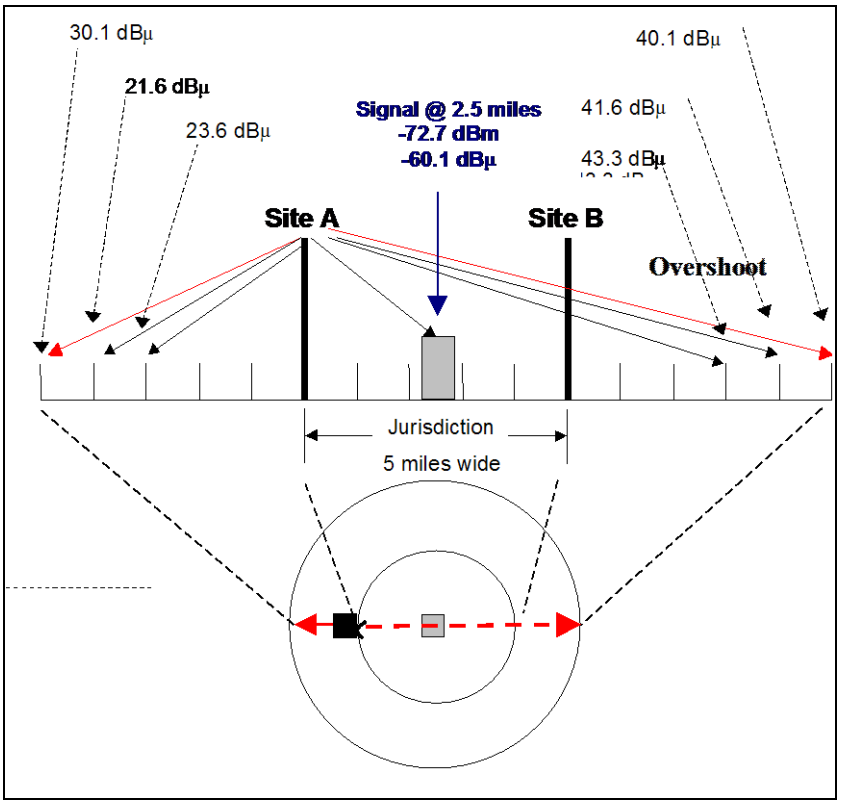


Figure 2 - Field Strength From Left Most Site.

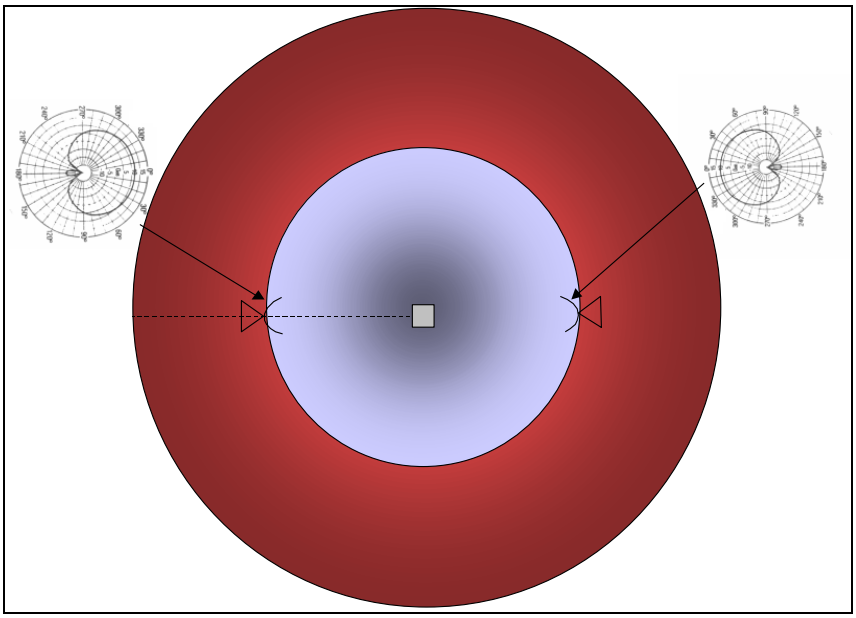


Figure 3 - Antenna Configuration Required To Limit Field Strength Off "Backside"

Figure 2 is for an urbanized area with a jurisdiction defined as a 5 mile circle. To provide the necessary coverage to portables in buildings at the center of the jurisdiction requires that the sites be placed along the edge of the service area and utilize directional antennas oriented toward the center of the service area (Figure 3). In this case, at 5 miles beyond the edge of the service area, the sites would produce a composite field strength of approximately 40 dBμ. Since one site is over 10 dB dominant, the contribution from the other site is not considered. The control of the field strength behind the site relies on a 20 dB antenna with a Front to Back Ratio (F/B) specification as shown in Figure 3. This performance may be optomistic due to back scatter off local obstructions in urbanized areas. However, use of antennas on the sides of buildings can assist in achieving better F/B ratios and the initial planning is not precise enough to prohibit using the full 20 dB.

The use of a single site at the center of the service area is not normally practical. To provide the necessary signal strength at the edge of the service area would produce a field strength 5 miles beyond in excess of 44 dBμ. However, if the high loss buildings were concentrated at the service area's center, then potentially a single site could be deployed, assuming that the building loss sufficiently decreases near the edge of the service area allowing a reduction in ERP to achieve the desired reliability.

Downtilting of antennas, instead of directional antennas, to control the 40 dBμ is not practical, in this scenario. For a 200 foot tall tower, the center of radiation from a 3 dB down-tilt antenna hits the ground at ~ 0.75 miles[6]. The difference in angular discrimination from a 200 foot tall tower at service area boundary at 5 miles and service contour at 10 miles is approximately 0.6 degrees, so ERP is basically the same as ERP toward the horizon. It would not be possible to achieve necessary signal strength at service area boundary and have 40 dBμ service contour be less than 5 miles away.

Tables 3 and 4 represent the same configuration, but for less dense buildings. In these cases, the distance to extend the 40 dBμ service contour can be determined from Table 5.

Estimated Performance at 3.5 miles from each site				
Channel Bandwidth	6.25 kHz	12.5 kHz	12.5 kHz	25.0 kHz
Receiver Noise Floor (dBm)	-126.20	-126.20	-124.50	-118.50
Signal at 3.5 miles (dBm)	-77.7	-77.7	-77.7	-77.7
Margin (dB)	48.50	48.50	46.80	40.80
C/N Required for DAQ = 3	17.0	17.0	18.0	20.0
Building Loss (dB)	15	15	15	15
Antenna Loss (dBd)	8	8	8	8
Reliability Margin	8.50	8.50	5.80	-2.20
Z	1.0625	1.0625	0.725	-0.275
Single Site Noise Reliability (%)	**85.60%**	**85.60%**	**76.58%**	**39.17%**
Simulcast with 2 sites	97.93%	97.93%	94.51%	62.99%
Simulcast with 3 sites	99.70%	99.70%	98.71%	77.49%
Simulcast with 4 sites	99.96%	99.96%	99.70%	86.30%

[6] Use of high gain antennas with down-tilt on low-level sites is one of the causes of far-near interference experienced in the 800 MHz band.

Table 3 - Lower Loss Buildings, 3.5 Mile From Site(s)

Estimated Performance at 5.0 miles from each site				
Channel Bandwidth	6.25 kHz	12.5 kHz	12.5 kHz	25.0 kHz
Receiver Noise Floor (dBm)	-126.20	-126.20	-124.50	-118.50
Signal at 5.0 miles (dBm)	-82.7	-82.7	-82.7	-82.7
Margin (dB)	43.50	43.50	41.80	35.80
C/N Required for DAQ = 3	17.0	17.0	18.0	20.0
Building Loss (dB)	10	10	10	10
Antenna Loss (dBd)	8	8	8	8
Reliability Margin	8.50	8.50	5.80	-2.20
Z	1.0625	1.0625	0.725	-0.275
Single Site Noise Reliability (%)	**85.60%**	**85.60%**	**76.58%**	**39.17%**
Simulcast with 2 sites	97.93%	97.93%	94.51%	62.99%
Simulcast with 3 sites	99.70%	99.70%	98.71%	77.49%
Simulcast with 4 sites	99.96%	99.96%	99.70%	86.30%

Table 4 - Low Loss Buildings, 5.0 Miles From Site(s)

Note that the receive signals were adjusted to offset the lowered building penetration loss. This produces the same numerical reliability results, but allows increasing the site to building separation and this in turn lowers the magnitude of the "overshoot" across the service area.

Table 5 shows the field strength for a direct path and for a path reduced by a 20 dB F/B antenna. This allows the analysis to be simplified for the specific example being discussed.

	Site A Direct Path	Site B Back Side of 20 dB F/B Antenna
Overshoot Distance (mi)	Field Strength (dBμ)	Field Strength (dBμ)
1	73.3	53.3
2	63.3	43.3
2.5	60.1	40.1
3	57.5	37.5
4	53.3	**33.5**
5	50.1	30.1
…	**…**	
10	40.1	
11	**38.4**	
12	37.5	
13	36.0	
14	34.5	
15	33.0	

Table 5 - Field Strength Vs. Distance From Site

For the scenarios above, the composite level at the Service Contour is the sum of the signals from the two sites. The sum can not exceed 40 dBμ. Table 5 allows you to calculate the distance to Service Contour given the distance from one of the sites.

Scenario 1: Refer to Figure 3a. Site B is just inside the Service Area boundary and Service Contour must be <5 Miles outside Service Area boundary. Signal level at Service Contour from Site B is 30.1 dBμ. Signal level for Site A can be up to 40 dBμ, since when summing two signals with >10 dB delta, the lower signal level has little effect (less than 0.4 dB in this case). Therefore, Site A can be 10 miles from the Service Contour, or 5 miles inside the Service Area boundary. The coverage perfomance for this scenario is shown in Table 2, above, for 20 dB building loss typical of urban areas.

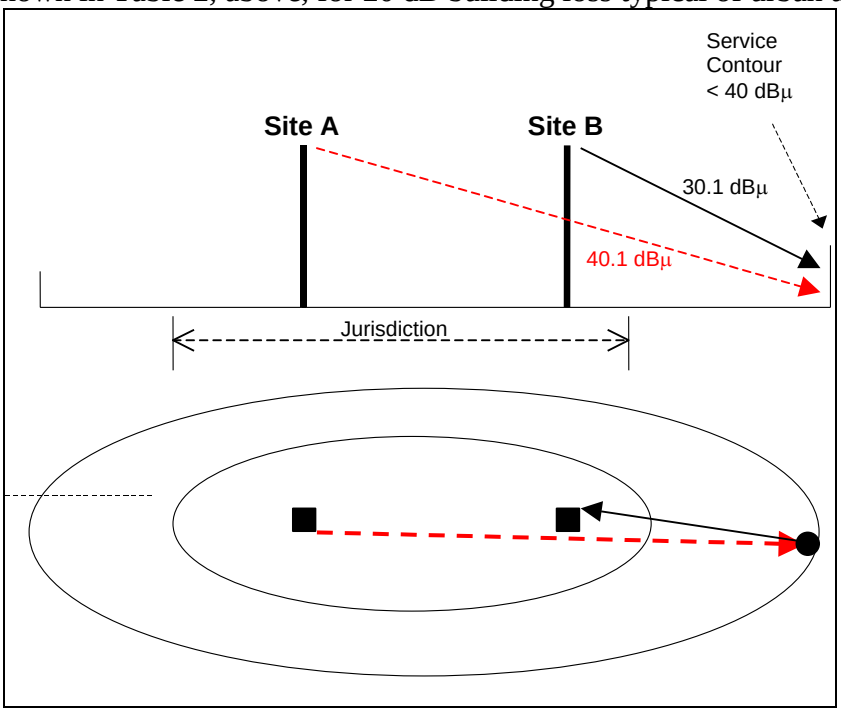


Figure 3a. Scenario 1 on of Use of Table 5

Scenario 2: Refer to bold data in Table 5. Site B is just inside the Service Area boundary and Service Contour must be <4 Miles outside Service Area boundary. Signal level at Service Contour from Site B is 33.5 dBμ. Signal level for Site A can be up to 38.4 dBμ. (See Appendix B for simple method to sum the powers of signals expressed in decibels.) The composite power level is 39.7 dBμ. Therefore, Site A can be slightly less than 11 miles from the Service Contour, or ~7 miles inside the Service Area boundary. The coverage perfomance for this example is shown in Table 3, above, for 15 dB building loss typical of suburban areas.

Scenario 3: Site B is just inside the Service Area boundary and Service Contour must be <3 Miles outside Service Area boundary. Signal level at Service Contour from Site B is

37.5 dBμ. Signal level for Site A can be up to 36.4 dBμ. (See Appendix B simple method to sum signals expressed in decibels.) The composite power level is 40.0 dBμ. Therefore, Site A can be ~13 miles from the Service Contour, or ~10 miles inside the Service Area boundary. The coverage perfomance for this example is shown in Table 4, above, for 10 dB building loss typical of rural areas.

Service Contour Extension Recommendation

The resulting recommendation for extending the 40 dBμ service contour beyond the service area boundary is:

Type of Area	Extension (mi.)
Urban (20 dB Buildings)	5
Suburban (15 dB Buildings)	4
Rural (10 dB Buildings)	3

Table 6 - Recommended Extension Distance Of 40 dBμ Field Strength

Using this recommendation the 40 dBμ service contour can then be constructed based on the defined service area without having to perform an actual prediction.

Interfering Contour

Table 1 above shows that 36.4 dB of margin is required to provide 10 dB of co-channel capture and <1% probability of interference. Since the 40 dBμ service contour is beyond the edge of the service area, some relaxation in the level of interference is reasonable. Therefore, a 35 dB co-channel C/I ratio is recommended and is consistent with what is currently being licensed in the 821-824/866-869 MHz Public Safety band.

Co-Channel Interfering Contour Recommendation

- Allow the constructed 40 dBμ (50,50) service contour to extend beyond the edge of the defined service area by the distance indicated in Table 6.
- Allow the 5 dBμ (50,50) interfering contour to intercept but not overlap the 40 dBμ service contour.

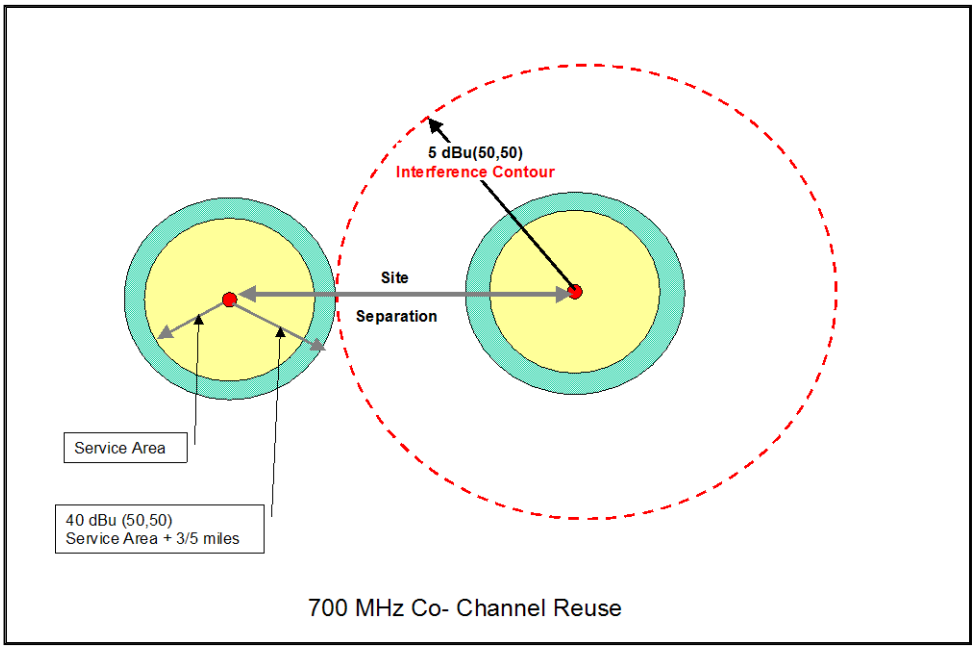


Figure 4 - Co-Channel Reuse Criterion

Adjacent and Alternate Channel Considerations

Adjacent and alternate channels are treated as being noise sources that alter the composite noise floor of a victim receiver. Using the 47 CFR § 90.543 values of ACCP can facilitate the coordination of adjacent and alternate channels. The C/I requirements for <1% interference can be reduced by the value of ACCPR. For example to achieve an X dB C/I for the adjacent channel that is -40 dBc a C/I of [X-40] dB is required. Where the alternate channel ACP value is -60 dBc, then the C/I = [X-60] dB is the goal for assignment(s). There is a compounding of interference energy, as there are numerous sources, i.e. co channel, adjacent channels and alternate channels plus the noise from CMRS OOBE.

There is insufficient information in 47 CFR § 90.543 to include the actual receiver performance. Receivers typically have "skirts" that allow energy outside the bandwidth of interest to be received. In addition, the FCC defines ACCP differently than does the TIA. The term used by the FCC is the same as the TIA definition of ACP. The subtle difference is that ACCP defines the energy intercepted by a defined receiver filter (e.g., 6 kHz ENBW). ACP defines the energy in a measured bandwidth that is typically wider than the receiver (e.g., 6.25 kHz channel bandwidth). As a result, the FCC values are optimistic at very close spacing and somewhat pessimistic at wider spacings, as the typical receiver filter is less than the channel bandwidth.

In addition, as channel bandwidth is increased, the total amount of noise intercepted rises compared to the level initially defined in a 6.25 kHz channel bandwidth. However, the effect is diminished at very close spacings as the slope of the noise curve falls off rapidly.

At greater spacings, the slope of the noise curve is essentially flat and the receiver's filter limits the noise to a rise in the thermal noise floor.

Digital receivers tend to be less tolerant to interference than analog. Therefore, a 3 dB reduction in the C/(I+N) can reduce a DAQ = 3 to a DAQ = 2, which is threshold to complete muting in digital receivers. Therefore to maintain a DAQ = 3, at least 17 dB of fading margin plus the 26.4 dB margin for keeping the interference below 1% probability is required, for a total margin of 43.4 dB. However, this margin would be at the edge of the service area and the 40 dBμ service contour is allowed to extend past the edge of the service area.

Frequency drift is controlled by the FCC requirement for 0.4-ppm stability when locked. This equates to approximately a 1 dB standard deviation, which is negligible when associated with the recommended initial lognormal standard deviation of 8 dB and can be ignored.

Project 25 requires that a transceiver receiver have an ACIPR of 60 dB. This implies that an ACCPR ≥ 65 dB will exist for a "companion receiver". A companion receiver is one that is designed for the specific modulation. At this time the highest likelihood is that receivers will be deploying the following receiver bandwidths at the following channel bandwidths.

Estimated Receiver Parameters	
Channel Bandwidth	Receiver Bandwidth
6.25 kHz	5.5 kHz
12.5 kHz	5.5 or 9 kHz
25 kHz	18.0 kHz

Table 7 - Estimated Receiver Parameters

Based on 47 CFR ¶ 90.543 and the P25 requirement for an ACCPR ≥ 65 dB into a 6.0 kHz channel bandwidth and leaving room for a migration from Phase 1 to Phase 2, allows for making the simplifying assumption that 65 dB ACCPR is available for both adjacent 25 kHz spectrum blocks.

The assumption is that initial spectrum coordination sorts are based on 25 kHz bandwidth channels. This provides the maximum flexibility by using 65 dB ACCPR for all but one possible combination of 6.25 kHz channels within the 25 kHz allotment.

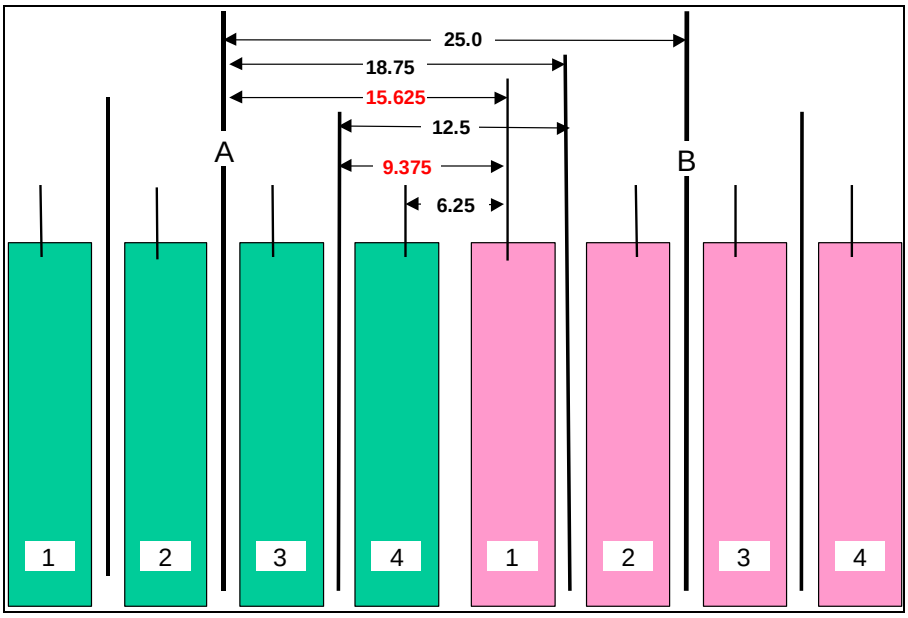


Figure 5, Potential Frequency Separations

Case	Spacing	ACCPR
25 kHz to 25 kHz	25 kHz	65 dB
25 kHz to 12.5 kHz	18.750 kHz	65 dB
25 kHz to 6.25 kHz	15.625 kHz	>40 dB
12.5 kHz to 12.5 kHz	12.5 kHz	65 dB
12.5 kHz to 6.25 kHz	9.375 kHz	>40 dB
6.25 kHz to 6.25 kHz	6.25 kHz	65 dB

Table 8 - ACCPR Values For Potential Frequency Separations

All cases meet or exceed the FCC requirement. The most troublesome cases occur where the wider bandwidths are working against a Project 25 Phase 2 narrowband 6.25 kHz channel. This pre-coordination based upon 25 kHz spectrum blocks still works if system designers and frequency coordinators keep this consideration in mind and move the edge 6.25 kHz channels inward away from the edge of the system. This approach allows a constant value of 65 dB ACCPR to be applied across all 25 kHz spectrum blocks regardless of what channel bandwidth is eventually deployed. There will also be additional coordination adjustments when exact system design details and antenna sites are known.

For spectrum blocks spaced farther away, it must be assumed that transmitter filtering, in addition to transmitter performance improvements due to greater frequency separation, will further reduce the ACCPR.

Therefore it is recommended that a consistent value of 65 dB ACCPR be used for the initial coordination of adjacent 25 kHz channel blocks. Rounding to be conservative due to the possibility of multiple sources allows the Adjacent Channel Interfering Contour to be approximately 20 dB above the 40 dBμ service contour, at 60 dBμ.

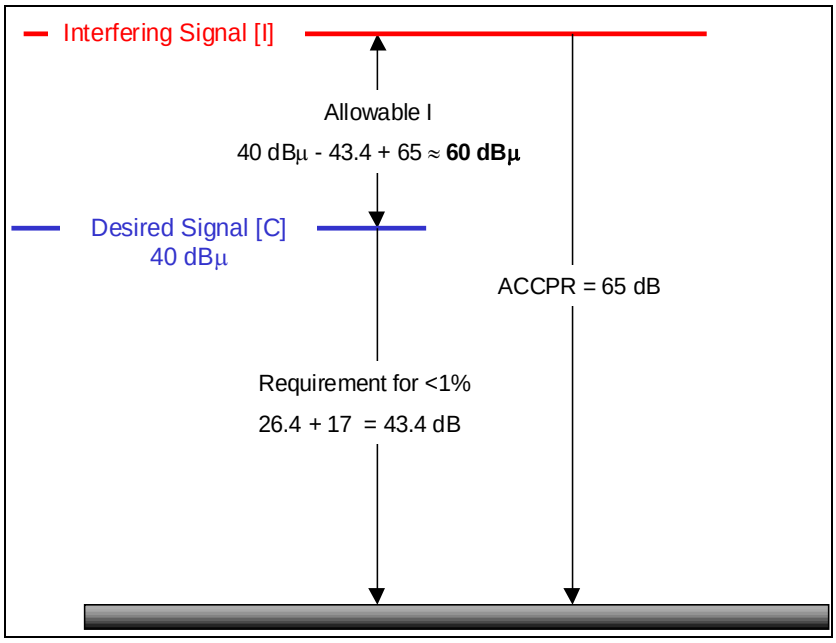


Figure 6 - Adjusted Adjacent 25 kHz Channel Interfering Contour Value

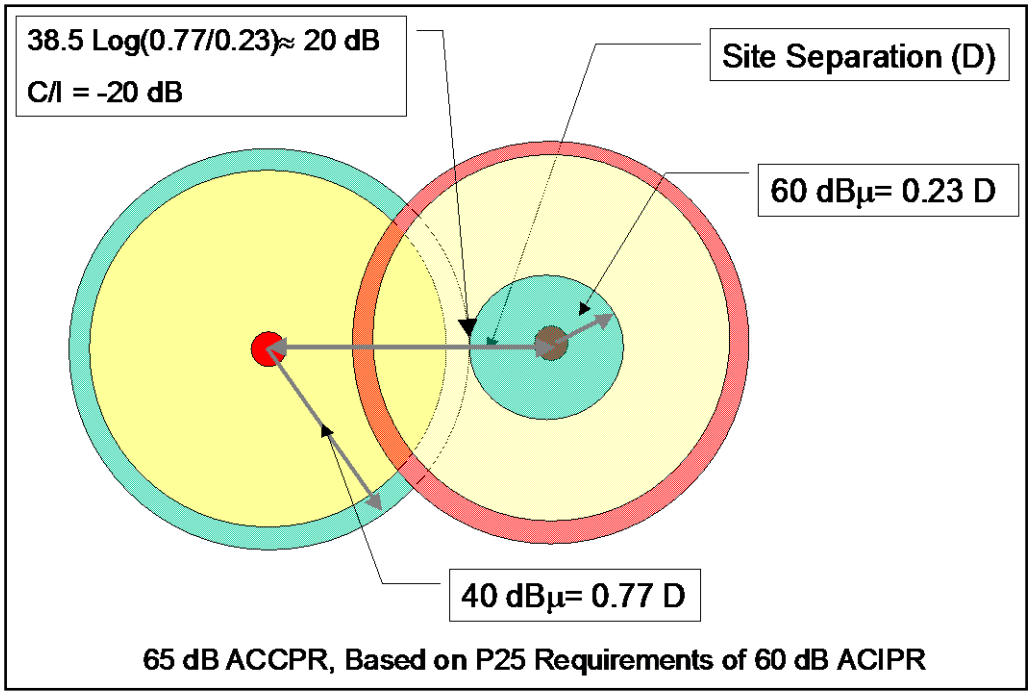


Figure 7 - Example Of Adjacent/Alternate Overlap Criterion

Adjacent Channel Interfering Contour Recommendation

An adjacent (25 kHz) channel shall be allowed to have its 60 dBμ (50,50) interfering contour touch but not overlap the 40 dBμ (50,50) service contour of a system being evaluated. Evaluations should be made in both directions.

Final Detailed Coordination

This simple method is only adequate for presorting large blocks of spectrum to potential entities. A more detailed analysis should be executed in the actual design phase to take all the issues into consideration.

Additional factors that should be considered include:

- Degree of Service Area Overlap
- Different size of Service Areas
- Different ERPs and HAATs
- Actual Terrain and Land Usage
- Differing User Reliability Requirements
- Migration from Project 25 Phase 1 to Phase 2
- Actual ACCP
- Balanced Systems
- Mobiles vs. Portables
- Use of voting
- Use of simulcast
- Radio specifications
- Simplex Operation
- Future unidentified requirements.

Special attention needs to be paid to the use of simplex operation. In this case, an interferer can be on an offset adjacent channel and in extremely close proximity to the victim receiver. This is especially critical in public safety where simplex operations are frequently used at a fire scene or during police operation. This type operation is also quite common in the lower frequency bands. In those cases, evaluation of base-to-base as well as mobile-to-mobile interference should be considered and evaluated.

Sub-Appendix A

Carrier to Interference Requirements

There are two different ways that Interference is considered.

- Co Channel
- Adjacent and Alternate Channels

Both involve using a C/I ratio. The C/I ratio requires a probability be assigned. For example, if 10% Interference is specified, the C/I implies 90% probability of successfully achieving the desired ratio. 1% interference means that there is a 99% probability of achieving the desired C/I.

$$\frac{C}{I}\% = \frac{1}{2} \bullet erfc\left(\frac{\frac{C}{I}\text{margin}}{2\sigma}\right) \quad (1)$$

This can also be written in a form using the standard deviate unit (Z). In this case the Z for the desired probability of achieving the C/I is entered. For example, for a 90% probability of achieving the necessary C/I, $Z = 1.28$.

$$\frac{C}{I}\% = Z \cdot \sqrt{2} \cdot \sigma \quad (2)$$

The most common requirements for several typical lognormal standard deviations (σ) are included in the following table based on Equation (2).

Location Standard Deviation (σ) dB	5.6	6.5	8	10
Probability %				
10%	10.14 dB	11.77 dB	14.48 dB	18.10 dB
5%	13.07 dB	15.17 dB	18.67 dB	23.33 dB
4%	13.86 dB	16.09 dB	19.81 dB	24.76 dB
3%	14.90 dB	17.29 dB	21.28 dB	26.20 dB
2%	16.27 dB	18.88 dB	23.24 dB	29.04 dB
1%	18.45 dB	21.42 dB	**26.36 dB**	32.95 dB

Table A1 - Probability Of Not Achieving C/I For Various Location Lognormal Standard Deviations

These various relationships are shown in Figure A1, a continuous plot of equation(s) 1 and 2.

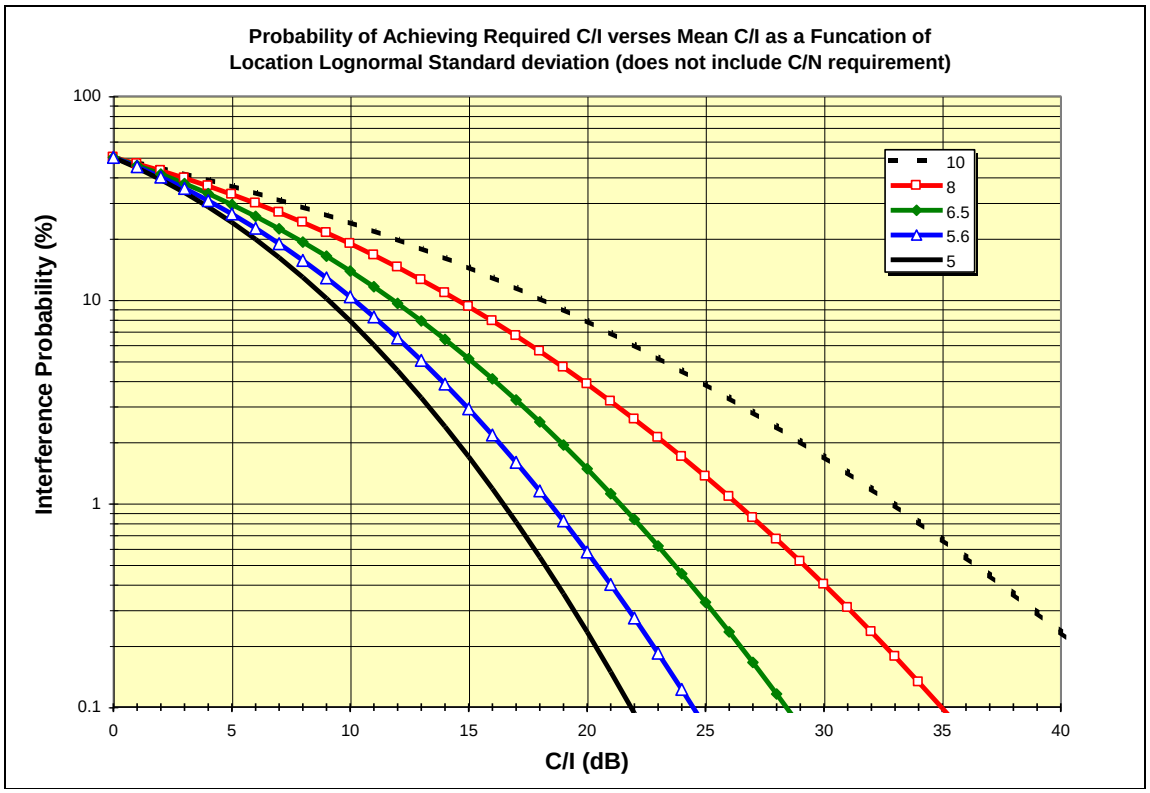


Figure A1, Probability Of Achieving Required C/I As A Function Of Location Standard Deviation

For co-channel the margin needs to include the “capture” requirement. When this is done, then a 1% probability of co channel interference can be rephrased to mean, there is

a 99% probability that the "capture ratio" will be achieved. The capture ratio varies with the type of modulation. Older analog equipment has a capture ratio of approximately 7 dB. Project 25 FDMA is specified at 9 dB. Figure A1 shows the C/I requirement without including the capture requirement.

The 8 dB value for lognormal location standard deviation is reasonable when little information is available. Later when a detailed design is required, additional details and high-resolution terrain and land usage databases will allow a lower value to be used. The TIA recommended value is 5.6 dB. Using 8 dB initially and changing to 5.6 dB provides additional flexibility necessary to complete the final system design.

To determine the desired probability that both the C/N and C/I will be achieved requires that a joint probability be determined. Figure A2 shows the effects of a family of various levels of C/N reliability and the joint probability (Y-axis) in the presence of various probabilities of Interference. Note that at 99% reliability with 1% interference (X-axis) that the reduction is nearly the difference. This is because the very high noise reliability is degraded by the interference, as there is little probability that the noise criterion will not be satisfied. At 90%, the 1% interference has a greater likelihood that it will occur simultaneously when the noise criterion not being met, resulting in less degradation of the 90%.

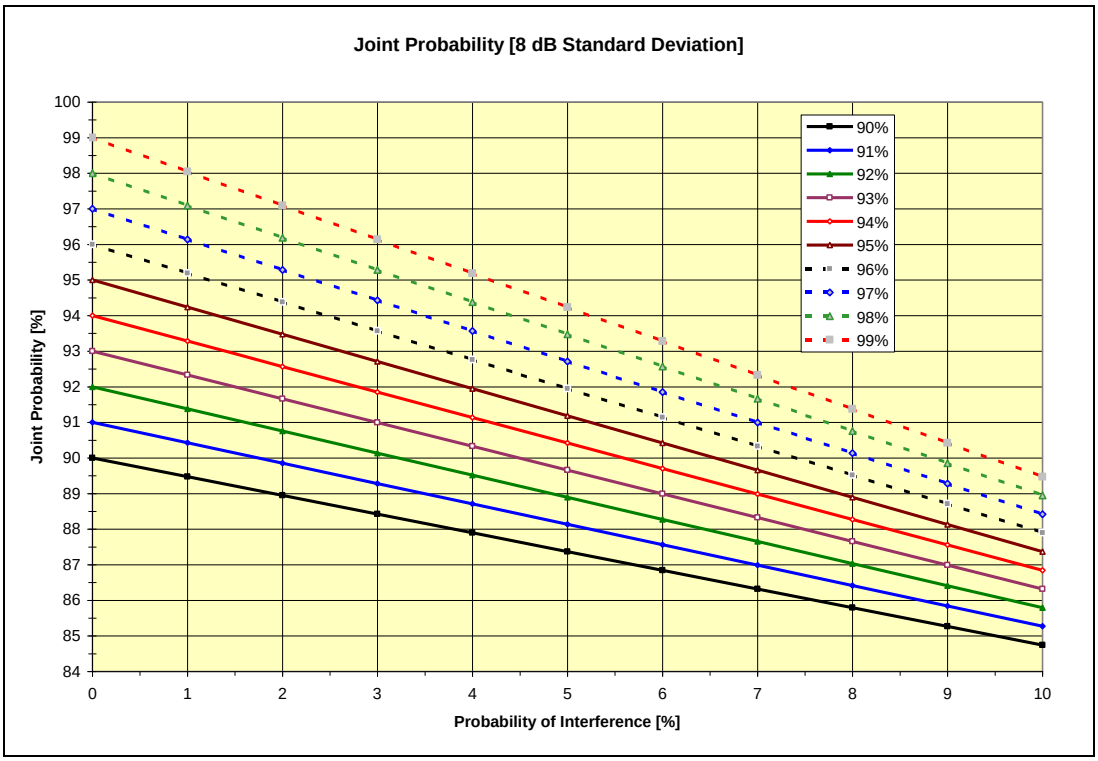
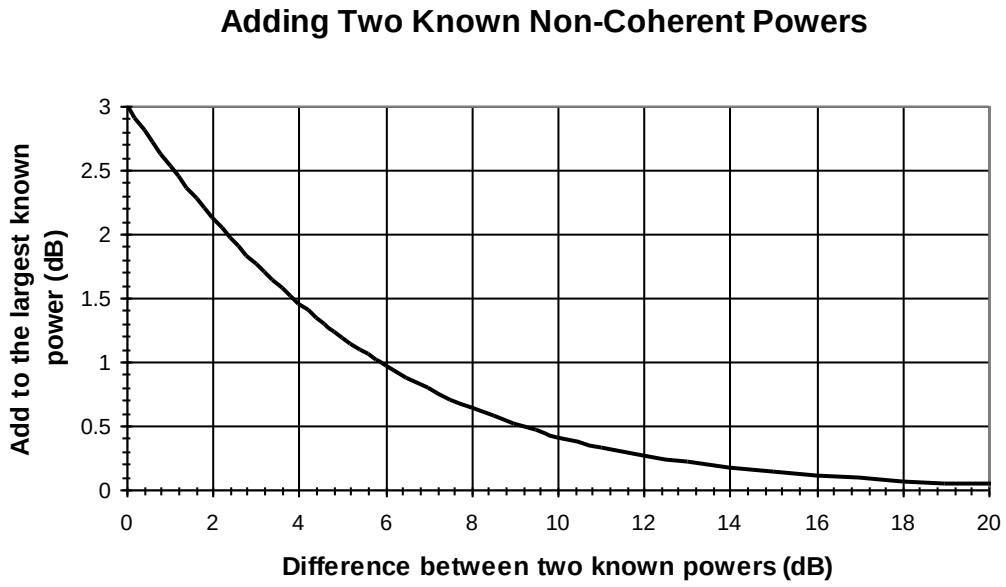


Figure A2 - Effect Of Joint Probability On The Composite Probability

For adjacent and alternate channels, the channel performance requirement must be added to the C/I ratio. When this is applied, then a 1% probability of adjacent/alternate channel interference can be rephrased to mean, there is a 99% probability that the "channel performance ratio" will be achieved.

Sub-Appendix B



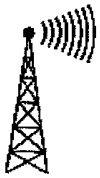
In order to sum the power of two or more signals expressed in dBm or dBμ, they level should be converted to a voltage level or a power level, summed (root of the sum of the squares), and then converted back to dBm or dBμ.

The chart above provides simple method to sum two power levels expressed in dBm or dBμ. First find the difference between the two signals on the horizontal axis. Go up to the curve and across to the vertical axis to find the power delta. Add the power delta to the larger of the two original signal levels.

Example 1: Signal A is 36.4 dBμ. Signal B is 37.5 dBμ. Difference is 1.1 dB. Power delta is about 2.5 dB. Composite signal level is 37.5 dBμ + 2.5 dB = 40 dBμ.

Example 2: Signal is –96.3 dBm. Signal B is –95.2 dBm. Difference is 1.1 dB. Power delta is about 2.5 dB. Composite signal level is –95.2 dBm + 2.5 dB = -92.7 dBm.

Appendix E
Adjacent Region Concurrences



800 MHz Region 13
Regional Conformance Review Committee

C/0: GARY COCHRAN, CHAIRMAN
801 S. Seventh Street
Suite 103-s, P.O. Box 19461
Springfield, Illinois 62794-9461
PHONE (217) 558-6363

November 10, 2010

Mr. Leslie Fish, Chairperson
Region 15 700 MHz Regional Planning Committee
5912 NW 2nd St.
Des Moines, Iowa 50313-1307

Dear Leslie:

As Chairperson of the Region 13 800 & 700 MHz Regional Planning Committee, I am pleased to provide you with this letter indicating Region 13's concurrence and approval of the Region 15 700 MHz plan. Region 13 looks forward to working with Region 15 on issues that provide efficient use of the 700 MHz public safety allocations and coordinating use of this important spectrum along the Illinois/Iowa border.

Region 13 congratulates the Region 15 700 MHz Regional Planning Committee on the successful development of their plan. Please feel free to contact me at 217-558-6363 should there be any questions regarding the Region 13 concurrence and approval of this plan.

Please accept my apology for the delay in the approval of the Region 15 Plan.

Regards,

Gary Cochran
Region 13 RCRC Chairman
Assistant Bureau Chief
Bureau of Communications
Illinois State Police
Office Phone:217-558-6363
Cell Phone :217-836-0546
E-Mail: gary.cochran@isp.state.il.us

MINNESOTA DEPARTMENT OF PUBLIC SAFETY

Emergency Communication Networks

445 Minnesota Street • Suite 137 • Saint Paul, Minnesota 55101-5137
Phone: 651.201.7547 • Fax: 651.296.2665 • TTY: 651.282.6555
www.ecn.state.mn.us

September 2, 2010

Mr. Leslie E. Fish
Chair, Region 15
Iowa State Patrol Communications
5912 NW 2nd St.
Des Moines, IA 50313-1307

Dear Mr. Fish:

Thank you for the submission of the proposed Region 15 700 MHz plan. We received the proposed plan on June 22, 2010 and were able to review the contents. Upon review, the Region 22 700 MHz Committee has no objection to the plan.

Please accept this letter as our official, written concurrence of the proposed Region 15 700 MHz Regional Plan.

Sincerely,

Scott Wiggins
Chair, Region 22

Enclosure

Region 24 700 MHz
Regional Planning Committee
Stephen T. Devine, Chair

July 4, 2010

Mr. Leslie E. Fish
Chair, Region 15
Iowa State Patrol Communications
5912 NW 2nd St.
Des Moines, IA 50313-1307

Dear Mr. Fish,

Region 24 (Missouri) is in receipt of your proposed Region 15 700 MHz Regional Plan submitted to this committee via Email on June 22, 2010. Region 24 has reviewed Region 15's (Iowa) Plan and has no objection to the elements of the plan or the General Use 700 MHz channel allotments in Iowa counties bordering Region 24. We look forward to working with Region 15 on 700 MHz implementation in the future.

This letter, distributed via email to you as the Region 15 Chairperson, serves as official written correspondence from Region 24 indicating our concurrence to the proposed Region 15 700 MHz Regional Plan.

Sincerely,

Steven T. Devine
Chair, Region 24 700 MHz Regional Planning Committee
Missouri Department of Public Safety, Office of the Director
Interoperability Program Manager
301 W High St. Harry S. Truman Building, Room 870
PO Box 749
Jefferson City, MO 65102

Dave Heineman
Governor

STATE OF NEBRASKA

OFFICE OF THE CHIEF INFORMATION OFFICER
Brenda L. Decker
Chief Information Officer
P.O. Box 95045
Lincoln, Nebraska 68509-5045
402-471-3560
402-471-2761
402-471-2065

REGION 26
Nebraska
CONCURRENCE LETTER

July 29, 2010
Mr. Leslie E. Fish
Chair, Region 15
Iowa State Patrol Communications
5912 NW 2nd St.
Des Moines, IA 50313-1307

Dear Mr. Fish,

Region 26 (Nebraska) is in receipt of your proposed 700 MHz Regional Plan, submitted to this Committee on June 22, 2010. Region 26 has reviewed Region 15's (Iowa) Plan and has no objections.

This letter serves as the official, written concurrence of Region 26 to your proposed 700 MHz Regional Plan.

Sincerely,

Michael Jeffries
Chair, Region 26
Office of the CIO
501 S 14th St.
Lincoln, NE 68508

REGION 45
Wisconsin, except for southern Lake Michigan counties
CONCURRENCE LETTER

1/24/2011
Mr. Leslie E. Fish
Chair, Region 15
Iowa State Patrol Communications
5912 NW 2nd St.
Des Moines, IA 50313-1307

Dear Mr. Fish,

Region 45 (Wisconsin, except southern Lake Michigan counties) is in receipt of your proposed 700 MHz Regional Plan, submitted to this Committee on June 22, 2010. Region 45 has reviewed Region 15's (Iowa) Plan and has no objections.

This letter serves as the official, written concurrence of Region 45 to your proposed 700 MHz Regional Plan.

Sincerely,

Russell Schreiner
Chair, Region 45
Communications Engineering
City of Sheboygan Police Department
1315 North 23rd Street
Sheboygan, WI 53081

State of South Dakota
State Radio
Bureau of Information & Telecommunications

REGION 38
South Dakota
CONCURRENCE LETTER

06/24/2010
Mr. Leslie E. Fish
Chair, Region 15
Iowa State Patrol Communications
5912 NW 2nd St.
Des Moines, IA 50313-1307

Dear Mr. Fish,

Region 38 (South Dakota) is in receipt of your proposed 700 MHz Regional Plan, submitted to this Committee on June 22, 2010. Region 38 has reviewed Region 15's (Iowa) Plan and has no objections.

This letter serves as the official, written concurrence of Region 38 to your proposed 700 MHz Regional Plan.

Sincerely,

Todd Dravland
Chair, Region 38
State of South Dakota
State Radio Communications Engineering
500 E. Capitol Ave.
Pierre, SD 57501-5070

Appendix F
Inter-Regional Dispute Resolution Agreements

M, Inter-Regional Coordination Procedures
and
Procedures for Resolution of Disputes
That May Arise Under FCC Approved Plans

I. Coordination Procedures

I. INTRODUCTION

1. This is a mutually agreed upon Inter-Regional Coordination Procedures Agreement (Agreement) by and between the following 700 MHz Regional Planning Committees, Region 15 (Iowa) and Region 13 (Illinois, except southern Lake Michigan Counties).

II. INTER-REGIONAL COORDINATION AGREEMENT

2. The following is the specific procedure for inter-regional coordination which has been agreed upon by Region 15 and Region 13, and which will be used by the Regions to coordinate with adjacent Regional Planning Committees.

a. An application filing window is opened or the Region announces that it is prepared to begin accepting applications on a first-come/first-served basis.

b. Applications by eligible entities are accepted.

c. An application filing window (if this procedure is being used) is closed after appropriate time interval.

d. Intra-regional review and coordination takes place, including a technical review resulting in assignment of channels.

e. After intra-regional review, a copy of those frequency-specific applications requiring adjacent Region approval, including a definition statement of proposed service area, shall then be forwarded to the adjacent Region(s) for review.[1] This information will be sent to the adjacent Regional chairperson(s) using the CAPRAD database.

---

[1] If an applicant's proposed service area or interference contour extends into an adjacent Public Safety Region(s), the application must be approved by the affected Region(s). Service area shall normally be defined as the area included within the geographical boundary of the applicant, plus three (3) miles. Interference contour shall normally be defined as a 5 dBu co-channel contour or a 60 dBu adjacent channel

f. The adjacent Region reviews the application. If the application is approved, a letter of concurrence shall be sent, via the CAPRAD database, to the initiating Regional chairperson within thirty (30) calendar days.

II. Dispute Resolution

(1) If the adjacent Region(s) cannot approve the request, the adjacent Region shall document the reasons for partial or non-concurrence, and respond within 10 (Ten) calendar days via email. If the applying Region cannot modify the application to satisfy the objections of the adjacent Region then, a working group comprised of representatives of the two Regions shall be convened within thirty (30) calendar days to attempt to resolve the dispute. The working group shall then report its findings within thirty (30) calendar days to the Regional chairpersons' email (CAPRAD database). Findings may include, but not be limited to:

(i) Unconditional concurrence;

(ii) Conditional concurrence contingent upon modification of applicant's technical parameters; or

(iii) Partial or total denial of proposed frequencies due to inability to meet co-channel/adjacent channel interference free protection to existing licensees within the adjacent Region.

(2) If the Inter-Regional Working Group cannot resolve the dispute, then the matter shall be forwarded for evaluation to the National Regional Planning Council (NRPC). Each Region involved in the dispute shall include a detailed explanation of its position, including engineering studies and any other technical information deemed relevant. The NRPC will, within thirty (30) calendar days, report its recommendation(s)

---

contour. Other definitions of service area or interference shall be justified with an accompanying *Memorandum of Understanding (MOU)* or other application documentation between agencies, i.e. mutual aid agreements.

to the Regional chairpersons via the CAPRAD database. The NRPC's decision may support either of the disputing Regions or it may develop a proposal that it deems mutually advantageous to each disputing Region.

g. Where adjacent Region concurrence has been secured, and the channel assignments would result in no change to the Region's currently Commission approved channel assignment matrix. The initiating Region may then advise the applicant(s) that their application may be forwarded to a frequency coordinator for processing and filing with the Commission.

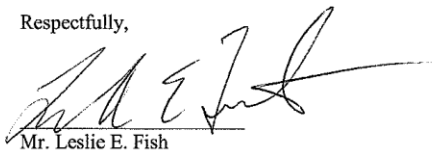
h. Where adjacent Region concurrence has been secured, and the channel assignments would result in a change to the Region's currently Commission approved channel assignment matrix, then the initiating Region shall file with the Commission a *Petition to Amend* their current Regional plan's frequency matrix, reflecting the new channel assignments, with a copy of the *Petition* sent to the adjacent Regional chairperson(s).

i. Upon Commission issuance of an *Order* adopting the amended channel assignment matrix, the initiating Regional chairperson will send a courtesy copy of the *Order* to the adjacent Regional chairperson(s) and may then advise the applicant(s) that they may forward their applications to the frequency coordinator for processing and filing with the Commission.

III. CONCLUSION

3. IN AGREEMENT HERETO, Regions 15 and 13 do hereunto set their signatures the day and year first above written.

Respectfully,



Mr. Leslie E. Fish
Chair, Region 15

Gary Cochran
Chair, Region 13

Date: 10/10/10

Inter-Regional Coordination Procedures
and
Procedures for Resolution of Disputes
That May Arise Under FCC Approved Plans

I. Coordination Procedures

I. INTRODUCTION

1. This is a mutually agreed upon Inter-Regional Coordination Procedures Agreement (Agreement) by and between the following 700 MHz Regional Planning Committees, Region 15 (Iowa) and Region 22 (Minnesota).

II. INTER-REGIONAL COORDINATION AGREEMENT

2. The following is the specific procedure for inter-regional coordination which has been agreed upon by Region 15 and Region 22, and which will be used by the Regions to coordinate with adjacent Regional Planning Committees.

a. An application filing window is opened or the Region announces that it is prepared to begin accepting applications on a first-come/first-served basis.

b. Applications by eligible entities are accepted.

c. An application filing window (if this procedure is being used) is closed after appropriate time interval.

d. Intra-regional review and coordination takes place, including a technical review resulting in assignment of channels.

e. After intra-regional review, a copy of those frequency-specific applications requiring adjacent Region approval, including a definition statement of proposed service area, shall then be forwarded to the adjacent Region(s) for review.[1] This information will be sent to the adjacent Regional chairperson(s) using the CAPRAD database.

---

[1] If an applicant's proposed service area or interference contour extends into an adjacent Public Safety Region(s), the application must be approved by the affected Region(s). Service area shall normally be defined as the area included within the geographical boundary of the applicant, plus three (3) miles. Interference contour shall normally be defined as a 5 dBu co-channel contour or a 60 dBu adjacent channel

f. The adjacent Region reviews the application. If the application is approved, a letter of concurrence shall be sent, via the CAPRAD database, to the initiating Regional chairperson within thirty (30) calendar days.

II. Dispute Resolution

(1) If the adjacent Region(s) cannot approve the request, the adjacent Region shall document the reasons for partial or non-concurrence, and respond within 10 (Ten) calendar days via email. If the applying Region cannot modify the application to satisfy the objections of the adjacent Region then, a working group comprised of representatives of the two Regions shall be convened within thirty (30) calendar days to attempt to resolve the dispute. The working group shall then report its findings within thirty (30) calendar days to the Regional chairpersons' email (CAPRAD database). Findings may include, but not be limited to:

(i) Unconditional concurrence;

(ii) Conditional concurrence contingent upon modification of applicant's technical parameters; or

(iii) Partial or total denial of proposed frequencies due to inability to meet co-channel/adjacent channel interference free protection to existing licensees within the adjacent Region.

(2) If the Inter-Regional Working Group cannot resolve the dispute, then the matter shall be forwarded for evaluation to the National Regional Planning Council (NRPC). Each Region involved in the dispute shall include a detailed explanation of its position, including engineering studies and any other technical information deemed relevant. The NRPC will, within thirty (30) calendar days, report its recommendation(s)

---

contour. Other definitions of service area or interference shall be justified with an accompanying *Memorandum of Understanding (MOU)* or other application documentation between agencies, i.e. mutual aid agreements.

to the Regional chairpersons via the CAPRAD database. The NRPC's decision may support either of the disputing Regions or it may develop a proposal that it deems mutually advantageous to each disputing Region.

g. Where adjacent Region concurrence has been secured, and the channel assignments would result in no change to the Region's currently Commission approved channel assignment matrix. The initiating Region may then advise the applicant(s) that their application may be forwarded to a frequency coordinator for processing and filing with the Commission.

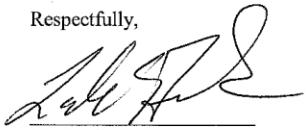
h. Where adjacent Region concurrence has been secured, and the channel assignments would result in a change to the Region's currently Commission approved channel assignment matrix, then the initiating Region shall file with the Commission a *Petition to Amend* their current Regional plan's frequency matrix, reflecting the new channel assignments, with a copy of the *Petition* sent to the adjacent Regional chairperson(s).

i. Upon Commission issuance of an *Order* adopting the amended channel assignment matrix, the initiating Regional chairperson will send a courtesy copy of the *Order* to the adjacent Regional chairperson(s) and may then advise the applicant(s) that they may forward their applications to the frequency coordinator for processing and filing with the Commission.

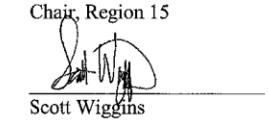
III. CONCLUSION

3. IN AGREEMENT HERETO, Regions 15 and 22 do hereunto set their signatures the day and year first above written.

Respectfully,



Mr. Leslie E. Fish
Chair, Region 15



Scott Wiggins
Chair, Region 22

Date: 09/13/2010

Inter-Regional Coordination Procedures
and
Procedures for Resolution of Disputes
That May Arise Under FCC Approved Plans

I. Coordination Procedures

I. INTRODUCTION

1. This is a mutually agreed upon Inter-Regional Coordination Procedures Agreement (Agreement) by and between the following 700 MHz Regional Planning Committees, Region 15 (Iowa) and Region 24 (Missouri).

II. INTER-REGIONAL COORDINATION AGREEMENT

2. The following is the specific procedure for inter-regional coordination which has been agreed upon by Region 15 and Region 24, and which will be used by the Regions to coordinate with adjacent Regional Planning Committees.

a. An application filing window is opened or the Region announces that it is prepared to begin accepting applications on a first-come/first-served basis.

b. Applications by eligible entities are accepted.

c. An application filing window (if this procedure is being used) is closed after appropriate time interval.

d. Intra-regional review and coordination takes place, including a technical review resulting in assignment of channels.

e. After intra-regional review, a copy of those frequency-specific applications requiring adjacent Region approval, including a definition statement of proposed service area, shall then be forwarded to the adjacent Region(s) for review.[1] This information will be sent to the adjacent Regional chairperson(s) using the CAPRAD database.

---

[1] If an applicant's proposed service area or interference contour extends into an adjacent Public Safety Region(s), the application must be approved by the affected Region(s). Service area shall normally be defined as the area included within the geographical boundary of the applicant, plus three (3) miles. Interference contour shall normally be defined as a 5 dBu co-channel contour or a 60 dBu adjacent channel

f. The adjacent Region reviews the application. If the application is approved, a letter of concurrence shall be sent, via the CAPRAD database, to the initiating Regional chairperson within thirty (30) calendar days.

II. Dispute Resolution

(1) If the adjacent Region(s) cannot approve the request, the adjacent Region shall document the reasons for partial or non-concurrence, and respond within 10 (Ten) calendar days via email. If the applying Region cannot modify the application to satisfy the objections of the adjacent Region then, a working group comprised of representatives of the two Regions shall be convened within thirty (30) calendar days to attempt to resolve the dispute. The working group shall then report its findings within thirty (30) calendar days to the Regional chairpersons' email (CAPRAD database). Findings may include, but not be limited to:

(i) Unconditional concurrence;

(ii) Conditional concurrence contingent upon modification of applicant's technical parameters; or

(iii) Partial or total denial of proposed frequencies due to inability to meet co-channel/adjacent channel interference free protection to existing licensees within the adjacent Region.

(2) If the Inter-Regional Working Group cannot resolve the dispute, then the matter shall be forwarded for evaluation to the National Regional Planning Council (NRPC). Each Region involved in the dispute shall include a detailed explanation of its position, including engineering studies and any other technical information deemed relevant. The NRPC will, within thirty (30) calendar days, report its recommendation(s)

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contour. Other definitions of service area or interference shall be justified with an accompanying *Memorandum of Understanding (MOU)* or other application documentation between agencies, i.e. mutual aid agreements.

to the Regional chairpersons via the CAPRAD database. The NRPC's decision may support either of the disputing Regions or it may develop a proposal that it deems mutually advantageous to each disputing Region.

g. Where adjacent Region concurrence has been secured, and the channel assignments would result in no change to the Region's currently Commission approved channel assignment matrix. The initiating Region may then advise the applicant(s) that their application may be forwarded to a frequency coordinator for processing and filing with the Commission.

h. Where adjacent Region concurrence has been secured, and the channel assignments would result in a change to the Region's currently Commission approved channel assignment matrix, then the initiating Region shall file with the Commission a *Petition to Amend* their current Regional plan's frequency matrix, reflecting the new channel assignments, with a copy of the *Petition* sent to the adjacent Regional chairperson(s).

i. Upon Commission issuance of an *Order* adopting the amended channel assignment matrix, the initiating Regional chairperson will send a courtesy copy of the *Order* to the adjacent Regional chairperson(s) and may then advise the applicant(s) that they may forward their applications to the frequency coordinator for processing and filing with the Commission.

III. CONCLUSION

3. IN AGREEMENT HERETO, Regions 15 and 24 do hereunto set their signatures the day and year first above written.

Respectfully,

Mr. Leslie E. Fish
Chair, Region 15

Steven T. Devine
Chair, Region 24

Date: JULY 4 2010

Inter-Regional Coordination Procedures
and
Procedures for Resolution of Disputes
That May Arise Under FCC Approved Plans

I. Coordination Procedures

I. INTRODUCTION

1. This is a mutually agreed upon Inter-Regional Coordination Procedures Agreement (Agreement) by and between the following 700 MHz Regional Planning Committees, Region 15 (Iowa) and Region 26 (Nebraska).

II. INTER-REGIONAL COORDINATION AGREEMENT

2. The following is the specific procedure for inter-regional coordination which has been agreed upon by Region 15 and Region 26, and which will be used by the Regions to coordinate with adjacent Regional Planning Committees.

a. An application filing window is opened or the Region announces that it is prepared to begin accepting applications on a first-come/first-served basis.

b. Applications by eligible entities are accepted.

c. An application filing window (if this procedure is being used) is closed after appropriate time interval.

d. Intra-regional review and coordination takes place, including a technical review resulting in assignment of channels.

e. After intra-regional review, a copy of those frequency-specific applications requiring adjacent Region approval, including a definition statement of proposed service area, shall then be forwarded to the adjacent Region(s) for review.[1] This information will be sent to the adjacent Regional chairperson(s) using the CAPRAD database.

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[1] If an applicant's proposed service area or interference contour extends into an adjacent Public Safety Region(s), the application must be approved by the affected Region(s). Service area shall normally be defined as the area included within the geographical boundary of the applicant, plus three (3) miles. Interference contour shall normally be defined as a 5 dBu co-channel contour or a 60 dBu adjacent channel

f. The adjacent Region reviews the application. If the application is approved, a letter of concurrence shall be sent, via the CAPRAD database, to the initiating Regional chairperson within thirty (30) calendar days.

II. Dispute Resolution

(1) If the adjacent Region(s) cannot approve the request, the adjacent Region shall document the reasons for partial or non-concurrence, and respond within 10 (Ten) calendar days via email. If the applying Region cannot modify the application to satisfy the objections of the adjacent Region then, a working group comprised of representatives of the two Regions shall be convened within thirty (30) calendar days to attempt to resolve the dispute. The working group shall then report its findings within thirty (30) calendar days to the Regional chairpersons' email (CAPRAD database). Findings may include, but not be limited to:

(i) Unconditional concurrence;

(ii) Conditional concurrence contingent upon modification of applicant's technical parameters; or

(iii) Partial or total denial of proposed frequencies due to inability to meet co-channel/adjacent channel interference free protection to existing licensees within the adjacent Region.

(2) If the Inter-Regional Working Group cannot resolve the dispute, then the matter shall be forwarded for evaluation to the National Regional Planning Council (NRPC). Each Region involved in the dispute shall include a detailed explanation of its position, including engineering studies and any other technical information deemed relevant. The NRPC will, within thirty (30) calendar days, report its recommendation(s)

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contour. Other definitions of service area or interference shall be justified with an accompanying *Memorandum of Understanding (MOU)* or other application documentation between agencies, i.e. mutual aid agreements.

to the Regional chairpersons via the CAPRAD database. The NRPC's decision may support either of the disputing Regions or it may develop a proposal that it deems mutually advantageous to each disputing Region.

g. Where adjacent Region concurrence has been secured, and the channel assignments would result in no change to the Region's currently Commission approved channel assignment matrix. The initiating Region may then advise the applicant(s) that their application may be forwarded to a frequency coordinator for processing and filing with the Commission.

h. Where adjacent Region concurrence has been secured, and the channel assignments would result in a change to the Region's currently Commission approved channel assignment matrix, then the initiating Region shall file with the Commission a *Petition to Amend* their current Regional plan's frequency matrix, reflecting the new channel assignments, with a copy of the *Petition* sent to the adjacent Regional chairperson(s).

i. Upon Commission issuance of an *Order* adopting the amended channel assignment matrix, the initiating Regional chairperson will send a courtesy copy of the *Order* to the adjacent Regional chairperson(s) and may then advise the applicant(s) that they may forward their applications to the frequency coordinator for processing and filing with the Commission.

III. CONCLUSION

3. IN AGREEMENT HERETO, Regions 15 and 26 do hereunto set their signatures the day and year first above written.

Respectfully,

Mr. Leslie E. Fish
Chair, Region 15

Michael Jeffries
Chair, Region 26

Date: 7/29/10

Inter-Regional Coordination Procedures
and
Procedures for Resolution of Disputes
That May Arise Under FCC Approved Plans

I. Coordination Procedures

I. INTRODUCTION

1. This is a mutually agreed upon Inter-Regional Coordination Procedures Agreement (Agreement) by and between the following 700 MHz Regional Planning Committees, Region 15 (Iowa) and Region 45 (Wisconsin).

II. INTER-REGIONAL COORDINATION AGREEMENT

2. The following is the specific procedure for inter-regional coordination which has been agreed upon by Region 15 and Region 45, and which will be used by the Regions to coordinate with adjacent Regional Planning Committees.

a. An application filing window is opened or the Region announces that it is prepared to begin accepting applications on a first-come/first-served basis.

b. Applications by eligible entities are accepted.

c. An application filing window (if this procedure is being used) is closed after appropriate time interval.

d. Intra-regional review and coordination takes place, including a technical review resulting in assignment of channels.

e. After intra-regional review, a copy of those frequency-specific applications requiring adjacent Region approval, including a definition statement of proposed service area, shall then be forwarded to the adjacent Region(s) for review.[1] This information will be sent to the adjacent Regional chairperson(s) using the CAPRAD database.

---

[1] If an applicant's proposed service area or interference contour extends into an adjacent Public Safety Region(s), the application must be approved by the affected Region(s). Service area shall normally be defined as the area included within the geographical boundary of the applicant, plus three (3) miles. Interference contour shall normally be defined as a 5 dBu co-channel contour or a 60 dBu adjacent channel

f. The adjacent Region reviews the application. If the application is approved, a letter of concurrence shall be sent, via the CAPRAD database, to the initiating Regional chairperson within thirty (30) calendar days.

II. Dispute Resolution

(1) If the adjacent Region(s) cannot approve the request, the adjacent Region shall document the reasons for partial or non-concurrence, and respond within 10 (Ten) calendar days via email. If the applying Region cannot modify the application to satisfy the objections of the adjacent Region then, a working group comprised of representatives of the two Regions shall be convened within thirty (30) calendar days to attempt to resolve the dispute. The working group shall then report its findings within thirty (30) calendar days to the Regional chairpersons' email (CAPRAD database). Findings may include, but not be limited to:

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(ii) Conditional concurrence contingent upon modification of applicant's technical parameters; or

(iii) Partial or total denial of proposed frequencies due to inability to meet co-channel/adjacent channel interference free protection to existing licensees within the adjacent Region.

(2) If the Inter-Regional Working Group cannot resolve the dispute, then the matter shall be forwarded for evaluation to the National Regional Planning Council (NRPC). Each Region involved in the dispute shall include a detailed explanation of its position, including engineering studies and any other technical information deemed relevant. The NRPC will, within thirty (30) calendar days, report its recommendation(s)

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contour. Other definitions of service area or interference shall be justified with an accompanying *Memorandum of Understanding (MOU)* or other application documentation between agencies, i.e. mutual aid agreements.

to the Regional chairpersons via the CAPRAD database. The NRPC's decision may support either of the disputing Regions or it may develop a proposal that it deems mutually advantageous to each disputing Region.

g. Where adjacent Region concurrence has been secured, and the channel assignments would result in no change to the Region's currently Commission approved channel assignment matrix. The initiating Region may then advise the applicant(s) that their application may be forwarded to a frequency coordinator for processing and filing with the Commission.

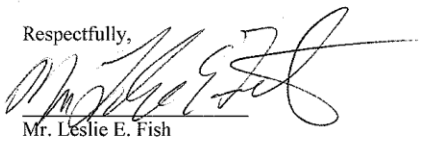
h. Where adjacent Region concurrence has been secured, and the channel assignments would result in a change to the Region's currently Commission approved channel assignment matrix, then the initiating Region shall file with the Commission a *Petition to Amend* their current Regional plan's frequency matrix, reflecting the new channel assignments, with a copy of the *Petition* sent to the adjacent Regional chairperson(s).

i. Upon Commission issuance of an *Order* adopting the amended channel assignment matrix, the initiating Regional chairperson will send a courtesy copy of the *Order* to the adjacent Regional chairperson(s) and may then advise the applicant(s) that they may forward their applications to the frequency coordinator for processing and filing with the Commission.

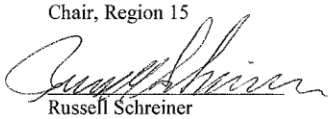
III. CONCLUSION

3. IN AGREEMENT HERETO, Regions 15 and 45 do hereunto set their signatures the day and year first above written.

Respectfully,



Mr. Leslie E. Fish
Chair, Region 15



Russell Schreiner
Chair, Region 45

Date: 1/24/2011

Inter-Regional Coordination Procedures
and
Procedures for Resolution of Disputes
That May Arise Under FCC Approved Plans

I. Coordination Procedures

I. INTRODUCTION

1. This is a mutually agreed upon Inter-Regional Coordination Procedures Agreement (Agreement) by and between the following 700 MHz Regional Planning Committees, Region 15 (Iowa) and Region 38 (South Dakota).

II. INTER-REGIONAL COORDINATION AGREEMENT

2. The following is the specific procedure for inter-regional coordination which has been agreed upon by Region 15 and Region 38, and which will be used by the Regions to coordinate with adjacent Regional Planning Committees.

a. An application filing window is opened or the Region announces that it is prepared to begin accepting applications on a first-come/first-served basis.

b. Applications by eligible entities are accepted.

c. An application filing window (if this procedure is being used) is closed after appropriate time interval.

d. Intra-regional review and coordination takes place, including a technical review resulting in assignment of channels.

e. After intra-regional review, a copy of those frequency-specific applications requiring adjacent Region approval, including a definition statement of proposed service area, shall then be forwarded to the adjacent Region(s) for review.[1] This information will be sent to the adjacent Regional chairperson(s) using the CAPRAD database.

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[1] If an applicant's proposed service area or interference contour extends into an adjacent Public Safety Region(s), the application must be approved by the affected Region(s). Service area shall normally be defined as the area included within the geographical boundary of the applicant, plus three (3) miles. Interference contour shall normally be defined as a 5 dBu co-channel contour or a 60 dBu adjacent channel

f. The adjacent Region reviews the application. If the application is approved, a letter of concurrence shall be sent, via the CAPRAD database, to the initiating Regional chairperson within thirty (30) calendar days.

II. Dispute Resolution

(1) If the adjacent Region(s) cannot approve the request, the adjacent Region shall document the reasons for partial or non-concurrence, and respond within 10 (Ten) calendar days via email. If the applying Region cannot modify the application to satisfy the objections of the adjacent Region then, a working group comprised of representatives of the two Regions shall be convened within thirty (30) calendar days to attempt to resolve the dispute. The working group shall then report its findings within thirty (30) calendar days to the Regional chairpersons' email (CAPRAD database). Findings may include, but not be limited to:

(i) Unconditional concurrence;

(ii) Conditional concurrence contingent upon modification of applicant's technical parameters; or

(iii) Partial or total denial of proposed frequencies due to inability to meet co-channel/adjacent channel interference free protection to existing licensees within the adjacent Region.

(2) If the Inter-Regional Working Group cannot resolve the dispute, then the matter shall be forwarded for evaluation to the National Regional Planning Council (NRPC). Each Region involved in the dispute shall include a detailed explanation of its position, including engineering studies and any other technical information deemed relevant. The NRPC will, within thirty (30) calendar days, report its recommendation(s)

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contour. Other definitions of service area or interference shall be justified with an accompanying *Memorandum of Understanding (MOU)* or other application documentation between agencies, i.e. mutual aid agreements.

to the Regional chairpersons via the CAPRAD database. The NRPC's decision may support either of the disputing Regions or it may develop a proposal that it deems mutually advantageous to each disputing Region.

g. Where adjacent Region concurrence has been secured, and the channel assignments would result in no change to the Region's currently Commission approved channel assignment matrix. The initiating Region may then advise the applicant(s) that their application may be forwarded to a frequency coordinator for processing and filing with the Commission.

h. Where adjacent Region concurrence has been secured, and the channel assignments would result in a change to the Region's currently Commission approved channel assignment matrix, then the initiating Region shall file with the Commission a *Petition to Amend* their current Regional plan's frequency matrix, reflecting the new channel assignments, with a copy of the *Petition* sent to the adjacent Regional chairperson(s).

Upon Commission issuance of an *Order* adopting the amended channel assignment matrix, the initiating Regional chairperson will send a courtesy copy of the *Order* to the adjacent Regional chairperson(s) and may then advise the applicant(s) that they may forward their applications to the frequency coordinator for processing and filing with the Commission.

III. CONCLUSION

3. **IN AGREEMENT HERETO,** Regions 15 and 38 do hereunto set their signatures the day and year first above written.

Respectfully,

Mr. Leslie E. Fish
Chair, Region 15

06/24/2010
Todd Dravland
Chair, Region 38

Date: 06/24/2010

Appendix G
Table of 700 MHz Interoperability Channels

16 Channel Sets	Description	Label
Channel 23 & 24	*General Public Safety Services (secondary trunked)*	*7TAC51*
Channel 103 & 104	*General Public Safety Services (secondary trunked)*	*7TAC52*
Channel 183 & 184	*General Public Safety Services (secondary trunked)*	*7TAC53*
Channel 263 & 264	*General Public Safety Services (secondary trunked)*	*7TAC54*
Channel 39 & 40	Calling Channel	7CALL50
Channel 119 & 120	General Public Safety Service	7TAC55
Channel 199 & 200	General Public Safety Service	7TAC56
Channel 279 & 280	Mobile Data	7DATA69
Channel 63 & 64	Emergency Medical Service	7MED65
Channel 143 & 144	Fire Service	7FIRE63
Channel 223 & 224	Law Enforcement Service	7LAW61
Channel 303 & 304	Mobile Repeater	7MOB59
Channel 79 & 80	Emergency Medical Service	7MED66
Channel 159 & 160	Fire Service	7FIRE64
Channel 239 & 240	Law Enforcement Service	7LAW62
Channel 319 & 320	Other Public Service	7GTAC57
Channel 657 & 658	*General Public Safety Services (secondary trunked)*	*7TAC71*
Channel 737 & 738	*General Public Safety Services (secondary trunked)*	*7TAC72*
Channel 817 & 818	*General Public Safety Services (secondary trunked)*	*7TAC73*
Channel 897 & 898	*General Public Safety Services (secondary trunked)*	*7TAC74*
Channel 681 & 682	Calling Channel	7CALL70
Channel 761 & 762	General Public Safety Service	7TAC75
Channel 841 & 842	General Public Safety Service	7TAC76
Channel 921 & 922	Mobile Data	7DATA89
Channel 641 & 642	Emergency Medical Service	7MED86
Channel 721 & 722	Fire Service	7FIRE83
Channel 801 & 802	Law Enforcement Service	7LAW81
Channel 881 & 882	Mobile Repeater	7MOB79
Channel 697 & 698	Emergency Medical Service	7MED87
Channel 777 & 778	Fire Service	7FIRE84
Channel 857 & 858	Law Enforcement Service	7LAW82
Channel 937 & 938	Other Public Services	7GTAC77

Project 25 Common Air Interface
Interoperability Channel Technical Parameters

Certain common P25 parameters need to be defined to ensure digital radios operating on the 700 MHz Interoperability Channels can communicate. This is analogous to defining the common CTCSS tone used on NPSPAC analog Interoperability channels.

Network Access Code

In the Project 25 Common Air Interface definition, the Network Access Code (NAC) is analogous to the use of CTCSS and CDCSS signals in analog radio systems. It is a code transmitted in the pre-amble of the P25 signal and repeated periodically throughout the transmission. Its purpose is to provide selective access to and maintain access to a receiver. It is also used to block nuisance and other co-channel signals. There are up to 4096 of these NAC codes. For ease of migration in other frequency bands, a NAC code table was developed which shows a mapping of CTCSS and CDCSS signals into corresponding NAC codes. Document TIA/EIA TSB102.BAAC contains NAC code table and other Project 25 Common Air Interface Reserve Values.

The use of NAC code $293 is required for the 700 MHz Interoperability Channel NAC code.

Talk group ID

In the Project 25 Common Air Interface definition, the Talk group ID on conventional channels is analogous to the use of talk groups in trunking. In order to ensure that all users can communicate, all units should use a common Talk group ID.

Recommendation: Use P25 default value for Talk group ID = $0001

Manufacturer's ID

The Project 25 Common Air Interface allows the ability to define manufacturer specific functions. In order to ensure that all users can communicate, all units should not use a specific Manufacturer's ID, but should use the default value of $00.

Message ID

The Project 25 Common Air Interface allows the ability to define specific message functions. In order to ensure that all users can communicate, all units should use the default Message ID for unencrypted messages of $0000000000000000000.

Encryption Algorithm ID and Key ID

The Project 25 Common Air Interface allows the ability to define specific encryption algorithms and encryption keys. In order to ensure that all users can communicate, encryption should not be used on the Interoperability Calling Channels, all units should use the default Algorithm ID for defaults may be used for the other Interoperability channels when encryption is not used.

Use of encryption is allowed on the other Interoperability channels. Regional Planning Committees need to define appropriate Message ID, Encryption Algorithm ID, and Encryption Key ID to be used in the encrypted mode on Interoperability channels.

Appendix H
Region 15 Channel Allotments

03/02/10 Region 15 - Iowa
Channel Allotments by Class

General Use

County	FCC Channel Band	Number	Base Frequency	Mobile Frequency
Adair				
	Voice 12.5KHz	89-90	769.556250	799.556250
	Voice 12.5KHz	403-404	771.518750	801.518750
	Voice 12.5KHz	465-466	771.906250	801.906250
	Voice 12.5KHz	527-528	772.293750	802.293750
	Voice 12.5KHz	569-570	772.556250	802.556250
	Voice 12.5KHz	615-616	772.843750	802.843750
	Voice 12.5KHz	675-676	773.218750	803.218750
	Voice 12.5KHz	717-718	773.481250	803.481250
	Voice 12.5KHz	759-760	773.743750	803.743750
	Voice 12.5KHz	905-906	774.656250	804.656250
Adams				
	Voice 12.5KHz	19-20	769.118750	799.118750
	Voice 12.5KHz	131-132	769.818750	799.818750
	Voice 12.5KHz	257-258	770.606250	800.606250
	Voice 12.5KHz	299-300	770.868750	800.868750
	Voice 12.5KHz	351-352	771.193750	801.193750
	Voice 12.5KHz	407-408	771.543750	801.543750
	Voice 12.5KHz	473-474	771.956250	801.956250
	Voice 12.5KHz	579-580	772.618750	802.618750
	Voice 12.5KHz	625-626	772.906250	802.906250
	Voice 12.5KHz	781-782	773.881250	803.881250

Allamakee

Voice	12.5KHz	245-246	770.531250	800.531250
Voice	12.5KHz	359-360	771.243750	801.243750
Voice	12.5KHz	403-404	771.518750	801.518750
Voice	12.5KHz	429-430	771.681250	801.681250
Voice	12.5KHz	465-466	771.906250	801.906250
Voice	12.5KHz	519-520	772.243750	802.243750
Voice	12.5KHz	547-548	772.418750	802.418750
Voice	12.5KHz	579-580	772.618750	802.618750
Voice	12.5KHz	611-612	772.818750	802.818750
Voice	12.5KHz	747-748	773.668750	803.668750
Voice	12.5KHz	785-786	773.906250	803.906250
Voice	12.5KHz	863-864	774.393750	804.393750

Appanoose

Voice	12.5KHz	81-82	769.506250	799.506250
Voice	12.5KHz	129-130	769.806250	799.806250
Voice	12.5KHz	171-172	770.068750	800.068750
Voice	12.5KHz	285-286	770.781250	800.781250
Voice	12.5KHz	333-334	771.081250	801.081250
Voice	12.5KHz	375-376	771.343750	801.343750
Voice	12.5KHz	427-428	771.668750	801.668750
Voice	12.5KHz	483-484	772.018750	802.018750
Voice	12.5KHz	533-534	772.331250	802.331250
Voice	12.5KHz	577-578	772.606250	802.606250
Voice	12.5KHz	627-628	772.918750	802.918750
Voice	12.5KHz	677-678	773.231250	803.231250

Audubon

Voice	12.5KHz	173-174	770.081250	800.081250
Voice	12.5KHz	247-248	770.543750	800.543750
Voice	12.5KHz	295-296	770.843750	800.843750
Voice	12.5KHz	341-342	771.131250	801.131250
Voice	12.5KHz	391-392	771.443750	801.443750
Voice	12.5KHz	449-450	771.806250	801.806250
Voice	12.5KHz	493-494	772.081250	802.081250
Voice	12.5KHz	553-554	772.456250	802.456250
Voice	12.5KHz	605-606	772.781250	802.781250
Voice	12.5KHz	703-704	773.393750	803.393750
Voice	12.5KHz	829-830	774.181250	804.181250

Benton

Voice 12.5KHz	13-14	769.081250	799.081250
Voice 12.5KHz	123-124	769.768750	799.768750
Voice 12.5KHz	205-206	770.281250	800.281250
Voice 12.5KHz	329-330	771.056250	801.056250
Voice 12.5KHz	395-396	771.468750	801.468750
Voice 12.5KHz	429-430	771.681250	801.681250
Voice 12.5KHz	473-474	771.956250	801.956250
Voice 12.5KHz	517-518	772.231250	802.231250
Voice 12.5KHz	543-544	772.393750	802.393750
Voice 12.5KHz	569-570	772.556250	802.556250
Voice 12.5KHz	601-602	772.756250	802.756250
Voice 12.5KHz	631-632	772.943750	802.943750
Voice 12.5KHz	719-720	773.493750	803.493750
Voice 12.5KHz	755-756	773.718750	803.718750
Voice 12.5KHz	793-794	773.956250	803.956250

Black Hawk

Voice 12.5KHz	19-20	769.118750	799.118750
Voice 12.5KHz	41-42	769.256250	799.256250
Voice 12.5KHz	87-88	769.543750	799.543750
Voice 12.5KHz	131-132	769.818750	799.818750
Voice 12.5KHz	175-176	770.093750	800.093750
Voice 12.5KHz	201-202	770.256250	800.256250
Voice 12.5KHz	247-248	770.543750	800.543750
Voice 12.5KHz	359-360	771.243750	801.243750
Voice 12.5KHz	381-382	771.381250	801.381250
Voice 12.5KHz	403-404	771.518750	801.518750
Voice 12.5KHz	425-426	771.656250	801.656250
Voice 12.5KHz	447-448	771.793750	801.793750
Voice 12.5KHz	469-470	771.931250	801.931250
Voice 12.5KHz	491-492	772.068750	802.068750
Voice 12.5KHz	513-514	772.206250	802.206250
Voice 12.5KHz	535-536	772.343750	802.343750
Voice 12.5KHz	557-558	772.481250	802.481250
Voice 12.5KHz	579-580	772.618750	802.618750
Voice 12.5KHz	625-626	772.906250	802.906250
Voice 12.5KHz	675-676	773.218750	803.218750
Voice 12.5KHz	701-702	773.381250	803.381250
Voice 12.5KHz	747-748	773.668750	803.668750
Voice 12.5KHz	835-836	774.218750	804.218750
Voice 12.5KHz	863-864	774.393750	804.393750
Voice 12.5KHz	903-904	774.643750	804.643750
Voice 12.5KHz	943-944	774.893750	804.893750

Boone

Voice 12.5KHz	53-54	769.331250	799.331250
Voice 12.5KHz	85-86	769.531250	799.531250
Voice 12.5KHz	339-340	771.118750	801.118750
Voice 12.5KHz	383-384	771.393750	801.393750
Voice 12.5KHz	427-428	771.668750	801.668750
Voice 12.5KHz	471-472	771.943750	801.943750
Voice 12.5KHz	515-516	772.218750	802.218750
Voice 12.5KHz	547-548	772.418750	802.418750
Voice 12.5KHz	577-578	772.606250	802.606250
Voice 12.5KHz	603-604	772.768750	802.768750
Voice 12.5KHz	629-630	772.931250	802.931250
Voice 12.5KHz	661-662	773.131250	803.131250
Voice 12.5KHz	705-706	773.406250	803.406250
Voice 12.5KHz	839-840	774.243750	804.243750
Voice 12.5KHz	877-878	774.481250	804.481250

Bremer

Voice 12.5KHz	15-16	769.093750	799.093750
Voice 12.5KHz	45-46	769.281250	799.281250
Voice 12.5KHz	83-84	769.518750	799.518750
Voice 12.5KHz	121-122	769.756250	799.756250
Voice 12.5KHz	219-220	770.368750	800.368750
Voice 12.5KHz	283-284	770.768750	800.768750
Voice 12.5KHz	323-324	771.018750	801.018750
Voice 12.5KHz	375-376	771.343750	801.343750
Voice 12.5KHz	407-408	771.543750	801.543750
Voice 12.5KHz	433-434	771.706250	801.706250
Voice 12.5KHz	459-460	771.868750	801.868750
Voice 12.5KHz	541-542	772.381250	802.381250
Voice 12.5KHz	603-604	772.768750	802.768750
Voice 12.5KHz	711-712	773.443750	803.443750
Voice 12.5KHz	757-758	773.731250	803.731250
Voice 12.5KHz	919-920	774.743750	804.743750

Buchanan

Voice 12.5KHz	57-58	769.356250	799.356250
Voice 12.5KHz	99-100	769.618750	799.618750
Voice 12.5KHz	179-180	770.118750	800.118750
Voice 12.5KHz	211-212	770.318750	800.318750
Voice 12.5KHz	251-252	770.568750	800.568750
Voice 12.5KHz	299-300	770.868750	800.868750
Voice 12.5KHz	351-352	771.193750	801.193750
Voice 12.5KHz	391-392	771.443750	801.443750
Voice 12.5KHz	437-438	771.731250	801.731250
Voice 12.5KHz	477-478	771.981250	801.981250
Voice 12.5KHz	607-608	772.793750	802.793750
Voice 12.5KHz	707-708	773.418750	803.418750
Voice 12.5KHz	751-752	773.693750	803.693750

Buena Vista

Voice 12.5KHz	15-16	769.093750	799.093750
Voice 12.5KHz	41-42	769.256250	799.256250
Voice 12.5KHz	83-84	769.518750	799.518750
Voice 12.5KHz	169-170	770.056250	800.056250
Voice 12.5KHz	329-330	771.056250	801.056250
Voice 12.5KHz	357-358	771.231250	801.231250
Voice 12.5KHz	383-384	771.393750	801.393750
Voice 12.5KHz	421-422	771.631250	801.631250
Voice 12.5KHz	447-448	771.793750	801.793750
Voice 12.5KHz	475-476	771.968750	801.968750
Voice 12.5KHz	501-502	772.131250	802.131250
Voice 12.5KHz	527-528	772.293750	802.293750
Voice 12.5KHz	567-568	772.543750	802.543750
Voice 12.5KHz	615-616	772.843750	802.843750
Voice 12.5KHz	675-676	773.218750	803.218750
Voice 12.5KHz	747-748	773.668750	803.668750
Voice 12.5KHz	833-834	774.206250	804.206250
Voice 12.5KHz	947-948	774.918750	804.918750

Butler

Voice 12.5KHz	97-98	769.606250	799.606250
Voice 12.5KHz	293-294	770.831250	800.831250
Voice 12.5KHz	393-394	771.456250	801.456250
Voice 12.5KHz	453-454	771.831250	801.831250
Voice 12.5KHz	499-500	772.118750	802.118750
Voice 12.5KHz	545-546	772.406250	802.406250
Voice 12.5KHz	587-588	772.668750	802.668750
Voice 12.5KHz	629-630	772.931250	802.931250
Voice 12.5KHz	671-672	773.193750	803.193750
Voice 12.5KHz	781-782	773.881250	803.881250
Voice 12.5KHz	831-832	774.193750	804.193750

Calhoun

Voice 12.5KHz	205-206	770.281250	800.281250
Voice 12.5KHz	255-256	770.593750	800.593750
Voice 12.5KHz	415-416	771.593750	801.593750
Voice 12.5KHz	459-460	771.868750	801.868750
Voice 12.5KHz	505-506	772.156250	802.156250
Voice 12.5KHz	555-556	772.468750	802.468750
Voice 12.5KHz	607-608	772.793750	802.793750
Voice 12.5KHz	741-742	773.631250	803.631250
Voice 12.5KHz	785-786	773.906250	803.906250
Voice 12.5KHz	917-918	774.731250	804.731250

Carroll

Voice 12.5KHz	13-14	769.081250	799.081250
Voice 12.5KHz	43-44	769.268750	799.268750
Voice 12.5KHz	81-82	769.506250	799.506250
Voice 12.5KHz	259-260	770.618750	800.618750
Voice 12.5KHz	289-290	770.806250	800.806250
Voice 12.5KHz	327-328	771.043750	801.043750
Voice 12.5KHz	353-354	771.206250	801.206250
Voice 12.5KHz	379-380	771.368750	801.368750
Voice 12.5KHz	405-406	771.531250	801.531250
Voice 12.5KHz	437-438	771.731250	801.731250
Voice 12.5KHz	463-464	771.893750	801.893750
Voice 12.5KHz	489-490	772.056250	802.056250
Voice 12.5KHz	525-526	772.281250	802.281250
Voice 12.5KHz	601-602	772.756250	802.756250
Voice 12.5KHz	713-714	773.456250	803.456250
Voice 12.5KHz	825-826	774.156250	804.156250
Voice 12.5KHz	873-874	774.456250	804.456250
Voice 12.5KHz	903-904	774.643750	804.643750

Cass

Voice 12.5KHz	83-84	769.518750	799.518750
Voice 12.5KHz	127-128	769.793750	799.793750
Voice 12.5KHz	169-170	770.056250	800.056250
Voice 12.5KHz	211-212	770.318750	800.318750
Voice 12.5KHz	323-324	771.018750	801.018750
Voice 12.5KHz	373-374	771.331250	801.331250
Voice 12.5KHz	415-416	771.593750	801.593750
Voice 12.5KHz	459-460	771.868750	801.868750
Voice 12.5KHz	549-550	772.431250	802.431250
Voice 12.5KHz	593-594	772.706250	802.706250
Voice 12.5KHz	823-824	774.143750	804.143750
Voice 12.5KHz	913-914	774.706250	804.706250

Cedar

Voice	12.5KHz	97-98	769.606250	799.606250
Voice	12.5KHz	127-128	769.793750	799.793750
Voice	12.5KHz	177-178	770.106250	800.106250
Voice	12.5KHz	213-214	770.331250	800.331250
Voice	12.5KHz	363-364	771.268750	801.268750
Voice	12.5KHz	405-406	771.531250	801.531250
Voice	12.5KHz	449-450	771.806250	801.806250
Voice	12.5KHz	491-492	772.068750	802.068750
Voice	12.5KHz	535-536	772.343750	802.343750
Voice	12.5KHz	615-616	772.843750	802.843750
Voice	12.5KHz	827-828	774.168750	804.168750

Cerro Gordo

Voice	12.5KHz	13-14	769.081250	799.081250
Voice	12.5KHz	43-44	769.268750	799.268750
Voice	12.5KHz	81-82	769.506250	799.506250
Voice	12.5KHz	129-130	769.806250	799.806250
Voice	12.5KHz	209-210	770.306250	800.306250
Voice	12.5KHz	245-246	770.531250	800.531250
Voice	12.5KHz	281-282	770.756250	800.756250
Voice	12.5KHz	321-322	771.006250	801.006250
Voice	12.5KHz	343-344	771.143750	801.143750
Voice	12.5KHz	365-366	771.281250	801.281250
Voice	12.5KHz	387-388	771.418750	801.418750
Voice	12.5KHz	409-410	771.556250	801.556250
Voice	12.5KHz	431-432	771.693750	801.693750
Voice	12.5KHz	457-458	771.856250	801.856250
Voice	12.5KHz	481-482	772.006250	802.006250
Voice	12.5KHz	503-504	772.143750	802.143750
Voice	12.5KHz	533-534	772.331250	802.331250
Voice	12.5KHz	561-562	772.506250	802.506250
Voice	12.5KHz	609-610	772.806250	802.806250
Voice	12.5KHz	637-638	772.981250	802.981250
Voice	12.5KHz	665-666	773.156250	803.156250
Voice	12.5KHz	705-706	773.406250	803.406250
Voice	12.5KHz	751-752	773.693750	803.693750
Voice	12.5KHz	787-788	773.918750	803.918750
Voice	12.5KHz	875-876	774.468750	804.468750
Voice	12.5KHz	905-906	774.656250	804.656250

Cherokee

Voice 12.5KHz 177-178	770.106250	800.106250
Voice 12.5KHz 219-220	770.368750	800.368750
Voice 12.5KHz 285-286	770.781250	800.781250
Voice 12.5KHz 349-350	771.181250	801.181250
Voice 12.5KHz 395-396	771.468750	801.468750
Voice 12.5KHz 465-466	771.906250	801.906250
Voice 12.5KHz 507-508	772.168750	802.168750
Voice 12.5KHz 553-554	772.456250	802.456250
Voice 12.5KHz 599-600	772.743750	802.743750
Voice 12.5KHz 711-712	773.443750	803.443750
Voice 12.5KHz 871-872	774.443750	804.443750
Voice 12.5KHz 943-944	774.893750	804.893750

Chickasaw

Voice 12.5KHz 51-52	769.318750	799.318750
Voice 12.5KHz 243-244	770.518750	800.518750
Voice 12.5KHz 289-290	770.806250	800.806250
Voice 12.5KHz 333-334	771.081250	801.081250
Voice 12.5KHz 379-380	771.368750	801.368750
Voice 12.5KHz 421-422	771.631250	801.631250
Voice 12.5KHz 463-464	771.893750	801.893750
Voice 12.5KHz 537-538	772.356250	802.356250
Voice 12.5KHz 581-582	772.631250	802.631250
Voice 12.5KHz 623-624	772.893750	802.893750
Voice 12.5KHz 871-872	774.443750	804.443750

Clarke

Voice 12.5KHz 163-164	770.018750	800.018750
Voice 12.5KHz 217-218	770.356250	800.356250
Voice 12.5KHz 341-342	771.131250	801.131250
Voice 12.5KHz 385-386	771.406250	801.406250
Voice 12.5KHz 433-434	771.706250	801.706250
Voice 12.5KHz 531-532	772.318750	802.318750
Voice 12.5KHz 575-576	772.593750	802.593750
Voice 12.5KHz 619-620	772.868750	802.868750
Voice 12.5KHz 661-662	773.131250	803.131250
Voice 12.5KHz 703-704	773.393750	803.393750
Voice 12.5KHz 753-754	773.706250	803.706250

Clay

Voice 12.5KHz 47-48	769.293750	799.293750
Voice 12.5KHz 93-94	769.581250	799.581250
Voice 12.5KHz 125-126	769.781250	799.781250
Voice 12.5KHz 209-210	770.306250	800.306250
Voice 12.5KHz 247-248	770.543750	800.543750
Voice 12.5KHz 281-282	770.756250	800.756250
Voice 12.5KHz 369-370	771.306250	801.306250
Voice 12.5KHz 403-404	771.518750	801.518750
Voice 12.5KHz 435-436	771.718750	801.718750
Voice 12.5KHz 481-482	772.006250	802.006250
Voice 12.5KHz 511-512	772.193750	802.193750
Voice 12.5KHz 539-540	772.368750	802.368750
Voice 12.5KHz 603-604	772.768750	802.768750
Voice 12.5KHz 637-638	772.981250	802.981250

Clayton

Voice 12.5KHz 47-48	769.293750	799.293750
Voice 12.5KHz 241-242	770.506250	800.506250
Voice 12.5KHz 281-282	770.756250	800.756250
Voice 12.5KHz 331-332	771.068750	801.068750
Voice 12.5KHz 367-368	771.293750	801.293750
Voice 12.5KHz 409-410	771.556250	801.556250
Voice 12.5KHz 523-524	772.268750	802.268750
Voice 12.5KHz 551-552	772.443750	802.443750
Voice 12.5KHz 591-592	772.693750	802.693750
Voice 12.5KHz 621-622	772.881250	802.881250
Voice 12.5KHz 833-834	774.206250	804.206250
Voice 12.5KHz 869-870	774.431250	804.431250

Clinton

Voice 12.5KHz 91-92	769.568750	799.568750
Voice 12.5KHz 201-202	770.256250	800.256250
Voice 12.5KHz 293-294	770.831250	800.831250
Voice 12.5KHz 347-348	771.168750	801.168750
Voice 12.5KHz 369-370	771.306250	801.306250
Voice 12.5KHz 395-396	771.468750	801.468750
Voice 12.5KHz 419-420	771.618750	801.618750
Voice 12.5KHz 441-442	771.756250	801.756250
Voice 12.5KHz 463-464	771.893750	801.893750
Voice 12.5KHz 507-508	772.168750	802.168750
Voice 12.5KHz 529-530	772.306250	802.306250
Voice 12.5KHz 565-566	772.531250	802.531250
Voice 12.5KHz 593-594	772.706250	802.706250
Voice 12.5KHz 629-630	772.931250	802.931250
Voice 12.5KHz 671-672	773.193750	803.193750
Voice 12.5KHz 743-744	773.643750	803.643750
Voice 12.5KHz 833-834	774.206250	804.206250
Voice 12.5KHz 867-868	774.418750	804.418750
Voice 12.5KHz 919-920	774.743750	804.743750

Crawford

Voice 12.5KHz 51-52	769.318750	799.318750
Voice 12.5KHz 87-88	769.543750	799.543750
Voice 12.5KHz 131-132	769.818750	799.818750
Voice 12.5KHz 161-162	770.006250	800.006250
Voice 12.5KHz 281-282	770.756250	800.756250
Voice 12.5KHz 331-332	771.068750	801.068750
Voice 12.5KHz 397-398	771.481250	801.481250
Voice 12.5KHz 441-442	771.756250	801.756250
Voice 12.5KHz 481-482	772.006250	802.006250
Voice 12.5KHz 559-560	772.493750	802.493750
Voice 12.5KHz 597-598	772.731250	802.731250
Voice 12.5KHz 635-636	772.968750	802.968750
Voice 12.5KHz 751-752	773.693750	803.693750
Voice 12.5KHz 791-792	773.943750	803.943750

Dallas

Voice 12.5KHz 95-96	769.593750	799.593750
Voice 12.5KHz 125-126	769.781250	799.781250
Voice 12.5KHz 171-172	770.068750	800.068750
Voice 12.5KHz 207-208	770.293750	800.293750
Voice 12.5KHz 245-246	770.531250	800.531250
Voice 12.5KHz 297-298	770.856250	800.856250
Voice 12.5KHz 321-322	771.006250	801.006250
Voice 12.5KHz 343-344	771.143750	801.143750
Voice 12.5KHz 365-366	771.281250	801.281250
Voice 12.5KHz 387-388	771.418750	801.418750
Voice 12.5KHz 409-410	771.556250	801.556250
Voice 12.5KHz 431-432	771.693750	801.693750
Voice 12.5KHz 453-454	771.831250	801.831250
Voice 12.5KHz 475-476	771.968750	801.968750
Voice 12.5KHz 497-498	772.106250	802.106250
Voice 12.5KHz 519-520	772.243750	802.243750
Voice 12.5KHz 561-562	772.506250	802.506250
Voice 12.5KHz 585-586	772.656250	802.656250
Voice 12.5KHz 611-612	772.818750	802.818750
Voice 12.5KHz 679-680	773.243750	803.243750
Voice 12.5KHz 701-702	773.381250	803.381250
Voice 12.5KHz 743-744	773.643750	803.643750
Voice 12.5KHz 795-796	773.968750	803.968750
Voice 12.5KHz 821-822	774.131250	804.131250
Voice 12.5KHz 863-864	774.393750	804.393750
Voice 12.5KHz 911-912	774.693750	804.693750

Davis

Voice 12.5KHz 325-326	771.031250	801.031250
Voice 12.5KHz 367-368	771.293750	801.293750
Voice 12.5KHz 409-410	771.556250	801.556250
Voice 12.5KHz 487-488	772.043750	802.043750
Voice 12.5KHz 559-560	772.493750	802.493750
Voice 12.5KHz 615-616	772.843750	802.843750
Voice 12.5KHz 661-662	773.131250	803.131250
Voice 12.5KHz 703-704	773.393750	803.393750
Voice 12.5KHz 759-760	773.743750	803.743750
Voice 12.5KHz 839-840	774.243750	804.243750

Decatur

Voice 12.5KHz 83-84	769.518750	799.518750
Voice 12.5KHz 247-248	770.543750	800.543750
Voice 12.5KHz 295-296	770.843750	800.843750
Voice 12.5KHz 373-374	771.331250	801.331250
Voice 12.5KHz 417-418	771.606250	801.606250
Voice 12.5KHz 467-468	771.918750	801.918750
Voice 12.5KHz 509-510	772.181250	802.181250
Voice 12.5KHz 561-562	772.506250	802.506250
Voice 12.5KHz 603-604	772.768750	802.768750
Voice 12.5KHz 665-666	773.156250	803.156250
Voice 12.5KHz 793-794	773.956250	803.956250
Voice 12.5KHz 837-838	774.231250	804.231250

Delaware

Voice 12.5KHz 135-136	769.843750	799.843750
Voice 12.5KHz 295-296	770.843750	800.843750
Voice 12.5KHz 337-338	771.106250	801.106250
Voice 12.5KHz 387-388	771.418750	801.418750
Voice 12.5KHz 451-452	771.818750	801.818750
Voice 12.5KHz 493-494	772.081250	802.081250
Voice 12.5KHz 537-538	772.356250	802.356250
Voice 12.5KHz 581-582	772.631250	802.631250
Voice 12.5KHz 613-614	772.831250	802.831250
Voice 12.5KHz 781-782	773.881250	803.881250
Voice 12.5KHz 861-862	774.381250	804.381250

Des Moines

Voice	12.5KHz	13-14	769.081250 799.081250
Voice	12.5KHz	129-130	769.806250 799.806250
Voice	12.5KHz	217-218	770.356250 800.356250
Voice	12.5KHz	255-256	770.593750 800.593750
Voice	12.5KHz	281-282	770.756250 800.756250
Voice	12.5KHz	321-322	771.006250 801.006250
Voice	12.5KHz	349-350	771.181250 801.181250
Voice	12.5KHz	411-412	771.568750 801.568750
Voice	12.5KHz	455-456	771.843750 801.843750
Voice	12.5KHz	493-494	772.081250 802.081250
Voice	12.5KHz	527-528	772.293750 802.293750
Voice	12.5KHz	563-564	772.518750 802.518750
Voice	12.5KHz	597-598	772.731250 802.731250
Voice	12.5KHz	625-626	772.906250 802.906250
Voice	12.5KHz	875-876	774.468750 804.468750
Voice	12.5KHz	947-948	774.918750 804.918750

Dickinson

Voice	12.5KHz	321-322	771.006250 801.006250
Voice	12.5KHz	387-388	771.418750 801.418750
Voice	12.5KHz	431-432	771.693750 801.693750
Voice	12.5KHz	473-474	771.956250 801.956250
Voice	12.5KHz	525-526	772.281250 802.281250
Voice	12.5KHz	569-570	772.556250 802.556250
Voice	12.5KHz	617-618	772.856250 802.856250
Voice	12.5KHz	661-662	773.131250 803.131250
Voice	12.5KHz	753-754	773.706250 803.706250
Voice	12.5KHz	799-800	773.993750 803.993750

Dubuque

Voice 12.5KHz 53-54	769.331250	799.331250
Voice 12.5KHz 85-86	769.531250	799.531250
Voice 12.5KHz 203-204	770.268750	800.268750
Voice 12.5KHz 327-328	771.043750	801.043750
Voice 12.5KHz 349-350	771.181250	801.181250
Voice 12.5KHz 371-372	771.318750	801.318750
Voice 12.5KHz 393-394	771.456250	801.456250
Voice 12.5KHz 417-418	771.606250	801.606250
Voice 12.5KHz 439-440	771.743750	801.743750
Voice 12.5KHz 461-462	771.881250	801.881250
Voice 12.5KHz 483-484	772.018750	802.018750
Voice 12.5KHz 505-506	772.156250	802.156250
Voice 12.5KHz 527-528	772.293750	802.293750
Voice 12.5KHz 561-562	772.506250	802.506250
Voice 12.5KHz 587-588	772.668750	802.668750
Voice 12.5KHz 609-610	772.806250	802.806250
Voice 12.5KHz 679-680	773.243750	803.243750
Voice 12.5KHz 705-706	773.406250	803.406250
Voice 12.5KHz 741-742	773.631250	803.631250
Voice 12.5KHz 829-830	774.181250	804.181250
Voice 12.5KHz 901-902	774.631250	804.631250
Voice 12.5KHz 941-942	774.881250	804.881250

Emmet

Voice 12.5KHz 55-56	769.343750	799.343750
Voice 12.5KHz 121-122	769.756250	799.756250
Voice 12.5KHz 171-172	770.068750	800.068750
Voice 12.5KHz 217-218	770.356250	800.356250
Voice 12.5KHz 299-300	770.868750	800.868750
Voice 12.5KHz 341-342	771.131250	801.131250
Voice 12.5KHz 399-400	771.493750	801.493750
Voice 12.5KHz 449-450	771.806250	801.806250
Voice 12.5KHz 505-506	772.156250	802.156250
Voice 12.5KHz 563-564	772.518750	802.518750
Voice 12.5KHz 749-750	773.681250	803.681250

Fayette

Voice 12.5KHz 91-92	769.568750	799.568750
Voice 12.5KHz 125-126	769.781250	799.781250
Voice 12.5KHz 161-162	770.006250	800.006250
Voice 12.5KHz 255-256	770.593750	800.593750
Voice 12.5KHz 343-344	771.143750	801.143750
Voice 12.5KHz 397-398	771.481250	801.481250
Voice 12.5KHz 441-442	771.756250	801.756250
Voice 12.5KHz 497-498	772.106250	802.106250
Voice 12.5KHz 565-566	772.531250	802.531250
Voice 12.5KHz 599-600	772.743750	802.743750
Voice 12.5KHz 743-744	773.643750	803.643750
Voice 12.5KHz 823-824	774.143750	804.143750
Voice 12.5KHz 875-876	774.468750	804.468750
Voice 12.5KHz 915-916	774.718750	804.718750

Floyd

Voice 12.5KHz 171-172	770.068750	800.068750
Voice 12.5KHz 213-214	770.331250	800.331250
Voice 12.5KHz 353-354	771.206250	801.206250
Voice 12.5KHz 401-402	771.506250	801.506250
Voice 12.5KHz 443-444	771.768750	801.768750
Voice 12.5KHz 485-486	772.031250	802.031250
Voice 12.5KHz 527-528	772.293750	802.293750
Voice 12.5KHz 569-570	772.556250	802.556250
Voice 12.5KHz 613-614	772.831250	802.831250
Voice 12.5KHz 661-662	773.131250	803.131250
Voice 12.5KHz 745-746	773.656250	803.656250
Voice 12.5KHz 793-794	773.956250	803.956250
Voice 12.5KHz 945-946	774.906250	804.906250

Franklin

Voice 12.5KHz 17-18	769.106250	799.106250
Voice 12.5KHz 123-124	769.768750	799.768750
Voice 12.5KHz 377-378	771.356250	801.356250
Voice 12.5KHz 419-420	771.618750	801.618750
Voice 12.5KHz 465-466	771.906250	801.906250
Voice 12.5KHz 507-508	772.168750	802.168750
Voice 12.5KHz 549-550	772.431250	802.431250
Voice 12.5KHz 605-606	772.781250	802.781250
Voice 12.5KHz 837-838	774.231250	804.231250

Fremont

Voice	12.5KHz	133-134	769.831250 799.831250
Voice	12.5KHz	355-356	771.218750 801.218750
Voice	12.5KHz	403-404	771.518750 801.518750
Voice	12.5KHz	447-448	771.793750 801.793750
Voice	12.5KHz	489-490	772.056250 802.056250
Voice	12.5KHz	535-536	772.343750 802.343750
Voice	12.5KHz	581-582	772.631250 802.631250
Voice	12.5KHz	675-676	773.218750 803.218750
Voice	12.5KHz	833-834	774.206250 804.206250
Voice	12.5KHz	941-942	774.881250 804.881250

Greene

Voice	12.5KHz	49-50	769.306250 799.306250
Voice	12.5KHz	99-100	769.618750 799.618750
Voice	12.5KHz	163-164	770.018750 800.018750
Voice	12.5KHz	215-216	770.343750 800.343750
Voice	12.5KHz	349-350	771.181250 801.181250
Voice	12.5KHz	395-396	771.468750 801.468750
Voice	12.5KHz	443-444	771.768750 801.768750
Voice	12.5KHz	571-572	772.568750 802.568750

Grundy

Voice	12.5KHz	93-94	769.581250 799.581250
Voice	12.5KHz	135-136	769.843750 799.843750
Voice	12.5KHz	341-342	771.131250 801.131250
Voice	12.5KHz	385-386	771.406250 801.406250
Voice	12.5KHz	439-440	771.743750 801.743750
Voice	12.5KHz	483-484	772.018750 802.018750
Voice	12.5KHz	525-526	772.281250 802.281250
Voice	12.5KHz	575-576	772.593750 802.593750
Voice	12.5KHz	619-620	772.868750 802.868750

Guthrie

Voice 12.5KHz 17-18	769.106250	799.106250
Voice 12.5KHz 139-140	769.868750	799.868750
Voice 12.5KHz 361-362	771.256250	801.256250
Voice 12.5KHz 421-422	771.631250	801.631250
Voice 12.5KHz 479-480	771.993750	801.993750
Voice 12.5KHz 535-536	772.343750	802.343750
Voice 12.5KHz 581-582	772.631250	802.631250
Voice 12.5KHz 637-638	772.981250	802.981250
Voice 12.5KHz 945-946	774.906250	804.906250

Hamilton

Voice 12.5KHz 133-134	769.831250	799.831250
Voice 12.5KHz 363-364	771.268750	801.268750
Voice 12.5KHz 407-408	771.543750	801.543750
Voice 12.5KHz 495-496	772.093750	802.093750
Voice 12.5KHz 539-540	772.368750	802.368750
Voice 12.5KHz 583-584	772.643750	802.643750
Voice 12.5KHz 783-784	773.893750	803.893750
Voice 12.5KHz 825-826	774.156250	804.156250
Voice 12.5KHz 867-868	774.418750	804.418750
Voice 12.5KHz 909-910	774.681250	804.681250

Hancock

Voice 12.5KHz 49-50	769.306250	799.306250
Voice 12.5KHz 91-92	769.568750	799.568750
Voice 12.5KHz 177-178	770.106250	800.106250
Voice 12.5KHz 349-350	771.181250	801.181250
Voice 12.5KHz 391-392	771.443750	801.443750
Voice 12.5KHz 435-436	771.718750	801.718750
Voice 12.5KHz 491-492	772.068750	802.068750
Voice 12.5KHz 541-542	772.381250	802.381250
Voice 12.5KHz 593-594	772.706250	802.706250
Voice 12.5KHz 911-912	774.693750	804.693750

Hardin

Voice 12.5KHz 57-58	769.356250	799.356250
Voice 12.5KHz 89-90	769.556250	799.556250
Voice 12.5KHz 173-174	770.081250	800.081250
Voice 12.5KHz 249-250	770.556250	800.556250
Voice 12.5KHz 299-300	770.868750	800.868750
Voice 12.5KHz 329-330	771.056250	801.056250
Voice 12.5KHz 373-374	771.331250	801.331250
Voice 12.5KHz 449-450	771.806250	801.806250
Voice 12.5KHz 479-480	771.993750	801.993750
Voice 12.5KHz 563-564	772.518750	802.518750
Voice 12.5KHz 623-624	772.893750	802.893750
Voice 12.5KHz 713-714	773.456250	803.456250
Voice 12.5KHz 941-942	774.881250	804.881250

Harrison

Voice 12.5KHz 249-250	770.556250	800.556250
Voice 12.5KHz 349-350	771.181250	801.181250
Voice 12.5KHz 375-376	771.343750	801.343750
Voice 12.5KHz 401-402	771.506250	801.506250
Voice 12.5KHz 431-432	771.693750	801.693750
Voice 12.5KHz 457-458	771.856250	801.856250
Voice 12.5KHz 491-492	772.068750	802.068750
Voice 12.5KHz 517-518	772.231250	802.231250
Voice 12.5KHz 543-544	772.393750	802.393750
Voice 12.5KHz 583-584	772.643750	802.643750
Voice 12.5KHz 631-632	772.943750	802.943750
Voice 12.5KHz 741-742	773.631250	803.631250
Voice 12.5KHz 821-822	774.131250	804.131250
Voice 12.5KHz 917-918	774.731250	804.731250

Henry

Voice	12.5KHz	19-20	769.118750 799.118750
Voice	12.5KHz	57-58	769.356250 799.356250
Voice	12.5KHz	135-136	769.843750 799.843750
Voice	12.5KHz	171-172	770.068750 800.068750
Voice	12.5KHz	285-286	770.781250 800.781250
Voice	12.5KHz	353-354	771.206250 801.206250
Voice	12.5KHz	381-382	771.381250 801.381250
Voice	12.5KHz	415-416	771.593750 801.593750
Voice	12.5KHz	473-474	771.956250 801.956250
Voice	12.5KHz	503-504	772.143750 802.143750
Voice	12.5KHz	531-532	772.318750 802.318750
Voice	12.5KHz	613-614	772.831250 802.831250
Voice	12.5KHz	677-678	773.231250 803.231250
Voice	12.5KHz	715-716	773.468750 803.468750
Voice	12.5KHz	869-870	774.431250 804.431250

Howard

Voice	12.5KHz	325-326	771.031250 801.031250
Voice	12.5KHz	385-386	771.406250 801.406250
Voice	12.5KHz	467-468	771.918750 801.918750
Voice	12.5KHz	511-512	772.193750 802.193750
Voice	12.5KHz	553-554	772.456250 802.456250
Voice	12.5KHz	595-596	772.718750 802.718750
Voice	12.5KHz	829-830	774.181250 804.181250
Voice	12.5KHz	879-880	774.493750 804.493750
Voice	12.5KHz	941-942	774.881250 804.881250

Humboldt

Voice	12.5KHz	45-46	769.281250 799.281250
Voice	12.5KHz	161-162	770.006250 800.006250
Voice	12.5KHz	211-212	770.318750 800.318750
Voice	12.5KHz	327-328	771.043750 801.043750
Voice	12.5KHz	379-380	771.368750 801.368750
Voice	12.5KHz	429-430	771.681250 801.681250
Voice	12.5KHz	517-518	772.231250 802.231250
Voice	12.5KHz	573-574	772.581250 802.581250
Voice	12.5KHz	635-636	772.968750 802.968750
Voice	12.5KHz	715-716	773.468750 803.468750
Voice	12.5KHz	835-836	774.218750 804.218750

Ida

Voice	12.5KHz	135-136	769.843750 799.843750
Voice	12.5KHz	245-246	770.531250 800.531250
Voice	12.5KHz	293-294	770.831250 800.831250
Voice	12.5KHz	343-344	771.143750 801.143750
Voice	12.5KHz	387-388	771.418750 801.418750
Voice	12.5KHz	519-520	772.243750 802.243750
Voice	12.5KHz	609-610	772.806250 802.806250
Voice	12.5KHz	787-788	773.918750 803.918750
Voice	12.5KHz	915-916	774.718750 804.718750

Iowa

Voice	12.5KHz	53-54	769.331250 799.331250
Voice	12.5KHz	137-138	769.856250 799.856250
Voice	12.5KHz	173-174	770.081250 800.081250
Voice	12.5KHz	249-250	770.556250 800.556250
Voice	12.5KHz	293-294	770.831250 800.831250
Voice	12.5KHz	339-340	771.118750 801.118750
Voice	12.5KHz	371-372	771.318750 801.318750
Voice	12.5KHz	407-408	771.543750 801.543750
Voice	12.5KHz	453-454	771.831250 801.831250
Voice	12.5KHz	679-680	773.243750 803.243750
Voice	12.5KHz	837-838	774.231250 804.231250
Voice	12.5KHz	865-866	774.406250 804.406250

Jackson

Voice	12.5KHz	123-124	769.768750 799.768750
Voice	12.5KHz	249-250	770.556250 800.556250
Voice	12.5KHz	287-288	770.793750 800.793750
Voice	12.5KHz	353-354	771.206250 801.206250
Voice	12.5KHz	401-402	771.506250 801.506250
Voice	12.5KHz	445-446	771.781250 801.781250
Voice	12.5KHz	519-520	772.243750 802.243750
Voice	12.5KHz	577-578	772.606250 802.606250
Voice	12.5KHz	603-604	772.768750 802.768750
Voice	12.5KHz	639-640	772.993750 802.993750
Voice	12.5KHz	747-748	773.668750 803.668750
Voice	12.5KHz	785-786	773.906250 803.906250
Voice	12.5KHz	871-872	774.443750 804.443750

Jasper

Voice 12.5KHz 55-56	769.343750	799.343750
Voice 12.5KHz 97-98	769.606250	799.606250
Voice 12.5KHz 219-220	770.368750	800.368750
Voice 12.5KHz 295-296	770.843750	800.843750
Voice 12.5KHz 451-452	771.818750	801.818750
Voice 12.5KHz 477-478	771.981250	801.981250
Voice 12.5KHz 499-500	772.118750	802.118750
Voice 12.5KHz 521-522	772.256250	802.256250
Voice 12.5KHz 559-560	772.493750	802.493750
Voice 12.5KHz 581-582	772.631250	802.631250
Voice 12.5KHz 627-628	772.918750	802.918750
Voice 12.5KHz 677-678	773.231250	803.231250
Voice 12.5KHz 745-746	773.656250	803.656250
Voice 12.5KHz 823-824	774.143750	804.143750
Voice 12.5KHz 879-880	774.493750	804.493750
Voice 12.5KHz 907-908	774.668750	804.668750

Jefferson

Voice 12.5KHz 131-132	769.818750	799.818750
Voice 12.5KHz 377-378	771.356250	801.356250
Voice 12.5KHz 423-424	771.643750	801.643750
Voice 12.5KHz 465-466	771.906250	801.906250
Voice 12.5KHz 507-508	772.168750	802.168750
Voice 12.5KHz 549-550	772.431250	802.431250
Voice 12.5KHz 609-610	772.806250	802.806250
Voice 12.5KHz 749-750	773.681250	803.681250
Voice 12.5KHz 791-792	773.943750	803.943750
Voice 12.5KHz 833-834	774.206250	804.206250
Voice 12.5KHz 877-878	774.481250	804.481250

Johnson

Voice 12.5KHz 59-60	769.368750	799.368750
Voice 12.5KHz 83-84	769.518750	799.518750
Voice 12.5KHz 133-134	769.831250	799.831250
Voice 12.5KHz 161-162	770.006250	800.006250
Voice 12.5KHz 209-210	770.306250	800.306250
Voice 12.5KHz 241-242	770.506250	800.506250
Voice 12.5KHz 283-284	770.768750	800.768750
Voice 12.5KHz 323-324	771.018750	801.018750
Voice 12.5KHz 345-346	771.156250	801.156250
Voice 12.5KHz 367-368	771.293750	801.293750
Voice 12.5KHz 389-390	771.431250	801.431250
Voice 12.5KHz 413-414	771.581250	801.581250
Voice 12.5KHz 435-436	771.718750	801.718750
Voice 12.5KHz 457-458	771.856250	801.856250
Voice 12.5KHz 479-480	771.993750	801.993750
Voice 12.5KHz 501-502	772.131250	802.131250
Voice 12.5KHz 523-524	772.268750	802.268750
Voice 12.5KHz 561-562	772.506250	802.506250
Voice 12.5KHz 583-584	772.643750	802.643750
Voice 12.5KHz 605-606	772.781250	802.781250
Voice 12.5KHz 627-628	772.918750	802.918750
Voice 12.5KHz 661-662	773.131250	803.131250
Voice 12.5KHz 703-704	773.393750	803.393750
Voice 12.5KHz 759-760	773.743750	803.743750
Voice 12.5KHz 879-880	774.493750	804.493750

Jones

Voice 12.5KHz 17-18	769.106250	799.106250
Voice 12.5KHz 45-46	769.281250	799.281250
Voice 12.5KHz 139-140	769.868750	799.868750
Voice 12.5KHz 165-166	770.031250	800.031250
Voice 12.5KHz 245-246	770.531250	800.531250
Voice 12.5KHz 341-342	771.131250	801.131250
Voice 12.5KHz 427-428	771.668750	801.668750
Voice 12.5KHz 471-472	771.943750	801.943750
Voice 12.5KHz 541-542	772.381250	802.381250
Voice 12.5KHz 571-572	772.568750	802.568750
Voice 12.5KHz 665-666	773.156250	803.156250
Voice 12.5KHz 795-796	773.968750	803.968750
Voice 12.5KHz 913-914	774.706250	804.706250

Keokuk

Voice 12.5KHz 99-100	769.618750	799.618750
Voice 12.5KHz 245-246	770.531250	800.531250
Voice 12.5KHz 297-298	770.856250	800.856250
Voice 12.5KHz 397-398	771.481250	801.481250
Voice 12.5KHz 445-446	771.781250	801.781250
Voice 12.5KHz 495-496	772.093750	802.093750
Voice 12.5KHz 545-546	772.406250	802.406250
Voice 12.5KHz 587-588	772.668750	802.668750
Voice 12.5KHz 901-902	774.631250	804.631250

Kossuth

Voice 12.5KHz 59-60	769.368750	799.368750
Voice 12.5KHz 165-166	770.031250	800.031250
Voice 12.5KHz 203-204	770.268750	800.268750
Voice 12.5KHz 259-260	770.618750	800.618750
Voice 12.5KHz 331-332	771.068750	801.068750
Voice 12.5KHz 359-360	771.243750	801.243750
Voice 12.5KHz 385-386	771.406250	801.406250
Voice 12.5KHz 417-418	771.606250	801.606250
Voice 12.5KHz 443-444	771.768750	801.768750
Voice 12.5KHz 483-484	772.018750	802.018750
Voice 12.5KHz 509-510	772.181250	802.181250
Voice 12.5KHz 537-538	772.356250	802.356250
Voice 12.5KHz 579-580	772.618750	802.618750
Voice 12.5KHz 619-620	772.868750	802.868750
Voice 12.5KHz 663-664	773.143750	803.143750
Voice 12.5KHz 797-798	773.981250	803.981250
Voice 12.5KHz 827-828	774.168750	804.168750
Voice 12.5KHz 869-870	774.431250	804.431250
Voice 12.5KHz 901-902	774.631250	804.631250

Lee

Voice 12.5KHz 41-42	769.256250	799.256250
Voice 12.5KHz 87-88	769.543750	799.543750
Voice 12.5KHz 125-126	769.781250	799.781250
Voice 12.5KHz 165-166	770.031250	800.031250
Voice 12.5KHz 211-212	770.318750	800.318750
Voice 12.5KHz 243-244	770.518750	800.518750
Voice 12.5KHz 331-332	771.068750	801.068750
Voice 12.5KHz 373-374	771.331250	801.331250
Voice 12.5KHz 429-430	771.681250	801.681250
Voice 12.5KHz 459-460	771.868750	801.868750
Voice 12.5KHz 489-490	772.056250	802.056250
Voice 12.5KHz 515-516	772.218750	802.218750
Voice 12.5KHz 553-554	772.456250	802.456250
Voice 12.5KHz 593-594	772.706250	802.706250
Voice 12.5KHz 629-630	772.931250	802.931250
Voice 12.5KHz 671-672	773.193750	803.193750
Voice 12.5KHz 705-706	773.406250	803.406250
Voice 12.5KHz 787-788	773.918750	803.918750

Linn

Voice 12.5KHz 49-50	769.306250	799.306250
Voice 12.5KHz 93-94	769.581250	799.581250
Voice 12.5KHz 169-170	770.056250	800.056250
Voice 12.5KHz 289-290	770.806250	800.806250
Voice 12.5KHz 333-334	771.081250	801.081250
Voice 12.5KHz 355-356	771.218750	801.218750
Voice 12.5KHz 377-378	771.356250	801.356250
Voice 12.5KHz 399-400	771.493750	801.493750
Voice 12.5KHz 421-422	771.631250	801.631250
Voice 12.5KHz 443-444	771.768750	801.768750
Voice 12.5KHz 465-466	771.906250	801.906250
Voice 12.5KHz 487-488	772.043750	802.043750
Voice 12.5KHz 509-510	772.181250	802.181250
Voice 12.5KHz 531-532	772.318750	802.318750
Voice 12.5KHz 553-554	772.456250	802.456250
Voice 12.5KHz 575-576	772.593750	802.593750
Voice 12.5KHz 597-598	772.731250	802.731250
Voice 12.5KHz 619-620	772.868750	802.868750
Voice 12.5KHz 669-670	773.181250	803.181250
Voice 12.5KHz 715-716	773.468750	803.468750
Voice 12.5KHz 787-788	773.918750	803.918750
Voice 12.5KHz 821-822	774.131250	804.131250
Voice 12.5KHz 907-908	774.668750	804.668750
Voice 12.5KHz 947-948	774.918750	804.918750

Louisa

Voice 12.5KHz 89-90	769.556250	799.556250
Voice 12.5KHz 401-402	771.506250	801.506250
Voice 12.5KHz 461-462	771.881250	801.881250
Voice 12.5KHz 517-518	772.231250	802.231250
Voice 12.5KHz 741-742	773.631250	803.631250
Voice 12.5KHz 797-798	773.981250	803.981250
Voice 12.5KHz 839-840	774.243750	804.243750
Voice 12.5KHz 917-918	774.731250	804.731250

Lucas

Voice 12.5KHz 45-46	769.281250	799.281250
Voice 12.5KHz 93-94	769.581250	799.581250
Voice 12.5KHz 137-138	769.856250	799.856250
Voice 12.5KHz 299-300	770.868750	800.868750
Voice 12.5KHz 345-346	771.156250	801.156250
Voice 12.5KHz 389-390	771.431250	801.431250
Voice 12.5KHz 443-444	771.768750	801.768750
Voice 12.5KHz 495-496	772.093750	802.093750
Voice 12.5KHz 545-546	772.406250	802.406250
Voice 12.5KHz 613-614	772.831250	802.831250

Lyon

Voice 12.5KHz 13-14	769.081250	799.081250
Voice 12.5KHz 385-386	771.406250	801.406250
Voice 12.5KHz 429-430	771.681250	801.681250
Voice 12.5KHz 479-480	771.993750	801.993750
Voice 12.5KHz 529-530	772.306250	802.306250
Voice 12.5KHz 571-572	772.568750	802.568750
Voice 12.5KHz 679-680	773.243750	803.243750
Voice 12.5KHz 759-760	773.743750	803.743750
Voice 12.5KHz 879-880	774.493750	804.493750

Madison

Voice 12.5KHz 13-14	769.081250	799.081250
Voice 12.5KHz 41-42	769.256250	799.256250
Voice 12.5KHz 179-180	770.118750	800.118750
Voice 12.5KHz 253-254	770.581250	800.581250
Voice 12.5KHz 291-292	770.818750	800.818750
Voice 12.5KHz 337-338	771.106250	801.106250
Voice 12.5KHz 381-382	771.381250	801.381250
Voice 12.5KHz 425-426	771.656250	801.656250
Voice 12.5KHz 469-470	771.931250	801.931250
Voice 12.5KHz 513-514	772.206250	802.206250
Voice 12.5KHz 539-540	772.368750	802.368750
Voice 12.5KHz 633-634	772.956250	802.956250
Voice 12.5KHz 707-708	773.418750	803.418750
Voice 12.5KHz 919-920	774.743750	804.743750

Mahaska

Voice 12.5KHz 49-50	769.306250	799.306250
Voice 12.5KHz 85-86	769.531250	799.531250
Voice 12.5KHz 177-178	770.106250	800.106250
Voice 12.5KHz 259-260	770.618750	800.618750
Voice 12.5KHz 351-352	771.193750	801.193750
Voice 12.5KHz 383-384	771.393750	801.393750
Voice 12.5KHz 439-440	771.743750	801.743750
Voice 12.5KHz 471-472	771.943750	801.943750
Voice 12.5KHz 511-512	772.193750	802.193750
Voice 12.5KHz 541-542	772.381250	802.381250
Voice 12.5KHz 597-598	772.731250	802.731250
Voice 12.5KHz 701-702	773.381250	803.381250
Voice 12.5KHz 757-758	773.731250	803.731250

Marion

Voice 12.5KHz 133-134	769.831250	799.831250
Voice 12.5KHz 205-206	770.281250	800.281250
Voice 12.5KHz 255-256	770.593750	800.593750
Voice 12.5KHz 359-360	771.243750	801.243750
Voice 12.5KHz 403-404	771.518750	801.518750
Voice 12.5KHz 455-456	771.843750	801.843750
Voice 12.5KHz 491-492	772.068750	802.068750
Voice 12.5KHz 517-518	772.231250	802.231250
Voice 12.5KHz 569-570	772.556250	802.556250
Voice 12.5KHz 601-602	772.756250	802.756250
Voice 12.5KHz 631-632	772.943750	802.943750
Voice 12.5KHz 671-672	773.193750	803.193750
Voice 12.5KHz 797-798	773.981250	803.981250
Voice 12.5KHz 835-836	774.218750	804.218750
Voice 12.5KHz 875-876	774.468750	804.468750
Voice 12.5KHz 903-904	774.643750	804.643750

Marshall

Voice 12.5KHz 51-52	769.318750	799.318750
Voice 12.5KHz 127-128	769.793750	799.793750
Voice 12.5KHz 179-180	770.118750	800.118750
Voice 12.5KHz 215-216	770.343750	800.343750
Voice 12.5KHz 253-254	770.581250	800.581250
Voice 12.5KHz 291-292	770.818750	800.818750
Voice 12.5KHz 325-326	771.031250	801.031250
Voice 12.5KHz 347-348	771.168750	801.168750
Voice 12.5KHz 369-370	771.306250	801.306250
Voice 12.5KHz 391-392	771.443750	801.443750
Voice 12.5KHz 413-414	771.581250	801.581250
Voice 12.5KHz 435-436	771.718750	801.718750
Voice 12.5KHz 457-458	771.856250	801.856250
Voice 12.5KHz 567-568	772.543750	802.543750
Voice 12.5KHz 599-600	772.743750	802.743750
Voice 12.5KHz 799-800	773.993750	803.993750

Mills

Voice 12.5KHz 53-54	769.331250	799.331250
Voice 12.5KHz 291-292	770.818750	800.818750
Voice 12.5KHz 379-380	771.368750	801.368750
Voice 12.5KHz 433-434	771.706250	801.706250
Voice 12.5KHz 483-484	772.018750	802.018750
Voice 12.5KHz 573-574	772.581250	802.581250
Voice 12.5KHz 629-630	772.931250	802.931250

Mitchell

Voice 12.5KHz 201-202	770.256250	800.256250
Voice 12.5KHz 329-330	771.056250	801.056250
Voice 12.5KHz 405-406	771.531250	801.531250
Voice 12.5KHz 515-516	772.218750	802.218750
Voice 12.5KHz 573-574	772.581250	802.581250
Voice 12.5KHz 617-618	772.856250	802.856250
Voice 12.5KHz 867-868	774.418750	804.418750
Voice 12.5KHz 909-910	774.681250	804.681250

Monona

Voice	12.5KHz	47-48	769.293750 799.293750
Voice	12.5KHz	97-98	769.606250 799.606250
Voice	12.5KHz	321-322	771.006250 801.006250
Voice	12.5KHz	365-366	771.281250 801.281250
Voice	12.5KHz	417-418	771.606250 801.606250
Voice	12.5KHz	513-514	772.206250 802.206250
Voice	12.5KHz	563-564	772.518750 802.518750
Voice	12.5KHz	705-706	773.406250 803.406250
Voice	12.5KHz	831-832	774.193750 804.193750
Voice	12.5KHz	877-878	774.481250 804.481250

Monroe

Voice	12.5KHz	19-20	769.118750 799.118750
Voice	12.5KHz	161-162	770.006250 800.006250
Voice	12.5KHz	321-322	771.006250 801.006250
Voice	12.5KHz	379-380	771.368750 801.368750
Voice	12.5KHz	431-432	771.693750 801.693750
Voice	12.5KHz	563-564	772.518750 802.518750
Voice	12.5KHz	605-606	772.781250 802.781250
Voice	12.5KHz	825-826	774.156250 804.156250

Montgomery

Voice	12.5KHz	177-178	770.106250 800.106250
Voice	12.5KHz	219-220	770.368750 800.368750
Voice	12.5KHz	397-398	771.481250 801.481250
Voice	12.5KHz	441-442	771.756250 801.756250
Voice	12.5KHz	515-516	772.218750 802.218750
Voice	12.5KHz	557-558	772.481250 802.481250
Voice	12.5KHz	601-602	772.756250 802.756250
Voice	12.5KHz	753-754	773.706250 803.706250
Voice	12.5KHz	799-800	773.993750 803.993750
Voice	12.5KHz	861-862	774.381250 804.381250
Voice	12.5KHz	909-910	774.681250 804.681250

Muscatine

Voice	12.5KHz	15-16	769.093750 799.093750
Voice	12.5KHz	47-48	769.293750 799.293750
Voice	12.5KHz	121-122	769.756250 799.756250
Voice	12.5KHz	167-168	770.043750 800.043750

Voice 12.5KHz	219-220	770.368750	800.368750
Voice 12.5KHz	247-248	770.543750	800.543750
Voice 12.5KHz	335-336	771.093750	801.093750
Voice 12.5KHz	425-426	771.656250	801.656250
Voice 12.5KHz	469-470	771.931250	801.931250
Voice 12.5KHz	497-498	772.106250	802.106250
Voice 12.5KHz	569-570	772.556250	802.556250
Voice 12.5KHz	599-600	772.743750	802.743750
Voice 12.5KHz	753-754	773.706250	803.706250
Voice 12.5KHz	793-794	773.956250	803.956250
Voice 12.5KHz	873-874	774.456250	804.456250
Voice 12.5KHz	905-906	774.656250	804.656250
Voice 12.5KHz	945-946	774.906250	804.906250

O'Brien

Voice 12.5KHz	89-90	769.556250	799.556250
Voice 12.5KHz	165-166	770.031250	800.031250
Voice 12.5KHz	363-364	771.268750	801.268750
Voice 12.5KHz	417-418	771.606250	801.606250
Voice 12.5KHz	469-470	771.931250	801.931250
Voice 12.5KHz	521-522	772.256250	802.256250
Voice 12.5KHz	583-584	772.643750	802.643750
Voice 12.5KHz	707-708	773.418750	803.418750
Voice 12.5KHz	783-784	773.893750	803.893750
Voice 12.5KHz	905-906	774.656250	804.656250

Osceola

Voice 12.5KHz	85-86	769.531250	799.531250
Voice 12.5KHz	205-206	770.281250	800.281250
Voice 12.5KHz	255-256	770.593750	800.593750
Voice 12.5KHz	337-338	771.106250	801.106250
Voice 12.5KHz	409-410	771.556250	801.556250
Voice 12.5KHz	485-486	772.031250	802.031250
Voice 12.5KHz	631-632	772.943750	802.943750
Voice 12.5KHz	789-790	773.931250	803.931250

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Voice 12.5KHz 81-82	769.506250	799.506250
Voice 12.5KHz 125-126	769.781250	799.781250
Voice 12.5KHz 173-174	770.081250	800.081250
Voice 12.5KHz 325-326	771.031250	801.031250
Voice 12.5KHz 369-370	771.306250	801.306250
Voice 12.5KHz 411-412	771.568750	801.568750
Voice 12.5KHz 453-454	771.831250	801.831250
Voice 12.5KHz 501-502	772.131250	802.131250
Voice 12.5KHz 545-546	772.406250	802.406250
Voice 12.5KHz 597-598	772.731250	802.731250
Voice 12.5KHz 671-672	773.193750	803.193750
Voice 12.5KHz 947-948	774.918750	804.918750

Palo Alto

Voice 12.5KHz 87-88	769.543750	799.543750
Voice 12.5KHz 131-132	769.818750	799.818750
Voice 12.5KHz 253-254	770.581250	800.581250
Voice 12.5KHz 375-376	771.343750	801.343750
Voice 12.5KHz 425-426	771.656250	801.656250
Voice 12.5KHz 497-498	772.106250	802.106250
Voice 12.5KHz 545-546	772.406250	802.406250
Voice 12.5KHz 587-588	772.668750	802.668750
Voice 12.5KHz 907-908	774.668750	804.668750

Plymouth

Voice 12.5KHz 55-56	769.343750	799.343750
Voice 12.5KHz 81-82	769.506250	799.506250
Voice 12.5KHz 129-130	769.806250	799.806250
Voice 12.5KHz 211-212	770.318750	800.318750
Voice 12.5KHz 241-242	770.506250	800.506250
Voice 12.5KHz 373-374	771.331250	801.331250
Voice 12.5KHz 401-402	771.506250	801.506250
Voice 12.5KHz 455-456	771.843750	801.843750
Voice 12.5KHz 493-494	772.081250	802.081250
Voice 12.5KHz 531-532	772.318750	802.318750
Voice 12.5KHz 579-580	772.618750	802.618750
Voice 12.5KHz 633-634	772.956250	802.956250
Voice 12.5KHz 677-678	773.231250	803.231250
Voice 12.5KHz 717-718	773.481250	803.481250
Voice 12.5KHz 743-744	773.643750	803.643750
Voice 12.5KHz 875-876	774.468750	804.468750

Pocahontas

Voice	12.5KHz	291-292	770.818750 800.818750
Voice	12.5KHz	335-336	771.093750 801.093750
Voice	12.5KHz	439-440	771.743750 801.743750
Voice	12.5KHz	493-494	772.081250 802.081250
Voice	12.5KHz	551-552	772.443750 802.443750
Voice	12.5KHz	595-596	772.718750 802.718750
Voice	12.5KHz	865-866	774.406250 804.406250
Voice	12.5KHz	913-914	774.706250 804.706250

Polk

Voice	12.5KHz	47-48	769.293750 799.293750
Voice	12.5KHz	91-92	769.568750 799.568750
Voice	12.5KHz	167-168	770.043750 800.043750
Voice	12.5KHz	211-212	770.318750 800.318750
Voice	12.5KHz	287-288	770.793750 800.793750
Voice	12.5KHz	331-332	771.068750 801.068750
Voice	12.5KHz	353-354	771.206250 801.206250
Voice	12.5KHz	375-376	771.343750 801.343750
Voice	12.5KHz	397-398	771.481250 801.481250
Voice	12.5KHz	419-420	771.618750 801.618750
Voice	12.5KHz	441-442	771.756250 801.756250
Voice	12.5KHz	463-464	771.893750 801.893750
Voice	12.5KHz	485-486	772.031250 802.031250
Voice	12.5KHz	507-508	772.168750 802.168750
Voice	12.5KHz	529-530	772.306250 802.306250
Voice	12.5KHz	551-552	772.443750 802.443750
Voice	12.5KHz	573-574	772.581250 802.581250
Voice	12.5KHz	595-596	772.718750 802.718750
Voice	12.5KHz	617-618	772.856250 802.856250
Voice	12.5KHz	667-668	773.168750 803.168750
Voice	12.5KHz	711-712	773.443750 803.443750
Voice	12.5KHz	755-756	773.718750 803.718750
Voice	12.5KHz	781-782	773.881250 803.881250
Voice	12.5KHz	827-828	774.168750 804.168750
Voice	12.5KHz	871-872	774.443750 804.443750
Voice	12.5KHz	947-948	774.918750 804.918750

Pottawattamie

Voice 12.5KHz	49-50	769.306250	799.306250
Voice 25KHz	57-60	769.362500	799.362500
Voice 12.5KHz	137-138	769.856250	799.856250
Voice 12.5KHz	165-166	770.031250	800.031250
Voice 12.5KHz	329-330	771.056250	801.056250
Voice 12.5KHz	359-360	771.243750	801.243750
Voice 25KHz	385-388	771.412500	801.412500
Voice 12.5KHz	419-420	771.618750	801.618750
Voice 12.5KHz	445-446	771.781250	801.781250
Voice 12.5KHz	467-468	771.918750	801.918750
Voice 12.5KHz	503-504	772.143750	802.143750
Voice 25KHz	509-512	772.187500	802.187500
Voice 12.5KHz	533-534	772.331250	802.331250
Voice 12.5KHz	567-568	772.543750	802.543750
Voice 12.5KHz	589-590	772.681250	802.681250
Voice 12.5KHz	613-614	772.831250	802.831250
Voice 12.5KHz	667-668	773.168750	803.168750
Voice 25KHz	677-680	773.237500	803.237500
Voice 12.5KHz	785-786	773.906250	803.906250

Poweshiek

Voice 12.5KHz	343-344	771.143750	801.143750
Voice 12.5KHz	387-388	771.418750	801.418750
Voice 12.5KHz	527-528	772.293750	802.293750
Voice 12.5KHz	591-592	772.693750	802.693750
Voice 12.5KHz	621-622	772.881250	802.881250
Voice 12.5KHz	663-664	773.143750	803.143750
Voice 12.5KHz	705-706	773.406250	803.406250
Voice 12.5KHz	741-742	773.631250	803.631250
Voice 12.5KHz	783-784	773.893750	803.893750
Voice 12.5KHz	829-830	774.181250	804.181250
Voice 12.5KHz	869-870	774.431250	804.431250
Voice 12.5KHz	919-920	774.743750	804.743750

Ringgold

Voice 12.5KHz 15-16	769.093750	799.093750
Voice 12.5KHz 281-282	770.756250	800.756250
Voice 12.5KHz 347-348	771.168750	801.168750
Voice 12.5KHz 395-396	771.468750	801.468750
Voice 12.5KHz 439-440	771.743750	801.743750
Voice 12.5KHz 491-492	772.068750	802.068750
Voice 12.5KHz 535-536	772.343750	802.343750
Voice 12.5KHz 611-612	772.818750	802.818750
Voice 12.5KHz 825-826	774.156250	804.156250
Voice 12.5KHz 911-912	774.693750	804.693750

Sac

Voice 12.5KHz 201-202	770.256250	800.256250
Voice 12.5KHz 297-298	770.856250	800.856250
Voice 12.5KHz 371-372	771.318750	801.318750
Voice 12.5KHz 427-428	771.668750	801.668750
Voice 12.5KHz 485-486	772.031250	802.031250
Voice 12.5KHz 533-534	772.331250	802.331250
Voice 12.5KHz 577-578	772.606250	802.606250
Voice 12.5KHz 623-624	772.893750	802.893750
Voice 12.5KHz 665-666	773.156250	803.156250
Voice 12.5KHz 719-720	773.493750	803.493750
Voice 12.5KHz 837-838	774.231250	804.231250
Voice 12.5KHz 879-880	774.493750	804.493750

Scott

Voice 12.5KHz 57-58	769.356250	799.356250
Voice 12.5KHz 81-82	769.506250	799.506250
Voice 12.5KHz 135-136	769.843750	799.843750
Voice 12.5KHz 253-254	770.581250	800.581250
Voice 12.5KHz 285-286	770.781250	800.781250
Voice 12.5KHz 329-330	771.056250	801.056250
Voice 12.5KHz 359-360	771.243750	801.243750
Voice 12.5KHz 383-384	771.393750	801.393750
Voice 12.5KHz 409-410	771.556250	801.556250
Voice 12.5KHz 431-432	771.693750	801.693750
Voice 12.5KHz 453-454	771.831250	801.831250
Voice 12.5KHz 475-476	771.968750	801.968750
Voice 12.5KHz 515-516	772.218750	802.218750
Voice 12.5KHz 549-550	772.431250	802.431250
Voice 12.5KHz 589-590	772.681250	802.681250
Voice 12.5KHz 623-624	772.893750	802.893750
Voice 12.5KHz 713-714	773.456250	803.456250
Voice 12.5KHz 757-758	773.731250	803.731250
Voice 12.5KHz 781-782	773.881250	803.881250
Voice 12.5KHz 837-838	774.231250	804.231250
Voice 12.5KHz 877-878	774.481250	804.481250
Voice 12.5KHz 909-910	774.681250	804.681250

Shelby

Voice 12.5KHz 121-122	769.756250	799.756250
Voice 12.5KHz 241-242	770.506250	800.506250
Voice 12.5KHz 369-370	771.306250	801.306250
Voice 12.5KHz 423-424	771.643750	801.643750
Voice 12.5KHz 471-472	771.943750	801.943750
Voice 12.5KHz 521-522	772.256250	802.256250
Voice 12.5KHz 575-576	772.593750	802.593750
Voice 12.5KHz 621-622	772.881250	802.881250
Voice 12.5KHz 673-674	773.206250	803.206250
Voice 12.5KHz 869-870	774.431250	804.431250
Voice 12.5KHz 941-942	774.881250	804.881250

Sioux

Voice 12.5KHz	17-18	769.106250	799.106250
Voice 12.5KHz	45-46	769.281250	799.281250
Voice 12.5KHz	121-122	769.756250	799.756250
Voice 12.5KHz	161-162	770.006250	800.006250
Voice 12.5KHz	299-300	770.868750	800.868750
Voice 12.5KHz	333-334	771.081250	801.081250
Voice 12.5KHz	359-360	771.243750	801.243750
Voice 12.5KHz	405-406	771.531250	801.531250
Voice 12.5KHz	461-462	771.881250	801.881250
Voice 12.5KHz	489-490	772.056250	802.056250
Voice 12.5KHz	515-516	772.218750	802.218750
Voice 12.5KHz	545-546	772.406250	802.406250
Voice 12.5KHz	595-596	772.718750	802.718750
Voice 12.5KHz	627-628	772.918750	802.918750
Voice 12.5KHz	667-668	773.168750	803.168750
Voice 12.5KHz	703-704	773.393750	803.393750
Voice 12.5KHz	755-756	773.718750	803.718750
Voice 12.5KHz	821-822	774.131250	804.131250
Voice 12.5KHz	863-864	774.393750	804.393750

Story

Voice 12.5KHz	15-16	769.093750	799.093750
Voice 12.5KHz	43-44	769.268750	799.268750
Voice 12.5KHz	81-82	769.506250	799.506250
Voice 12.5KHz	121-122	769.756250	799.756250
Voice 12.5KHz	161-162	770.006250	800.006250
Voice 12.5KHz	203-204	770.268750	800.268750
Voice 12.5KHz	241-242	770.506250	800.506250
Voice 12.5KHz	281-282	770.756250	800.756250
Voice 12.5KHz	335-336	771.093750	801.093750
Voice 12.5KHz	357-358	771.231250	801.231250
Voice 12.5KHz	379-380	771.368750	801.368750
Voice 12.5KHz	401-402	771.506250	801.506250
Voice 12.5KHz	423-424	771.643750	801.643750
Voice 12.5KHz	445-446	771.781250	801.781250
Voice 12.5KHz	467-468	771.918750	801.918750
Voice 12.5KHz	489-490	772.056250	802.056250
Voice 12.5KHz	511-512	772.193750	802.193750
Voice 12.5KHz	533-534	772.331250	802.331250
Voice 12.5KHz	555-556	772.468750	802.468750
Voice 12.5KHz	607-608	772.793750	802.793750
Voice 12.5KHz	635-636	772.968750	802.968750
Voice 12.5KHz	673-674	773.206250	803.206250
Voice 12.5KHz	717-718	773.481250	803.481250
Voice 12.5KHz	751-752	773.693750	803.693750
Voice 12.5KHz	787-788	773.918750	803.918750

Tama

Voice 12.5KHz	257-258	770.606250	800.606250
Voice 12.5KHz	363-364	771.268750	801.268750
Voice 12.5KHz	417-418	771.606250	801.606250
Voice 12.5KHz	461-462	771.881250	801.881250
Voice 12.5KHz	503-504	772.143750	802.143750
Voice 12.5KHz	547-548	772.418750	802.418750
Voice 12.5KHz	585-586	772.656250	802.656250
Voice 12.5KHz	611-612	772.818750	802.818750
Voice 12.5KHz	637-638	772.981250	802.981250
Voice 12.5KHz	789-790	773.931250	803.931250
Voice 12.5KHz	873-874	774.456250	804.456250
Voice 12.5KHz	911-912	774.693750	804.693750

Taylor

Voice 12.5KHz 91-92	769.568750	799.568750
Voice 12.5KHz 357-358	771.231250	801.231250
Voice 12.5KHz 401-402	771.506250	801.506250
Voice 12.5KHz 449-450	771.806250	801.806250
Voice 12.5KHz 495-496	772.093750	802.093750
Voice 12.5KHz 541-542	772.381250	802.381250
Voice 12.5KHz 587-588	772.668750	802.668750
Voice 12.5KHz 709-710	773.431250	803.431250
Voice 12.5KHz 791-792	773.943750	803.943750
Voice 12.5KHz 865-866	774.406250	804.406250
Voice 12.5KHz 943-944	774.893750	804.893750

Union

Voice 12.5KHz 49-50	769.306250	799.306250
Voice 12.5KHz 333-334	771.081250	801.081250
Voice 12.5KHz 377-378	771.356250	801.356250
Voice 12.5KHz 429-430	771.681250	801.681250
Voice 12.5KHz 477-478	771.981250	801.981250
Voice 12.5KHz 521-522	772.256250	802.256250
Voice 12.5KHz 565-566	772.531250	802.531250
Voice 12.5KHz 607-608	772.793750	802.793750
Voice 12.5KHz 669-670	773.181250	803.181250
Voice 12.5KHz 901-902	774.631250	804.631250

Van Buren

Voice 12.5KHz 91-92	769.568750	799.568750
Voice 12.5KHz 139-140	769.868750	799.868750
Voice 12.5KHz 289-290	770.806250	800.806250
Voice 12.5KHz 347-348	771.168750	801.168750
Voice 12.5KHz 403-404	771.518750	801.518750
Voice 12.5KHz 469-470	771.931250	801.931250
Voice 12.5KHz 537-538	772.356250	802.356250
Voice 12.5KHz 903-904	774.643750	804.643750

Wapello

Voice 12.5KHz	15-16	769.093750	799.093750
Voice 12.5KHz	43-44	769.268750	799.268750
Voice 12.5KHz	95-96	769.593750	799.593750
Voice 12.5KHz	123-124	769.768750	799.768750
Voice 12.5KHz	213-214	770.331250	800.331250
Voice 12.5KHz	241-242	770.506250	800.506250
Voice 12.5KHz	337-338	771.106250	801.106250
Voice 12.5KHz	363-364	771.268750	801.268750
Voice 12.5KHz	393-394	771.456250	801.456250
Voice 12.5KHz	419-420	771.618750	801.618750
Voice 12.5KHz	449-450	771.806250	801.806250
Voice 12.5KHz	475-476	771.968750	801.968750
Voice 12.5KHz	501-502	772.131250	802.131250
Voice 12.5KHz	529-530	772.306250	802.306250
Voice 12.5KHz	555-556	772.468750	802.468750
Voice 12.5KHz	635-636	772.968750	802.968750
Voice 12.5KHz	785-786	773.906250	803.906250
Voice 12.5KHz	911-912	774.693750	804.693750
Voice 12.5KHz	945-946	774.906250	804.906250

Warren

Voice 12.5KHz	87-88	769.543750	799.543750
Voice 12.5KHz	175-176	770.093750	800.093750
Voice 12.5KHz	201-202	770.256250	800.256250
Voice 12.5KHz	249-250	770.556250	800.556250
Voice 12.5KHz	283-284	770.768750	800.768750
Voice 12.5KHz	327-328	771.043750	801.043750
Voice 12.5KHz	349-350	771.181250	801.181250
Voice 12.5KHz	371-372	771.318750	801.318750
Voice 12.5KHz	415-416	771.593750	801.593750
Voice 12.5KHz	437-438	771.731250	801.731250
Voice 12.5KHz	459-460	771.868750	801.868750
Voice 12.5KHz	481-482	772.006250	802.006250
Voice 12.5KHz	503-504	772.143750	802.143750
Voice 12.5KHz	525-526	772.281250	802.281250
Voice 12.5KHz	589-590	772.681250	802.681250
Voice 12.5KHz	623-624	772.893750	802.893750
Voice 12.5KHz	715-716	773.468750	803.468750
Voice 12.5KHz	749-750	773.681250	803.681250
Voice 12.5KHz	789-790	773.931250	803.931250
Voice 12.5KHz	831-832	774.193750	804.193750
Voice 12.5KHz	867-868	774.418750	804.418750
Voice 12.5KHz	915-916	774.718750	804.718750
Voice 12.5KHz	943-944	774.893750	804.893750

Washington

Voice 12.5KHz	203-204	770.268750	800.268750
Voice 12.5KHz	357-358	771.231250	801.231250
Voice 12.5KHz	385-386	771.406250	801.406250
Voice 12.5KHz	441-442	771.756250	801.756250
Voice 12.5KHz	485-486	772.031250	802.031250
Voice 12.5KHz	513-514	772.206250	802.206250
Voice 12.5KHz	539-540	772.368750	802.368750
Voice 12.5KHz	573-574	772.581250	802.581250
Voice 12.5KHz	639-640	772.993750	802.993750
Voice 12.5KHz	665-666	773.156250	803.156250
Voice 12.5KHz	709-710	773.431250	803.431250
Voice 12.5KHz	745-746	773.656250	803.656250
Voice 12.5KHz	823-824	774.143750	804.143750
Voice 12.5KHz	861-862	774.381250	804.381250

Wayne

Voice	12.5KHz	207-208	770.293750 800.293750
Voice	12.5KHz	251-252	770.568750 800.568750
Voice	12.5KHz	361-362	771.256250 801.256250
Voice	12.5KHz	411-412	771.568750 801.568750
Voice	12.5KHz	457-458	771.856250 801.856250
Voice	12.5KHz	505-506	772.156250 802.156250
Voice	12.5KHz	557-558	772.481250 802.481250
Voice	12.5KHz	599-600	772.743750 802.743750
Voice	12.5KHz	713-714	773.456250 803.456250
Voice	12.5KHz	907-908	774.668750 804.668750

Webster

Voice	12.5KHz	19-20	769.118750 799.118750
Voice	12.5KHz	129-130	769.806250 799.806250
Voice	12.5KHz	251-252	770.568750 800.568750
Voice	12.5KHz	285-286	770.781250 800.781250
Voice	12.5KHz	323-324	771.018750 801.018750
Voice	12.5KHz	345-346	771.156250 801.156250
Voice	12.5KHz	367-368	771.293750 801.293750
Voice	12.5KHz	389-390	771.431250 801.431250
Voice	12.5KHz	411-412	771.568750 801.568750
Voice	12.5KHz	433-434	771.706250 801.706250
Voice	12.5KHz	455-456	771.843750 801.843750
Voice	12.5KHz	477-478	771.981250 801.981250
Voice	12.5KHz	499-500	772.118750 802.118750
Voice	12.5KHz	521-522	772.256250 802.256250
Voice	12.5KHz	543-544	772.393750 802.393750
Voice	12.5KHz	565-566	772.531250 802.531250
Voice	12.5KHz	591-592	772.693750 802.693750
Voice	12.5KHz	625-626	772.906250 802.906250
Voice	12.5KHz	669-670	773.181250 803.181250
Voice	12.5KHz	709-710	773.431250 803.431250
Voice	12.5KHz	745-746	773.656250 803.656250
Voice	12.5KHz	793-794	773.956250 803.956250
Voice	12.5KHz	831-832	774.193750 804.193750
Voice	12.5KHz	861-862	774.381250 804.381250
Voice	12.5KHz	943-944	774.893750 804.893750

Winnebago

Voice	12.5KHz	373-374	771.331250 801.331250
Voice	12.5KHz	421-422	771.631250 801.631250
Voice	12.5KHz	487-488	772.043750 802.043750
Voice	12.5KHz	529-530	772.306250 802.306250
Voice	12.5KHz	585-586	772.656250 802.656250
Voice	12.5KHz	627-628	772.918750 802.918750
Voice	12.5KHz	669-670	773.181250 803.181250
Voice	12.5KHz	719-720	773.493750 803.493750
Voice	12.5KHz	791-792	773.943750 803.943750
Voice	12.5KHz	839-840	774.243750 804.243750
Voice	12.5KHz	941-942	774.881250 804.881250

Winneshiek

Voice	12.5KHz	177-178	770.106250 800.106250
Voice	12.5KHz	205-206	770.281250 800.281250
Voice	12.5KHz	337-338	771.106250 801.106250
Voice	12.5KHz	363-364	771.268750 801.268750
Voice	12.5KHz	389-390	771.431250 801.431250
Voice	12.5KHz	415-416	771.593750 801.593750
Voice	12.5KHz	455-456	771.843750 801.843750
Voice	12.5KHz	481-482	772.006250 802.006250
Voice	12.5KHz	507-508	772.168750 802.168750
Voice	12.5KHz	533-534	772.331250 802.331250
Voice	12.5KHz	575-576	772.593750 802.593750
Voice	12.5KHz	639-640	772.993750 802.993750
Voice	12.5KHz	717-718	773.481250 803.481250
Voice	12.5KHz	795-796	773.968750 803.968750

Woodbury

Voice 12.5KHz 59-60	769.368750	799.368750
Voice 12.5KHz 207-208	770.293750	800.293750
Voice 12.5KHz 253-254	770.581250	800.581250
Voice 12.5KHz 339-340	771.118750	801.118750
Voice 12.5KHz 361-362	771.256250	801.256250
Voice 12.5KHz 391-392	771.443750	801.443750
Voice 12.5KHz 413-414	771.581250	801.581250
Voice 12.5KHz 451-452	771.818750	801.818750
Voice 12.5KHz 473-474	771.956250	801.956250
Voice 12.5KHz 523-524	772.268750	802.268750
Voice 12.5KHz 549-550	772.431250	802.431250
Voice 12.5KHz 571-572	772.568750	802.568750
Voice 12.5KHz 593-594	772.706250	802.706250
Voice 12.5KHz 619-620	772.868750	802.868750
Voice 12.5KHz 671-672	773.193750	803.193750
Voice 12.5KHz 701-702	773.381250	803.381250
Voice 12.5KHz 759-760	773.743750	803.743750
Voice 12.5KHz 781-782	773.881250	803.881250
Voice 12.5KHz 827-828	774.168750	804.168750
Voice 12.5KHz 861-862	774.381250	804.381250
Voice 12.5KHz 919-920	774.743750	804.743750

Worth

Voice 12.5KHz 85-86	769.531250	799.531250
Voice 12.5KHz 167-168	770.043750	800.043750
Voice 12.5KHz 291-292	770.818750	800.818750
Voice 12.5KHz 337-338	771.106250	801.106250
Voice 12.5KHz 383-384	771.393750	801.393750
Voice 12.5KHz 473-474	771.956250	801.956250
Voice 12.5KHz 621-622	772.881250	802.881250
Voice 12.5KHz 709-710	773.431250	803.431250

Wright

Voice 12.5KHz	95-96	769.593750	799.593750
Voice 12.5KHz	219-220	770.368750	800.368750
Voice 12.5KHz	355-356	771.218750	801.218750
Voice 12.5KHz	397-398	771.481250	801.481250
Voice 12.5KHz	461-462	771.881250	801.881250
Voice 12.5KHz	513-514	772.206250	802.206250
Voice 12.5KHz	557-558	772.481250	802.481250
Voice 12.5KHz	601-602	772.756250	802.756250
Voice 12.5KHz	701-702	773.381250	803.381250
Voice 12.5KHz	757-758	773.731250	803.731250
Voice 12.5KHz	879-880	774.493750	804.493750
Voice 12.5KHz	947-948	774.918750	804.918750

APPENDIX I
Low Power Pool Frequencies
Pursuant to 2nd Report & Order
(Released August 10, 2007/Effective October 23, 2007)

Channel #	Center Frequency (6.25 kHz)	Center Frequency (12.5 kHz)	Center Frequency (25 kHz)	Use	Channel #	Center Frequency (6.25 kHz)	Center Frequency (12.5 kHz)	Center Frequency (25 kHz)
1	769.003125			**RPC Admin**	961	799.003125		
2	769.009375	769.00625		**RPC Admin**	962	799.009375	799.00625	
3	769.015625		769.0125	**RPC Admin**	963	799.015625		799.0125
4	769.021875	769.01875		**RPC Admin**	964	799.021875	799.01875	
5	769.028125			**RPC Admin**	965	799.028125		
6	769.034375	769.03125		**RPC Admin**	966	799.034375	799.03125	
7	769.040625		769.0375	**RPC Admin**	967	799.040625		799.0375
8	769.046875	769.04375		**RPC Admin**	968	799.046875	799.04375	
9	769.053125			**Itinerant**	969	799.053125		
10	769.059375	769.05625		**Itinerant**	970	799.059375	799.05625	
11	769.065625		769.0625	**Itinerant**	971	799.065625		799.0625
12	769.071875	769.06875		**Itinerant**	972	799.071875	799.06875	
949	774.928125			**RPC Admin**	1909	804.928125		
950	774.934375	774.93125		**RPC Admin**	1910	804.934375	804.93125	
951	774.940625		774.9375	**RPC Admin**	1911	804.940625		804.9375
952	774.946875	774.94375		**RPC Admin**	1912	804.946875	804.94375	
953	774.953125			**RPC Admin**	1913	804.953125		
954	774.959375	774.95625		**RPC Admin**	1914	804.959375	804.95625	
955	774.965625		774.9625	**RPC Admin**	1915	804.965625		804.9625
956	774.971875	774.96875		**RPC Admin**	1916	804.971875	804.96875	
957	774.978125			**RPC Admin**	1917	804.978125		
958	774.984375	774.98125		**RPC Admin**	1918	804.984375	804.98125	
959	774.990625		774.9875	**Itinerant**	1919	804.990725		804.9875
960	774.996875	774.99375		**Itinerant**	1920	804.996875	804.99375	