REGION 23

700 MHz
PUBLIC SAFETY BAND
REGIONAL PLAN

700 MHz COMMITTEE OFFICERS

CHAIRMAN:	Tom Lariviere
SECRETARY:	Lana Nicks
TREASURER:	Vann Byrd
CONVENER:	Tom Lariviere

October 29, 2015

SPECIAL THANKS

This is a Plan that provides for a strong and more reliable telecommunication network to assist units of government and public safety professionals. It is they who provide first responses to the approximately ten million people living in the state of Mississippi and protect more than one hundred thirty five billion dollars of property value. The safety of first responders and those they've been sent to help, in a great part, depends upon a reliable and modern communication system. The creation of a workable telecommunication plan utilizing contemporary technology, and providing wisely for future change, is no small under taking. This Plan developed over six years.

Over the course of those years, there were those whose dedication and efforts to bring this Plan to fruition were exceptional. Fairness dictates that each of the members be recognized for their contributions as leaders. They kept this document on track and helped the committee persevere during changes in regulations that had to be navigated. Their record keeping and mailings provided essential records. The Committee's efforts were supported by Ms. Jeannie Benfaida of the FCC who was most gracious in their advice and guidance.

Special note should also be made of the Chairpersons of the Regions lying adjacent to Region 23. They, and in some cases their predecessors, came to our meetings or conference with us via telephone or shared concerns and offered assistance during the development of this plan. You will find the signatures of the Chairpersons of Regions 1, 4, 18 and 39 affixed in Appendix X.

Documentation illustrates that almost 500 persons were contacted or somehow participated in discussion or e-mails or some other form of interaction during the eight years this plan was developed. Outstanding among them were the few scores of individuals who formed the membership of the 700 MHz Regional Planning Committee. With the limited space of one page, it would be imprudent to attempt to name all of them now. Nevertheless, they played important roles in the development of the Region 23 700 MHz Plan and it breaks my heart not to be able to set each contributor before you for recognition.

The reader is asked to review the list of Committee members in Appendix A. Each and every one of the persons listed contributed in an important way or ways to this Plan's development. Some engaged in knowledgeable and civil debates, formulating written concepts codified within the Plan. Others distributed important documentation which may have been included within the Plan. In addition, we thank The Region 23 700MHz Regional Writing Committee for their efforts in the preparation of this document. All played important roles and we thank them.

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THE REGION 23 700 MHz PLAN

SCOPE

Introduction

This is the second major planning thrust for Region 23. The first was to meet the Federal Communications Commission's (FCC) requirements for the National Public Safety Planning Advisory Committee (NPSPAC). This planning thrust was precipitated by the establishment of the 700 MHz public safety band.

The FCC announced the allocation of 24 MHz in the 700 MHz radio spectrum subsequent to the Public Safety Wireless Advisory Committee (PSWAC) report that established need requirements throughout the country. Interoperability within and among public safety and public service providers was identified in the PSWAC report as a basic minimum essential requirement.

Subsequent to the PSWAC, the FCC established a Federal Advisory Committee called the National Coordination Committee (NCC). The NCC was created to address interoperability, technology, and implementation issues to be considered for the 700 MHz spectrum. The FCC required that a Regional Plan outlining the use of public safety radio frequencies be complete and approved of by the FCC before any agency within a region would receive channels from this new allocation. The Regional 23 Plan conforms to the NCC planning guidelines. The Region 23 Mississippi 700 MHz Regional Planning and Frequency Advisory Committee's (MRPFAC or Committee) membership represents a cross-section of public safety and public service users. A Committee membership list is contained in Appendix A.

Purpose

The purpose of the Regional Plan is to insure that maximum public benefit is derived from use of the 700 MHz spectrum by eligible agencies. Further, the Plan was developed to guide eligibles through the application process and provide an equitable means of settling disputes concerning frequency allocations should they arise.

Plan Summary

First, Region 23 is defined as the entire State of Mississippi. The broad classifications of entities eligible to apply for spectrum are defined in accord with NCC definitions. Next, to garner their participation in and support of the planning process, an attempt was made to contact all eligible agencies. These attempts are documented. The authority by which the Committee undertook these planning efforts is reviewed. A discussion follows of the process by which the initial spectrum allocation was made. Finally, a detailed discussion of the application process is given. This includes guidelines for spectrum use, application requirements, application review process, and dispute resolution. Also included is a discussion of the future planning process.

The Region 23 Committee accepts the Computer Assisted Pre-Coordination Resource and Database (CAPRAD) database initial allocation based on population density and call volume by county. It has been noted by the committee that this allocation closely matches the description of Designated Statistical Areas by the US Department of Management and Budget Bulletin 03-04 of June 6, 2003 (see Appendix L). The Committee will use the CAPRAD database when allocating frequency resources in Region 23.

Interoperability guidelines and usage must be in accordance with the requirements of the State Interoperability Executive Committee (SIEC).[1] Any conflict between the I/O rules for National Calling and Tactical channels in this plan and SIEC guidelines, the SIEC guidelines will prevail.

Television broadcasting activity is currently limited to approximately the southern half of the Region. Therefore, until February 18, 2009, assignments in certain areas of the state on channels where interference issues are anticipated will be made on the basis of the guidelines laid out in NCC planning documents (see Appendix T). Frequency assignments which are secondary to Public Safety operations, such as television translator, Low Power TV stations, or other secondary assignments will not be granted interference protection. Licensees of transmitters located within the state of Mississippi were notified of the last Public Hearing prior to finalization of the Plan. They will be notified again when the FCC has approved the Region 23 Plan, and a final time when applications for frequency assignment within the station's coverage area are received by the Region.

[1] The Mississippi Wireless Communication Commission serves as the SIEC for the State of Mississippi Pursuant to Miss. Code Ann. § 25-53-171.

Region 23 Defined

Region 23 consists of the entire state of Mississippi. Mississippi is comprised of 82 counties, located within 47,233 square miles, the majority offering rural agricultural areas. Mississippi has 362 miles of coastline extending from Louisiana to Alabama. Mississippi has an elaborate system of interstate highways and major thoroughfares that make traveling quick and easy. The geographic center of Mississippi is located in Leake County, approximately nine (9) miles west-northwest of Carthage. The highest point is Woodall Mountain at 806 feet, which is located in the county of Tishomingo. The value of all taxable property in Region 23 in the year 2006 was estimated as One Hundred Thirty Five Billion, Seven Hundred Sixty Three Million, Two Hundred Twenty Six Thousand, Five Hundred Sixty Five dollars, $135,763,226,565. The population of this region is 2,879,146 based upon the 2000 US Census (Appendix L), a 10.4% increase since 1990. This Regional plan will consider the communication needs of all agencies currently eligible in the FCC Public Safety pool (PW). No other agencies within Region 23 that we are aware of have developed 700 MHz band plans.

Definition of Eligible Entities

Eligible agency users are defined by the PSWAC and NCC as follows: Public safety – the public's right, exercised through Federal, State or Local government as prescribed by law, to protect and preserve life, property, and natural resources and to serve the public welfare. Public safety services – those services rendered by or through Federal, State or Local government entities in support of Public Safety duties. Public safety services provider – governmental and public entities or those non-government, private organizations, which are properly authorized by the appropriate governmental authority whose primary mission is providing Public Safety duties. Public services – those services provided by non-Public Safety entities that furnish, maintain, and protect the nation's basic infrastructures which are required to promote the public's safety and welfare.

Meetings, Public Notices and Meeting Attendance

A diverse group of individuals and agencies were invited to participate in the development of the Regional Plan. Notification was accomplished by US mail, web page postings, and e-mail sent to public safety and public service organizations and to organizations representing eligible agencies. In addition, Federal, State, Local, and Tribal government agencies concerned with National Security and Emergency Preparedness were contacted. Appendix B contains the notification list, Appendix E contains the initial convening information, and Appendix F contains the minutes of the meetings. All Region 23 Committee meetings are open to the general public, as certified in Appendix W.

AUTHORITY

Mississippi 700 MHz Regional Planning and Frequency Advisory Committee Authority

Authority for the MRPFAC to carry out its assigned tasks is derived from the FCC Report and Order, Docket 96-86. The by-laws for Region 23 are contained in Appendix D of this plan.

National Interrelationships

The Region 23 700 MHz Plan conforms to the NCC planning documents. If there is a conflict between this plan, the NCC documents, or the FCC rules, the FCC rules will prevail. It is expected that Regional Plans for other areas in the country may differ from this plan due to their local needs. By officially sanctioning this Plan, the FCC agrees that it conforms to the NCC and FCC planning requirements. This Plan is not intended to conflict with the proper functions and duties of the frequency coordination entities in the Private Land Mobile Service. The Region 23 Plan provides procedures that are the consensus of the group of individuals involved in its development over several years. If there is a perceived conflict, the judgment of the FCC will prevail.

SPECTRUM ALLOCATION

Usage Guidelines

Systems operating in the Region must comply with all applicable FCC rules and regulations and the requirements of this Plan. Applications for the purpose of expanding existing systems will NOT be given consideration unless the applicant can demonstrate that the existing system is loaded to the criteria contained in this Plan.

Adjacent Region Coordination

Any applicant requesting frequency allocation(s) within 113 km (70 miles) of the border between Region 23 and the adjoining regions must be coordinated with the effected adjoining Region. Applicants will be required to file identical applications with the Region 23 Committee and the committee of the region or regions adjoining the proposed stations.

Application Requirements

This portion of the plan provides a basis for proper spectrum utilization. Its purpose is to evaluate the implementation of 700 MHz radio communication systems within the Region. Any applications for spectrum must be submitted after the date this plan is approved by the FCC and will be processed in the order they are received.

Agencies that desire spectrum must submit a complete application containing various documents as listed in Appendix G. The applicant may need to include a system design that incorporates base stations for use on the interoperability channels. This will be dependent upon the hierarchy of levels of government as listed on page 6, the geographic coverage of the proposed system, or the pre-existence of any other 700 MHz applications or systems in the same geographic area. Evaluation of applications for available spectrum is accomplished during the regularly scheduled MRPFAC meetings.

Applicants are encouraged to join larger existing systems whenever possible, or to form consortiums with neighboring agencies to create spectrum efficient new systems. As the 700 MHz spectrum is allocated, applicants for new systems surrounded by or adjacent to existing systems may be required to document as part of the application process the technical, functional, financial, or political reasons joining the existing system does not meet their requirements.

Interoperability

Interoperability between Federal, State and Local Governments during both daily and emergency and disaster operations will primarily take place on the interoperability channels. These channels are identified in this and the National Plan. Additionally, through the use of an S-160 or the MOU (see Appendix P) or equivalent agreements, a licensee may permit Federal use of non-Federal communications system spectrum.

Interoperability Requirements

All applicants shall submit an Interoperability Plan with their application. In this plan, the applicant shall:

A. Identify the organizations with whom interoperable communications are to be achieved, and

B. Stipulate how they will accomplish interoperable communications in their proposed system (for example, via gateway, switch, cross-band repeater, console cross patch, software defined radio or other means) with the agencies listed in A as well as for each of the following priorities:

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 for an event of a preplanned nature including task force operations.) Through proper consideration, design, and implementation, the best possible interoperability will be achieved.

Interoperability Responsibilities

Responsibility for the implementation of operation on the interoperability frequencies rests with:

1. The highest level of government submitting an application within or encompassing a given geographical area, or
2. The applicant whose proposed system coverage encompasses the largest geographical area, or
3. The first or "lead" agency in a multi-agency environment using 700 MHz frequencies in a given geographic area.

The hierarchy of levels of government shall be as follows:

1. The State of Mississippi
2. Regional Consortiums or Multi-county systems
3. County systems
4. Multiple city, village or township Consortium systems
5. Single city, village, township or other eligible system

For Region 23, the largest geographic area and the highest level of government is the state of Mississippi. Should the state of Mississippi apply for a statewide 700 MHz system on channels outside the state channel block, their application must show the inclusion of interoperability frequencies according to state and regional area requirements. Otherwise, the next largest jurisdiction to apply must include provisions for wide area operation on the interoperability frequencies throughout their coverage area and so forth. System implementations must provide interoperability between area wide agencies as mandated by this plan. Such implementation must be reviewed and approved by the SIEC and Region 23 Committee.

Incident Command System Standard
Region 23 supports NCC recommendations regarding the National Incident Management System (NIMS) and ICS.

Coverage and Interference
Systems are to be designed and protected in accordance with the methods given in TIA/EIA Telecommunications Systems Bulletin TSB-88A and its addendums. Required engineering submittals are listed in Appendix G. Applicants which demonstrate compliance with 50-50 40 dB curve standards shall be deemed to have complied with the coverage requirements of this plan. Where a question of compliance arises, applicants shall demonstrate to the committee that they are in compliance with the applicable portions of TSB-88A and its addendums.

Those systems that are designed to provide "wide area" coverage must demonstrate their need to require such coverage. Communication coverage beyond the bounds of a jurisdictional area cannot be tolerated unless it is critical to the protection of life and property. Otherwise, strict criteria for limiting area of coverage to the boundaries of the applicant's jurisdiction must be observed. Overlapping or extended coverage must be minimized; even where "intermixed" systems are proposed for cooperative and/or mutual aid purposes.

Antenna heights are to be limited to provide only the necessary coverage for a system. When antenna locations are placed on the "high ground," reduced transmitter output effective radiated power (ERP) limits and special antenna patterns must be employed to produce the necessary coverage within and confined to the protected service area.

Interference complaints will be addressed in cooperation with the appropriate FCC certified frequency coordinators. In the event that the Committee determines adjacent channel interference is likely, the applicant will be required to provide the appropriate technical data in accord with the NCC Implementation Sub-Committee Simplified 700 MHz Pre-Assignment Rules Recommendation pp 183 - 193 (see Appendix Q). The Committee may require additional technical exhibits and documentation in order to conduct a full and proper evaluation of the complaints.

TV/DTV Protection

The following analog television operations exist on NTSC channels 60 through 69 in Region 23.

County	Channel	Call Sign	Location	Latitude NAD83	Longitude NAD83
Bolivar County	63	NEW	Cleveland	33°44'0N"	90°42'50W"
Calhoun County	65	NEW	Bruce	34°1'29N"	89°21'10W"
Forrest County	63	W63CY	Hattiesburg	31°21'21N"	89°13'27W"
Hinds County	64	WJKO-LP	Jackson	32°16'0N"	90°16'59W"
Jasper County	65	W65DE	Meridian	32°8'18N"	89°5'36W"
	69	W69DJ	Meridian	32°8'18N"	89°5'36W"
Jones County	64	W64CU	Laurel	31°41'29N"	89°4'25W"
	68	W68DX	Laurel	31°41'44N"	89°5'40W"
Oktibbeha County	63	W63DA	Starkville	33°28'11N"	88°45'13W"
Prentiss County	65	W65ED	Tupelo	34°28'28N"	88°43'41W"
	68	K68GQ	Tupelo	34°28'28N"	88°43'41W"
	68	NEW	Hattiesburg	31°15'8N"	89°20'24W"
	68	NEW	Laurel	31°41'44N"	89°5'40W"
Washington County	63	K63HD	Greenville	33°24'21N"	90°59'30W"

Applicants desiring to utilize channels prior to February 18, 2009, which are presently affected by incumbent Primary TV stations are required to protect these incumbents by:

a) Utilizing geographic separation specified in the 40 dB Tables of 90.309, or

b) Submitting an engineering study justifying other distance separations which the FCC approves, or

c) Obtaining concurrence from the applicable TV station (see Appendix T).

Loading

Per-channel block loading requirements are given in Appendix G.

Channel Reuse

All necessary precautions will be taken to gain maximum reuse of the limited 700 MHz spectrum. The distance between transmitters for co-channel reuse will be determined through the use of TR 8.8 standards. Consideration will be given to the coverage needs of the applicant, natural barriers for separation, antenna patterning, and limiting ERP where possible. System tests and/or propagation studies should be provided to establish minimum distances for separation.

The Regional Committee shall be responsible for reviewing the engineering submittals on an application. Applicants will submit additional relevant documents to the FCC certified coordinators as the Committee deems necessary.

Reassignment of Existing Frequencies

Applicants shall furnish the committee with a list of agencies transitioning to the 700 MHz system. At the time of application, the applicant must provide a Letter of Intent listing all frequencies per agency to be relinquished if 700 MHz allocations are granted and an anticipated date the frequencies will be relinquished. This document will be submitted as a condition of license grant by the FCC. At the time the applicant files a Construction Completion Notification and /or final Slow Growth Implementation Report with the FCC, a copy of these documents shall immediately be provided to the Mississippi Public Safety Frequency Advisory Committee. When the transition to the 700 MHz band has been completed, the VHF and UHF frequencies presently licensed to an applicant and listed for relinquishment shall be returned to the frequency pool for reassignment.

However, the Committee recognizes that it may be necessary for an applicant to maintain certain operations on legacy systems. Therefore, applicants desiring to maintain such legacy operations must submit a request to retain each existing frequency in writing. This request must specify the current as well as the future use of the requested legacy frequency.

Frequencies not approved for retention will be returned to the pool by cancellation of those frequencies from the appropriate FCC license(s). It shall be the responsibility of the licensee to cancel all frequencies not approved for retention from their FCC Licenses.

Normal application and coordination procedures will be followed with returned channels.

It is not consistent with the goals and objectives of this Region to permit the direct reassignment of radio frequencies between agencies. Similarly, agencies shall not "farm down" or otherwise make frequencies available to other radio services within their political structure.

Channel Assignment

The applicant evaluation criteria established in the NCC process and further defined in this Regional Plan are to be complied with. In cases where more than one applicant requires a specific allotment, the Competing Application Evaluation Matrix will be utilized to determine the successful applicant. In all cases, area of coverage criteria, technical requirements, and channel loading criteria will be applied, except upon unique circumstances after review and approval from the Committee. No deviation from FCC rules is to be approved unless a fully justifiable waiver has been presented to the Committee.

Expansion of Existing NPSPAC Systems

Existing NPSPAC systems that are to be expanded to include the frequency bands of 700 MHz will have to separately meet the requirements of the Region 23 plans on each band. They must maintain compliance with the NPSPAC plan and the 700 MHz plan also.

FREQUENCY ALLOTMENT METHODOLOGY

Allotment Process

The Region 23-700 MHZ Planning Committee accepts the National Law Enforcement and Corrections Technology Center (NLECTC) database as the official allotment for Region 23 (see Appendix O for explanation). The sorted channel assignments by county are given in Appendix N.

Orphaned Channels

The narrowband pool allotments with Region 23 will have a channel bandwidth of 12.5 KHz. These 12.5 KHz allotments have been characterized as "Technology Neutral" and flexible enough to accommodate multiple technologies utilizing multiple bandwidths. 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 or 12.5 kHz bandwidth immediately adjacent to the assigned channel within a given county area.

An orphaned channel may be used at another location within the county area where it was originally approved, if it meets co- and adjacent channel interference criteria. Region 23 will utilize **"county areas"** as guidelines for channel implementation within the area of Region 23. The definition of **"county area"** in this plan is the geographical/political boundaries of a given county, plus a distance of up to 10 miles outside of the county. 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 23 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 23 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 23 Committee shall have the authority to move orphan channel allotments, and/or co-/adjacent 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.

Application Review

The flow chart entitled "Application Review Matrix" presents the sequence of events that will be followed in the allocation of the 700 MHz spectrum. The flow chart may be found in Appendix M. Applications are received and reviewed by the MRPFAC (Block #I & II). If the application is not in compliance with WCC requirements (Block #III) and Regional Plan requirements, the application will be rejected at this point and returned to the applicant with an explanation of the reason(s) for rejection. If there are no competing applications to be considered, the application will be populated with channels and be forwarded to the frequency coordinating body of choice (Block #V and beyond). The Competing Application Evaluation Matrix will be used when competition for spectrum arises.

Competing Application Dispute Resolution

The implementation of the Competing Application Evaluation Matrix (see Appendix M) will result in the award of a score for each application. The application score is the total number of the points awarded in eight categories. The applicant with the highest total score will have their application processed and supported for frequency coordination.

Others will be returned to the applicant if no spectrum is available. The eight categories are as follows:

1. Service and Use (Block #1) – maximum score 360 points. Each of the eligible services, and each use, has a predetermined point value. Total points for this block will be the sum of the point assignments for each service and use the system is to support.

SERVICE	Points
Federal	24
Tribal Nation	24
State	24
Local Gov	24

Police	24
Special Emergency/EMS	24
Emergency Management	24
Fire	24
Forestry Conservation	24
Highway Maintenance USE	24
Rescue	40
Safety of Life and Property	40
Environmental Protection	40
Maximum Total	360

Environmental protection shall be considered tasks that directly reduce any contamination to the air, water or ground by chemicals or waste materials

2. Interoperability Diversity (Block #2) – maximum score 100 points.

The application is scored on the degree of interoperability that is demonstrated, with range of points from 0 to 100. This category does not rate the application on the inclusion of the mandated interoperability channels. This category does rate the application on its proposed ability to communicate with different levels of government and services during times of emergency.

Each applicant is encouraged to have direct mobile-to-mobile communications among the Federal, State, and Local Government, Tribal Nations, police, special emergency-EMS, fire, forestry conservation and highway maintenance radio services. All applications start with 100 points and points are deducted based upon their lack of intersystem communications.

Deducts

Deduct 10 points for each radio service type function in which the applicant lacks communication at the operator position via console patch or other means, when direct mobile-to-mobile communication does not exist. Radio services type functions are stated above.

Deduct five points for each radio service that the applicant lacks direct mobile-to- mobile communications with. Radio services type functions are stated above.

3. Cooperative Use (Block #3) – maximum score 150 points. Those applications that have demonstrated that they are part of cooperative, multi-organization systems will be scored depending

upon the extent of the cooperative system.

System Points

Multi-agency trunked system fully loaded	150
Trunked system fully loaded/channel	100
Conventional system fully loaded/channel	75

Expansion of Existing Systems

As it is the intent of this plan to promote cooperative use of the spectrum, expansion of an existing system will be given greater competitive weight than a competing new system. Therefore, the point award from the aforementioned category will be doubled as,

System Points (from previous category) X 2 = Score.

4. Spectrum Efficient Technology (Block #4) maximum score 125 points.

This category scores the applicant on the degree of spectrum efficient technology that the system demonstrates. A point value range of 0 to 100 points can be awarded for this category. Technologies that are designed to provide for more efficient spectrum use shall be awarded twenty-five (25) additional points.

Spectrum Efficiency Points

Description	Points
Trunked System, voice only on narrow channels	50
Trunked System, voice and data or equally efficient Technology	100
Conventional System using MDT on wide channels	50
Technologies that result in increased system throughput	25

5. This section (Block #5) gives municipalities consideration for the impact of urban sprawl. If they have recently established or plan to establish a public safety agency with approved funding and they do not yet have any radio frequencies allocated, they will receive 150 points.

Applicants requesting initial radio frequency (ies) for the purpose of communicating vital voice messages. 150

6. Systems Implementation Factors (Block #6) – maximum score 100 points.

This category scores the applicant on two factors, budgetary commitment and planning completeness. The degree of budgetary commitment is scored on a range of 0 to 50 points. An applicant who demonstrates a high degree of commitment in funding the proposed system will receive the higher score. Each applicant will be scored on the degree of planning completeness with a range of scoring from 0 to 50 points. Applicants will be required to submit a timetable for the implementation of the communications system or systems.

Description	Points
Multi-Phase Project with the applicant committing funds to all phases.	50
Multi-Phase project plan completed for all phases	50

7. System Density (Block #7)

Each applicant will be scored on the ratio of subscriber units to the area covered.

System Density Points

(Total number of subscriber units) / (Area in square miles) x 100 = score.

8. Givebacks or relinquished Frequencies (Block #8) – maximum score 200 points. The applicant is scored on the number of channels given back. The applicant with the greater number of channels given back will receive a higher score.

Scoring: Number frequencies to be Relinquished x 10 = Score

Points are totaled for each competing application (Block #SUM).

Applicants with less than a complete funding commitment and/or incomplete plan will have their point score reduced accordingly. Resolutions shall be included in each plan stating the applicants governing boards (or equal) financial commitment.
The competing applications are prioritized based on the total number of points each has received in the evaluation process. The application with the higher score will then proceed with the approval process. The application with the lower score will be returned to the applicant. The applications (Block #VI) are sent to the PW coordinated requested by the applicant. Subsequent to coordination approval (Block #VII) the FCC would grant the license(s) to the applicant (Block #VIII).

This plan has been prepared to enable consistent evaluation of competing applications. Variation within the parameters of this plan and submitted application and/or plans may require extensive evaluation. Therefore the MRPFAC shall evaluate each plan or situation on its own merit, as well as on a relative basis to other competing applications.

REGIONAL COMMITTEE

The MRPFAC shall be responsible for the frequency coordination of the application. This shall include making a determination about the engineering of the system, ERP, coverage, and compliance with FCC requirements.

System Implementation

Should system implementation not begin (award of contract) within a two-year period or if projected channel loading is not attained within four years after the granting of license(s), the channel(s) will be returned for reassignment to others. A one-year extension may be supported by the MRPFAC depending upon circumstances that are beyond the control of the applicant. The applicant will be responsible to contact the FCC to request an extension from the Commission. Any applicant must be doing all in their power to implement the project within their authority.

The MRPFAC will determine if progress is being made on the implementation of the system (Block #IX & X). Monitoring of systems implementation by the MRPFAC will take place at intervals not longer than one-year. If progress is made, the system is implemented (Block #XI). If progress is not made, the licensee is advised of the consequences and the MRPFAC informs the PW frequency coordinator of the situation (Block #XII). The MRPFAC continues to monitor progress on the implementation of the system (Block #IX). If progress is still not being made in the next evaluation period, the licensee is notified of the pending action of the MRPFAC to advise FCC of lack of progress (Block #XIII).

The notified licensee can appeal this action (Block #XIV) or can allow the license to be cancelled or withdrawn. If the authorized frequencies are withdrawn they are added back to the frequency allotment pool (Block #XVI).

Appeal Process

Throughout the application review and frequency allotment process, applicants are given opportunities to appeal decisions that have caused the rejection of their application. The appeal process has two levels: the MRPFAC and the FCC. An applicant who decides to appeal a rejection should initiate that appeal within ten (10) business days after receiving the decision. In the event that an appeal reaches the second level, the FCC, the FCC decision will be final and binding upon all parties. The Region 23 appeal process is contained in Appendix H.

Future Planning Process

The MRPFAC shall serve as the Plan Update Committee. This Committee's responsibility is to recommend changes in the Plan and resolve interregional problems that may arise. The MRPFAC shall also be responsible for receiving, reviewing, considering, and acting on applications as well as updating the database for spectrum in the 700 MHz band. The CAPRAD Administrator and Alternate Administrator will each be members of the MRPFAC committee with voting privileges. MRPFAC committee structure and routine duties are contained in Appendix U.

Regional Plan Updates

This section is focused on instances when actions taken by the FCC or the MRPFAC itself necessitate a change in the regional plan. 700 MHz Regional Plan changes are required to be submitted to the FCC under Docket 02-378. Regional Plan updates are contained in Appendix Z.

REGION 23 700 MHz PLAN
APPENDIX A - REGIONAL PLAN OFFICERS AND MEMBERSHIP LISTS

This Appendix Contains

1. A listing of the current officers of the Region 23 RPC
2. Documentation of the identity of Committee Members

Historical Accounting of 700 MHz RPC Officers

November 10, 2005 Organization formalized and following officers are installed

Bill Ford	Chairman
Don Loper	Vice Chairman
Don McKennon	Treasurer
Jim Hennessey	Secretary

November 1, 2007 Don Loper assumes duties as "Acting Chairman"

700 MHz RPC Officers as of October 1, 2008

Donald Loper	Chairman
Donald Loper	Vice Chairman
Don McKennon	Treasurer
Jim Hennessey	Secretary

700 MHz RPC Officers as of November 27, 2009

Donald Loper	Chairman
Susan Perkins	Vice Chairman
Don McKennon	Treasurer
Lana Nicks	Secretary

700 MHz RPC Officers as of November 10, 2011

Tom Lariviere	Chairman
Susan Perkins	Vice Chairman
Vann Byrd	Treasurer
Lana Nicks	Secretary

Organization	Name, Title	Phone/E-mail	Location / Address
		State	
Mississippi Emergency Management Agency (MEMA)	Tom McAllister	24 hr Emergency Line: 1-800-222-6362 Office: 601-933-6715 Cellular: 601-927-4136 Fax: 601-933-6800 tmcallister@mema.ms.gov	1 MEMA Drive Pearl, MS 39288-5644
Mississippi Emergency Management Agency (MEMA) Logistics	Don Wilson Logistics Chief	Office: 601-933-6705 Cellular: 601-519-1883 Fax: 601-933-6800 dwilson@mema.ms.gov	1 MEMA Drive Pearl, MS 39288-5644
Mississippi Emergency Management Agency (MEMA) Operations Bureau	Charlie Smith Bureau Director	24 hr Emergency Line: 1-800-222-6362 Office: 601-933-6716 Cellular: Fax: 601-933-6800 csmith@mema.ms.gov	1 MEMA Drive Pearl, MS 39288-5644
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Region 23 700 MHz RPC Membership List

REGION 23 700 MHZ PLAN
APPENDIX B - MEMBERSHIP APPLICATION AND LIST OF DOCUMENTED PARTICIPANT/CONTACTS

This Appendix Contains

1. Membership Application
2. List of individuals contacted to participate and participating in the planning process

REGION 23

700 MHz Membership Application

NAME ______________________________

AGENCY ______________________________

ADDRESS ______________________________

____

____

PHONE ______________________________

E-
MAIL

Your primary responsibilities
are

Your agency is (please check one)

____ Government agency/authority

____ Company that provides public safety or public service to a government agency

____ Non-public safety or public service agency or organization

Public safety and public service definitions follow:

Public safety – the public's right, exercised through Federal, State or Local government as prescribed by law, to protect and preserve life, property, and natural resources and to serve the public welfare.

Public safety services – those services rendered by or through Federal, State or Local government entities in support of Public Safety duties.

Public safety services provider – governmental and public entities or those non-governmental, private organizations, which are properly authorized by the appropriate governmental authority whose primary mission is providing Public Safety services.

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REGION 23 700 MHZ PLAN

APPENDIX C - REGION MAP AND LISTING OF MISSISSIPPI CITIES

This Appendix Contains

1. A listing of cities in the state of Mississippi
2. Federally Recognized (BIA) Mississippi Native American Tribes
3. A map identifying the FCC designated 700 MHz Region 23

Region 23 - Appendix C – Mississippi

Mississippi Cities, Villages and Townships

ABBEVILLE
ABERDEEN
ACKERMAN
ALGOMA
ALLIGATOR
AMORY
ANGUILLA
ARCOLA
ARTESIA
ASHLAND
BALDWYN
BASSFIELD
BATESVILLE
BAY SAINT LOUIS
BAY SPRINGS
BEAUMONT
BEAUREGARD
BELMONT
BELZONI
BENOIT
BENTONIA
BEULAH
BIG CREEK
BILOXI

BLUE MOUNTAIN
BLUE SPRINGS
BOLTON
BOONEVILLE
BOYLE
BRANDON
BRAXTON
BROOKHAVEN
BROOKSVILLE
BRUCE
BUDE
BURNSVILLE
BYHALIA
BYRAM
CALEDONIA
CALHOUN CITY
CANTON
CARROLLTON
CARTHAGE
CARY
CENTREVILLE
CHARLESTON
CHUNKY
CLARKSDALE

CLEVELAND
CLINTON
COAHOMA
COFFEEVILLE
COLDWATER
COLLINS
COLUMBIA
COLUMBUS
COMO
CORINTH
COURTLAND
CRAWFORD
CRENSHAW
CROSBY
CROWDER
CRUGER
CRYSTAL SPRINGS
D LO
DECATUR
DEKALB
DERMA
D'LBERVILLE
DODDSVILLE
DREW

Region 23 - Appendix C – Mississippi

Mississippi Cities, Villages and Townships

DUCK HILL	GEORGETOWN	INVERNESS
DUMAS	GLENDORA	ISOLA
DUNCAN	GLENN	ITTA BENA
DURANT	GLOSTER	IUKA
ECRU	GOLDEN	JACKSON
EDEN	GOODMAN	JONESTOWN
EDWARDS	GRENADA	JUMPERTOWN
ELLISVILLE	GREENVILLE	KILMICHAEL
ENTERPRISE	GREENWOOD	KOSCIUSKO
ETHEL	GULFPORT	KOSSUTH
EUPORA	GUNNISON	LAKE
FALCON	GUNTOWN	LAMBERT
FALKNER	HATLEY	LAUREL
FARMINGTON	HATTIESBURG	LEAKESVILLE
FAYETTE	HAZLEHURST	LEARNED
FLORA	HEIDELBERG	LELAND
FLORENCE	HERNANDO	LENA
FLOWOOD	HICKORY	LEXINGTON
FOREST	HICKORY FLAT	LIBERTY
FRENCH CAMP	HOLLANDALE	LONG BEACH
FRIARS POINT	HOLLY SPRINGS	LORMAN
FULTON	HORN LAKE	LOUIN
GATTMAN	HOUSTON	LOUISE
GAUTIER	INDIANOLA	LOUISVILLE

Region 23 - Appendix C – Mississippi

Mississippi Cities, Villages and Townships

LUCEDALE	METCALFE	OSYKA
LULA	MIZE	OXFORD
LUMBERTON	MONTICELLO	PACE
LYON	MONTROSE	PACHUTA
MABEN	MOORHEAD	PADEN
MACON	MORGAN CITY	PASCAGOULA
MADISON	MORTON	PASS CHRISTIAN
MAGEE	MOSS POINT	PEARL
MAGNOLIA	MOUND BAYOU	PELAHATCHIE
MANTACHIE	MOUNT OLIVE	PETAL
MANTEE	MYRTLE	PHILADELPHIA
MARIETTA	NATCHEZ	PICAYUNE
MARION	NETTLETON	PICKENS
MARKS	NEW AGUSTA	PITTSBORO
MATHISTON	NEW ALBANY	PLANTERSVILLE
MAYERSVILLE	NEW HEBRON	POLKVILLE
MCCOMB	NEW HOULKA	PONTOTOC
MCCOOL	NEWTON	POPE
MCLAIN	NORTH CARROLLTON	POPLARVILLE
MEADVILLE	NOXAPATER	PORT GIBSON
MENDENHALL	OAKLAND	POTTS CAMP
MEMPHIS	OCEAN SPRINGS	PRENTISS
MERIDIAN	OKOLONA	PUCKETT
MERIGOLD	OLIVE BRANCH	PURVIS

Region 23 - Appendix C – Mississippi

Mississippi Cities, Villages and Townships

QUITMAN	SHAW	TAYLOR
RALEIGH	SHELBY	TAYLORSVILLE
RAYMOND	SHERMAN	TCHULA
RENOVA	SHUBUTA	TERRY
RICHLAND	SHUQUALAK	THAXTON
RICHTON	SIDON	TISHOMINGO
RIDGELAND	SILVER CITY	TOCCOPOLA
RIENZI	SILVER CREEK	TOOMSUBA
RIPLEY	SLATE SPRINGS	TREMONT
ROLLING FORK	SLEDGE	TUNICA
ROSEDALE	SMITHVILLE	TUPELO
ROXIE	SNOW LAKE SHORES	TUTWILER
RULEVILLE	SOSO	TYLERTOWN
SALLIS	SOUTHAVEN	UNION
SALTILLO	STAR	UTICA
SANDERSVILLE	STARKVILLE	VAIDEN
SARDIS	STATE LINE	VERDAMAN
SATARTIA	STONEWALL	VERONA
SCHLATER	STURGIS	VICKSBURG
SCOOBA	SUMMIT	WALLS
SEBASTOPOL	SUMNER	WALNUT
SEMINARY	SUMRALL	WALNUT GROVE
SENATOBIA	SUNFLOWER	WALTHALL
SHANNON	SYLVARENA	WATER VALLEY

Region 23 - Appendix C – Mississippi

Mississippi Cities, Villages and Townships

WAVELAND

WAYNESBORO

WEBB

WIER

WESSON

WEST

WEST POINT

WIGGINS

WINONA

WINSTONVILLE

WOODLAND

WOODVILLE

YAZOO CITY

Region 23 - Appendix C – Mississippi

FEDERALLY RECOGNIZED (BIA) MISSISSIPPI NATIVE AMERICAN TRIBES

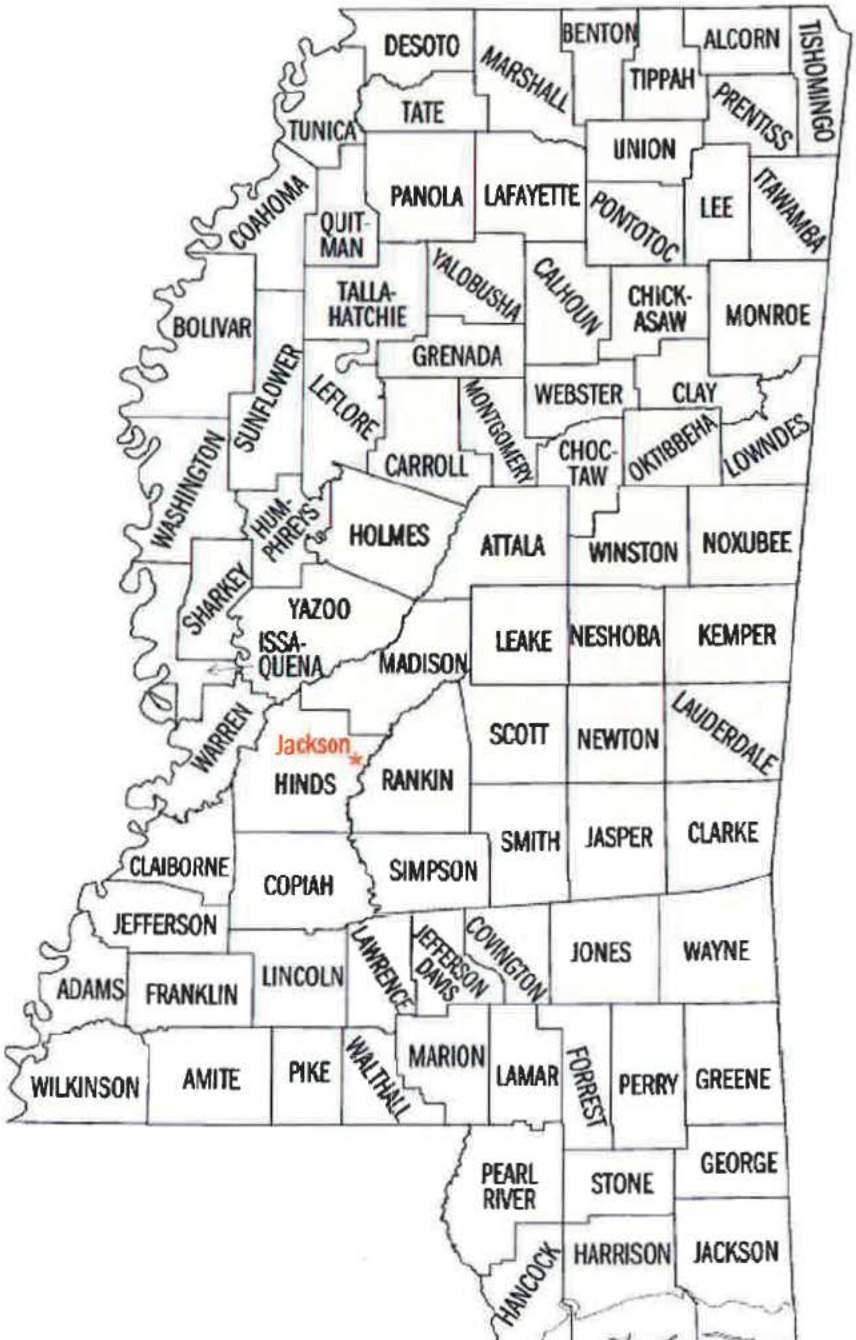
Jena Band of Choctaw Indians

Tunica-Biloxi Indians of Louisiana

The Chicksaw Nation

APPENDIX C

MAP OF REGION 23



REGION 23 700 MHz PLAN
APPENDIX D - REGION BYLAWS

This Appendix Contains

By-Laws for the Region 23 700MHz MRPFAC

Region 23-Appendix D-Region Bylaws

Mississippi 700 MHz Regional Planning
and
Frequency Advisory Committee

BY LAWS

Article I: Name and Purpose.

Section 1. Name:
Upon implementation of the 700 MHz Public Safety Band; the Region 23 700 MHz Planning Committee shall incorporate the Frequency Advisory Committee into the Planning Committee. The Region 23 700 MHz Planning Committee shall become known as the Mississippi 700 MHz Regional Planning and Frequency Advisory Committee (MRPFAC).

Section 2. Purpose:
The purpose of this organization shall be the fostering of cooperation among all interested parties; the equitable planning, development, distribution and implementation of the regions plans with respect to the allocation and use of the 700 MHz Public Safety Frequency Band. This process is open to all state, county, city, tribal and other political subdivisions that are formed and operating in the state of Mississippi.
This Committee will implement the 700 MHz Region 23 Frequency Plans as authorized by FCC Docket #96-86 and FCC Part 90 Subpart "R" and modify these plans as changes in law and need may require. Encourage the implementation of interoperability of radio systems. Inform the Public Safety Community on matters of FCC regulation and Public Safety Communications in general. Attempt to mitigate interference problems brought to the committee's attention. Represent Region 23 before the FCC and other regulatory agencies in regard to proposed policy and rule changes. Assist APCO Frequency Advisors with their duties as they may request.

Article II: Organization and Operation.

Section 1. Authority:
This Committee (MRPFAC) shall operate as a volunteer-staffed, independent not for profit body. Constituted under regulations created by the Federal Communications Commission in the National Public Safety Planning Advisory Committee proceeding identified as Docket #96-86 and the Mississippi Region 23 plans.

Section 2. Voting:
All meetings shall be conducted by Robert's Rules of Order Newly Revised 2000, tenth edition, by Henry M. Robert III and others. All actions of the Committee, except bylaw changes, may be approved by a simple majority vote of representatives attending a regularly scheduled and pre-announced Committee meeting that has a quorum. Should action be required between

meetings, an e-mail or telephone vote may be taken by the Chairperson and will require a majority of official committee members for approval.

Section 3. Quorum:
A quorum must be present to conduct a formal vote on any motion. A quorum shall be two-thirds (2/3) of the duly authorized members present at an officially announced meeting.

Section 4. Officers:
The MRPFAC shall have a Chairperson, Vice Chairperson, Secretary, and Treasurer. Officers shall be elected at the first meeting after January 1st of every year and serve a minimum of one (1) year.

A. **Duties:**

   Chairperson: Shall conduct all meetings, call special meetings as needed, appoint committees, develop agendas and enforce these bylaws.

   Vice Chairperson: Shall assume duties of the Chairperson in case the Chairperson is absent.

   Secretary: Shall record minutes of all minutes and maintain them in a binder available at meetings for review. Minutes shall include record of all applications submitted to the committee and actions taken. Send announcements of meetings to all members.

   Treasurer: Administer any funds that may be used by MRPFAC and submit a financial report to each meeting if funds are available.

B. **Vacancies of Officers:**

   The Chairperson shall fill any vacancies that occur between elections by appointment. In case of vacancy of the Chairperson, the Vice Chairperson shall serve as Chairperson until the next election.

Section 5. Finance:
Individual Committee Members, Officers, and Representatives expenses for their attendance at meetings shall be borne by those individuals or the agency they represent.

Article III: Membership.

Section 1. Qualifications:
Member and Alternate Representatives of the MRPFAC shall be appointed by the Public Safety Organization of Public Safety Service. Appointed Member and Alternate Representatives need to have a technical background in Communications, communication equipment, and frequencies. Members who have interest or benefit directly or indirectly from the actions of the

MRPFAC must abstain from any such vote. (Employees, Retirees, or Consultants are acceptable.)

Section 2. Membership:
The MRPFAC shall be composed of Members and Alternates drawn from the following Representative Organizations:

Mississippi Band of Choctaw Indians
One member and one alternate member

Mississippi Association of Supervisors
One member and one alternate member

Mississippi Association of Chiefs of Police
One member and one alternate member

Mississippi Sheriff's Association
One member and one alternate member

Mississippi Association of Fire Chiefs
One member and one alternate member

Mississippi Municipal League
One member and one alternate member

Mississippi Prehospital Professions Association
One member and one alternate member

Mississippi Emergency Management Agency
One member and one alternate member

Mississippi Department of Public Safety
One member and one alternate member

Mississippi Wireless Communication Commission
One member and one alternate member

Mississippi APCO Chapter
One member and alternate

Mississippi NENA Chapter
One member and alternate

Section 3. Petition for Membership to the Committee:
Addition or deletion of Members to the MRPFAC may be made by a majority vote of the Committee at a regular Committee meeting with a quorum. New Member requests must be made to the Chairman in writing.

Section 4. Member Appointment:
A Primary and Alternate Member shall be designated by each Member Organization and shall meet the requirements of Section 1 of this Article. Appointments must be received on respective organization letterhead and signed by the organization's appropriate officer. If no change is received by January 31of each year in writing to the Chairperson of MRPFAC then it shall be assumed that the preceding year Member Representative and Alternate are reappointed.

Section 5. Representative Responsibility:
Each appointed Representative shall represent the interest of their appointing authority, the Public Safety Community, and the goals and objectives of the MRPFAC. It is the responsibility of the Primary Representative to make the Alternate aware of each meeting's proceedings. Each Representative shall notify the Secretary if they are unable to attend a meeting and notify their Alternate to attend. Each Representative shall have one vote, may hold office if selected, and serve on Sub-Committees as appointed by the Chairperson.

Section 6. Alternate Representative:
Alternate Member Representatives must meet the requirements of Article III. Section 1. Alternates may attend any meeting of the MRPFAC but may vote only in the absence of the Primary Representative. Member Alternates may serve on Sub-Committees if appointed by the Chairperson.

Article IV: Policy and Procedure.

Section 1. Equality:
The services of the MRPFAC shall be made available equally to all applicants and licensees in the Mississippi Public Safety Community.

Section 2. Applications:
All applicants shall be submitted at least two (2) weeks before the next scheduled MRPFAC meeting for consideration at that meeting. The Chairperson may waive this under special conditions. Copies of the applications must be sent to all current members at that time. E-mail copies are sufficient. A hard copy must be submitted to the Chairperson or Secretary.

Section 3. Application Content:

Applications must contain sufficient information to allow the Committee to fully evaluate that application. This shall include all information called for in the appropriate Region 23 Plan and any other supplemental information that will aid the Committee in evaluating the application.

Section 4. Application Approval:

Applications will require a majority vote of the members present at a regular scheduled Committee meeting having a quorum. The Chairperson may also, under special circumstances, request a vote on an application outside of a regularly scheduled meeting. Such a vote may be conducted by telephone or e-mail, or any other means of electronic conferencing after distribution of the application to all Committee members. Under these circumstances, a majority vote of the current membership is necessary to approve the application. The application shall be tabled until the next scheduled meeting if failure to obtain valid response from a simple majority of the membership.

Section 5. Interoperability:

Where authority exists, MRPFAC shall create, adopt, and follow policy and procedure to assure that interoperability channels identified by the FCC, Proper Band Plans, and the MRPFAC are protected and promoted. MRPFAC shall encourage established interoperability channels and plans in Mississippi and Nationally.

Section 6. Records:

Records of the Committee shall be maintained in a secure place where they may be available to any past applicant or member as directed by a majority vote of the MRPFAC. The MRPFAC shall maintain a record of Committee established Policy and Procedure in addition to meeting minutes. This Policy and Procedure Book shall be generated and maintained by the Secretary or a member appointed by the Chairperson. This Policy Book shall be made available at all meetings and made available for members to copy.

Article V: Meetings.

Section 1. Schedule:

MRPFAC shall meet at least twice a year and may meet at the discretion of the majority members or by call of the Chairperson. Time and location of meetings shall be at the call of the Chairperson or majority vote at a meeting.

Section 2. Notifications:

The Secretary shall notify each Member Representative at least two weeks in advance with the place and date of the next meeting. Member Organizations and MRPFAC may also post meeting schedules on their Websites.

Section 3. Attendance:

All meetings are open to public attendance. Applicants and their engineering and vendor support are encouraged to attend. The Chairperson shall acknowledge the public in attendance and ask for name and representation. The Chairperson shall give opportunity for public comments at each meeting.

Article VI: Communications.

Section 1. Official Communications:
Official Communications of the MRPFAC, written, oral, or electronic, shall only come directly from the Chairperson or authorized Member as approved by a majority vote at any MRPFAC meeting or by appointment of Chairperson in writing. All written communications shall be on approved MRPFAC letterhead and be approved by majority vote at any MRPFAC meeting.

Section 2. Publication:
The MRPFAC may upon majority vote at any meeting direct the publication of any brochure, letter, newsletter, and magazine article as they see fit to educate, inform, and instruct the Public Safety Community regarding all communication matters.

Section 3. Website:
The MRPFAC may maintain an electronic Website under the direction of the Chairperson or appointed Webmaster, with the purpose of communicating with the Public Safety Community. Content shall be kept current and reviewed by all members and may be altered by majority vote.

Article VII: Bylaw Changes:

Section 1. Proposal:
Any member may suggest an amendment to the bylaws and present it to the Chairperson in writing. It shall be reviewed at the next MRPFAC meeting. The drafted change shall then be sent to all Members by U.S. Mail or e-mail within thirty (30) days along with the date and place a meeting will be held for vote.

Section 2. Bylaw Voting:
Two-thirds (2/3) of the current members must be in attendance at a meeting to consider a bylaw vote. A majority is required for approval.

REGION 23 700 MHZ PLAN
APPENDIX E - NOTIFICATION INFORMATION: GENERAL MEETING NOTICES, AGENDAS AND SPECIAL NOTICES

This Appendix Contains

1. A summary of Meeting Dates
2. Copies of Meeting Announcements and Solicitation of Comments
3. Summary of methods used for notification
4. Summary of adjacent Region notifications

Region 23 – Appendix E - Mississippi

LISTING OF MEETING DATES AND LOCATIONS

Meeting Date	*Location*
January 9, 2002	Emergency Management District, Hattiesburg, MS
March 27, 2002	Eagle Ridge Conference Center, Raymond, MS
November 10, 2005	Vicksburg, MS
October 27, 2009	MPB Auditorium, Jackson, MS
January 7, 2010	MS Emergency Management Agency, Pearl, MS
November 10, 2011	MS Department of Transportation, Jackson, MS
October 14, 2015	Woolfolk Building Room 145, Jackson, MS

Region 23 – Appendix E - Mississippi

METHODS OF NOTIFYING INTERESTED PARTIES USED BY REGION 23 700 MHZ MRPFAC

1. DIRECT MAIL VIA U.S. POSTAL MAIL
2. DIRECT MAIL VIA E-MAIL
3. ELECTRONIC POSTING ON WEB SITES:
    a. FCC website
    b. MRPFAC website – Under Development
    c. NPSTC website
    d. MEMA website
    e. WCC website
4. USE OF LIST SERVERS
5. VERBAL ANNOUNCENTS TO PUBLIC OF NEXT MEETING DATE AND LOCATION MADE AT END OF CURRENT PUBLIC MEETING
6. MISSISSIPPI MUNICIPAL LEAGUE, MISSISSIPPI ASSOCIATION OF SHERIFFS, ET CETERA
7. PARTICIPATION IN INTRA-STATE AND INTER-STATE TELEPHONE CONFERENCE CALLS WITH INTERESTED PARTIES

Note: Documentation of each of these techniques follows in this Appendix

Region 23 – Appendix E - Mississippi

Meeting Notification and Solicitation of Comments

A major obligation and challenge for any rule making process is proper notification of the appropriate constituency. Reasonable notification has at least two critical components: (1) an adequate time period for information to be disseminated and responded to; (2) execution of reasonable efforts to contact appropriate parties.

With regard to time, this Plan's public comment period encompassed almost eight years. The first announcement to solicit committee members and inform interested parties of the planning process was made in November 2001, sixty (60) days prior to the meeting in January 2002. Since then three (3) formal public meetings and other conferences were held to solicit input. Two surveys were distributed (one via mail the other via email). Telephone calls and break-out sessions were made with other Regional Planning Commissions and other interested parties. Besides public meetings, the eight years also included comments via the exchange of hundreds of e-mail and postal communications.

Notification of meetings and solicitations for comment were made to both general public and "specific" constituencies via several methods over the last eight years.

First, internet posting requirements were complied with by using several internet sites including the FCC, the Mississippi Chapter of APCO, and NPSTC and MEMA web sites. Second, television broadcasters, who provide news too directly to the public, were contacted.

Region 23 RPC members also worked diligently to identify and specifically notify parties who may have had a direct, or indirect, interest in the outcome of the planning process. In many cases, contact was made with groups that might be directly affected as potential users of new spectrum and the rules that would eventually be promulgated. In other cases, entities might have educational, technical or financial interests in the outcome of the planning process.

Examples of those parties who received meeting notices and planning information in addition to general "public" announcements include, but are not limited to: all public safety, first responder or other agencies and units of government within the state equipped to receive LEIN (Law Enforcement Information Network) broadcasts; public media outlets such as low power television stations; organizations representing public bodies such as the Mississippi Association of Supervisors, the Mississippi Municipal League; and individuals on the Mississippi RPC contact list. Three separate communications were sent to each of Mississippi's Native American tribal organizations.

Entities with special concerns or interests communicated with the committee. They included commercial firms and manufacturers and distributors of technology.

There were academic researchers and others who had an interest in the project or process, who received information from a committee representative. Copies of the Region 23 Plan were sent to all adjacent regions along with solicitations for comment.

So that individuals residing in various geographic areas would have an easier opportunity to offer comment, the Region 23 RPC also conducted its formal meetings in various communities located around the state. RPC Committee members are all volunteers and the committee has no funding source. In some cases these volunteers are retired or otherwise received no compensation for gasoline or other expenses. The geographic area in which meetings were held is approximately 200 miles from the most northerly to the most southerly point and 100 miles wide. Reasonable opportunity for public comment over a broad geographic area was provided by RPC members who traversed those 20,000 square miles many times over the eight years. This meant long drives, substantial effort and considerable expense.

RPC members believe Region 23's efforts for notification and to solicit public comment substantially exceed any existing minimum standards. The Committee worked hard to meet or exceed efforts that any other RPC in the U.S. made to provide open access to the planning process. This appendix documents numerous communications notifying both the general public and entities with direct and indirect interests in the 700 MHz Plan of opportunities for public comment.

Region 23 – Appendix E - Mississippi

Notifications

This Section of Appendix E Contains Distributed Agendas and Meeting Notices

PUBLIC NOTICE

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

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

DA 01-2612
November 8, 2001

WIRELESS TELECOM ACTION

REGION 23 (MISSISSIPPI) 700 MHz PUBLIC SAFETY PLANNING COMMITTEE ANNOUNCES FIRST MEETING

The Region 23 (Mississippi) 700 MHz Public Safety Planning Committee announces that its first meeting will be held on Wednesday, January 9, 2002, at 9:00 a.m. at 4080 US Highway 11, Hattiesburg, Mississippi. The purpose of the meeting is to:

1. Establish a 700 MHz Regional Planning Committee,
2. Elect a chairman.

The Region 23 700 MHz Public Safety Planning Committee meeting is open to the public. All eligible public safety providers in Mississippi may utilize these frequencies. It is essential that participants be representatives of all eligible public safety providers 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 your agency's needs.

All interested parties wishing to participate in the planning for the use of new public safety spectrum in the 700 MHz band within Region 23 should plan to attend. The convener for the Region 23 700 MHz Regional Planning Committee meeting is Mr. Terry Steed. For further information about the meeting, please contact:

Richard Wilson, Director
Emergency Management of Rankin County
601 Marquette Road
Brandon, Mississippi 39042
(601) 825-1499 (voice)
(601) 824-7219 (fax)
email: rwmkeoc@bellsouth.net

– FCC –

PUBLIC NOTICE

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

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

DA 09-2199

October 9, 2009

PUBLIC SAFETY AND HOMELAND SECURITY BUREAU ANNOUNCES REGION 23 (MISSISSIPPI) PUBLIC SAFETY REGIONAL PLANNING COMMITTEE TO HOLD 700 MHZ REGIONAL PUBLIC SAFETY PLANNING MEETING

The Region 23 (Mississippi)[1] Public Safety Regional Planning Committee (RPC) will hold its next meeting on Tuesday, October 27, 2009, beginning at 10:00 a.m. at the Mississippi Public Broadcasting Auditorium, 3825 Ridgewood Road, Jackson, Mississippi.

The agenda for this meeting includes:

- Historical overview of the 700 MHz Regional Planning Committee
- Election of Officers
- Discussion and review of the 700 MHz regional plan draft
- Adoption of revision of the 700 MHz plan
- Distribution to neighboring states for concurrence of the 700 MHz plan

The Region 23 700 MHz Public Safety RPC meeting is open to the public. All eligible public safety providers in Region 23 may utilize these frequencies. It is essential that eligible 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 23 should plan to attend. For further information, please contact:

Donald W. Loper, Chairman (Interim)
Region 23 700 MHz Public Safety RPC
Director of Communications MDPS/MHSP
3893 Highway 468 West
Pearl, MS 39208
(601) 933-2603
dloper@mdps.state.ms.us

- FCC -

[1] The Region 23 (Mississippi) 700 MHz regional planning area consists of the entire state of Mississippi.

PROOF OF PUBLICATION
THE STATE OF MISSISSIPPI
HINDS COUNTY

PASTE PROOF HERE

C92784
WIRELESS COMMUNICATION COM.,
0200260111
700 mHz Planning Meeting Notice

LEGAL NOTICE
Region 23 (Mississippi) 700MHz MISSISSIPPI REGIONAL PLANNING MEETING

A public meeting of the Region 23 (Mississippi) 700MHz Regional Planning Committee will be held on Tuesday, October 27, 2009 at 10:00 AM, at the Mississippi Public Broadcasting Auditorium, located at 3825 Ridgewood Road, Jackson, Mississippi. This meeting is being held in order to discuss the 700MHz plan draft and adopt any revisions. All eligible Public Safety, Public Service, Native American Tribal and non-governmental entities, eligible under FCC Rule 90.523 or 90.603 should plan to attend in order to ensure that their future spectrum needs are considered in the planning process. For more information, please contact:
Donald Leper
3883 Hwy 468 West
Pearl, MS 39208
PH: 601 933-2003
September 29, 2009

October 2 and 22, 2009 0200260111-01

PERSONALLY appeared before me, the undersigned notary public in and for Hinds County, Mississippi,

GLORIA JOINER

an authorized clerk of THE CLARION-LEDGER, a newspaper as defined and prescribed in Sections 13-3-31 and 13-3-32, of the Mississippi Code of 1972, as amended, who, being duly sworn, states that the notice, a true copy of which is hereto attached, appeared in the issues of said newspaper as follows:

10/2/2009
10/22/2009

Size: 138 words / 2.00 col. x 23.00 lines
Published: 2 time(s)
Total: $42.36

Signed Gloria Joiner
Authorized Clerk of
The Clarion-Ledger

SWORN to and subscribed before me on 10/22/2009.

Rick Tyler
Notary Public
RICK TYLER

Notary Public State of Mississippi at Large. Bonded thru Notary Public Underwriters

(SEAL)

STATE OF MISSISSIPPI
RICK TYLER
NOTARY PUBLIC
RANKIN COUNTY

PUBLIC NOTICE

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

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

DA 09-2428

November 16, 2009

PUBLIC SAFETY AND HOMELAND SECURITY BUREAU ANNOUNCES REGION 23 (MISSISSIPPI) PUBLIC SAFETY REGIONAL PLANNING COMMITTEE TO HOLD 700 MHZ REGIONAL PUBLIC SAFETY PLANNING MEETING

The Region 23 (Mississippi)[1] 700 MHz Public Safety Regional Planning Committee (RPC) will hold its next meeting on Thursday, January 7, 2010, beginning at 10:00 a.m., at the Mississippi Emergency Management Agency (MEMA), 1 MEMA Drive, Training Room 110, Pearl, Mississippi.

The agenda for this meeting includes:

- Discussion and review of the updated Region 23 700 MHz plan draft
- Adoption or revisions of the Region 23 700 MHz plan
- Distribution to adjacent regions states for concurrence of the 700 MHz plan

The Region 23 700 MHz Public Safety RPC meeting is open to the public. All eligible public safety providers in Region 23 may utilize these frequencies. It is essential that eligible 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 23 should plan to attend. For further information, please contact:

Donald W. Loper, Chairman
Region 23 700 MHz Public Safety RPC
Director of Communications MDPS/MHSP
3893 Highway 468 West
Pearl, MS 39208
(601) 933-2603
dloper@mdps.state.ms.us

- FCC -

[1] The Region 23 (Mississippi) 700 MHz regional planning area consists of the entire state of Mississippi.

PUBLIC NOTICE

Region 23 (Mississippi)

MISSISSIPPI REGIONAL PLANNING COMMITTEE

ANNOUNCES THE FOLLOWING MEETING:

The Region 23 (Mississippi) 700MHz Regional Planning Committee announces that its next meeting will be held on Thursday, November 10, 2011 at 10:00 AM CST, at the MDOT Lab Complex, located at 412 E. Woodrow Wilson Avenue, 2nd Floor Appeals Board Room E249,Jackson, Mississippi 39216.

The purpose of the meeting is to hold the annual meeting of the 700 MHz RPC and transition to the MS Public Safety Frequency Advisory Committee (MSPSFAC). The Region 23 (Mississippi) 700MHz Regional Planning Committee meeting is open to the public.

THE MEETING AGENDA INCLUDES:

1. Announcement of Region 23 700Mhz Regional Plan Approval
2. Dissolution of Region 23 700MHz Planning Committee/Transition to the MS Public Safety Frequency Advisory Committee
3. Election of officers for MSPSFAC
4. New Business

All eligible Public Safety, Public Service, Native American Tribal and non-governmental entities, eligible under FCC Rule 90.523 or 90.603 should plan to attend. It is essential that participants be representatives of all eligible Public Safety and Public Service disciplines in order to ensure that future spectrum needs are considered in the planning process. Administrators who are not oriented in the communications field should delegate someone with this knowledge to attend, participate and represent your agency's needs.

All interested parties wishing to participate in the planning for the use of new Public Safety Spectrum in the 700 MHz Band should plan to attend.

For further information, please contact:

Donald Loper
Communications Director, Mississippi Department of Public Safety
Chairman, Region 23 (Mississippi) 700 MHz Regional Planning Committee
3893 Hwy 468 West
Pearl, MS 39208
PH: 601 933-2603
FAX: 601 933-2673
Email: dloper@mdps.state.ms.us

PUBLIC NOTICE

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

News media information 202 / 418-0500
Internet: http://www.fcc.gov
TTY 1-888-835-5322

DA 15-1101
September 30, 2015

PUBLIC SAFETY AND HOMELAND SECURITY BUREAU ANNOUNCES REGION 23 (MISSISSIPPI) 700 MHz REGIONAL PLANNING COMMITTEE TO HOLD MEETING

WT Docket 02-378

The Region 23 (Mississippi)[1] 700 MHz Regional Planning Committee (RPC) will hold a planning meeting on Wednesday, October 14, 2015. Beginning at 1:30 PM CST, the Region 23 RPC will convene at the Woolfolk Building - Room 145, 501 North West Street, Jackson, Mississippi 39201.

The purpose of the meeting is to review, discuss, and approve changes to the Region 23 700 MHz regional plan. The Region 23 700 MHz RPC will also nominate and elect new officers at this meeting.

The Region 23 700 MHz RPC meeting is open to the public. All eligible public safety providers whose sole or principal purpose is to protect the safety of life, health, or property in Region 23 may utilize these frequencies. 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 FCC Rule 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 your 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 23 should plan to attend. For further information, please contact:

Tom Lanviere, Chairman
Region 23 (Mississippi) 700 MHz Regional Planning Committee
412 E Woodrow Wilson Avenue, Mail Stop 6601
Jackson, MS 39216
(601) 966-1024
tlan437@gmail.com

- FCC -

[1] The Region 23 (Mississippi) 700 MHz regional planning area consists of the entire state of Mississippi.

REGION 23 700 MHz PLAN
APPENDIX F – MEETING MINUTES AND SIGN-IN SHEETS

This Appendix Contains

1. Minutes of Meetings
2. Meeting Sign In Sheets

Minutes of Meetings

RPC Committee Meeting Minutes

1-9-02 . The first meeting to organize a 700 mhz Regional Planning Committee was held at the Emergency Management District in Hattiesburg, MS

Total Attendees : 31

1-9-02 : 9am John Wyckoff, APCO Coordinator for Region 23 started the meeting.

1-9-02 Mr. Wyckoff introduced Mr Richard Wilson to the attendees and stated that Mr Wilson was acting as the convenor of the meeting.

1-9-02: Mr. Wilson let all in attendance introduce themselves and the agency or entity that they represented.

1-9-02: It was recommended by Mr. Terry Steed that nominations be made to elect the executive committee members:

Richard Wilson of Rankin County EOC, and Donald Loper of MHP were both nominated for the position of Chairman. By a vote of 10-4 Mr Wilson was elected as Chairman.

Mrs. Rhonda Allen of ITS was nominated as Secretary for the Committee but declined to commit to the position until it was approved by ITS.

Bill Ford of the City of Vicksburg, nominated Donald Loper to serve as vice-chairman of the committee . Mr. Loper was elected with no opposition.

Don McKennon of the City of Laurel, was elected with no opposition to serve as Treasurer of the Committee.

Richard Wilson made the following appointments:

Terry Steed to serve as the Chairman of the By-Laws Committee
Donald Loper to head the Interoperability Committee
Bill Ford to head the Technical Committee

Mr. Robert Bailey, of Harrison County E911 made the recommendation to hold the next general meeting during the NENA/APCO conference to be held on March 27th, at 1:30pm at Eagle Ridge Conference Center in Raymond, MS. All in attendance approved.

Mr. Rich O'Regan , of ITS gave a brief update as to the status of the statewide radio study currently being conducted by RCC within the state of Mississippi

REGIONAL PLANNING COMMITTEE
March 27, 2002

The Mississippi Regional Planning Committee met on Wednesday, March 27, at 1:30 PM at the Eagle Ridge Conference Center in Raymond, Mississippi.

Attendees:
Richard Wilson, Rankin Co EOC, Chairman Bill Roberts, Motorola
John Wilson, Hinds Co SO Phillip Kidd, MS Dept of Public Safety
Tommy Baylis, Em Mgmt Dist Don McKinnon, Jones Co EOC
George Cricenti, Jackson PD

George Cricenti was appointed Secretary for the Committee, replacing Rhonda Allen who acted in that capacity for the first meeting.

Minutes of the previous meeting, a list of that meeting's attendees, proposed By-Laws and a Financial Report were submitted. The committee approved the minutes and the financial report.

Discussion.

Phillip Kidd advised that the FCC has verbally placed Interoperability under the State and there may be a need to abolish the Interoperability Committee. An April notice on the subject is expected.

Due to the limited attendance, the Chairman proposed to delay discussion and acceptance of the By-Laws until the next meeting.

Bill Ford will name members of Technical Committee.

Bill Roberts reported that the State of Missouri's plan is nearly complete and there is an indication that their plan may be shared by other states to use as a model.

Prior to adjournment, the location and date of the next meeting was set for 1:30PM on May 22, 2002, at the Forrest County EOC. Attendees were asked to talk up the meeting to increase participation. An additional goal would be to gain broader participation from across the state to make this a true "state-wide" project.

Region 23 (MS) 700MHz Regional Planning Committee
October 27, 2009 Meeting Minutes

Place: MPB Auditorium, 3825 Ridgewood Road, Jackson, MS 39211

Chairman Loper called the meeting to order at approximately 10:20 AM and welcomed everyone. He stated that the purpose of the meeting was to elect new officers and to present the Region 23 700MHz Regional Plan draft proposal. He also shared a PowerPoint Presentation to bring attendees up to date on Committee actions.

Chairman Loper then called for nominations for the office of Chairman. Bill Quinton, Bolivar County, EMA nominated Chairman Loper to continue in the position. No further nominations were made, Chairman Loper accepted and a vote was taken with none opposed.

Chairman Loper then called for nominations for the office of Vice Chairman. Clifford Galey, Lincoln County, EMA nominated Susan Perkins, MEMA Communications Branch Director for the position. No further nominations were made, Susan Perkins accepted and a vote was taken with none opposed.

Chairman Loper then called for nominations for the office of Secretary. Clifford Galey, Lincoln County, EMA nominated Lana Nicks, WCC for the position. No further nominations were made, Lana Nicks accepted and a vote was taken with none opposed.

Chairman Loper then called for nominations for the office of Treasurer. Bette Rhinehart, Motorola noted that unless there were funds being held, the office of Treasurer did not need to be filled. A motion was made and seconded to table the election of Treasurer until the status of any funds can be determined.

The Chairman then called for a motion to submit the Region 23 700MHz Regional Plan draft proposal in order to start the processes necessary to get it ready for submission for approval/agreement with adjacent regions on spectrum sharing and then submission to the FCC. Jack Duncan noted that there are approximately twenty-three (23) items which must be updated before submission. Tom McAllister made the motion. The motion was seconded by Bill Quinton and passed with none opposed.

Chairman Loper noted the need for a Writing Committee to work on and update the proposed plan and called for volunteers. The following person volunteered:

Bette Rhinehart
Tom McAllister
Johnnie Bailey
Lana Nicks
Bill Buffington

The Writing Committee scheduled its first meeting on November 10, 2009 at 9:30 AM at MEMA.

The next Region 23 (MS) 700MHz Regional Planning Committee Meeting will be January 7, 2010 at 10:00 AM at MEMA. Proper notifications of this meeting will begin immediately.

Tom McAllister made a motion to adjourn and Bill Buffington seconded the motion. The motion passed with none opposed. Meeting adjourned at approximately 11:00 AM.

Region 23 (MS) 700MHz Regional Planning Committee
January 7, 2010 Meeting Minutes

Place: Mississippi Emergency Management Agency – Training Room 110
#1 MEMA Drive, Pearl, MS

Chairman Loper called the meeting to order at approximately 10:15 AM and welcomed everyone. He stated that the primary purpose of the meeting was to review the Region 23 700MHz Regional Plan draft, make any necessary updates & corrections and get a confirmation vote to send the 'Plan' to the adjacent regions for concurrence and upon adjacent region concurrence, submit the 'Plan' to the FCC for approval.

Chairman Loper noted that the Region 23 Writing Committee has met four (4) times since it was formed in October 2009, in order to make the necessary updates to the present document. He further noted that the document is available for viewing on CAPRAD for those having access.

Chairman Loper then called for the reading of the minutes from the last meeting. The minutes were read by Secretary Nicks. Chairman Loper called for a motion to approve the minutes of the October 27, 2009 meeting. Mike Murphy made the motion, it was seconded by Richard Ellzey, and the motion passed with none opposed.

Chairman Loper called for the discussion of old business. He stated that the election of a Region 23 700MHz Treasurer had been tabled until the status of any funds being held by the Planning committee could be determined. Johnnie Bailey researched and found that as of October 31, 2009, an amount of $2,075.98 was in the Bank of Jones County in Laurel, MS. The Chairman then called for nominations for the office of Treasurer. Johnnie Bailey nominated Van Byrd, Lamar County EMA for the office of Treasurer. No further nominations were made. Dent Guynes made a motion that nominations cease and it was seconded by Richard Ellzey. Vann Byrd accepted the nomination and a vote was taken with none opposed.

Further discussion ensued and it was determined that a letter will be sent by Treasurer Byrd to Don McKinnon, the former treasurer and the Bank of Jones County to get access to the funds by the new treasurer. It was also decided that the money should be either moved into an interest bearing account or an account where no fees are involved. This will be handled by Treasurer Byrd.

Chairman Loper then called for discussion of the plan document. He recognized Bette Rinehart. Bette noted that there must be a statement of notification included in Appendix E. It was decided that Appendix E, Meeting Notification and Solicitation of Comments, Paragraph 2, will be amended to read 'The first announcement to solicit committee members and inform interested parties of the planning process was made in November 2001, sixty (60) days prior to the meeting in January 2002'.

Harry Warner indicated that it is necessary to update Channel Allotments to reflect a bandwidth of 12.5 KHz rather than 25 KHz. That has been done. After further discussion, Chairman Loper called for a motion to approve the Region 23 700MHz Regional Plan for distribution to adjacent regions for concurrence and then for submission to the FCC. Johnnie Bailey made the motion, it was seconded by Dent Guynes and the motion passed with none opposed.

Bette Rinehart indicated that she has templates for Regional approval and will update and email them to the secretary for submission with the 'Plan'.

There was no other business to be discussed and the Chairman noted that the next meeting will be scheduled for January 2011. A special 'called' meeting will be scheduled if necessary and the notification process will be handled accordingly.

Dent Guynes made a motion to adjourn and Richard Ellzey seconded the motion. The motion passed with none opposed. The meeting adjourned at approximately 11:31 AM.

Region 23 (MS) 700MHz Regional Planning Committee
November 10, 2011 Meeting Minutes

Place: Mississippi Department of Transportation – Appeals Board Room E249
412 E. Woodrow Wilson Avenue, Jackson, MS 39216

Chairman Loper called the meeting to order at approximately 10:05 AM and welcomed everyone. He stated that the primary purpose of the meeting was to announce the approval of the Region 23 700MHz Regional Plan by the FCC, transition to the Region 23 700 MHz (Mississippi) Public Safety Frequency Planning and Advisory Committee, and election of new officers.

The Region 23 (Mississippi) 700MHz Regional Plan for General Use Spectrum in the 769-775/799-805 MHz band was submitted to the FCC for review and approval on August 26, 2010. Approval was received on January 12, 2011.

Chairman Loper then called for the reading of the minutes from the last meeting. The minutes were read by Secretary Nicks. Chairman Loper called for a motion to approve the minutes of the January 7, 2010 meeting. Ms. Susan Perkins made the motion, it was seconded by Richard Ellzey, and the motion passed with none opposed.

Chairman Loper noted that the FCC, upon receipt of our agenda for this meeting, indicated that the Region 23 700MHz Committee should not be dissolved, but rather incorporate the Frequency Advisory Committee into the Planning Committee. Mr. Scott Berry made a motion that the BY LAWS, Article I; Section 1, be updated to reflect that the change in wording. The motion was seconded by Mr. Johnnie Bailey and the motion passed with none opposed.

Chairman Loper stated that he had received two requests for approval of 700MHz General Use frequencies. One for frequencies in Rankin County and one from the Mississippi Wireless Communication Commission for the rest of the General Use frequencies for the State of Mississippi. The Chairman provided copies of the requests for review and then made a motion to approve the requests. The motion was seconded by Mr. Gary Galloway and the motion passed with none opposed. Chairman Loper indicated that the Chairman of the Region 23 700 MHz (Mississippi) Regional Planning and Frequency Advisory Committee (MRPFAC) would need to respond to the requestors in writing and that letter of approval would need to be submitted to the Federal Communication Commission along with the FCC application and associated paperwork for licensing.

Chairman Loper then called for nominations for the office of Chairman of the Region 23 MRPFAC. Mr. Tom Lariviere was nominated. Mr. Dennis Guynes made a motion to close the nomination. The motion was seconded by Mr. Gary Galloway and passed with none opposed. The vote for Mr. Tom Lariviere as Chairman was unanimous.

Chairman Loper then called for nominations for the office of Vice Chairman of the Region 23 MRPFAC. (Ms. Susan Perkins was nominated. Mr. Dennis Guynes made a motion to close the nomination. The motion was seconded by Mr. Richard Ellzey and passed with none opposed. The vote for Ms. Susan Perkins as Vice Chairman was unanimous.

Chairman Loper then called for nominations for the office of Secretary of the Region 23 MRPFAC. Ms. Lana Nicks was nominated. Mr. Willie Huff made a motion to close the nomination. The motion was seconded by Mr. Greg Sanford and passed with none opposed. The vote for Ms. Lana Nicks as Secretary was unanimous.

Chairman Loper then called for nominations for the office of Treasurer of the Region 23 MRPFAC. Mr. Vann Byrd was nominated. Mr. Kirk Gayle made a motion to close the nomination. The motion was seconded by Mr. Gary Galloway and passed with none opposed. The vote for Mr. Vann Byrd as Treasurer was unanimous. That concluded the election of officers. Chairman Loper welcomed the new officers and thanked the committee for the time he had been allowed to serve them.

There was no other business to be discussed and the Chairman noted that the next meeting will be determined by need and the notification process will be handled accordingly.

Mr. Willie Huff made a motion to adjourn and Richard Ellzey seconded the motion. The motion passed with none opposed. The meeting adjourned at approximately 10:25 AM.

Region 23 – Appendix F - Mississippi

Meeting Sign in Sheets

700 Mhz Regional Planning Committee Meeting "1-9-02"

Attendee List

Name	Agency	Phone	Email
Terry Steed	The Emergency Mgmt District	601-544-5911	
David Bowles	Comm South Inc.	601-584-9026	debowles@comsouthinc.com
Rich O'Regan	ITS State of MS	601-359-2610	
Rhonda Allen	ITS State of MS	601-359-2655	
John Wilson	Hinds County SO	601-857-2600	jcwilson@netdoor.com
Bill Ford	City of Vicksburg	601-631-2995	billf@vicksburg.org
L.W. Callaway	Warren County EMA	601-636-1544	rwcallaway@co.warren.ms.us
Don McKinnon	Jones County EOC	601-428-3187	DMcKinnon@joneseoc.com
Ben Durant	City of Mobile	251-208-5825	ben@cityofmobile.org
David A. Rose Sr.	Mobile Fire-Rescue	251-208-1192	rose@cityomobile.org
Richard Elizey	Jones County EOC	601-425-0230	richardlz@joneseoc.com
Dale Purvis	Comm South Inc.	601-584-9026	dpurvis@comsouthinc.com
James Smith	Lamar County EMA	601-794-5378	lcemd@netdoor.com
Bill Roberts	Motorola Inc.	601-825-2254	C12971@email.mot.com
Bobby Strahan	Pearl River County EMA	601-795-3085	
Tommy Baylis	The Emergency Mgmt District	601-544-5911	tommy@temd.state.ms.us
Jim Hennessey	The Emergency Mgmt District	601-544-5911	jim@temd.state.ms.us
John Wyckoff	APCO AFC	251-666-2682	wyckoffJ@apco911.org
David C. Wynn	City of Hattiesburg PD	601-545-4900	dwynn@hattiesburg.com
H.C. "Bunky Partridge	City of Meridian FD	601-485-1822	
Bobby Smith	City Councilman, Meridian	601-485-1959	
DeLaine Stacy	MS Dept. of Public Safety	601-987-1447	dstacy@mdps.state.ms.us
Robert Errington	MS Bureau of Narcotics	601-371-3658	rerrington@mbn.state.ms.us
Phillip Kidd	MS Dept. of Public Safety	601-582-3529	
Donald Loper	MS Dept. of Public Safety	601-987-1322	dloper@mdps.state.ms.us
George Cricenti	City of Jackson PD	601-960-2407	gcricentr@city.jackson.ms.us
Shawn Ellis	City of Petal Police Dept.	601-544-5331	
Bette Rinehart	Motorola Inc.	717-334-0654	c18923@email.mot.com
Richard Wilson	Rankin County EOC	601-824-7218	krwilson@rankincounty.org
Robert "Gil" Bailey	Harrison County E911	228-831-0760	harrison911@co.harrison.ms.us

Region 23 – Appendix F - Mississippi

700 MHz Regional Planning Meeting Attendee List – 10/27/2009

Name	Agency	Address	Phone	Email
Bri Buffington	WCC	412 E Woodrow Wilson Ave, Mail Stop 6601 Jackson, MS 39216	601-359-5333	bbuffington@wcc.ms.gov
Johnnie Bailey	WCC	412 E Woodrow Wilson Ave, Mail Stop 6601 Jackson, MS 39216	601-359-5363	jbailey@wcc.ms.gov
Bob Busch	Motorola	214 Meadow Lands Drive Brandon, MS 39047	601-420-4528	bob.busch@motorola.com
Kent Buckley	MEMA	1 Mema Dr. Pearl, MS	601-933-6882	kbuckley@mema.ms.gov
Alec Clark	Tunica County EOC	1165 U S Hwy 61 Tunica, MS 38676	662-363-4012	Alec.clark@tunicagov.com
Randle Drane	Copiah County EMA	122 South Lowe Street Hazlehurst, MS 39083	601-894-1658	rdrane@copiahcountyms.gov
Jack Duncan	Buford Goff & Associates	1331 Elmwood Avenue, Suite 200 Columbia, SC 29201	803-254-6302	Jack.duncan@bgainc.com
David Fink	Self	1019 Choctaw Lane Wesson, MS 39191	601-826-0854	David_fink@bellsouth.net
Dannette Ford	Copiah County EMA	122 South Lowe Street Hazlehurst, MS 39083	601-894-1658	dford@copiahcountyms.gov
Clifford Galey	Lincoln County EMA	PO Box 672 Brookhaven, MS 39602	601-754-3210	blcd@cableone.net
Donald Loper	MDPS/MHP/R23 RPC	3893 Hwy 468 W Pearl, MS 39208	601-260-9425	dloper@mdps.state.ms.us
Tom McAllister	MEMA	1 MEMA Dr Pearl, MS	601-933-6715	tmcallister@mema.ms.gov
Susan Perkins	MEMA	1 MEMA Dr Pearl, MS	601-933-6375	sperkins@mema.ms.gov
Bill Quinton	Bolivar County EMA	PO Box 538 Cleveland, MS 38732	662-843-2300	wlquinton@cableone.net
Bette Rinehart	Motorola	28 Twin Lakes Dr. Gettysburg, PA 17325	717-334-0654	C18923@email.mot.com
Rick Stevens	Copiah County Deputy Dir. EMA	122 South Lowe Street Hazlehurst, MS 39083	601-894-1658	rstevens@copiahcountyms.gov
Randy Stewart	Tunica County	PO Box 25 Tunica, MS 38676	662-363-1411	randystewart@tunicagov.com
Harry Warner	Buford Goff & Associates	1331 Elmwood Avenue, Suite 200 Columbia, SC 29201	517-256-6968	gwingharry@sbcglobal.net
Jim Whitehead	Motorola	10 Canebrake Blvd #350 Flowood, MS 39232	601-622-8835	jim.whitehead@motorola.com
John Wilson	Motorola	10 Canebrake Blvd #350 Flowood, MS 39232	769-610-2188	John.wilson@motorola.com

Region 23 – Appendix F - Mississippi

700 MHz Regional Planning Meeting Attendee List – 1/7/2010

Name	Agency	Address	Phone	Email
Johnnie Bailey	WCC	412 E Woodrow Wilson Ave, Mail Stop 6601 Jackson, MS 39216	601-359-5363	jbailey@wcc.ms.gov
Vann Byrd	Lamar County EMA	630 Purvis Oloh Road Puravis, MS 39475	601-794-5378	vbyrd@lamarcounty.com
Richard Ellzey	Jones County EOC/Region 23 Advisor	22 Mason Street Laurel, MS 39440	601-428-3187	richardlz@joneseoc.com
Robert Groves	Mississippi State University	Cooley BLDG Miss State, MS 39762	662-325-1867	edacs@physplant.msstate.edu
Dent Guynes	MSDH	P O Box 1700 Jackson, MS 39215	601-750-9028	Dennis.guynes@msdh.state.ms.us
Donald Loper	MDPS/MHP/R23 RPC	3893 Hwy 468 W Pearl, MS 39208	601-260-9425	dloper@mdps.state.ms.us
Mike Murphy	GSRCPI/GCICC	42334 Deluxe Plaza, Suite 1 Hammond, LA 70403	225-337-8088	mmurphy@gsrcpi.org
Rod McLain	Buford Goff & Associates	1331 Elmwood Avenue, Suite 200 Columbia, SC 29201		Rod.mclain@bgainc.com
Lana Nicks	Wireless Communication Commission	412 E Woodrow Wilson Ave, Mail Stop 6601 Jackson, MS 39216	601-359-5333	lnicks@wcc.ms.gov
Susan Perkins	MEMA	1 MEMA Dr. Pearl, MS	601-933-6375	sperkins@mema.ms.gov
Bette Rinehart	Motorola	26 Twin Lakes Dr. Gettysburg, PA 17325	717-334-0654	C16923@email.mot.com
Harry Warner	Buford Goff & Associates	807 Eaton Drive Mason, MI 48854	517-256-6968	gwingharry@sbcglobal.net

Region 23 – Appendix F - Mississippi

700 MHz Regional Planning Meeting Attendee List - 11/10/2011

Name	County/Agency	Attending	Conferencing	Email	Phone
Robert 'Gil' Bailey	Harrison Co	√		Harrison911@co.harrison.ms.us	
Richard Ellzey	Jones Co	√		richardlz@joneseoc.com	
Dent Guynes	MSDH	√		Dennis.guynes@msdh.state.ms.us	
Jeff Arrington	Clarke Co EMA	√		cfire@clarkecountyms.gov	
Tony Fleming	Clarke BOS	√			
Vann Byrd	Lamar Co	√		vbyrd@lamar.county.com	
David Burford	Washington Co		√	dburford@co.washington.ms.us	
Richey Gibens	Alcorn Co		√	rgacfs@avsoa.com	
Cindy Lawrence	Lowndes Co		√	clawrence@bellsouth.net	
Dannette Ford	Copiah Co		√	dford@copiahcountyms.gov	
Rick Stevens	Copiah Co		√		
Tom Lariviere	Madison Co		√	tlariviere@madisonthecit.com	
Donald Loper	MHP	√		dloper@mdps.state.ms.us	
Susan Perkins	MEMA	√		sperkins@mema.ms.gov	
Johnnie Bailey	WCC	√		jbailey@wcc.ms.gov	
Willie Huff	MDOT	√		whuff@mdot.state.ms.us	
Trebia Rodgers	Grenada Co	√		grenada911@cableone.net	
Bill Buffington	WCC	√		bbuffington@wcc.ms.gov	
Lana Nicks	WCC	√		lnicks@wcc.ms.gov	
Scott Berry	Reservoir FD, Fire Chief, VP MS Fire Chiefs Assoc		√	chief@reservoirfire.com	601-922-2657

REGION 23 700 MHz PLAN
APPENDIX G - PLAN SUBMITTAL REQUIREMENTS, CO-CHANNEL ASSIGNMENTS AND RETURN TO POOL

This Appendix Contains

1. Technical requirements for coverage power densities and contours

2. Co-Channel assignment methodology

3. System Loading requirements

4. "Return to Pool" stipulations for less than fully loaded Channels

Appendix G - COVERAGE REQUIREMENTS

Coverage parameters are to be consistent with TR 8.8 and NCC Planning Committee guidelines. That is, the designed mean signal strength shall not exceed +40 dB (+40 decibels above one microvolt per meter as measured using a □/4 antenna at five (5) feet above ground level see Appendix I) at a uniform distance from the boundary of the applicant's service area of:

i) three (3) miles for RURAL areas,
ii) four (4) miles for SUBURBAN areas and
iii) five (5) miles for URBAN areas.

Co-channel assignments may be made using the modified R-6602 contour (with 9 dB correction factor) as described in TIA/EIA TSB88-A1 as; the interfering 11 dB (50,50) co-channel contour will be allowed to touch, but not overlap the 40 db (50,50) contour of the incumbent station.

Adjacent channel assignments may be made when the interfering systems 60 dB (50, 50) contour does not overlap the incumbent stations 40 dB (50, 50) contour. The interfering contour may touch the incumbent contour. In cases where the 60 dB (50, 50) contour is considered too restrictive, the applicant can make a showing based on good engineering practice that the ACCPR would not exceed 65 dB.

For purposes of frequency coordination, contours are to be predicted using either method described in TIA/EIA TSB88 – A1; the modified Carey R-6602 curves, or the Okumura – Hata – Davidson radial method, whichever describes the worst case.

APPENDIX G - LOADING

Each applicant for a trunked system shall certify that a minimum of 100 mobiles for each 12.5 kHz channel block will be placed in service within five years of the initial plan approval date. If that is not the case, then less than fully loaded channels hall be returned to the allotment pool and the licensee shall modify their license accordingly. Conventional channels shall be loaded to 100 mobile stations per 12.5 kHz channel block. Where an applicant does not load a 12.5 kHz channel block to 70 mobile radios, the channel block will be available for assignment to other licensees. Mobile, portable and control stations will be considered as mobile units. An applicant will be required to provide loading information consistent with this plan. If an applicant is unable to reach minimum loading criteria, and should a system licensed to a higher level of government be available in the area, the applicant must consider utilizing this system. As the higher-level systems reach their capacity, the smaller systems in the public safety service must then consider uniting their communications efforts to formulate one large system, when feasible.

APPENDIX G - REQUIRED SUBMITTALS

Each application must contain the following:

- FCC ULS 601 Form(s) and PSCC FDR3 (formally APCO FDR3):
- Statement of need for installing a new 700 MHz system. Statement to include justification for requested frequencies based on loading criteria in this Appendix.
- Details of engineering surveys showing radio coverage will *not* exceed applicant's minimum requirements. System engineering is to conform to the Coverage Requirements section of this Appendix.
- Explain any budget commitment that has been made for the proposed system; include agency budgets and/or agency resolution(s).
- Explain your systems future growth for all agencies involved in the system.
- Local Interoperability Plan explaining and certifying that applicant's agency will comply with interoperability requirements.
- Frequency Give Back Plan to include:
    - List of agencies transitioning to the 700 MHz system.
    - Reference copies of FCC licenses held by these agencies
    - List of frequencies used by these agencies to be returned to frequency pool.
    - Applicants must provide proof they communicated an announcement of their intent to seek new 700 MHz frequencies and offered an invitation to the State of Mississippi, the county or counties within which the proposed system is located and local governmental units within their county of residence, to participate in a discussion of interoperability issues.
- 821 MHz systems that are expanded to 700 MHz shall explain how they plan to meet the interoperability requirements of both plans.

Region 23 – Appendix G - Mississippi

- Stipulate the PW frequency coordinator you desire to have
- Coordinate your license application: AASHTO, APCO, FCCA, IAFC or IMSA.
- The application shall provide a complete review of matrix issues, including what the applicant feels their point score is for the MRPFAC to review in case there is a competing application.

REGION 23

APPENDIX H - REGIONAL PLAN APPEAL PROCESS

This Appendix Contains

1. The Plan's Appeal Process

APPENDIX H

Appeal Procedure

Appeals from decisions made with respect to a variety of matters regulated by the Regional Planning process and MRPFAC will be heard. The formal requirements of the appeal process are set out below.

In order to ensure that the appeal process is open and understandable to the public, the Regional Committee has developed this procedure. Those involved in the appeal process can expect the Committee and its members to follow the procedures. Where any matter arises during the course of an appeal that is not dealt with in this document, the Committee will do whatever is necessary to enable it to be resolved fairly, effectively and completely on the appeal. The Committee may dispense with any part of this procedure where it is appropriate to do so.

The MRPFAC will make every effort to process appeals in a timely fashion and issue decisions expeditiously.

Appeals Committee

Members

The MRPFAC Chairman may organize the Committee into Sub-Committees, each comprised of one or more members.

Where an appeal is scheduled to be heard be a Sub-Committee the chair is determined as follows:

(a) If the chair of the Committee is on the Sub-Committee they are the chair:
(b) If the chair of the Committee is not on the Sub-Committee but he vice-chair is than the vice-chair will be the chair; and
(c) If neither the chair nor the vice-chair is on the Sub-Committee, the MRPFAC Committee will designate one of the members to be the chair.

Withdrawal or Disqualification of a Committee Member on the Grounds of Bias

Where the chair or a Committee member becomes aware of any facts that would lead an informed person, viewing the matter reasonably and practically, to conclude that a member, whether consciously or unconsciously, would not decide a matter fairly, the member will be prohibited from conducting the appeal unless consent is obtained from all parties to continue. In addition, any party to an appeal may challenge a member on the basis of real or a reasonable apprehension of bias.

THE APPEAL PROCESS

An official of the entity who filed the original application to the MRPFAC must be the person who files the appeal on behalf of the entity.

How to appeal

A notice of appeal must be served upon the MRPFAC. The notice of appeal may be "delivered" by mail, courier, or hand delivered to the office of the Chair and all Members of the Committee. See page 18 for information. The Committee will also accept a notice of appeal by electronic means to the Chair and Secretary with the original paper copy of the notice of appeal served as indicated above.

Certain things must be included in a notice of appeal for it to be accepted. The notice of appeal **must** include:

1. the name and address of the appellant;
2. the name of the person, if any, making the request for an appeal on behalf of the appellant;
3. the address for service of the appellant;
4. the grounds for appeal (a detailed explanation of the appellant's objections to the determination – describe errors in the decision);
5. a description of the relief requested (what do you want the MRPFAC/Committee/Sub-Committee to order at the end of the appeal);
6. The signature of the appellant or the appellant's representative; and data.

Time limit for filing the appeal

To appeal a determination or allocation the entity must deliver a notice of appeal within10 business days after receiving the decision. If a notice of appeal is not delivered within the time required, the right to an appeal is lost. However, the Committee is allowed to extend the deadline, either before or after its expiration based upon a 2/3 majority of the Committee.

Rejection of a notice of appeal

The Committee may reject a notice of appeal if:

(a) It is determined that the appellant does not have standing to appeal; or

(b) The Committee does not have jurisdiction over the subject matter or the remedy sought.

Before a notice of appeal is rejected, the MRPFAC will inform the appellant of this in writing, with reasons. The appellant has an opportunity to make submissions within 10 business days.

Appeal Meeting

The MRPFAC and/or established Sub-Committee will set a meeting date to review the appeal documents submitted by the applicant and meet with them to discuss the issue in an open meeting. The MRPFAC will arrive at a decision based upon the documents presented, FCC rules, NCC requirements, and the regional plan and advise the applicant of the decision.

Committee members will not contact a party on any matter relevant to the merits of the appeal, unless that member puts all other parties on notice and gives them an opportunity to participate.

REGION 23 – 700 MHz PLAN
APPENDIX I - FIELD STRENGTH MEASUREMENTS

This Appendix Contains

1. The Plan's reference for field strength measurements.

RADIATED EMISSIONS MEASUREMENT SYSTEMS TUTORIAL

BY

MICHAEL A. NICOLAY

INTRODUCTION

Measuring radiated electromagnetic emissions first requires a measurement system. A basic measurement system usually contains a minimum of an antenna and a receiver. To measure very small signal levels may require the addition of a pre-amplifier to the receiver system. Figure 1 shows a typical receiver system block diagram *including a pre-amplifier*. Figure 1 will be used for the following discussion.

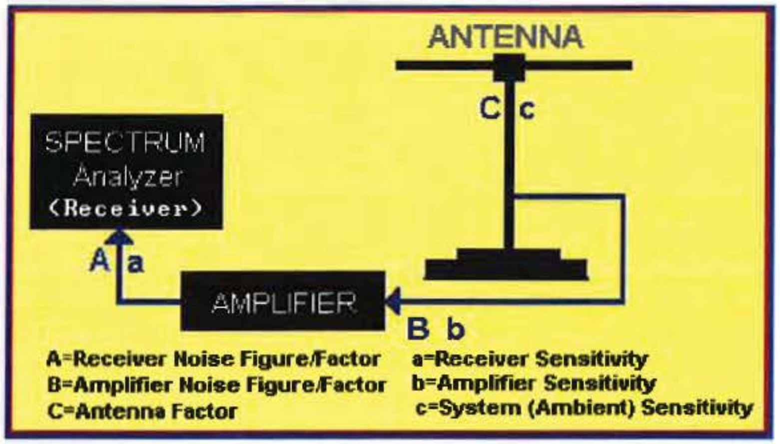


FIGURE 1. RECEIVER SYSTEM BLOCK DIAGRAM

It is beyond the scope of this text to address in detail such measurement errors as receiver detection mode errors, radio frequency pre-selection (RF) filtering, or tuner overload errors. Peak detection of continuous waves (CW) will mainly be discussed.

There are many *terms* currently used to define radiated electromagnetic energy. Some common terms used are non-ionizing radiation (NIR), electromagnetic fields (EMFs), radiated emissions, and broadcast signals. In this paper, "emissions" will be used to describe radiated electromagnetic energy.

Electromagnetic measurement systems are used to measure power densities, or power spectral densities, of electromagnetic fields at a point in space. Power density is defined as the "power per unit area normal to the direction of propagation usually expressed in units of Watts per square meter W/m^2), or for convenience in units such as milliwatts per square meter (mW/m^2), or even in microwatts per square centimeter (W/cm^2)."

Plane-waves, power densities, electric field strengths (E), and magnetic field strengths (H) are related by *free space* loss, i.e., 37 ohms (Ω). Electric field strengths and magnetic field strengths are expressed in units of Volts per meter (V/m) and Amperes per meter (A/m), respectively. Field strength is therefore defined as:

$$E = \text{Square Root } (120\pi P)$$

Where,

E = rms value of field strength in Volts/meter
P = power density in watt/meter^2
120 = impedance of free space in ohms

Power density (P_D) is related to the electric field strength (E) and the magnetic field strength (H) as:

$$P_D = E^2/377\Omega = 377\Omega H^2$$

Again, the rate at which electromagnetic energy (power) is propagated by a wave -- power density -- is usually specified in Watts per square meter (W/m^2). The power density equation is:

$$P_D = P_T/4\pi r^2$$

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Where,

P_D= power density in watts/meter^2

P_T= transmitted power in Watts

r = distance in meters

Radiated electromagnetic fields -- radiated emissions - are produced from many sources. Sources of electromagnetic

energy range from

Man made sources such as commercial broadcast stations and automobile ignition systems to natural sources such as galactic noise and lightning. To further complicate matters, these emissions can drastically differ in frequencies and in their magnitudes.

Because of the potential wide range of measurement requirements special measurement systems are sometimes necessary. These systems must be well-planned or inaccurate measurements may result. Important design specifications should include *system selectivity* and *system sensitivity*. These terms will be defined and demonstrated in the following sections.

THE ANTENNA

Measuring radiated emissions, or electromagnetic energy, begins with the antenna. Antennas are devices that receive (capture) electromagnetic energy traveling through space. Antennas can also be used for transmitting electromagnetic energy. There are many different types of antennas, some are designed to be "broad-banded," to receive or transmit over a large frequency range, and some are designed to receive or transmit at specific frequencies. In any case, all receive antennas are intended to capture "off-air" electromagnetic energy and to deliver these "signals" to a receiver. For this discussion, electric fields (E) will mainly be addressed.

Because antennas can only capture a small portion of the radiated power, or energy, a correction factor must be added to the detected emission levels to accurately determine the radiated power being measured. The actual power received by an antenna is determined by multiplying the *power density* of the emission by the receiving area of the antenna, A_e. This antenna correction factor is called the "antenna factor." To further understand antenna factors see Figure 2. Below are the antenna factor derivation equations.

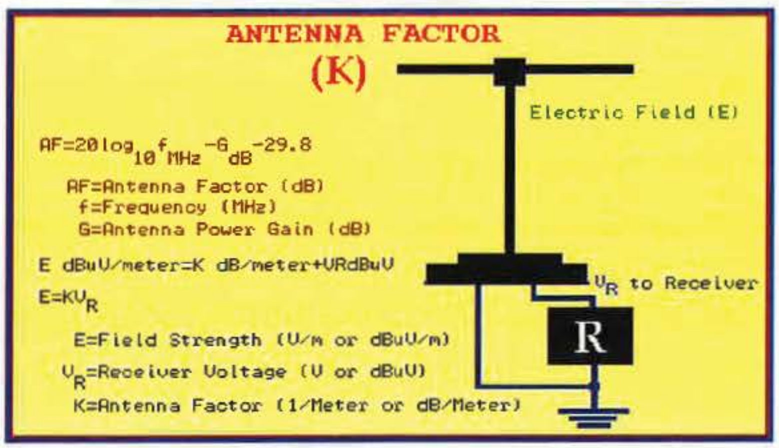

FIGURE 2. ANTENNA FACTOR

$$A_e = \lambda 2/4\pi \ (\text{Meters}^2)$$

The power received by the antenna is then defined by:

$$P_r = PA_e = PG\lambda 2/4\pi \ (\text{Watts})$$

Where,

P = power density in Watts/meter^2

G = antenna (power) gain

λ = wavelength in meters

Combining these equations with the field strength equation yields:

$$P_r = E^2 G\lambda 2/480\pi^2$$

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Also,

$$P_r = V_{r2}/Z_o$$

Where,

V_r= received voltage
Z_o= receiver input impedance

Then,

$$V_{r2}/Z_o = E^2G\lambda 2/480\pi 2$$

Knowing that:

$$\lambda = 300\ \text{meters/second}/f\ (\text{MHz})$$

Since an antenna factor is defined as:

$$E = (V_r f\pi/50\Omega)\ (\text{Square Root}\ (30/Z_oG))$$

We can simplify and rearrange terms to yield:

$$K = E/V_r$$

Then,

$$K = (f\pi\pi\pi/50\&)\ (\text{Square Root}\ (30/Z_oG))$$

Or in logarithmic form [*for* $Z_o = 50$ & ohm) system]:

$$K = 20\log_{10}f_{MHz} - G_{dB} - 29.78\ (\text{dB})$$

THE RECEIVER AND AMPLIFIER

A receiver is an electro-mechanical device that receives electromagnetic energy captured by the antenna and then processes (extracts) the information, or data, contained in the "signal."

The basic function of all receivers is the same regardless of their specific design intentions, broadcast radio receivers receive and reproduce commercial broadcast programming, and likewise, TV receivers detect and reproduce commercial television broadcasting programming. Special, or unique, receivers are sometimes needed to detect and measure all types of radiated, or transmitted, electromagnetic emissions. These specialized receivers may be called tuned receivers, field intensity meters (FIMs), or spectrum analyzers.

Radiated emissions that receiver systems may be required to measure can be generated from intentional radiators or unintentional radiators. The information contained in intentionally radiated signals may contain analog information, such as audio, or they may contain digital data, such as radio navigation beacon transmissions. Television transmissions, for example, contain both analog and digital information. This information is placed in the transmitted emission, called the "carrier," by a process called "modulation." Again, there are many different types of modulation, the most common being amplitude modulation (AM) and frequency modulation (FM). Receivers detect, or extract, the information/data from radiated emissions by a process called "demodulation", the reverse of modulation.

Many radiated emissions requiring measurements do not contain any useful information or data at all. As an example, radiated emissions from unintentional radiators, such as computer systems, are essentially undesired byproducts of electronic systems and serve no desired or useful purpose. These undesired emissions can, however, cause interference to communications system, and *if strong enough*, they can cause interference to other unintentional radiating devices. Radiated signals (if strong enough) can also present possible health hazards to humans and animals. Because these emissions must be measured to determine any potential interference problems or health hazard risks, specialized receiver systems must be used.

An important parameter for any receiver is its *noise figure*, or *noise factor*. This parameter will basically define the *sensitivity* that can be achieved with a particular receiver.

An amplifier, usually called a pre-amplifier, is sometimes required when attempting to measure very small signals or emission levels. Because these devices amplify signals, they will also amplify ambient electromagnetic noise. If improperly used, amplifiers can detract from the overall system's sensitivity as well as possibly causing overloading to the receiver's tuner input stage. Overloading a tuner's input stage is simply supplying a larger signal amplitude than the receiver's tuner input circuitry is capable of handling, thus, saturating the tuner's input stage.

Just as with the receiver, it is important to know what the *noise figure*, or *noise factor*, of the selected amplifier is when designing or specifying a measurement system containing a pre-amplifier.

The noise figure (N_{fig}) for a device (receiver or amplifier) is defined as:

$$N_{fig} = 10\log_{10}N_o - 10\log_{10}G_d - (-174\ \text{dB} + 10\log_{10}B_r)$$

Tutorial

Where,

N_o= measured noise in milliwatts

G_d= device power gain - linear ratio

B_n= receiver bandwidth in Hz

The use of these parameters for designing or specifying measurement systems will be explained and demonstrated in the following section.

SPECIFYING OR DESIGNING RADIATED MEASUREMENT SYSTEMS

When specifying or designing any measurement receiver system, one should consider that the "system" will include other devices such as antennas, amplifiers, cabling, and possibly filters.

Because a receiver's selectivity, the ability to select frequencies or frequency bands, is primarily a function of the receiver's tuner design, and will be chiefly dependent on the individual receiver selection, selectivity will not be specifically addressed in this text. Receiver system *sensitivity*, however, presents one of the greatest difficulties, or challenges, when designing or specifying receiver measurement systems. Therefore, the sensitivity of the two basic types of receiver systems, *one with a pre-amplifier* and *one without a pre-amplifier*, will be addressed in some detail.

Because antennas are not perfect devices and have associated "losses," the following examples will include explanations for these error corrections. As mentioned previously, amplifiers will not only amplify the emissions being measured but they will also amplify ambient electromagnetic noise. These ambient conditions can drastically change the overall sensitivity of a measurement system. Another potential problem associated with using amplifiers is that they also generate internal electromagnetic noise. Being active devices they will introduce their own internal electromagnetic noise into the receiver system, again having an influence on the total system's noise level, thus, its sensitivity.

Some corrections for the above mentioned problems are necessary to accurately calculate both the receiver's signal input sensitivity and (more importantly) the total system's *ambient* sensitivity. Without knowing the total measurement system's *ambient sensitivity*, measurements may not be possible down to anticipated emission levels.

In electromagnetic measurement systems terms such as ambient sensitivity, system sensitivity, and receiver sensitivity have been used interchangeably. More confusing expressions commonly used are terms such as "receiver noise floor," or "system noise floor."

In this text, the term "system sensitivity" will be defined as ambient electromagnetic noise level seen by, and at, the antenna for 0 dB *Signal-to-Noise* ratio at the receiver's intermediate- frequency (I-F) stage. System sensitivities defined herein are for *far-field* conditions.

The following are general terms and definitions that will be used in describing and calculating the following receiver/system parameters:

General Definitions:

1. Nfig (dB) = Noise Figure = $10\log_{10}$ Noise Factor (NF)
2. A_e (dB) = Effective Capture Area = $10\log_{10}(\lambda^2/4\pi)$ - for *unity gain*
3. T (dB) = Average Room Temperature = $10\log_{10}$ 290°K
   (K=degrees Kelvin)
4. B_R (dB) = $10\log_{10}$Receiver Bandwidth (Hertz)
5. K (dB) = Boltzman's Constant
   = $10\log_{10} 1.4 \times 10^{-23}$ Watts/K/Hz
6. S_o (dBm/m^2) = System Sensitivity = N_{fig}-174+B_r-A_e

THE RECEIVER AND ANTENNA SYSTEM SENSITIVITY

Receiver sensitivity is one of the most important design parameters to consider when designing or specifying any measurement system. This parameter will determine the lowest signal level that the receiver will be capable of detecting or measuring. However, when designing a system to measure radiated radio frequency (RF) emissions (signals), it is important to go further in your analysis. The sensitivity level at the receiver may be considerably different than the sensitivity level at the antenna, especially if a pre-amplifier is attached between the antenna and the receiver. If not considered, measuring the "noise floor" of the *receiver system*, itself, instead of the anticipated radiated emissions levels may result. The following measurement system discussion will be as shown in Figure 1, *without the use of the pre-amplifier*.

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Receiver sensitivity (S_R) is defined as the RF noise power level generated within the receiver. It may also be defined as the co-channel interference level for 0 dB *signal-to-noise ratio*, defined as:

$$S_R = NF\ K\ T\ B_r\ \text{(Watts)}$$

Or in logarithmic form:

$$S_R=10\log_{10}NF+10\log_{10}K+10\log_{10}T+10\log_{10}B_R\ \text{(dBW)}$$

Where,

K = Boltzman's Constant = 1.4×10^{-23} Watts/K/Hz
T = temperature in degrees Kelvin
B_R = receiver I-F bandwidth in Hertz
NF = receiver noise factor

Note: *Noise figures and noise factors are different ways of specifying noise. In this text, noise factors will be used to describe linear ratios, and noise figures will be used to describe logarithmic ratios.*

Again, a receiver's selectivity, the ability to select frequencies or frequency bands, is chiefly dependent on the receiver's tuner design, which is mainly the function of the receiver selection. Because receiver system sensitivity presents one of the greatest challenges, sensitivity will be addressed in detail.

For simplicity, a *spectrum analyzer* will be used as the receiver for this discussion. We will first determine the receiver's sensitivity from its indicated power level. The indicated power level of a spectrum analyzer is essentially the base-line trace observed on its cathode-ray tube (CRT) display, usually expressed in dBm. It may be more useful to convert this unit (dBm) to a more useful unit such as dBV. In a 50Ω system this conversion is done by adding 107 dB to the indicated power level displayed on the analyzers CRT display. As an example, an indicated power level of -90 dBm (on the CRT display) is equivalent to an electric plane-wave of 17 V. **Note:** *The 107 dB factor is only applicable in a 50Ω system.*

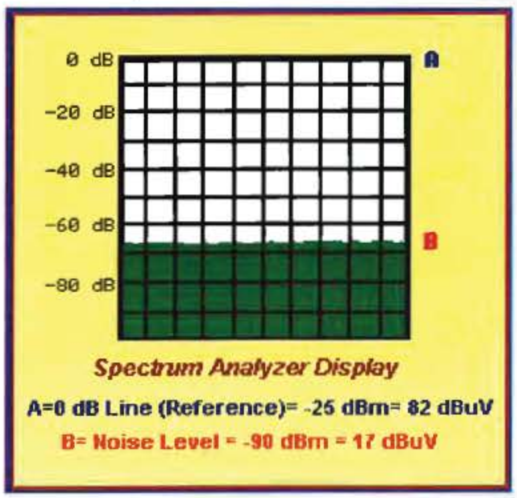

FIGURE 3. SPECTRUM ANALYZER DISPLAY

Converting the *receiver's sensitivity* into a plane-wave field strength equivalency, ambient field strength reference at the **antenna, is not difficult but may be confusing at first because of the unit conversions and the concept of** equivalent field strengths. **As shown above, it may be easier to first convert the receiver's indicated sensitivity power level (dBm),** to a plane-wave equivalent **voltage (dB V). After this conversion, the equivalent field strength sensitivities can be easily calculated** in units of dB V/m or V/m. **This conversion can be accomplished using "antenna factors."**

The antenna factor (dB/m) when added to the indicated sensitivity level (dB V) of the receiver will produce the equivalent field strength sensitivity referenced at the antenna (dB V/m), referenced to an isotropic antenna. For example, an indicated field strength of 17 dB V plus an antenna factor of 25 dB/m is equal to a field strength of 42 dB V/m.

Because the *antenna factor* does not include any losses such as cable losses and filter losses, these losses will have to be accounted for to accurately calculate equivalent field strengths or field strength sensitivities.

For ease in calculating, these losses (in dB) can be added to the antenna factor. This resultant number, when added to the indicated receiver sensitivity, in dB V, will yield an equivalent ambient field strength or electric plane-wave sensitivity. **Note:** *This will only be true for a particular antenna at a specific frequency. Each antenna factor will be different for each measurement frequency.*

Tutorial

Using the following measurement receiver (*spectrum analyzer*) system specifications as an example:

System Specifications:

1. Receiver sensitivity (indicated) = -90 dBm
2. The antenna factor at 45.50 MHz = 25 dB
3. The cable loss at 45.50 MHz = 2 dB

By performing the following steps the measurement system's plane-wave equivalent sensitivity, in dBμ V/m, would be:

Step 1. First, converting the indicated receiver sensitivity level from a power (dBm) to an equivalent voltage (dBμV), assume a 50Ω system, would yield:

$$S_R = -90 \text{ dBm} + 107 \text{ dB} = 17 \text{ dB}\mu\text{V}$$

Step 2. Correcting for cable losses and antenna factors, the system sensitivity (S_e) would be:

$$S_e = 17 \text{ dB}\mu\text{V} + 25 \text{ dB/m} + 2 \text{ dB} = 44.0 \text{ dB}\mu\text{V/m}$$

Step 3. By taking the antilog of the sensitivity level calculated in step 2, the equivalent, or effective, plane-wave electric field strength sensitivity

(S_e) in V/m will be:

$$S_e = 44.0 \text{ dB}\mu\text{V/m} = 10\ (44.0\text{dB}\mu\text{V/m}/20) = 158.49\ \mu\text{V/m}$$

THE RECEIVER PRE-AMPLIFIER AND ANTENNA SYSTEM SENSITIVITY

Now that the sensitivity of a receiver system with just an antenna has been defined, the sensitivity of a measurement system *including a pre-amplifier* will be explained - without *the use of antenna factors*. This will be slightly more complicated than a measurement system containing only a receiver and an antenna.

Again, the system's sensitivity will be defined as the minimum ambient signal level, power density, or field strength that the system can detect or measure referenced at the receive antenna.

To determine the overall system sensitivity the total system's noise factor must be calculated using the noise factors of each active device within the system. If the manufacturer of each device has not specified these parameters they can be measured and/or calculated.

To calculate the system noise factor the following equation is used when a preamplifier is included in the measurement system:

$$NF_s = NF_1 + \left((NF_2 - 1) / G \right)$$

Where,

NF_s = noise factor of the system

NF_1 = noise factor of the preamplifier

NF_2 = noise factor of the receiver

G = Gain of the Preamplifier (Power)

Because antenna factors will not be used, there are two other parameters that will be needed to complete the overall system sensitivity calculations, the *measurement frequency* must be defined and the antenna gain must be known. The frequency is important because the *effective capture area* (A_e) of the antenna must be known. This calculation is based on the equation $\lambda\ 2/4\pi$; Lambda (λ) being the emission wavelength specified in meters. The antenna gain is important because it obviously effects the system's sensitivity.

To make the system sensitivity calculations easier, logarithmic expressions will be used in most cases. Again, noise figures will be used to express noise factors in logarithmic form.

The system sensitivity (S_e) of the measurement system can be calculated using the following:

$$S_e = N_{fig} - 174^* + B_r - A_e\ (\text{dBW/m}^2)$$

Tutorial

Where,

N_{fig} = system noise figure (dB)
B_R = receiver bandwidth, in Hertz (dB)
A_e = antenna effective capture area (dB)
* = 10 $\log_{10}$ Boltzman's Constant x 290 °K + 30 dB

As an example, the following will demonstrate how to calculate the system's sensitivity (S_e) using the following device parameters:

Device Parameters:

1. Receiver I-F Bandwidth = 9 kHz
2. Receiver Noise Figure = 15 dB
3. RF Preamplifier Power Gain = 26 dB
4. Preamplifier Noise Figure = 4.15 dB
5. Measurement Frequency = 635 MHz

First, the receiver sensitivity (S_R) is equal to:

$$S_R = 15 + (-228.5) + 24.6 + 39.5 = -149.4 \text{ (dBW)}$$
$$= \mathbf{-119.4} \textbf{ (dBm)}$$

(For convenience in later comparisons, *dBW* was converted to *dBm*. You will notice (later) the difference between the *receiver sensitivity* and the ambient *system's sensitivity*.)

Next, we must calculate the system noise figure (N_{fig}). This will be more complicated because we must obtain the answer in *logarithmic form* from calculations done in a *linear manner*:

1. NF_1 = 4.15 dB=10(4.15/10) = **2.6**
2. NF_2= 15 dB=10(15/10) = **31.6**
3. G = 26 dB=10(26/10) = **398**
4. NF_3=2.6+ ((31.6-1)/398)=**2.68**

Then,

$$N_{fig} = 10\log_{10} 2.68 = \mathbf{4.3\ dB}$$

The effective capture area of the antenna, A_e, will now be calculated as follows (for unity gain antenna):

1. λ= 300 m/s ÷ frequency (MHz)
   = 300 / 635 = **.47 meters**
2. $A_e = \lambda 2 / 4\pi$
   = .472 / (4 x 3.1415)
   = **.0176 meters^2**
   = 10 $\log_{10}$ .0176 = **-17.5 dB**

The receiver bandwidth (B_R) calculation will be:

1. B_R = 10 $\log_{10}$Frequency (Hz)
3. B_R = 10 $\log_{10}$ 9000 Hz = **39.5 dB**

Tutorial

Finally, using equation $S_e = N_{fsg} - 174 + B_r - A_e$, we can calculate the total system sensitivity. The system sensitivity (power density) will be:

$$S_e = 4.3 - 174 + 39.5 - (-17.5) = \mathbf{-112.7\ dBm/m^2}$$

Now that the system sensitivity (S_e) is known, defined in power density units (dBm/m^2), it may be more useful to convert further to more commonly used units such as field strengths. Again, the units of measurement for field strengths are Volts per meter (V/m), or for convenience dB V/m (decibel ratio of V/m referenced to 1 microvolt).

For ease in understanding, and for simplicity in calculating, it is recommended that unit changes be done by first converting power densities (dBm/m^2) to milliwatts per square centimeter (mW/cm^2), then converting to field strength units such as V/m or dB V/m. In converting *power densities* to *field strengths* the following conversion factors will be helpful:

1. Units/$\mathbf{cm^2}$ (square centimeters) = units/$\mathbf{m^2}$ - 40 dB
2. Volts/meter (**V/m**) = Square Root (mW/$\mathbf{cm^2}$ x 3763.6&)

Using the above conversion factors (1 and 2), the equivalent field strength sensitivity would be:

1. -112.7 dBm/m^2 = -152.7 dBm/cm^2
2. -152.7 dBm/cm^2 = 10(-152.7dBm/10) = 5.4 x 10^{-16} mW/cm^2
3. Square Root (5.4 x 10^{-16} mW/cm^2 x 3763.6&) = 1.4 x 10^{-6} V/m
4. $20\log_{10}1.4 \times 10^{-6}$ V/m = **2.9dB V/m**

Some additional helpful conversion factors for radiated measurement units are:

dBW/m^2 = dBV/m-25.8
dBW/m^2 = dBαααV/m-145.8
dBm/m^2 = dBαααV/m-115.8
dBm/cm^2 = dBαααV/m-155.8
dBm/cm^2 = dBV/m-35.8
dBW/m^2 = dBm/m^2-30.0
dBW/m^2 = dBW/cm^2+40.0
dBW/m^2= dBm/cm^2+10.0

The measurement system's sensitivity has now been calculated and defined. It is important to note, however, that the system may not be capable of measuring all ambient signal levels down to this level. As mentioned earlier, ambient noise levels may be higher than the measurement system sensitivity. This will result in the ambient noise levels masking potential measurements down to these levels.

These potential problems can be resolved with proper system pre-selection (RF input filtering) and receiver I-F bandwidth adjustments.

SUMMARY

In summary, designing or specifying receiver systems requires that each system be designed or specified for its particular application. Two important design parameters that must be addressed are the system's selectivity and its sensitivity. This can become demanding because measurement systems may be required to detect and measure radiated emissions comprised of narrow-band and/or wide-band signals, they may also be required to measure radiated signal strengths varying from very small to very large amplitude levels.

Selectivity, the ability to tune (select) to a frequency or a band of frequencies, is primarily dependent on the particular tuner (receiver) selection in addition to any radio frequency (RF) input filtering, called pre-selection. By filtering undesired input RF emissions, and with proper receiver intermediate-frequency (I-F) filter adjustments, it is possible to measure very low emission amplitudes present in frequency bands containing much higher amplitude emissions or noise levels. These filter selections will be based on the emission types being measured and on the ambient conditions under which the measurements are made.

Sensitivity, the lowest RF amplitude levels that a receiver system will be capable of measuring, is dependent on several variables. These variables are involved with specific antenna selections, receiver noise figures/factors, pre-amplifier gains and noise figures/factors (if used), and the system's filtering and cabling. If not properly planned, all these devices can detract from the overall system's performance.

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The first step in designing or specifying a measurement system is to understand the actual measurement requirements. This should include the emission frequencies, their bandwidths, and probable emission amplitude levels. This information will determine any required RF and I-F filtering and, in particular, the overall system's sensitivity needs.

The second step should be to calculate the total system parameters to include all the devices selected to be used in the measurement system. Any pre-selection required can usually be accomplished using passive high-pass, low-pass, or band-pass filters. These types of filters can greatly assist in removing any undesired ambient noise or signals removed from the intended measurement frequency or frequency band of interest.

The RF filtering will primarily determine the *"carrier-to-noise ratio"* of the system. RF filtering will also prevent possible overloading to the system's pre-amplifier or to the receiver if a pre-amplifier is not used. Overloading, exceeding the maximum allowed input levels, to the system's pre-amplifier or receiver input levels can result in creating intermodulation products within these devices and may result in inaccurate measurement results.

The I-F filtering selection will primarily determine the *"signal-to-noise ratio"* within the receiver itself.

The overall system sensitivity will thus be dependent on the noise figure of the selected receiver, the noise figure and gain of the preamplifier (if used), the system cabling losses, and the gains of the selected antennas.

For high-gain systems, used for measuring low signal levels, extreme caution should be taken to ensure that the combination of the antenna gains and amplifier gains will not produce signal levels that exceed the maximum input levels allowed for the selected receiver. Again, because of the importance, saturating an amplifier or a receiver's input stage may create intermodulation products and may result in inaccurate measurements.

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REGION 23 700 MHz PLAN
APPENDIX J - PRE-ASSIGNMENT RULES - INTEROPERABILITY CHANNELS/REQUIREMENTS

This Appendix Contains

1. The Plan's reference for Pre-Assignment Rules

Note: The Region 23 Plan through this Appendix J adopts the recommendations advanced by the National Coordination Committee (NCC) through its Implementation Subcommittee. These recommendations are identified by the NCC document IM00039-20010510 as NCC Appendix O. NCC Appendix 0 becomes this Plan's Appendix J.

Region 23 – Appendix J – Mississippi

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[1] 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.

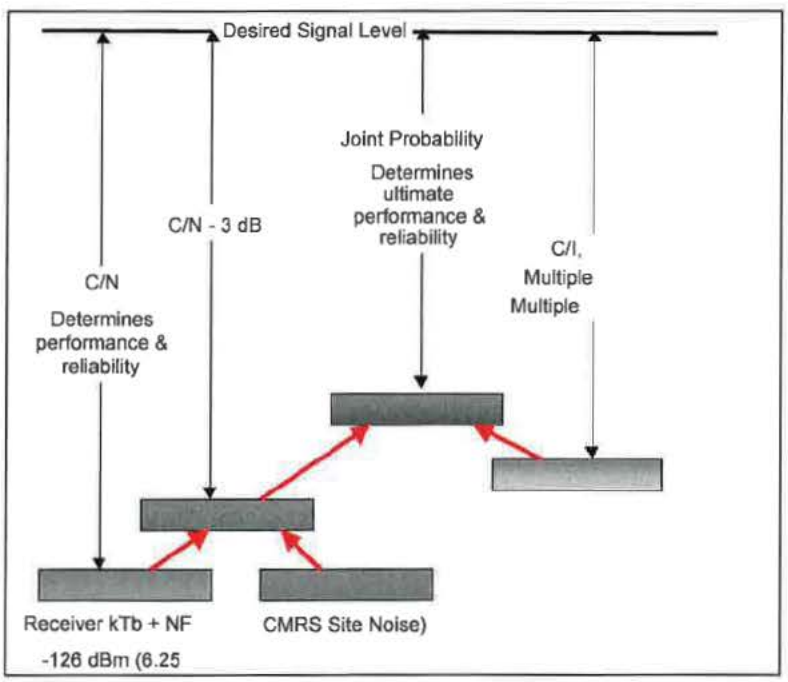


Figure 1 - Interfering Sources Create A "Noise" Level Influencing Reliability

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.[2].

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

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

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.

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[3] 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

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

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
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)

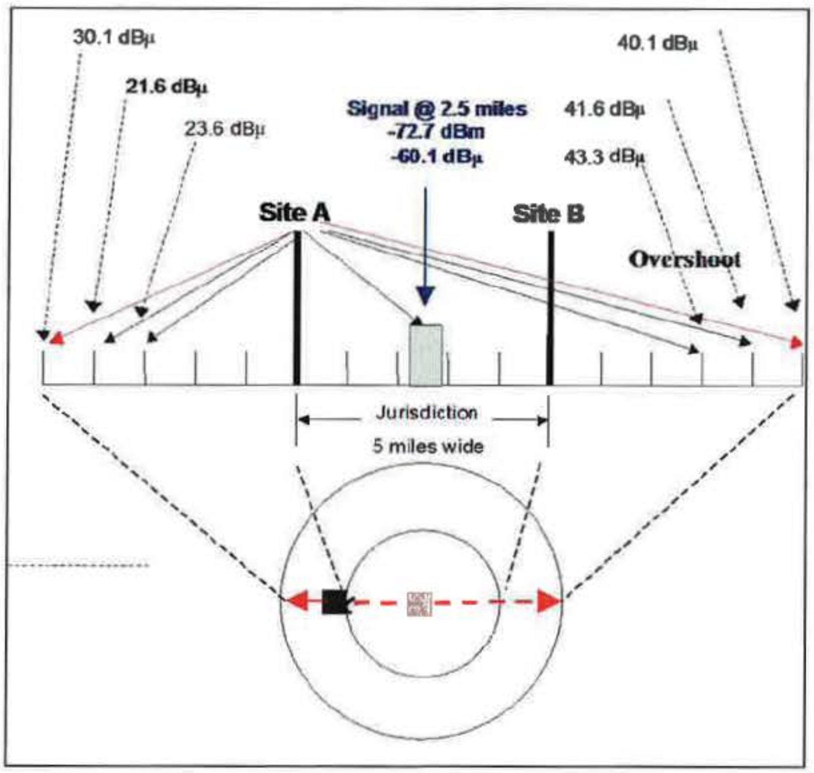


Figure 2 - Field Strength From Left Most Sites.

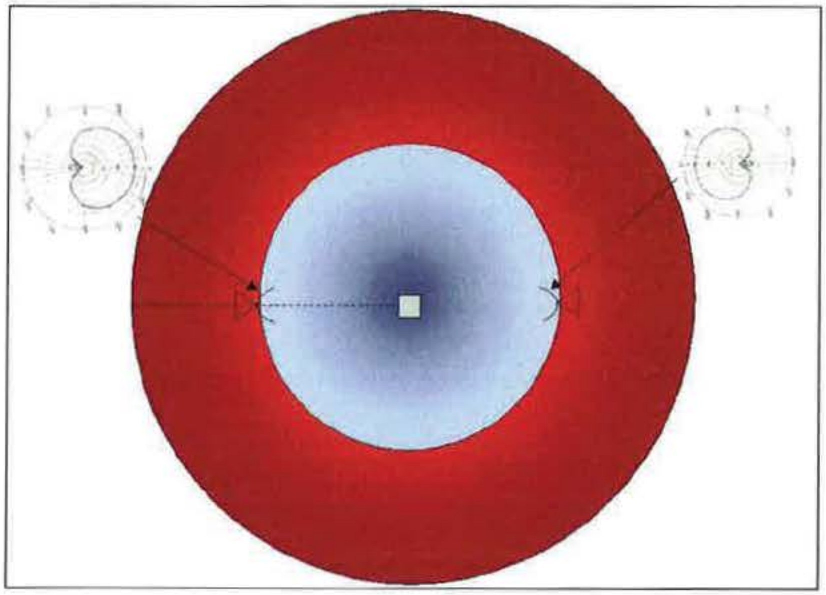


Figure 3 - Antenna Configuration Required To Limit Field Strength Off "Backside"

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[4]. 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%

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

[4] 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.

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.

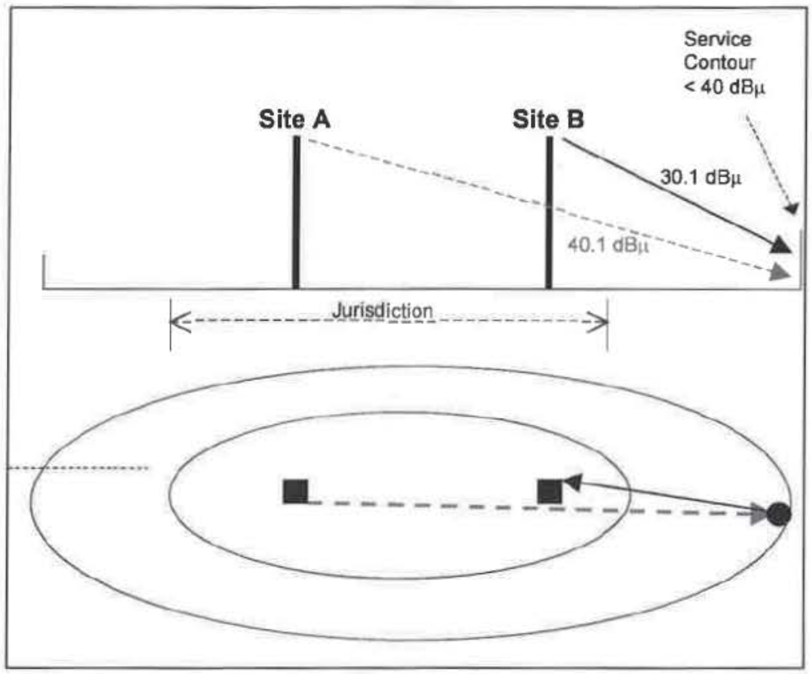


Figure 3a. Scenario 1 on of Use of Table 5

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.

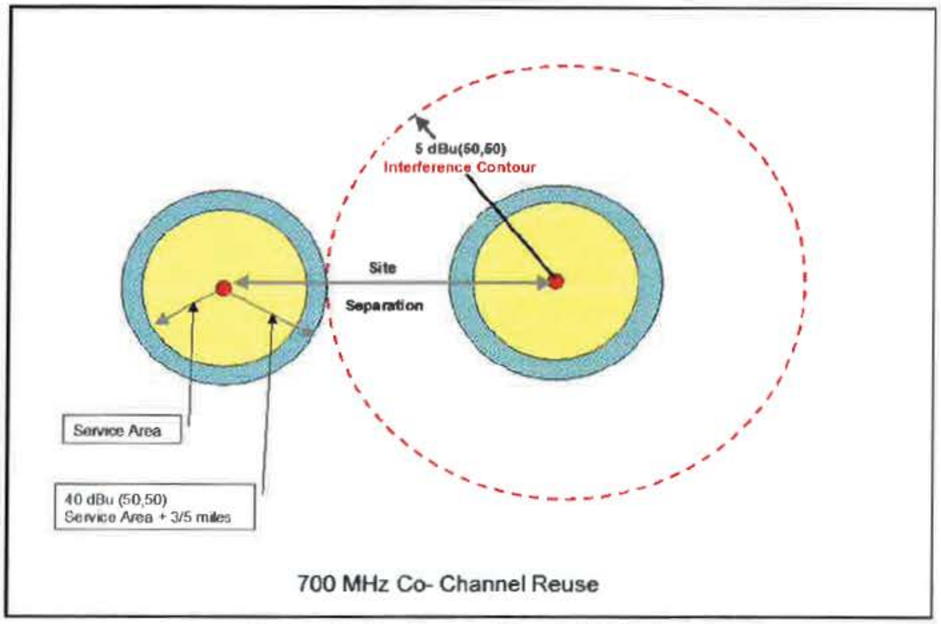


Figure 4 - Co-Channel Reuse Criterion

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 spacing's, 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 spacing's as the slope of the noise curve falls off rapidly. At greater spacing's, 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.

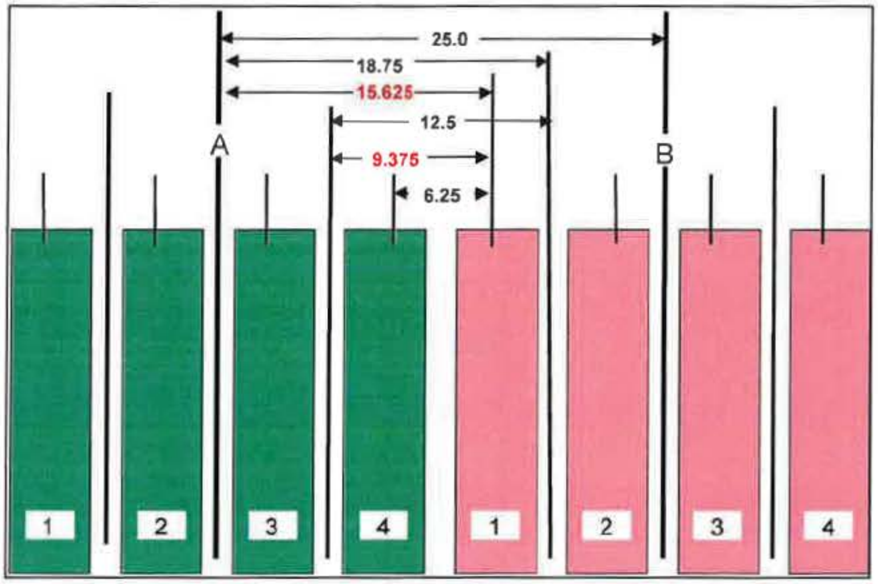


Figure 5, Potential Frequency Separations

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.

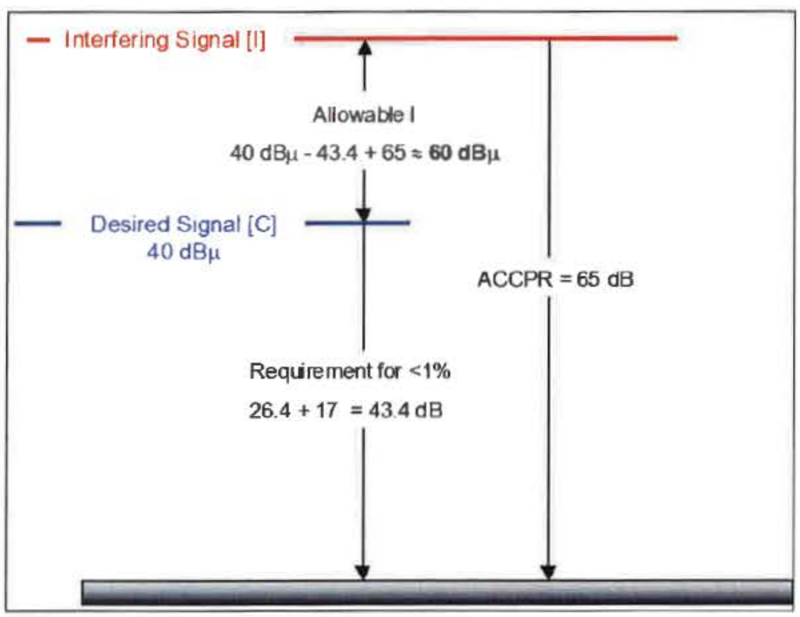


Figure 6 - Adjusted Adjacent 25 kHz Channel Interfering Contour Value

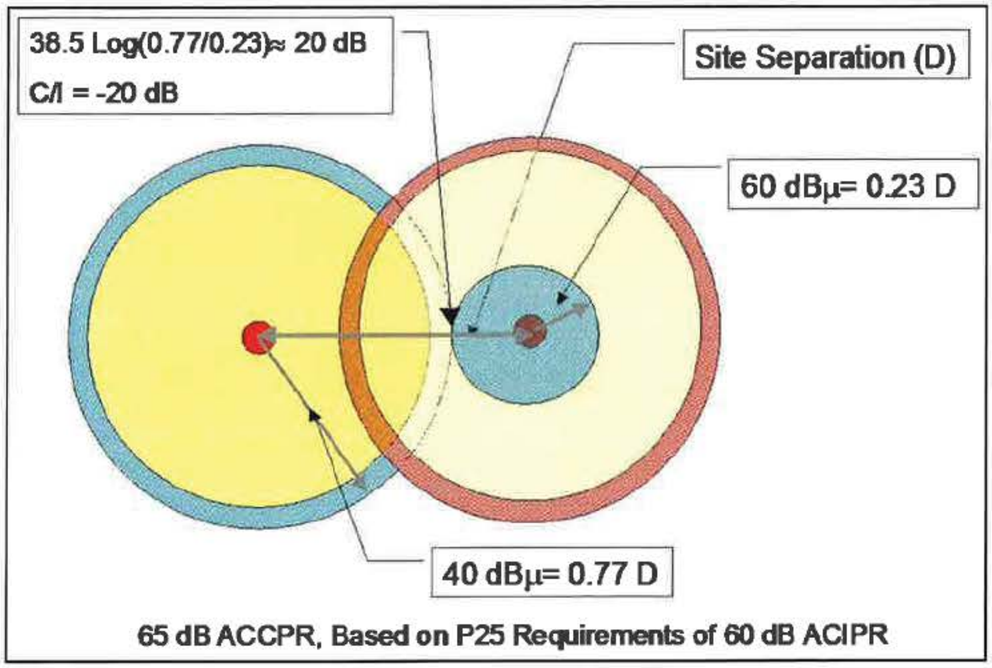


Figure 7 - Example Of Adjacent/Alternate Overlap Criterion

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.

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.

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

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.

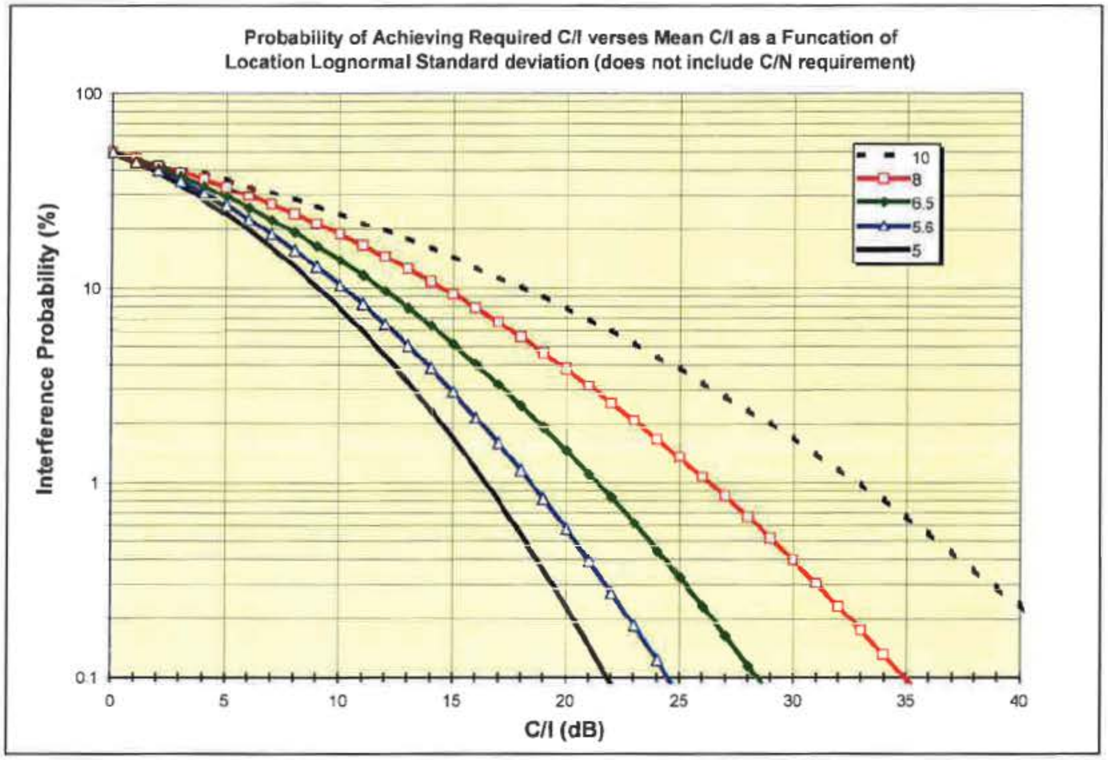


Figure A1, Probability Of Achieving Required C/I As A Function Of Location Standard Deviation

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%.

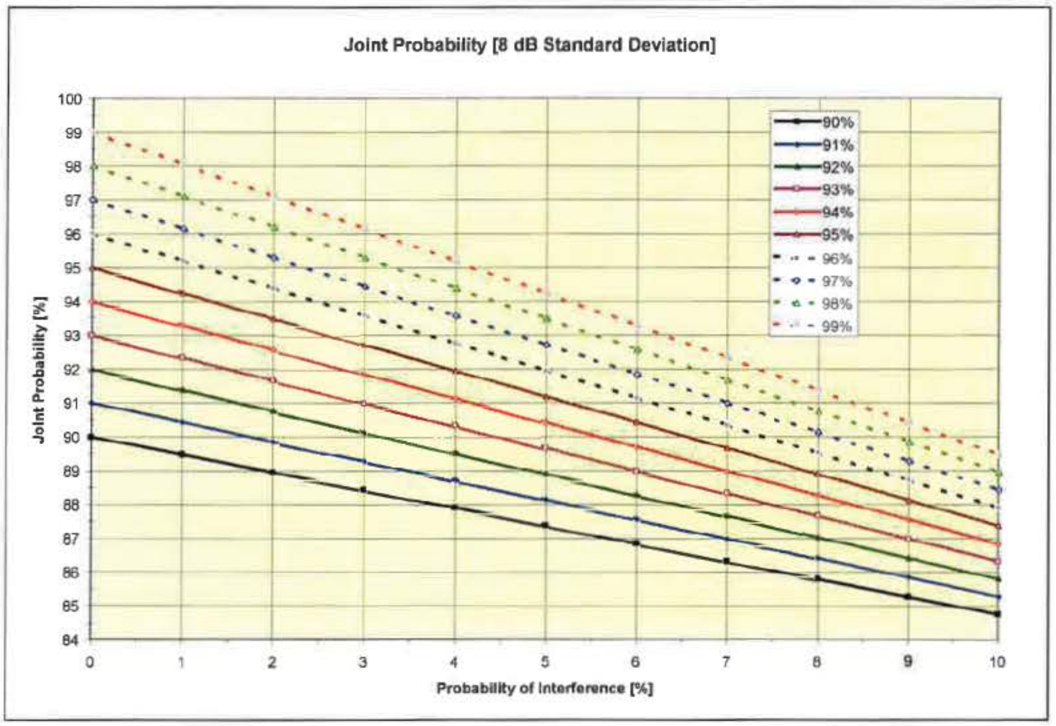
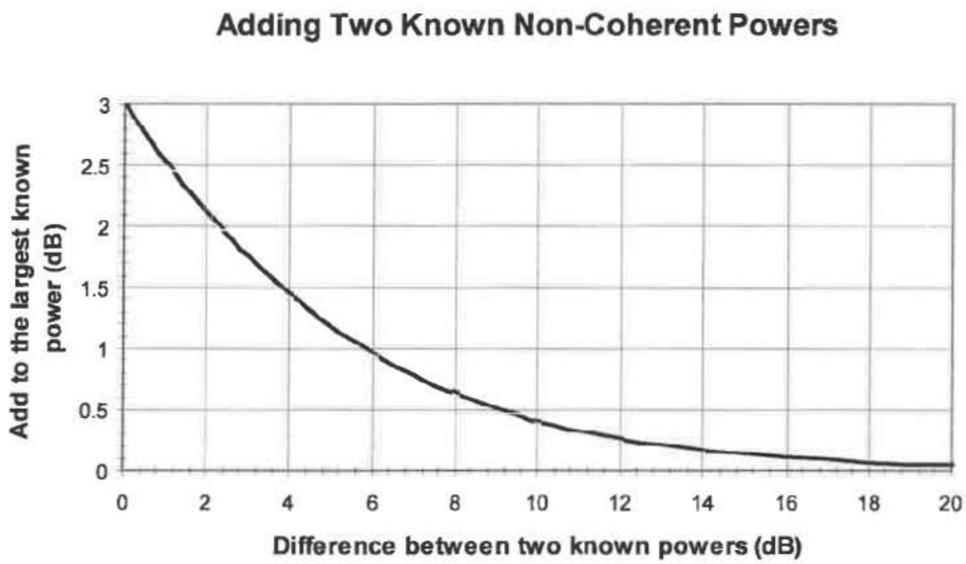


Figure A2 - Effect Of Joint Probability On The Composite Probability

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.

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.

REGION 23 700 MHz PLAN
APPENDIX K - FUNDING REQUEST DOCUMENT

This Appendix Contains

1. The Plan's reference to a funding request form

Note: The Region 23 Plan through this Appendix K incorporates the National Coordination Committee (NCC) Implementation Subcommittee's Appendix L as the Region 23 Plan's Appendix K. NCC Appendix L is also identified as the NCC document IM00036-20010510

APPENDIX L
FUNDING REQUEST FORM

Invoice # 37009

Date: ______________________

Host Organization: ______________________

RPC Chair/Convener: ______________________

State / Region # ______________________

Phone: ______________________

Address: ______________________

____

City, State, Zip: ______________________

Alternate Contact: ______________________

Alt Phone: ______________________

Fax: ______________________

Charged to the National Law Enforcement and
Corrections Technology Center - Rocky Mountain
c/o The University of Denver 800-416-8086
2050 E. Iliff Ave., Denver CO 80208

Amount Due: $2,500.00

Terms: Net 45

OPTION 1

Signature: ______________________

I am requesting PRELIMINARY FUNDING. I understand and agree to comply with authorized expenditure limitations. I agree to submit to the NLECTC an annual financial summary report specifying each area of expenditure until all such funds are depleted.

OPTION 2

Signature: ______________________

I am requesting REIMBURSEMENT FUNDING. I understand and agree to comply with authorized expenditure limitations. I agree to submit to the NLECTC an accurate financial summary report specifying each area of expenditure requested for reimbursement.

REGION 23 700 MHz PLAN
APPENDIX L - POPULATION AND VALUE OF PROTECTED PROPERTY DOCUMENTATION

This Appendix Contains

1. An indicator of the number of people directly affected by the Region 23 700 MHz Plan in the form of a summary of the population of the state of Mississippi and its 82 counties.

2. A summary of the known value of property protected by public safety agencies within the state of Mississippi (Region 23). The value stated does not account for public properties such as public highways, local roads, and infrastructure such as publicly owned water, sewer and electrical transmission grids, public buildings such as court houses and city halls, nor other public properties such as libraries, parks and preserves.

Mississippi Population by County, 1990 and 2000

County Name	Census Population		Change from 1990 to 2000	
	April 1, 1990	April 1, 2000	Number	Percent
Adams	35,356	34,340	(1,016)	(3)
Alcorn	31,722	34,558	2,836	9
Amite	13,328	13,599	271	2
Attala	18,481	19,661	1,180	6
Benton	8,046	8,026	(20)	(0)
Bolivar	41,875	40,633	(1,242)	(3)
Calhoun	14,908	15,069	161	1
Carroll	9,237	10,769	1,532	17
Chickasaw	18,085	19,440	1,355	8
Choctaw	9,071	9,758	687	8
Claiborne	11,370	11,831	461	4
Clarke	17,313	17,955	642	4
Clay	21,120	21,979	859	4
Coahoma	31,665	30,622	(1,043)	(3)
Copiah	27,592	28,757	1,165	4
Covington	16,527	19,407	2,880	17
Desoto	67,910	107,199	39,289	58
Forrest	68,314	72,604	4,290	6
Franklin	8,377	8,448	71	1
George	16,673	19,144	2,471	15
Greene	10,220	13,299	3,079	30
Grenada	21,555	23,263	1,708	8
Hancock	31,760	42,967	11,207	35
Harrison	165,365	189,601	24,236	15
Hinds	254,441	250,800	(3,641)	(1)
Holmes	21,604	21,609	5	-
Humphreys	12,134	11,206	(928)	(8)
Issaquena	1,909	2,274	365	19
Itawamba	20,017	22,770	2,753	14
Jackson	115,243	131,420	16,177	14
Jasper	17,114	18,149	1,035	6
Jefferson	8,653	9,740	1,087	13
Jefferson Davis	14,051	13,962	(89)	(1)
Jones	62,031	64,958	2,927	5
Kemper	10,356	10,453	97	1

Region 23 – Appendix L – Mississippi

Mississippi Population by County, 1990 and 2000				
	Census Population		Change from 1990 to 2000	
County Name				
	April 1, 1990	April 1, 2000	Number	Percent
Lafayette	31,826	38,744	6,918	22
Lamar	30,424	39,070	8,646	28
Lauderdale	75,555	78,161	2,606	3
Lawrence	12,458	13,258	800	6
Leake	18,436	20,940	2,504	14
Lee	65,581	75,755	10,174	16
Leflore	37,341	37,947	606	2
Lincoln	30,278	33,166	2,888	10
Lowndes	59,308	61,586	2,278	4
Madison	53,794	74,674	20,880	39
Marion	25,544	25,595	51	0
Marshall	30,361	34,993	4,632	15
Monroe	36,582	38,014	1,432	4
Montgomery	12,388	12,189	(199)	(2)
Neshoba	24,800	28,684	3,884	16
Newton	20,291	21,838	1,547	8
Noxubee	12,604	12,548	(56)	(0)
Oktibbeha	38,375	42,902	4,527	12
Panola	29,996	34,274	4,278	14
Pearl River	38,714	48,621	9,907	26
Perry	10,865	12,138	1,273	12
Pike	36,882	38,940	2,058	6
Pontotoc	22,237	26,726	4,489	20
Prentiss	23,278	25,556	2,278	10
Quitman	10,490	10,117	(373)	(4)
Rankin	87,161	115,327	28,166	32
Scott	24,137	28,423	4,286	18
Sharkey	7,066	6,580	(486)	(7)
Simpson	23,953	27,639	3,686	15
Smith	14,798	16,182	1,384	9
Stone	10,750	13,622	2,872	27
Sunflower	32,867	34,369	1,502	5
Tallahatchie	15,210	14,903	(307)	(2)
Tate	21,432	25,370	3,938	18
Tippah	19,523	20,826	1,303	7

Region 23 – Appendix L – Mississippi

Mississippi Population by County, 1990 and 2000				
	Census Population		Change from 1990 to 2000	
County Name				
	April 1, 1990	April 1, 2000	Number	Percent
Tishomingo	17,683	19,163	1,480	8
Tunica	8,164	9,227	1,063	13
Union	22,085	25,362	3,277	15
Walthall	47,880	49,644	1,764	4
Warren	47,880	49,644	1,764	4
Washington	67,935	62,977	(4,958)	(7)
Wayne	19,517	21,216	1,699	9
Webster	10,222	10,294	72	1
Wilkinson	9,678	10,312	634	7
Winston	19,433	20,160	727	4
Yalobusha	12,033	13,051	1,018	9
Yazoo	25,506	28,149	2,643	10

Source: U.S. Census Bureau Census 2000 Redistricting Data (P.L. 94-171)
Summary File Table PL1 and 1990 census.

Region 23 – Appendix L – Mississippi

Market Value of Protected Property

Sources: State of Mississippi Department of Treasury, Mississippi DOT, Private Vendors and Public Records

2006 STATE BY CLASS

REAL PROPERTY CLASSIFICATION	ASSESSED VALUATION	MARKET VALUE
	$749,143,713	$6,071,940,550
Buildings & Improvements Class 2	$1,154,171,816	$9,354,764,018
Un-cultivatable Land	$732,678,389	$5,938,486,225
Class 1 Residential	$5,265,211,058	$42,675,454,617
In Lieu	$188,960,116	$1,531,554,721
Real Estate Class 2	$1,154,053,744	$9,353,807,024
Buildings and Improvements	$2,722,531,334	$22,066,591,654
Assessed Valuation Subject Only to 27-39-329 & School Tax	$250,277,405	2,028,542,051
TOTAL REAL PROPERTY	$12,217,027,575	$99,021,140,861
TOTAL PERSONAL PROPERTY	$7,485,469,459	$36,742,085,704
TOTAL REAL and PERSONAL PROPERTY	$19,702,497,034	$135,763,226,565

Estimates of Additional Values Protected

62,638	miles of paved county and city roadway @ $500,000 per lane mile	$62,638,000,000
14,026	miles of major highway @ $900,000 per lane mile	$50,493,600,000
28	Hospitals	70,000,000
294	City and Township Government Centers 2M	588,000,000
82	County Court Houses	410,000,000
7	Passenger Airports	150,769,231
	Public Safety Telecommunications Infrastructure 12.8B	1,063,000,000,000
	TOTAL (Approximately One Trillion Three Hundred Thirteen Million Dollars)	$1,313,113,595,796

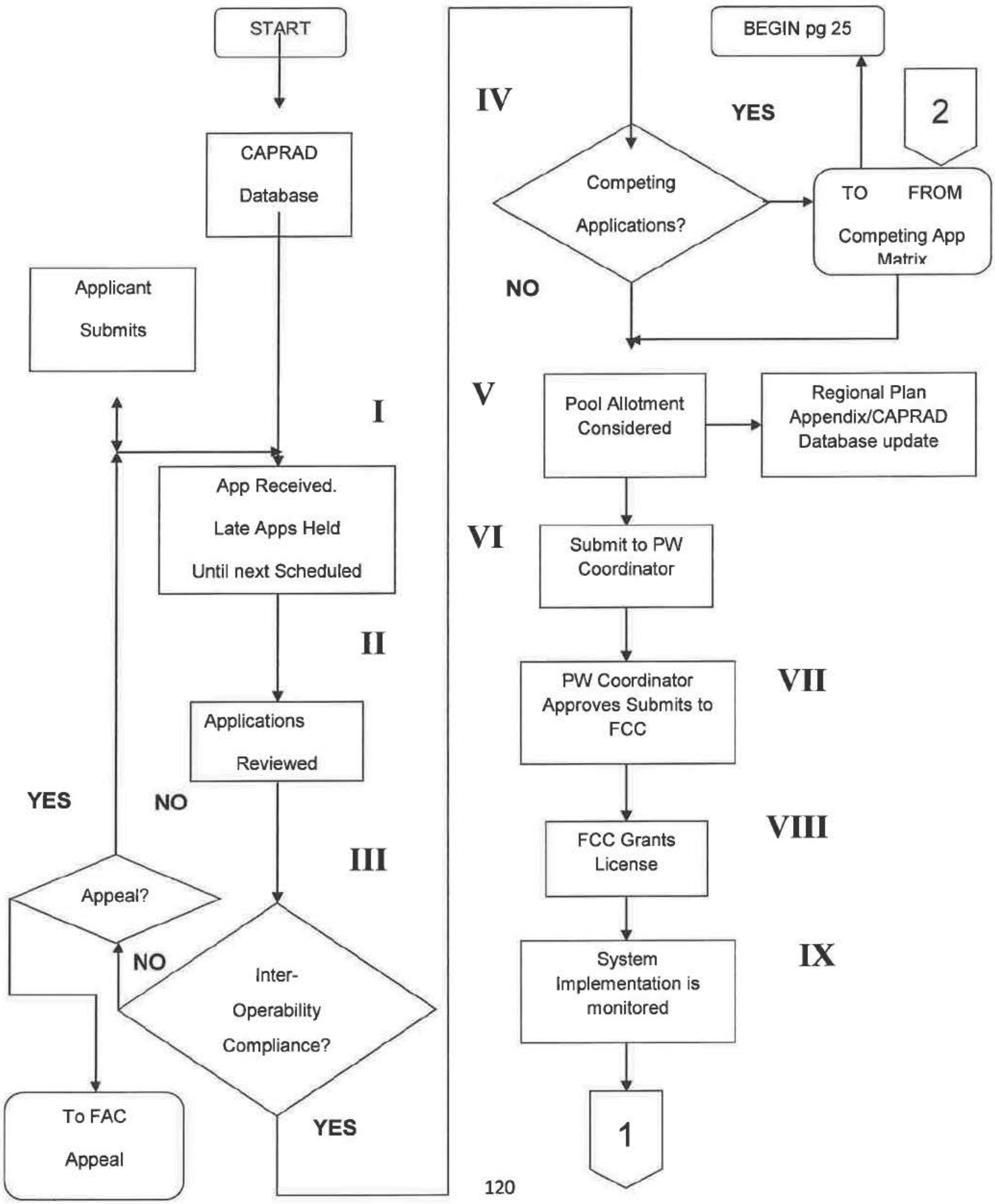
REGION 23 700 MHz PLAN
APPENDIX M - APPLICATION AND COMPETING APPLICATION MATRIX

This Appendix Contains

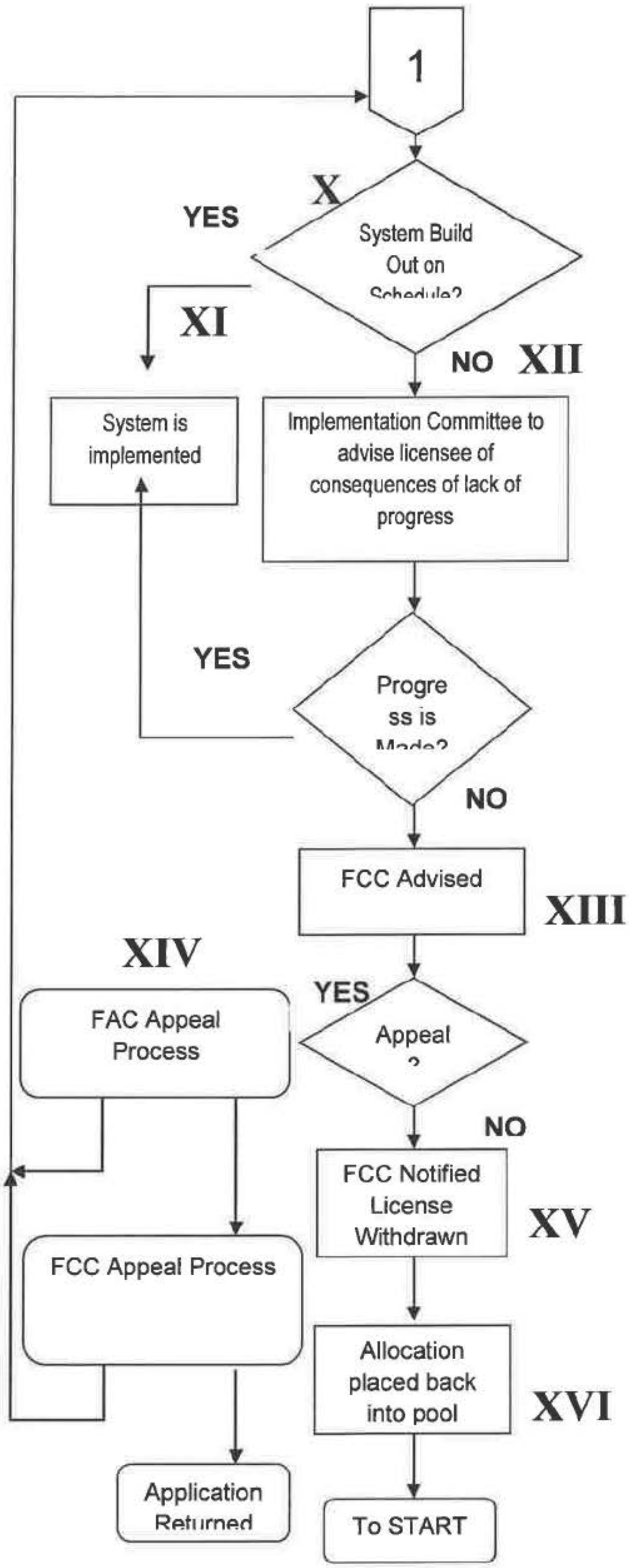
1. A matrix outlining this Plan's application procedure
2. A matrix outlining this Plan's procedure when two or more applications compete for spectrum

Appendix M

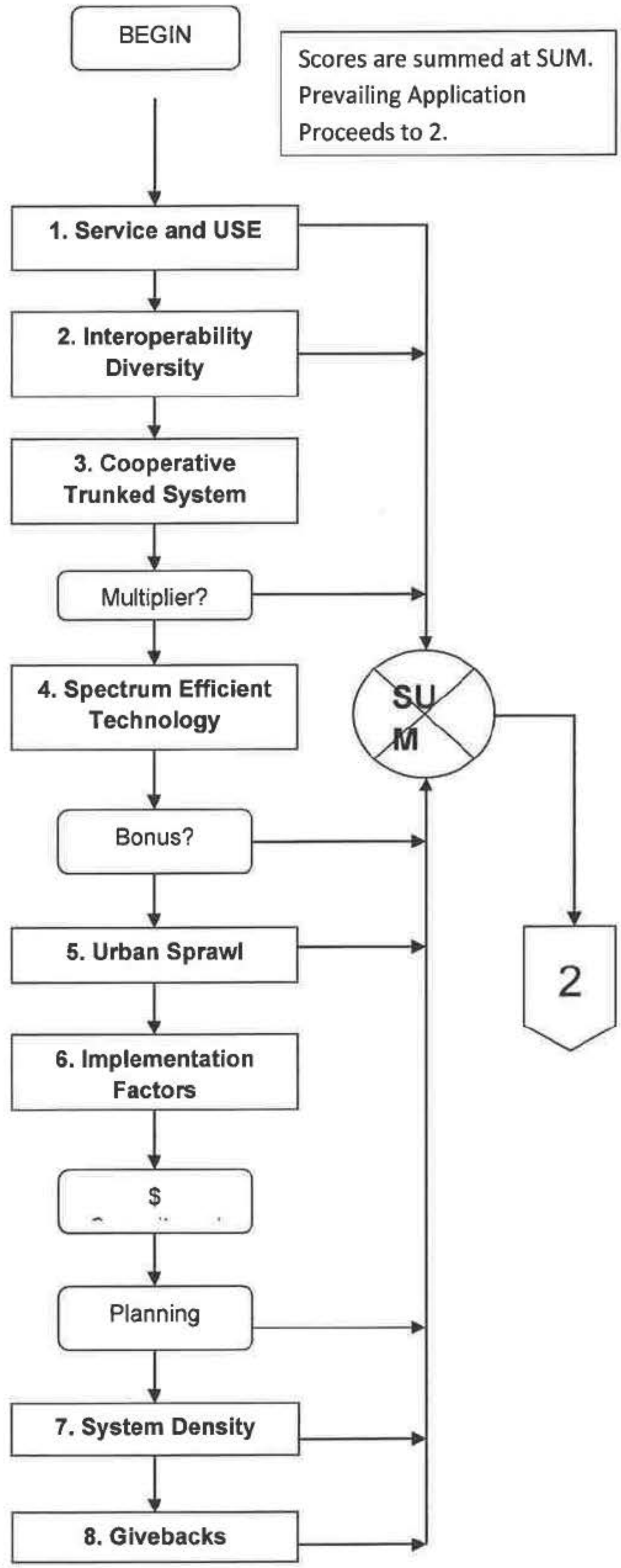
Application Submission and Approval



Application Submission and Approval, cont



Competing Application Matrix



Region 23 - Mississippi
Channel Allotments by County

REGION 23 700 MHz PLAN
APPENDIX N - SPECTRUM ALLOCATIONS

This Appendix Contains

Spectrum allotment criteria in the form of a matrix outlining channel assignments by county along with relevant channel width and channel usage

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
Adams	General Use	Voice 12.5KHz	13-14	769.08125	799.08125	
	General Use	Voice 12.5KHz	15-16	769.09375	799.09375	
	General Use	Voice 12.5KHz	53-54	769.33125	799.33125	
	General Use	Voice 12.5KHz	55-56	769.34375	799.34375	
	General Use	Voice 12.5KHz	93-94	769.58125	799.58125	
	General Use	Voice 12.5KHz	95-96	769.59375	799.59375	
	General Use	Voice 12.5KHz	333-334	771.08125	801.08125	
	General Use	Voice 12.5KHz	335-336	771.09375	801.09375	
	General Use	Voice 12.5KHz	385-386	771.40625	801.40625	
	General Use	Voice 12.5KHz	387-388	771.41875	801.41875	
	General Use	Voice 12.5KHz	437-438	771.73125	801.73125	
	General Use	Voice 12.5KHz	439-440	771.74375	801.74375	
	General Use	Voice 12.5KHz	533-534	772.33125	802.33125	
	General Use	Voice 12.5KHz	535-536	772.34375	802.34375	
	General Use	Voice 12.5KHz	669-670	773.18125	803.18125	
	General Use	Voice 12.5KHz	671-672	773.19375	803.19375	
	General Use	Voice 12.5KHz	709-710	773.43125	803.43125	
	General Use	Voice 12.5KHz	711-712	773.44375	803.44375	
	General Use	Voice 12.5KHz	781-782	773.88125	803.88125	
	General Use	Voice 12.5KHz	783-784	773.89375	803.89375	
	General Use	Voice 12.5KHz	861-862	774.38125	804.38125	
	General Use	Voice 12.5KHz	863-864	774.39375	804.39375	
	General Use	Voice 12.5KHz	901-902	774.63125	804.63125	
	General Use	Voice 12.5KHz	903-904	774.64375	804.64375	
	State License	Voice 25.0KHz	109-112	769.6875	799.6875	
	State License	Voice 25.0KHz	149-152	769.9375	799.9375	
	State License	Voice 25.0KHz	265-268	770.6625	800.6625	
	State License	Voice 25.0KHz	773-776	773.8375	803.8375	
	State License	Voice 25.0KHz	925-928	774.7875	804.7875	
Alcorn	General Use	Voice 12.5KHz	49-50	769.30625	799.30625	
	General Use	Voice 12.5KHz	51-52	769.31875	799.31875	
	General Use	Voice 12.5KHz	129-130	769.80625	799.80625	
	General Use	Voice 12.5KHz	131-132	769.81875	799.81875	
	General Use	Voice 12.5KHz	281-282	770.75625	800.75625	
	General Use	Voice 12.5KHz	283-284	770.76875	800.76875	
	General Use	Voice 12.5KHz	373-374	771.33125	801.33125	
	General Use	Voice 12.5KHz	375-376	771.34375	801.34375	
	General Use	Voice 12.5KHz	421-422	771.63125	801.63125	
	General Use	Voice 12.5KHz	423-424	771.64375	801.64375	
	General Use	Voice 12.5KHz	485-486	772.03125	802.03125	
	General Use	Voice 12.5KHz	487-488	772.04375	802.04375	
	General Use	Voice 12.5KHz	561-562	772.50625	802.50625	
	General Use	Voice 12.5KHz	563-564	772.51875	802.51875	
	General Use	Voice 12.5KHz	609-610	772.80625	802.80625	
	General Use	Voice 12.5KHz	611-612	772.81875	802.81875	
	General Use	Voice 12.5KHz	701-702	773.38125	803.38125	
	General Use	Voice 12.5KHz	703-704	773.39375	803.39375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	905-906	774.65625	804.65625	
	General Use	Voice 12.5KHz	907-908	774.66875	804.66875	
	State License	Voice 25.0KHz	33-36	769.2125	799.2125	
	State License	Voice 25.0KHz	189-192	770.1875	800.1875	
	State License	Voice 25.0KHz	273-276	770.7125	800.7125	
	State License	Voice 25.0KHz	765-768	773.7875	803.7875	
Amite	General Use	Voice 12.5KHz	165-166	770.03125	800.03125	
	General Use	Voice 12.5KHz	167-168	770.04375	800.04375	
	General Use	Voice 12.5KHz	241-242	770.50625	800.50625	
	General Use	Voice 12.5KHz	243-244	770.51875	800.51875	
	General Use	Voice 12.5KHz	461-462	771.88125	801.88125	
	General Use	Voice 12.5KHz	463-464	771.89375	801.89375	
	General Use	Voice 12.5KHz	505-506	772.15625	802.15625	
	General Use	Voice 12.5KHz	507-508	772.16875	802.16875	
	General Use	Voice 12.5KHz	561-562	772.50625	802.50625	
	General Use	Voice 12.5KHz	563-564	772.51875	802.51875	
	General Use	Voice 12.5KHz	797-798	773.98125	803.98125	
	General Use	Voice 12.5KHz	799-800	773.99375	803.99375	
	General Use	Voice 12.5KHz	909-910	774.68125	804.68125	
	General Use	Voice 12.5KHz	911-912	774.69375	804.69375	
	State License	Voice 25.0KHz	845-848	774.2875	804.2875	
	State License	Voice 25.0KHz	885-888	774.5375	804.5375	
Attala	General Use	Voice 12.5KHz	49-50	769.30625	799.30625	
	General Use	Voice 12.5KHz	51-52	769.31875	799.31875	
	General Use	Voice 12.5KHz	129-130	769.80625	799.80625	
	General Use	Voice 12.5KHz	131-132	769.81875	799.81875	
	General Use	Voice 12.5KHz	169-170	770.05625	800.05625	
	General Use	Voice 12.5KHz	171-172	770.06875	800.06875	
	General Use	Voice 12.5KHz	457-458	771.85625	801.85625	
	General Use	Voice 12.5KHz	459-460	771.86875	801.86875	
	General Use	Voice 12.5KHz	497-498	772.10625	802.10625	
	General Use	Voice 12.5KHz	499-500	772.11875	802.11875	
	General Use	Voice 12.5KHz	597-598	772.73125	802.73125	
	General Use	Voice 12.5KHz	599-600	772.74375	802.74375	
	General Use	Voice 12.5KHz	705-706	773.40625	803.40625	
	General Use	Voice 12.5KHz	707-708	773.41875	803.41875	
	General Use	Voice 12.5KHz	745-746	773.65625	803.65625	
	General Use	Voice 12.5KHz	747-748	773.66875	803.66875	
	General Use	Voice 12.5KHz	877-878	774.48125	804.48125	
	General Use	Voice 12.5KHz	879-880	774.49375	804.49375	
	State License	Voice 25.0KHz	229-232	770.4375	800.4375	
	State License	Voice 25.0KHz	733-736	773.5875	803.5875	
	State License	Voice 25.0KHz	809-812	774.0625	804.0625	
Benton	General Use	Voice 12.5KHz	41-42	769.25625	799.25625	
	General Use	Voice 12.5KHz	43-44	769.26875	799.26875	
	General Use	Voice 12.5KHz	177-178	770.10625	800.10625	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	179-180	770.11875	800.11875	
	General Use	Voice 12.5KHz	297-298	770.85625	800.85625	
	General Use	Voice 12.5KHz	299-300	770.86875	800.86875	
	General Use	Voice 12.5KHz	417-418	771.60625	801.60625	
	General Use	Voice 12.5KHz	419-420	771.61875	801.61875	
	General Use	Voice 12.5KHz	473-474	771.95625	801.95625	
	General Use	Voice 12.5KHz	475-476	771.96875	801.96875	
	State License	Voice 25.0KHz	813-816	774.0875	804.0875	
Bolivar	General Use	Voice 12.5KHz	41-42	769.25625	799.25625	
	General Use	Voice 12.5KHz	43-44	769.26875	799.26875	
	General Use	Voice 12.5KHz	81-82	769.50625	799.50625	
	General Use	Voice 12.5KHz	83-84	769.51875	799.51875	
	General Use	Voice 12.5KHz	121-122	769.75625	799.75625	
	General Use	Voice 12.5KHz	123-124	769.76875	799.76875	
	General Use	Voice 12.5KHz	169-170	770.05625	800.05625	
	General Use	Voice 12.5KHz	171-172	770.06875	800.06875	
	General Use	Voice 12.5KHz	293-294	770.83125	800.83125	
	General Use	Voice 12.5KHz	295-296	770.84375	800.84375	
	General Use	Voice 12.5KHz	345-346	771.15625	801.15625	
	General Use	Voice 12.5KHz	347-348	771.16875	801.16875	
	General Use	Voice 12.5KHz	425-426	771.65625	801.65625	
	General Use	Voice 12.5KHz	427-428	771.66875	801.66875	
	General Use	Voice 12.5KHz	477-478	771.98125	801.98125	
	General Use	Voice 12.5KHz	479-480	771.99375	801.99375	
	General Use	Voice 12.5KHz	521-522	772.25625	802.25625	
	General Use	Voice 12.5KHz	523-524	772.26875	802.26875	
	General Use	Voice 12.5KHz	565-566	772.53125	802.53125	
	General Use	Voice 12.5KHz	567-568	772.54375	802.54375	
	General Use	Voice 12.5KHz	605-606	772.78125	802.78125	
	General Use	Voice 12.5KHz	607-608	772.79375	802.79375	
	General Use	Voice 12.5KHz	665-666	773.15625	803.15625	
	General Use	Voice 12.5KHz	667-668	773.16875	803.16875	
	General Use	Voice 12.5KHz	745-746	773.65625	803.65625	
	General Use	Voice 12.5KHz	747-748	773.66875	803.66875	
	State License	Voice 25.0KHz	265-268	770.6625	800.6625	
	State License	Voice 25.0KHz	645-648	773.0375	803.0375	
	State License	Voice 25.0KHz	685-688	773.2875	803.2875	
	State License	Voice 25.0KHz	725-728	773.5375	803.6375	
	State License	Voice 25.0KHz	805-808	774.0375	804.0375	
Calhoun	General Use	Voice 12.5KHz	57-58	769.35625	799.35625	
	General Use	Voice 12.5KHz	59-60	769.36875	799.36875	
	General Use	Voice 12.5KHz	241-242	770.50625	800.50625	
	General Use	Voice 12.5KHz	243-244	770.51875	800.51875	
	General Use	Voice 12.5KHz	293-294	770.83125	800.83125	
	General Use	Voice 12.5KHz	295-296	770.84375	800.84375	
	General Use	Voice 12.5KHz	345-346	771.15625	801.15625	
	General Use	Voice 12.5KHz	347-348	771.16875	801.16875	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	421-422	771.63125	801.63125	
	General Use	Voice 12.5KHz	423-424	771.64375	801.64375	
	General Use	Voice 12.5KHz	601-602	772.75625	802.75625	
	General Use	Voice 12.5KHz	603-604	772.76875	802.76875	
	General Use	Voice 12.5KHz	677-678	773.23125	803.23125	
	General Use	Voice 12.5KHz	679-680	773.24375	803.24375	
	State License	Voice 25.0KHz	73-76	769.4625	799.4625	
	State License	Voice 25.0KHz	189-192	770.1875	800.1875	
	State License	Voice 25.0KHz	805-808	774.0375	804.0375	
Carroll	General Use	Voice 12.5KHz	289-290	770.80625	800.80625	
	General Use	Voice 12.5KHz	291-292	770.81875	800.81875	
	General Use	Voice 12.5KHz	341-342	771.13125	801.13125	
	General Use	Voice 12.5KHz	343-344	771.14375	801.14375	
	General Use	Voice 12.5KHz	401-402	771.50625	801.50625	
	General Use	Voice 12.5KHz	403-404	771.51875	801.51875	
	General Use	Voice 12.5KHz	517-518	772.23125	802.23125	
	General Use	Voice 12.5KHz	519-520	772.24375	802.24375	
	General Use	Voice 12.5KHz	573-574	772.58125	802.58125	
	General Use	Voice 12.5KHz	575-576	772.59375	802.59375	
	General Use	Voice 12.5KHz	637-638	772.98125	802.98125	
	General Use	Voice 12.5KHz	639-640	772.99375	802.99375	
	State License	Voice 25.0KHz	105-108	769.6625	799.6625	
	State License	Voice 25.0KHz	765-768	773.7875	803.7875	
Chickasaw	General Use	Voice 12.5KHz	217-218	770.35625	800.35625	
	General Use	Voice 12.5KHz	219-220	770.36875	800.36875	
	General Use	Voice 12.5KHz	321-322	771.00625	801.00625	
	General Use	Voice 12.5KHz	323-324	771.01875	801.01875	
	General Use	Voice 12.5KHz	381-382	771.38125	801.38125	
	General Use	Voice 12.5KHz	383-384	771.39375	801.39375	
	General Use	Voice 12.5KHz	433-434	771.70625	801.70625	
	General Use	Voice 12.5KHz	435-436	771.71875	801.71875	
	General Use	Voice 12.5KHz	489-490	772.05625	802.05625	
	General Use	Voice 12.5KHz	491-492	772.06875	802.06875	
	General Use	Voice 12.5KHz	541-542	772.38125	802.38125	
	General Use	Voice 12.5KHz	543-544	772.39375	802.39375	
	General Use	Voice 12.5KHz	585-586	772.65625	802.65625	
	General Use	Voice 12.5KHz	587-588	772.66875	802.66875	
	General Use	Voice 12.5KHz	753-754	773.70625	803.70625	
	General Use	Voice 12.5KHz	755-756	773.71875	803.71875	
	State License	Voice 25.0KHz	29-32	769.1875	799.1875	
	State License	Voice 25.0KHz	305-308	770.9125	800.9125	
	State License	Voice 25.0KHz	653-656	773.0875	803.0875	
Choctaw	General Use	Voice 12.5KHz	213-214	770.33125	800.33125	
	General Use	Voice 12.5KHz	215-216	770.34375	800.34375	
	General Use	Voice 12.5KHz	349-350	771.18125	801.18125	
	General Use	Voice 12.5KHz	351-352	771.19375	801.19375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	429-430	771.68125	801.68125	
	General Use	Voice 12.5KHz	431-432	771.69375	801.69375	
	General Use	Voice 12.5KHz	533-534	772.33125	802.33125	
	General Use	Voice 12.5KHz	535-536	772.34375	802.34375	
	General Use	Voice 12.5KHz	577-578	772.60625	802.60625	
	General Use	Voice 12.5KHz	579-580	772.61875	802.61875	
	General Use	Voice 12.5KHz	629-630	772.93125	802.93125	
	General Use	Voice 12.5KHz	631-632	772.94375	802.94375	
	General Use	Voice 12.5KHz	673-674	773.20625	803.20625	
	General Use	Voice 12.5KHz	675-676	773.21875	803.21875	
	General Use	Voice 12.5KHz	829-830	774.18125	804.18125	
	General Use	Voice 12.5KHz	831-832	774.19375	804.19375	
	General Use	Voice 12.5KHz	901-902	774.63125	804.63125	
	General Use	Voice 12.5KHz	903-904	774.64375	804.64375	
	General Use	Voice 12.5KHz	941-942	774.88125	804.88125	
	General Use	Voice 12.5KHz	943-944	774.89375	804.89375	
	State License	Voice 25.0KHz	69-72	769.4375	799.4375	
	State License	Voice 25.0KHz	193-196	770.2125	800.2125	
	State License	Voice 25.0KHz	645-648	773.0375	803.0375	
	State License	Voice 25.0KHz	933-936	774.8375	804.8375	
Claiborne	General Use	Voice 12.5KHz	289-290	770.80625	800.80625	
	General Use	Voice 12.5KHz	291-292	770.81875	800.81875	
	General Use	Voice 12.5KHz	357-358	771.23125	801.23125	
	General Use	Voice 12.5KHz	359-360	771.24375	801.24375	
	General Use	Voice 12.5KHz	397-398	771.48125	801.48125	
	General Use	Voice 12.5KHz	399-400	771.49375	801.49375	
	General Use	Voice 12.5KHz	521-522	772.25625	802.25625	
	General Use	Voice 12.5KHz	523-524	772.26875	802.26875	
	General Use	Voice 12.5KHz	865-866	774.40625	804.40625	
	General Use	Voice 12.5KHz	867-868	774.41875	804.41875	
	State License	Voice 25.0KHz	185-188	770.1625	800.1625	
Clarke	General Use	Voice 12.5KHz	121-122	769.75625	799.75625	
	General Use	Voice 12.5KHz	123-124	769.76875	799.76875	
	General Use	Voice 12.5KHz	321-322	771.00625	801.00625	
	General Use	Voice 12.5KHz	323-324	771.01875	801.01875	
	General Use	Voice 12.5KHz	361-362	771.25625	801.25625	
	General Use	Voice 12.5KHz	363-364	771.26875	801.26875	
	General Use	Voice 12.5KHz	457-458	771.85625	801.85625	
	General Use	Voice 12.5KHz	459-460	771.86875	801.86875	
	General Use	Voice 12.5KHz	525-526	772.28125	802.28125	
	General Use	Voice 12.5KHz	527-528	772.29375	802.29375	
	General Use	Voice 12.5KHz	573-574	772.58125	802.58125	
	General Use	Voice 12.5KHz	575-576	772.59375	802.59375	
	General Use	Voice 12.5KHz	633-634	772.95625	802.95625	
	General Use	Voice 12.5KHz	635-636	772.96875	802.96875	
	General Use	Voice 12.5KHz	821-822	774.13125	804.13125	
	General Use	Voice 12.5KHz	823-824	774.14375	804.14375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	State License	Voice 25.0KHz	273-276	770.7125	800.7125	
	State License	Voice 25.0KHz	845-848	774.2875	804.2875	
	State License	Voice 25.0KHz	885-888	774.5375	804.5375	
Clay	General Use	Voice 12.5KHz	201-202	770.25625	800.25625	
	General Use	Voice 12.5KHz	203-204	770.26875	800.26875	
	General Use	Voice 12.5KHz	249-250	770.55625	800.55625	
	General Use	Voice 12.5KHz	251-252	770.56875	800.56875	
	General Use	Voice 12.5KHz	329-330	771.05625	801.05625	
	General Use	Voice 12.5KHz	331-332	771.06875	801.06875	
	General Use	Voice 12.5KHz	393-394	771.45625	801.45625	
	General Use	Voice 12.5KHz	395-396	771.46875	801.46875	
	General Use	Voice 12.5KHz	449-450	771.80625	801.80625	
	General Use	Voice 12.5KHz	451-452	771.81875	801.81875	
	General Use	Voice 12.5KHz	505-506	772.15625	802.15625	
	General Use	Voice 12.5KHz	507-508	772.16875	802.16875	
	General Use	Voice 12.5KHz	561-562	772.50625	802.50625	
	General Use	Voice 12.5KHz	563-564	772.51875	802.51875	
	General Use	Voice 12.5KHz	861-862	774.38125	804.38125	
	General Use	Voice 12.5KHz	863-864	774.39375	804.39375	
	State License	Voice 25.0KHz	113-116	769.7125	799.7125	
	State License	Voice 25.0KHz	685-688	773.2875	803.2875	
	State License	Voice 25.0KHz	765-768	773.7875	803.7875	
Coahoma	General Use	Voice 12.5KHz	133-134	769.83125	799.83125	
	General Use	Voice 12.5KHz	135-136	769.84375	799.84375	
	General Use	Voice 12.5KHz	245-246	770.53125	800.53125	
	General Use	Voice 12.5KHz	247-248	770.54375	800.54375	
	General Use	Voice 12.5KHz	357-358	771.23125	801.23125	
	General Use	Voice 12.5KHz	359-360	771.24375	801.24375	
	General Use	Voice 12.5KHz	397-398	771.48125	801.48125	
	General Use	Voice 12.5KHz	399-400	771.49375	801.49375	
	General Use	Voice 12.5KHz	449-450	771.80625	801.80625	
	General Use	Voice 12.5KHz	451-452	771.81875	801.81875	
	General Use	Voice 12.5KHz	557-558	772.48125	802.48125	
	General Use	Voice 12.5KHz	559-560	772.49375	802.49375	
	General Use	Voice 12.5KHz	677-678	773.23125	803.23125	
	General Use	Voice 12.5KHz	679-680	773.24375	803.24375	
	General Use	Voice 12.5KHz	757-758	773.73125	803.73125	
	General Use	Voice 12.5KHz	759-760	773.74375	803.74375	
	General Use	Voice 12.5KHz	829-830	774.18125	804.18125	
	General Use	Voice 12.5KHz	831-832	774.19375	804.19375	
	General Use	Voice 12.5KHz	873-874	774.45625	804.45625	
	General Use	Voice 12.5KHz	875-876	774.46875	804.46875	
	State License	Voice 25.0KHz	153-156	769.9625	799.9625	
	State License	Voice 25.0KHz	769-772	773.8125	803.8125	
	State License	Voice 25.0KHz	813-816	774.0875	804.0875	
Copiah	General Use	Voice 12.5KHz	369-370	771.30625	801.30625	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	371-372	771.31875	801.31875	
	General Use	Voice 12.5KHz	441-442	771.75625	801.75625	
	General Use	Voice 12.5KHz	443-444	771.76875	801.76875	
	General Use	Voice 12.5KHz	509-510	772.18125	802.18125	
	General Use	Voice 12.5KHz	511-512	772.19375	802.19375	
	General Use	Voice 12.5KHz	565-566	772.53125	802.53125	
	General Use	Voice 12.5KHz	567-568	772.54375	802.54375	
	General Use	Voice 12.5KHz	609-610	772.80625	802.80625	
	General Use	Voice 12.5KHz	611-612	772.81875	802.81875	
	General Use	Voice 12.5KHz	673-674	773.20625	803.20625	
	General Use	Voice 12.5KHz	675-676	773.21875	803.21875	
	General Use	Voice 12.5KHz	913-914	774.70625	804.70625	
	General Use	Voice 12.5KHz	915-916	774.71875	804.71875	
	State License	Voice 25.0KHz	69-72	769.4375	799.4375	
	State License	Voice 25.0KHz	193-196	770.2125	800.2125	
	State License	Voice 25.0KHz	729-732	773.5625	803.5625	
Covington	General Use	Voice 12.5KHz	385-386	771.40625	801.40625	
	General Use	Voice 12.5KHz	387-388	771.41875	801.41875	
	General Use	Voice 12.5KHz	437-438	771.73125	801.73125	
	General Use	Voice 12.5KHz	439-440	771.74375	801.74375	
	General Use	Voice 12.5KHz	489-490	772.05625	802.05625	
	General Use	Voice 12.5KHz	491-492	772.06875	802.06875	
	General Use	Voice 12.5KHz	597-598	772.73125	802.73125	
	General Use	Voice 12.5KHz	599-600	772.74375	802.74375	
	General Use	Voice 12.5KHz	825-826	774.15625	804.15625	
	General Use	Voice 12.5KHz	827-828	774.16875	804.16875	
	General Use	Voice 12.5KHz	877-878	774.48125	804.48125	
	General Use	Voice 12.5KHz	879-880	774.49375	804.49375	
	General Use	Voice 12.5KHz	917-918	774.73125	804.73125	
	General Use	Voice 12.5KHz	919-920	774.74375	804.74375	
	State License	Voice 25.0KHz	145-148	769.9125	799.9125	
	State License	Voice 25.0KHz	733-736	773.5875	803.5875	
De Soto	General Use	Voice 12.5KHz	13-14	769.08125	799.08125	
	General Use	Voice 12.5KHz	15-16	769.09375	799.09375	
	General Use	Voice 12.5KHz	121-122	769.75625	799.75625	
	General Use	Voice 12.5KHz	123-124	769.76875	799.76875	
	General Use	Voice 12.5KHz	161-162	770.00625	800.00625	
	General Use	Voice 12.5KHz	163-164	770.01875	800.01875	
	General Use	Voice 12.5KHz	201-202	770.25625	800.25625	
	General Use	Voice 12.5KHz	203-204	770.26875	800.26875	
	General Use	Voice 12.5KHz	241-242	770.50625	800.50625	
	General Use	Voice 12.5KHz	243-244	770.51875	800.51875	
	General Use	Voice 12.5KHz	281-282	770.75625	800.75625	
	General Use	Voice 12.5KHz	283-284	770.76875	800.76875	
	General Use	Voice 12.5KHz	345-346	771.15625	801.15625	
	General Use	Voice 12.5KHz	347-348	771.16875	801.16875	
	General Use	Voice 12.5KHz	413-414	771.58125	801.58125	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	415-416	771.59375	801.59375	
	General Use	Voice 12.5KHz	457-458	771.85625	801.85625	
	General Use	Voice 12.5KHz	459-460	771.86875	801.86875	
	General Use	Voice 12.5KHz	525-526	772.28125	802.28125	
	General Use	Voice 12.5KHz	527-528	772.29375	802.29375	
	General Use	Voice 12.5KHz	565-566	772.53125	802.53125	
	General Use	Voice 12.5KHz	567-568	772.54375	802.54375	
	General Use	Voice 12.5KHz	613-614	772.83125	802.83125	
	General Use	Voice 12.5KHz	615-616	772.84375	802.84375	
	General Use	Voice 12.5KHz	665-666	773.15625	803.15625	
	General Use	Voice 12.5KHz	667-668	773.16875	803.16875	
	General Use	Voice 12.5KHz	785-786	773.90625	803.90625	
	General Use	Voice 12.5KHz	787-788	773.91875	803.91875	
	General Use	Voice 12.5KHz	825-826	774.15625	804.15625	
	General Use	Voice 12.5KHz	827-828	774.16875	804.16875	
	General Use	Voice 12.5KHz	865-866	774.40625	804.40625	
	General Use	Voice 12.5KHz	867-868	774.41875	804.41875	
	State License	Voice 25.0KHz	653-656	773.0875	803.0875	
	State License	Voice 25.0KHz	693-696	773.3375	803.3375	
	State License	Voice 25.0KHz	733-736	773.5875	803.5875	
	State License	Voice 25.0KHz	853-856	774.3375	804.3375	
Forrest	General Use	Voice 12.5KHz	41-42	769.25625	799.25625	
	General Use	Voice 12.5KHz	43-44	769.26875	799.26875	
	General Use	Voice 12.5KHz	81-82	769.50625	799.50625	
	General Use	Voice 12.5KHz	83-84	769.51875	799.51875	
	General Use	Voice 12.5KHz	133-134	769.83125	799.83125	
	General Use	Voice 12.5KHz	135-136	769.84375	799.84375	
	General Use	Voice 12.5KHz	201-202	770.25625	800.25625	
	General Use	Voice 12.5KHz	203-204	770.26875	800.26875	
	General Use	Voice 12.5KHz	289-290	770.80625	800.80625	
	General Use	Voice 12.5KHz	291-292	770.81875	800.81875	
	General Use	Voice 12.5KHz	337-338	771.10625	801.10625	
	General Use	Voice 12.5KHz	339-340	771.11875	801.11875	
	General Use	Voice 12.5KHz	377-378	771.35625	801.35625	
	General Use	Voice 12.5KHz	379-380	771.36875	801.36875	
	General Use	Voice 12.5KHz	421-422	771.63125	801.63125	
	General Use	Voice 12.5KHz	423-424	771.64375	801.64375	
	General Use	Voice 12.5KHz	461-462	771.88125	801.88125	
	General Use	Voice 12.5KHz	463-464	771.89375	801.89375	
	General Use	Voice 12.5KHz	513-514	772.20625	802.20625	
	General Use	Voice 12.5KHz	515-516	772.21875	802.21875	
	General Use	Voice 12.5KHz	621-622	772.88125	802.88125	
	General Use	Voice 12.5KHz	623-624	772.89375	802.89375	
	General Use	Voice 12.5KHz	669-670	773.18125	803.18125	
	General Use	Voice 12.5KHz	671-672	773.19375	803.19375	
	General Use	Voice 12.5KHz	745-746	773.65625	803.65625	
	General Use	Voice 12.5KHz	747-748	773.66875	803.66875	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	785-786	773.90625	803.90625	
	General Use	Voice 12.5KHz	787-788	773.91875	803.91875	
	General Use	Voice 12.5KHz	869-870	774.43125	804.43125	
	General Use	Voice 12.5KHz	871-872	774.44375	804.44375	
	State License	Voice 25.0KHz	269-272	770.6875	800.6875	
	State License	Voice 25.0KHz	313-316	770.9625	800.9625	
	State License	Voice 25.0KHz	645-648	773.0375	803.0375	
	State License	Voice 25.0KHz	785-788	773.7875	803.7875	
	State License	Voice 25.0KHz	805-808	774.0375	804.0375	
Franklin	General Use	Voice 12.5KHz	321-322	771.00625	801.00625	
	General Use	Voice 12.5KHz	323-324	771.01875	801.01875	
	General Use	Voice 12.5KHz	361-362	771.25625	801.25625	
	General Use	Voice 12.5KHz	363-364	771.26875	801.26875	
	General Use	Voice 12.5KHz	401-402	771.50625	801.50625	
	General Use	Voice 12.5KHz	403-404	771.51875	801.51875	
	General Use	Voice 12.5KHz	517-518	772.23125	802.23125	
	General Use	Voice 12.5KHz	519-520	772.24375	802.24375	
	General Use	Voice 12.5KHz	585-586	772.65625	802.65625	
	General Use	Voice 12.5KHz	587-588	772.66875	802.66875	
	General Use	Voice 12.5KHz	741-742	773.63125	803.63125	
	General Use	Voice 12.5KHz	743-744	773.64375	803.64375	
	General Use	Voice 12.5KHz	825-826	774.15625	804.15625	
	General Use	Voice 12.5KHz	827-828	774.16875	804.16875	
	General Use	Voice 12.5KHz	877-878	774.48125	804.48125	
	General Use	Voice 12.5KHz	879-880	774.49375	804.49375	
	State License	Voice 25.0KHz	233-236	770.4625	800.4625	
	State License	Voice 25.0KHz	689-692	773.3125	803.3125	
George	General Use	Voice 12.5KHz	245-246	770.53125	800.53125	
	General Use	Voice 12.5KHz	247-248	770.54375	800.54375	
	General Use	Voice 12.5KHz	325-326	771.03125	801.03125	
	General Use	Voice 12.5KHz	327-328	771.04375	801.04375	
	General Use	Voice 12.5KHz	405-406	771.53125	801.53125	
	General Use	Voice 12.5KHz	407-408	771.54375	801.54375	
	General Use	Voice 12.5KHz	457-458	771.85625	801.85625	
	General Use	Voice 12.5KHz	459-460	771.86875	801.86875	
	General Use	Voice 12.5KHz	497-498	772.10625	802.10625	
	General Use	Voice 12.5KHz	499-500	772.11875	802.11875	
	General Use	Voice 12.5KHz	553-554	772.45625	802.45625	
	General Use	Voice 12.5KHz	555-556	772.46875	802.46875	
	General Use	Voice 12.5KHz	613-614	772.83125	802.83125	
	General Use	Voice 12.5KHz	615-616	772.84375	802.84375	
	General Use	Voice 12.5KHz	673-674	773.20625	803.20625	
	General Use	Voice 12.5KHz	675-676	773.21875	803.21875	
	State License	Voice 25.0KHz	265-268	770.6625	800.6625	
	State License	Voice 25.0KHz	733-736	773.5875	803.5875	
Greene	General Use	Voice 12.5KHz	17-18	769.10625	799.10625	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	19-20	769.11875	799.11875	
	General Use	Voice 12.5KHz	353-354	771.20625	801.20625	
	General Use	Voice 12.5KHz	355-356	771.21875	801.21875	
	General Use	Voice 12.5KHz	417-418	771.60625	801.60625	
	General Use	Voice 12.5KHz	419-420	771.61875	801.61875	
	General Use	Voice 12.5KHz	521-522	772.25625	802.25625	
	General Use	Voice 12.5KHz	523-524	772.26875	802.26875	
	General Use	Voice 12.5KHz	581-582	772.63125	802.63125	
	General Use	Voice 12.5KHz	583-584	772.64375	802.64375	
	General Use	Voice 12.5KHz	913-914	774.70625	804.70625	
	General Use	Voice 12.5KHz	915-916	774.71875	804.71875	
	State License	Voice 25.0KHz	853-856	774.3375	804.3375	
Grenada	General Use	Voice 12.5KHz	13-14	769.08125	799.08125	
	General Use	Voice 12.5KHz	15-16	769.09375	799.09375	
	General Use	Voice 12.5KHz	137-138	769.85625	799.85625	
	General Use	Voice 12.5KHz	139-140	769.86875	799.86875	
	General Use	Voice 12.5KHz	333-334	771.08125	801.08125	
	General Use	Voice 12.5KHz	335-336	771.09375	801.09375	
	General Use	Voice 12.5KHz	445-446	771.78125	801.78125	
	General Use	Voice 12.5KHz	447-448	771.79375	801.79375	
	General Use	Voice 12.5KHz	493-494	772.08125	802.08125	
	General Use	Voice 12.5KHz	495-496	772.09375	802.09375	
	General Use	Voice 12.5KHz	537-538	772.35625	802.35625	
	General Use	Voice 12.5KHz	539-540	772.36875	802.36875	
	General Use	Voice 12.5KHz	621-622	772.88125	802.88125	
	General Use	Voice 12.5KHz	623-624	772.89375	802.89375	
	General Use	Voice 12.5KHz	905-906	774.65625	804.65625	
	General Use	Voice 12.5KHz	907-908	774.66875	804.66875	
	General Use	Voice 12.5KHz	945-946	774.90625	804.90625	
	General Use	Voice 12.5KHz	947-948	774.91875	804.91875	
	State License	Voice 25.0KHz	65-68	769.4125	799.4125	
	State License	Voice 25.0KHz	233-236	770.4625	800.4625	
	State License	Voice 25.0KHz	845-848	774.2875	804.2875	
Hancock	General Use	Voice 12.5KHz	45-46	769.28125	799.28125	
	General Use	Voice 12.5KHz	47-48	769.29375	799.29375	
	General Use	Voice 12.5KHz	241-242	770.50625	800.50625	
	General Use	Voice 12.5KHz	243-244	770.51875	800.51875	
	General Use	Voice 12.5KHz	341-342	771.13125	801.13125	
	General Use	Voice 12.5KHz	343-344	771.14375	801.14375	
	General Use	Voice 12.5KHz	517-518	772.23125	802.23125	
	General Use	Voice 12.5KHz	519-520	772.24375	802.24375	
	General Use	Voice 12.5KHz	561-562	772.50625	802.50625	
	General Use	Voice 12.5KHz	563-564	772.51875	802.51875	
	General Use	Voice 12.5KHz	625-626	772.90625	802.90625	
	General Use	Voice 12.5KHz	627-628	772.91875	802.91875	
	General Use	Voice 12.5KHz	789-790	773.93125	803.93125	
	General Use	Voice 12.5KHz	791-792	773.94375	803.94375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	State License	Voice 25.0KHz	105-108	769.6625	799.6625	
	State License	Voice 25.0KHz	649-652	773.0625	803.0625	
	State License	Voice 25.0KHz	809-812	774.0625	804.0625	
Harrison	General Use	Voice 12.5KHz	13-14	769.08125	799.08125	
	General Use	Voice 12.5KHz	15-16	769.09375	799.09375	
	General Use	Voice 12.5KHz	57-58	769.35625	799.35625	
	General Use	Voice 12.5KHz	59-60	769.36875	799.36875	
	General Use	Voice 12.5KHz	97-98	769.60625	799.60625	
	General Use	Voice 12.5KHz	99-100	769.61875	799.61875	
	General Use	Voice 12.5KHz	137-138	769.85625	799.85625	
	General Use	Voice 12.5KHz	139-140	769.86875	799.86875	
	General Use	Voice 12.5KHz	209-210	770.30625	800.30625	
	General Use	Voice 12.5KHz	211-212	770.31875	800.31875	
	General Use	Voice 12.5KHz	253-254	770.58125	800.58125	
	General Use	Voice 12.5KHz	255-256	770.59375	800.59375	
	General Use	Voice 12.5KHz	293-294	770.83125	800.83125	
	General Use	Voice 12.5KHz	295-296	770.84375	800.84375	
	General Use	Voice 12.5KHz	333-334	771.08125	801.08125	
	General Use	Voice 12.5KHz	335-336	771.09375	801.09375	
	General Use	Voice 12.5KHz	385-386	771.40625	801.40625	
	General Use	Voice 12.5KHz	387-388	771.41875	801.41875	
	General Use	Voice 12.5KHz	429-430	771.68125	801.68125	
	General Use	Voice 12.5KHz	431-432	771.69375	801.69375	
	General Use	Voice 12.5KHz	469-470	771.93125	801.93125	
	General Use	Voice 12.5KHz	471-472	771.94375	801.94375	
	General Use	Voice 12.5KHz	533-534	772.33125	802.33125	
	General Use	Voice 12.5KHz	535-536	772.34375	802.34375	
	General Use	Voice 12.5KHz	597-598	772.73125	802.73125	
	General Use	Voice 12.5KHz	599-600	772.74375	802.74375	
	General Use	Voice 12.5KHz	637-638	772.98125	802.98125	
	General Use	Voice 12.5KHz	639-640	772.99375	802.99375	
	General Use	Voice 12.5KHz	717-718	773.48125	803.48125	
	General Use	Voice 12.5KHz	719-720	773.49375	803.49375	
	General Use	Voice 12.5KHz	757-758	773.73125	803.73125	
	General Use	Voice 12.5KHz	759-760	773.74375	803.74375	
	General Use	Voice 12.5KHz	797-798	773.98125	803.98125	
	General Use	Voice 12.5KHz	799-800	773.99375	803.99375	
	General Use	Voice 12.5KHz	861-862	774.38125	804.38125	
	General Use	Voice 12.5KHz	863-864	774.39375	804.39375	
	General Use	Voice 12.5KHz	901-902	774.63125	804.63125	
	General Use	Voice 12.5KHz	903-904	774.64375	804.64375	
	State License	Voice 25.0KHz	73-76	769.4625	799.4625	
	State License	Voice 25.0KHz	113-116	769.7125	799.7125	
	State License	Voice 25.0KHz	229-232	770.4375	800.4375	
	State License	Voice 25.0KHz	309-312	770.9375	800.9375	
	State License	Voice 25.0KHz	693-696	773.3375	803.3375	
	State License	Voice 25.0KHz	769-772	773.8125	803.8125	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	State License	Voice 25.0KHz	929-932	774.8125	804.8125	
Hinds	General Use	Voice 12.5KHz	13-14	769.08125	799.08125	
	General Use	Voice 12.5KHz	15-16	769.09375	799.09375	
	General Use	Voice 12.5KHz	53-54	769.33125	799.33125	
	General Use	Voice 12.5KHz	55-56	769.34375	799.34375	
	General Use	Voice 12.5KHz	93-94	769.58125	799.58125	
	General Use	Voice 12.5KHz	95-96	769.59375	799.59375	
	General Use	Voice 12.5KHz	133-134	769.83125	799.83125	
	General Use	Voice 12.5KHz	135-136	769.84375	799.84375	
	General Use	Voice 12.5KHz	173-174	770.08125	800.08125	
	General Use	Voice 12.5KHz	175-176	770.09375	800.09375	
	General Use	Voice 12.5KHz	217-218	770.35625	800.35625	
	General Use	Voice 12.5KHz	219-220	770.36875	800.36875	
	General Use	Voice 12.5KHz	257-258	770.60625	800.60625	
	General Use	Voice 12.5KHz	259-260	770.61875	800.61875	
	General Use	Voice 12.5KHz	297-298	770.85625	800.85625	
	General Use	Voice 12.5KHz	299-300	770.86875	800.86875	
	General Use	Voice 12.5KHz	337-338	771.10625	801.10625	
	General Use	Voice 12.5KHz	339-340	771.11875	801.11875	
	General Use	Voice 12.5KHz	377-378	771.35625	801.35625	
	General Use	Voice 12.5KHz	379-380	771.36875	801.36875	
	General Use	Voice 12.5KHz	425-426	771.65625	801.65625	
	General Use	Voice 12.5KHz	427-428	771.66875	801.66875	
	General Use	Voice 12.5KHz	477-478	771.98125	801.98125	
	General Use	Voice 12.5KHz	479-480	771.99375	801.99375	
	General Use	Voice 12.5KHz	553-554	772.45625	802.45625	
	General Use	Voice 12.5KHz	555-556	772.46875	802.46875	
	General Use	Voice 12.5KHz	593-594	772.70625	802.70625	
	General Use	Voice 12.5KHz	595-596	772.71875	802.71875	
	General Use	Voice 12.5KHz	633-634	772.95625	802.95625	
	General Use	Voice 12.5KHz	635-636	772.96875	802.96875	
	General Use	Voice 12.5KHz	709-710	773.43125	803.43125	
	General Use	Voice 12.5KHz	711-712	773.44375	803.44375	
	General Use	Voice 12.5KHz	749-750	773.68125	803.68125	
	General Use	Voice 12.5KHz	751-752	773.69375	803.69375	
	General Use	Voice 12.5KHz	789-790	773.93125	803.93125	
	General Use	Voice 12.5KHz	791-792	773.94375	803.94375	
	General Use	Voice 12.5KHz	829-830	774.18125	804.18125	
	General Use	Voice 12.5KHz	831-832	774.19375	804.19375	
	General Use	Voice 12.5KHz	873-874	774.45625	804.45625	
	General Use	Voice 12.5KHz	875-876	774.46875	804.46875	
	General Use	Voice 12.5KHz	945-946	774.90625	804.90625	
	General Use	Voice 12.5KHz	947-948	774.91875	804.91875	
	State License	Voice 25.0KHz	105-108	769.6625	799.6625	
	State License	Voice 25.0KHz	153-156	769.9625	799.9625	
	State License	Voice 25.0KHz	225-228	770.4125	800.4125	
	State License	Voice 25.0KHz	265-268	770.6625	800.6625	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	State License	Voice 25.0KHz	305-308	770.9125	800.9125	
	State License	Voice 25.0KHz	653-656	773.0875	803.0875	
	State License	Voice 25.0KHz	693-696	773.3375	803.3375	
	State License	Voice 25.0KHz	773-776	773.8375	803.8375	
	State License	Voice 25.0KHz	813-816	774.0875	804.0875	
	State License	Voice 25.0KHz	853-856	774.3375	804.3375	
	State License	Voice 25.0KHz	893-896	774.5875	804.5875	
	State License	Voice 25.0KHz	933-936	774.8375	804.8375	
Holmes	General Use	Voice 12.5KHz	17-18	769.10625	799.10625	
	General Use	Voice 12.5KHz	19-20	769.11875	799.11875	
	General Use	Voice 12.5KHz	57-58	769.35625	799.35625	
	General Use	Voice 12.5KHz	59-60	769.36875	799.36875	
	General Use	Voice 12.5KHz	97-98	769.60625	799.60625	
	General Use	Voice 12.5KHz	99-100	769.61875	799.61875	
	General Use	Voice 12.5KHz	353-354	771.20625	801.20625	
	General Use	Voice 12.5KHz	355-356	771.21875	801.21875	
	General Use	Voice 12.5KHz	409-410	771.55625	801.55625	
	General Use	Voice 12.5KHz	411-412	771.56875	801.56875	
	General Use	Voice 12.5KHz	465-466	771.90625	801.90625	
	General Use	Voice 12.5KHz	467-468	771.91875	801.91875	
	General Use	Voice 12.5KHz	509-510	772.18125	802.18125	
	General Use	Voice 12.5KHz	511-512	772.19375	802.19375	
	General Use	Voice 12.5KHz	561-562	772.50625	802.50625	
	General Use	Voice 12.5KHz	563-564	772.51875	802.51875	
	General Use	Voice 12.5KHz	785-786	773.90625	803.90625	
	General Use	Voice 12.5KHz	787-788	773.91875	803.91875	
	State License	Voice 25.0KHz	269-272	770.6875	800.6875	
	State License	Voice 25.0KHz	309-312	770.9375	800.9375	
	State License	Voice 25.0KHz	649-652	773.0625	803.0625	
	State License	Voice 25.0KHz	889-892	774.5625	804.5625	
Humphreys	General Use	Voice 12.5KHz	125-126	769.78125	799.78125	
	General Use	Voice 12.5KHz	127-128	769.79375	799.79375	
	General Use	Voice 12.5KHz	397-398	771.48125	801.48125	
	General Use	Voice 12.5KHz	399-400	771.49375	801.49375	
	General Use	Voice 12.5KHz	545-546	772.40625	802.40625	
	General Use	Voice 12.5KHz	547-548	772.41875	802.41875	
	General Use	Voice 12.5KHz	601-602	772.75625	802.75625	
	General Use	Voice 12.5KHz	603-604	772.76875	802.76875	
	General Use	Voice 12.5KHz	661-662	773.13125	803.13125	
	General Use	Voice 12.5KHz	663-664	773.14375	803.14375	
	General Use	Voice 12.5KHz	741-742	773.63125	803.63125	
	General Use	Voice 12.5KHz	743-744	773.64375	803.64375	
	State License	Voice 25.0KHz	149-152	769.9375	799.9375	
	State License	Voice 25.0KHz	729-732	773.5625	803.5625	
Issaquena	General Use	Voice 12.5KHz	429-430	771.68125	801.68125	
	General Use	Voice 12.5KHz	431-432	771.69375	801.69375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	497-498	772.10625	802.10625	
	General Use	Voice 12.5KHz	499-500	772.11875	802.11875	
	General Use	Voice 12.5KHz	541-542	772.38125	802.38125	
	General Use	Voice 12.5KHz	543-544	772.39375	802.39375	
	General Use	Voice 12.5KHz	637-638	772.98125	802.98125	
	General Use	Voice 12.5KHz	639-640	772.99375	802.99375	
	General Use	Voice 12.5KHz	781-782	773.88125	803.88125	
	General Use	Voice 12.5KHz	783-784	773.89375	803.89375	
	State License	Voice 25.0KHz	109-112	769.6875	799.6875	
Itawamba	General Use	Voice 12.5KHz	325-326	771.03125	801.03125	
	General Use	Voice 12.5KHz	327-328	771.04375	801.04375	
	General Use	Voice 12.5KHz	385-386	771.40625	801.40625	
	General Use	Voice 12.5KHz	387-388	771.41875	801.41875	
	General Use	Voice 12.5KHz	437-438	771.73125	801.73125	
	General Use	Voice 12.5KHz	439-440	771.74375	801.74375	
	General Use	Voice 12.5KHz	513-514	772.20625	802.20625	
	General Use	Voice 12.5KHz	515-516	772.21875	802.21875	
	General Use	Voice 12.5KHz	557-558	772.48125	802.48125	
	General Use	Voice 12.5KHz	559-560	772.49375	802.49375	
	General Use	Voice 12.5KHz	621-622	772.88125	802.88125	
	General Use	Voice 12.5KHz	623-624	772.89375	802.89375	
	General Use	Voice 12.5KHz	785-786	773.90625	803.90625	
	General Use	Voice 12.5KHz	787-788	773.91875	803.91875	
	General Use	Voice 12.5KHz	877-878	774.48125	804.48125	
	General Use	Voice 12.5KHz	879-880	774.49375	804.49375	
	State License	Voice 25.0KHz	185-188	770.1625	800.1625	
	State License	Voice 25.0KHz	229-232	770.4375	800.4375	
Jackson	General Use	Voice 12.5KHz	49-50	769.30625	799.30625	
	General Use	Voice 12.5KHz	51-52	769.31875	799.31875	
	General Use	Voice 12.5KHz	89-90	769.55625	799.55625	
	General Use	Voice 12.5KHz	91-92	769.56875	799.56875	
	General Use	Voice 12.5KHz	129-130	769.80625	799.80625	
	General Use	Voice 12.5KHz	131-132	769.81875	799.81875	
	General Use	Voice 12.5KHz	169-170	770.05625	800.05625	
	General Use	Voice 12.5KHz	171-172	770.06875	800.06875	
	General Use	Voice 12.5KHz	217-218	770.35625	800.35625	
	General Use	Voice 12.5KHz	219-220	770.36875	800.36875	
	General Use	Voice 12.5KHz	285-286	770.78125	800.78125	
	General Use	Voice 12.5KHz	287-288	770.79375	800.79375	
	General Use	Voice 12.5KHz	357-358	771.23125	801.23125	
	General Use	Voice 12.5KHz	359-360	771.24375	801.24375	
	General Use	Voice 12.5KHz	397-398	771.48125	801.48125	
	General Use	Voice 12.5KHz	399-400	771.49375	801.49375	
	General Use	Voice 12.5KHz	437-438	771.73125	801.73125	
	General Use	Voice 12.5KHz	439-440	771.74375	801.74375	
	General Use	Voice 12.5KHz	477-478	771.98125	801.98125	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	479-480	771.99375	801.99375	
	General Use	Voice 12.5KHz	541-542	772.38125	802.38125	
	General Use	Voice 12.5KHz	543-544	772.39375	802.39375	
	General Use	Voice 12.5KHz	605-606	772.78125	802.78125	
	General Use	Voice 12.5KHz	607-608	772.79375	802.79375	
	General Use	Voice 12.5KHz	709-710	773.43125	803.43125	
	General Use	Voice 12.5KHz	711-712	773.44375	803.44375	
	General Use	Voice 12.5KHz	749-750	773.68125	803.68125	
	General Use	Voice 12.5KHz	751-752	773.69375	803.69375	
	General Use	Voice 12.5KHz	833-834	774.20625	804.20625	
	General Use	Voice 12.5KHz	835-836	774.21875	804.21875	
	General Use	Voice 12.5KHz	873-874	774.45625	804.45625	
	General Use	Voice 12.5KHz	875-876	774.46875	804.46875	
	General Use	Voice 12.5KHz	917-918	774.73125	804.73125	
	General Use	Voice 12.5KHz	919-920	774.74375	804.74375	
	State License	Voice 25.0KHz	33-36	769.2125	799.2125	
	State License	Voice 25.0KHz	153-156	769.9625	799.9625	
	State License	Voice 25.0KHz	273-276	770.7125	800.7125	
	State License	Voice 25.0KHz	653-656	773.0875	803.0875	
	State License	Voice 25.0KHz	849-852	774.3125	804.3125	
	State License	Voice 25.0KHz	893-896	774.5875	804.5875	
Jasper	General Use	Voice 12.5KHz	89-90	769.55625	799.55625	
	General Use	Voice 12.5KHz	91-92	769.56875	799.56875	
	General Use	Voice 12.5KHz	341-342	771.13125	801.13125	
	General Use	Voice 12.5KHz	343-344	771.14375	801.14375	
	General Use	Voice 12.5KHz	509-510	772.18125	802.18125	
	General Use	Voice 12.5KHz	511-512	772.19375	802.19375	
	General Use	Voice 12.5KHz	565-566	772.53125	802.53125	
	General Use	Voice 12.5KHz	567-568	772.54375	802.54375	
	General Use	Voice 12.5KHz	717-718	773.48125	803.48125	
	General Use	Voice 12.5KHz	719-720	773.49375	803.49375	
	General Use	Voice 12.5KHz	865-866	774.40625	804.40625	
	General Use	Voice 12.5KHz	867-868	774.41875	804.41875	
	General Use	Voice 12.5KHz	909-910	774.68125	804.68125	
	General Use	Voice 12.5KHz	911-912	774.69375	804.69375	
	State License	Voice 25.0KHz	65-68	769.4125	799.4125	
	State License	Voice 25.0KHz	265-268	770.6625	800.6625	
	State License	Voice 25.0KHz	649-652	773.0625	803.0625	
Jefferson	General Use	Voice 12.5KHz	45-46	769.28125	799.28125	
	General Use	Voice 12.5KHz	47-48	769.29375	799.29375	
	General Use	Voice 12.5KHz	129-130	769.80625	799.80625	
	General Use	Voice 12.5KHz	131-132	769.81875	799.81875	
	General Use	Voice 12.5KHz	205-206	770.28125	800.28125	
	General Use	Voice 12.5KHz	207-208	770.29375	800.29375	
	General Use	Voice 12.5KHz	421-422	771.63125	801.63125	
	General Use	Voice 12.5KHz	423-424	771.64375	801.64375	
	General Use	Voice 12.5KHz	481-482	772.00625	802.00625	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	483-484	772.01875	802.01875	
	General Use	Voice 12.5KHz	541-542	772.38125	802.38125	
	General Use	Voice 12.5KHz	543-544	772.39375	802.39375	
	General Use	Voice 12.5KHz	661-662	773.13125	803.13125	
	General Use	Voice 12.5KHz	663-664	773.14375	803.14375	
	General Use	Voice 12.5KHz	701-702	773.38125	803.38125	
	General Use	Voice 12.5KHz	703-704	773.39375	803.39375	
	General Use	Voice 12.5KHz	753-754	773.70625	803.70625	
	General Use	Voice 12.5KHz	755-756	773.71875	803.71875	
	General Use	Voice 12.5KHz	793-794	773.95625	803.95625	
	General Use	Voice 12.5KHz	795-796	773.96875	803.96875	
	State License	Voice 25.0KHz	33-36	769.2125	799.2125	
	State License	Voice 25.0KHz	809-812	774.0625	804.0625	
	State License	Voice 25.0KHz	849-852	774.3125	804.3125	
	State License	Voice 25.0KHz	889-892	774.5625	804.5625	
Jefferson Davis	General Use	Voice 12.5KHz	57-58	769.35625	799.35625	
	General Use	Voice 12.5KHz	59-60	769.36875	799.36875	
	General Use	Voice 12.5KHz	293-294	770.83125	800.83125	
	General Use	Voice 12.5KHz	295-296	770.84375	800.84375	
	General Use	Voice 12.5KHz	333-334	771.08125	801.08125	
	General Use	Voice 12.5KHz	335-336	771.09375	801.09375	
	General Use	Voice 12.5KHz	569-570	772.55625	802.55625	
	General Use	Voice 12.5KHz	571-572	772.56875	802.56875	
	General Use	Voice 12.5KHz	753-754	773.70625	803.70625	
	General Use	Voice 12.5KHz	755-756	773.71875	803.71875	
	General Use	Voice 12.5KHz	833-834	774.20625	804.20625	
	General Use	Voice 12.5KHz	835-836	774.21875	804.21875	
	State License	Voice 25.0KHz	769-772	773.8125	803.8125	
	State License	Voice 25.0KHz	809-812	774.0625	804.0625	
Jones	General Use	Voice 12.5KHz	49-50	769.30625	799.30625	
	General Use	Voice 12.5KHz	51-52	769.31875	799.31875	
	General Use	Voice 12.5KHz	97-98	769.60625	799.60625	
	General Use	Voice 12.5KHz	99-100	769.61875	799.61875	
	General Use	Voice 12.5KHz	177-178	770.10625	800.10625	
	General Use	Voice 12.5KHz	179-180	770.11875	800.11875	
	General Use	Voice 12.5KHz	241-242	770.50625	800.50625	
	General Use	Voice 12.5KHz	243-244	770.51875	800.51875	
	General Use	Voice 12.5KHz	329-330	771.05625	801.05625	
	General Use	Voice 12.5KHz	331-332	771.06875	801.06875	
	General Use	Voice 12.5KHz	369-370	771.30625	801.30625	
	General Use	Voice 12.5KHz	371-372	771.31875	801.31875	
	General Use	Voice 12.5KHz	429-430	771.68125	801.68125	
	General Use	Voice 12.5KHz	431-432	771.69375	801.69375	
	General Use	Voice 12.5KHz	481-482	772.00625	802.00625	
	General Use	Voice 12.5KHz	483-484	772.01875	802.01875	
	General Use	Voice 12.5KHz	557-558	772.48125	802.48125	
	General Use	Voice 12.5KHz	559-560	772.49375	802.49375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	609-610	772.80625	802.80625	
	General Use	Voice 12.5KHz	611-612	772.81875	802.81875	
	General Use	Voice 12.5KHz	677-678	773.23125	803.23125	
	General Use	Voice 12.5KHz	679-680	773.24375	803.24375	
	General Use	Voice 12.5KHz	757-758	773.73125	803.73125	
	General Use	Voice 12.5KHz	759-760	773.74375	803.74375	
	General Use	Voice 12.5KHz	797-798	773.98125	803.98125	
	General Use	Voice 12.5KHz	799-800	773.99375	803.99375	
	General Use	Voice 12.5KHz	837-838	774.23125	804.23125	
	General Use	Voice 12.5KHz	839-840	774.24375	804.24375	
	General Use	Voice 12.5KHz	901-902	774.63125	804.63125	
	General Use	Voice 12.5KHz	903-904	774.64375	804.64375	
	General Use	Voice 12.5KHz	945-946	774.90625	804.90625	
	General Use	Voice 12.5KHz	947-948	774.91875	804.91875	
	State License	Voice 25.0KHz	33-36	769.2125	799.2125	
	State License	Voice 25.0KHz	153-156	769.9625	799.9625	
	State License	Voice 25.0KHz	225-228	770.4125	800.4125	
	State License	Voice 25.0KHz	725-728	773.5375	803.5375	
	State License	Voice 25.0KHz	773-776	773.8375	803.8375	
Kemper	General Use	Voice 12.5KHz	205-206	770.28125	800.28125	
	General Use	Voice 12.5KHz	207-208	770.29375	800.29375	
	General Use	Voice 12.5KHz	365-366	771.28125	801.28125	
	General Use	Voice 12.5KHz	367-368	771.29375	801.29375	
	General Use	Voice 12.5KHz	405-406	771.53125	801.53125	
	General Use	Voice 12.5KHz	407-408	771.54375	801.54375	
	General Use	Voice 12.5KHz	465-466	771.90625	801.90625	
	General Use	Voice 12.5KHz	467-468	771.91875	801.91875	
	General Use	Voice 12.5KHz	585-586	772.65625	802.65625	
	General Use	Voice 12.5KHz	587-588	772.66875	802.66875	
	General Use	Voice 12.5KHz	905-906	774.65625	804.65625	
	General Use	Voice 12.5KHz	907-908	774.66875	804.66875	
	State License	Voice 25.0KHz	269-272	770.6875	800.6875	
	State License	Voice 25.0KHz	889-892	774.5625	804.5625	
Lafayette	General Use	Voice 12.5KHz	17-18	769.10625	799.10625	
	General Use	Voice 12.5KHz	19-20	769.11875	799.11875	
	General Use	Voice 12.5KHz	125-126	769.78125	799.78125	
	General Use	Voice 12.5KHz	127-128	769.79375	799.79375	
	General Use	Voice 12.5KHz	213-214	770.33125	800.33125	
	General Use	Voice 12.5KHz	215-216	770.34375	800.34375	
	General Use	Voice 12.5KHz	285-286	770.78125	800.78125	
	General Use	Voice 12.5KHz	287-288	770.79375	800.79375	
	General Use	Voice 12.5KHz	337-338	771.10625	801.10625	
	General Use	Voice 12.5KHz	339-340	771.11875	801.11875	
	General Use	Voice 12.5KHz	389-390	771.43125	801.43125	
	General Use	Voice 12.5KHz	391-392	771.44375	801.44375	
	General Use	Voice 12.5KHz	461-462	771.88125	801.88125	
	General Use	Voice 12.5KHz	463-464	771.89375	801.89375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	529-530	772.30625	802.30625	
	General Use	Voice 12.5KHz	531-532	772.31875	802.31875	
	General Use	Voice 12.5KHz	593-594	772.70625	802.70625	
	General Use	Voice 12.5KHz	595-596	772.71875	802.71875	
	General Use	Voice 12.5KHz	749-750	773.68125	803.68125	
	General Use	Voice 12.5KHz	751-752	773.69375	803.69375	
	General Use	Voice 12.5KHz	869-870	774.43125	804.43125	
	General Use	Voice 12.5KHz	871-872	774.44375	804.44375	
	General Use	Voice 12.5KHz	909-910	774.68125	804.68125	
	General Use	Voice 12.5KHz	911-912	774.69375	804.69375	
	State License	Voice 25.0KHz	105-108	769.6625	799.6625	
	State License	Voice 25.0KHz	153-156	769.9625	799.9625	
	State License	Voice 25.0KHz	309-312	770.9375	800.9375	
	State License	Voice 25.0KHz	849-852	774.3125	804.3125	
Lamar	General Use	Voice 12.5KHz	121-122	769.75625	799.75625	
	General Use	Voice 12.5KHz	123-124	769.76875	799.76875	
	General Use	Voice 12.5KHz	161-162	770.00625	800.00625	
	General Use	Voice 12.5KHz	163-164	770.01875	800.01875	
	General Use	Voice 12.5KHz	213-214	770.33125	800.33125	
	General Use	Voice 12.5KHz	215-216	770.34375	800.34375	
	General Use	Voice 12.5KHz	257-258	770.60625	800.60625	
	General Use	Voice 12.5KHz	259-260	770.61875	800.61875	
	General Use	Voice 12.5KHz	321-322	771.00625	801.00625	
	General Use	Voice 12.5KHz	323-324	771.01875	801.01875	
	General Use	Voice 12.5KHz	361-362	771.25625	801.25625	
	General Use	Voice 12.5KHz	363-364	771.26875	801.26875	
	General Use	Voice 12.5KHz	473-474	771.95625	801.95625	
	General Use	Voice 12.5KHz	475-476	771.96875	801.96875	
	General Use	Voice 12.5KHz	529-530	772.30625	802.30625	
	General Use	Voice 12.5KHz	531-532	772.31875	802.31875	
	General Use	Voice 12.5KHz	577-578	772.60625	802.60625	
	General Use	Voice 12.5KHz	579-580	772.61875	802.61875	
	General Use	Voice 12.5KHz	661-662	773.13125	803.13125	
	General Use	Voice 12.5KHz	663-664	773.14375	803.14375	
	General Use	Voice 12.5KHz	713-714	773.45625	803.45625	
	General Use	Voice 12.5KHz	715-716	773.46875	803.46875	
	State License	Voice 25.0KHz	69-72	769.4375	799.4375	
	State License	Voice 25.0KHz	233-236	770.4625	800.4625	
	State License	Voice 25.0KHz	845-848	774.2875	804.2875	
	State License	Voice 25.0KHz	933-936	774.8375	804.8375	
Lauderdale	General Use	Voice 12.5KHz	17-18	769.10625	799.10625	
	General Use	Voice 12.5KHz	19-20	769.11875	799.11875	
	General Use	Voice 12.5KHz	57-58	769.35625	799.35625	
	General Use	Voice 12.5KHz	59-60	769.36875	799.36875	
	General Use	Voice 12.5KHz	133-134	769.83125	799.83125	
	General Use	Voice 12.5KHz	135-136	769.84375	799.84375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	173-174	770.08125	800.08125	
	General Use	Voice 12.5KHz	175-176	770.09375	800.09375	
	General Use	Voice 12.5KHz	217-218	770.35625	800.35625	
	General Use	Voice 12.5KHz	219-220	770.36875	800.36875	
	General Use	Voice 12.5KHz	257-258	770.60625	800.60625	
	General Use	Voice 12.5KHz	259-260	770.61875	800.61875	
	General Use	Voice 12.5KHz	297-298	770.85625	800.85625	
	General Use	Voice 12.5KHz	299-300	770.86875	800.86875	
	General Use	Voice 12.5KHz	349-350	771.18125	801.18125	
	General Use	Voice 12.5KHz	351-352	771.19375	801.19375	
	General Use	Voice 12.5KHz	393-394	771.45625	801.45625	
	General Use	Voice 12.5KHz	395-396	771.46875	801.46875	
	General Use	Voice 12.5KHz	449-450	771.80625	801.80625	
	General Use	Voice 12.5KHz	451-452	771.81875	801.81875	
	General Use	Voice 12.5KHz	489-490	772.05625	802.05625	
	General Use	Voice 12.5KHz	491-492	772.06875	802.06875	
	General Use	Voice 12.5KHz	553-554	772.45625	802.45625	
	General Use	Voice 12.5KHz	555-556	772.46875	802.46875	
	General Use	Voice 12.5KHz	593-594	772.70625	802.70625	
	General Use	Voice 12.5KHz	595-596	772.71875	802.71875	
	General Use	Voice 12.5KHz	661-662	773.13125	803.13125	
	General Use	Voice 12.5KHz	663-664	773.14375	803.14375	
	General Use	Voice 12.5KHz	701-702	773.38125	803.38125	
	General Use	Voice 12.5KHz	703-704	773.39375	803.39375	
	General Use	Voice 12.5KHz	741-742	773.63125	803.63125	
	General Use	Voice 12.5KHz	743-744	773.64375	803.64375	
	General Use	Voice 12.5KHz	793-794	773.95625	803.95625	
	General Use	Voice 12.5KHz	795-796	773.96875	803.96875	
	General Use	Voice 12.5KHz	833-834	774.20625	804.20625	
	General Use	Voice 12.5KHz	835-836	774.21875	804.21875	
	General Use	Voice 12.5KHz	873-874	774.45625	804.45625	
	General Use	Voice 12.5KHz	875-876	774.46875	804.46875	
	State License	Voice 25.0KHz	105-108	769.0625	799.0625	
	State License	Voice 25.0KHz	149-152	769.9375	799.9375	
	State License	Voice 25.0KHz	193-196	770.2125	800.2125	
	State License	Voice 25.0KHz	685-688	773.2875	803.2875	
	State License	Voice 25.0KHz	765-768	773.7875	803.7875	
	State License	Voice 25.0KHz	805-808	774.0375	804.0375	
	State License	Voice 25.0KHz	853-856	774.3375	804.3375	
	State License	Voice 25.0KHz	933-936	774.8375	804.8375	
Lawrence	General Use	Voice 12.5KHz	169-170	770.05625	800.05625	
	General Use	Voice 12.5KHz	171-172	770.06875	800.06875	
	General Use	Voice 12.5KHz	209-210	770.30625	800.30625	
	General Use	Voice 12.5KHz	211-212	770.31875	800.31875	
	General Use	Voice 12.5KHz	325-326	771.03125	801.03125	
	General Use	Voice 12.5KHz	327-328	771.04375	801.04375	
	General Use	Voice 12.5KHz	389-390	771.43125	801.43125	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	391-392	771.44375	801.44375	
	General Use	Voice 12.5KHz	581-582	772.63125	802.63125	
	General Use	Voice 12.5KHz	583-584	772.64375	802.64375	
	General Use	Voice 12.5KHz	625-626	772.90625	802.90625	
	General Use	Voice 12.5KHz	627-628	772.91875	802.91875	
	State License	Voice 25.0KHz	149-152	769.9375	799.9375	
	State License	Voice 25.0KHz	229-232	770.4375	800.4375	
Leake	General Use	Voice 12.5KHz	177-178	770.10625	800.10625	
	General Use	Voice 12.5KHz	179-180	770.11875	800.11875	
	General Use	Voice 12.5KHz	293-294	770.83125	800.83125	
	General Use	Voice 12.5KHz	295-296	770.84375	800.84375	
	General Use	Voice 12.5KHz	345-346	771.15625	801.15625	
	General Use	Voice 12.5KHz	347-348	771.16875	801.16875	
	General Use	Voice 12.5KHz	513-514	772.20625	802.20625	
	General Use	Voice 12.5KHz	515-516	772.21875	802.21875	
	General Use	Voice 12.5KHz	557-558	772.48125	802.48125	
	General Use	Voice 12.5KHz	559-560	772.49375	802.49375	
	General Use	Voice 12.5KHz	617-618	772.85625	802.85625	
	General Use	Voice 12.5KHz	619-620	772.86875	802.86875	
	General Use	Voice 12.5KHz	669-670	773.18125	803.18125	
	General Use	Voice 12.5KHz	671-672	773.19375	803.19375	
	General Use	Voice 12.5KHz	869-870	774.43125	804.43125	
	General Use	Voice 12.5KHz	871-872	774.44375	804.44375	
	State License	Voice 25.0KHz	25-28	769.1625	799.1625	
	State License	Voice 25.0KHz	145-148	769.9125	799.9125	
	State License	Voice 25.0KHz	313-316	770.9625	800.9625	
Lee	General Use	Voice 12.5KHz	13-14	769.08125	799.08125	
	General Use	Voice 12.5KHz	15-16	769.09375	799.09375	
	General Use	Voice 12.5KHz	53-54	769.33125	799.33125	
	General Use	Voice 12.5KHz	55-56	769.34375	799.34375	
	General Use	Voice 12.5KHz	133-134	769.83125	799.83125	
	General Use	Voice 12.5KHz	135-136	769.84375	799.84375	
	General Use	Voice 12.5KHz	205-206	770.28125	800.28125	
	General Use	Voice 12.5KHz	207-208	770.29375	800.29375	
	General Use	Voice 12.5KHz	245-246	770.53125	800.53125	
	General Use	Voice 12.5KHz	247-248	770.54375	800.54375	
	General Use	Voice 12.5KHz	289-290	770.80625	800.80625	
	General Use	Voice 12.5KHz	291-292	770.81875	800.81875	
	General Use	Voice 12.5KHz	349-350	771.18125	801.18125	
	General Use	Voice 12.5KHz	351-352	771.19375	801.19375	
	General Use	Voice 12.5KHz	397-398	771.48125	801.48125	
	General Use	Voice 12.5KHz	399-400	771.49375	801.49375	
	General Use	Voice 12.5KHz	469-470	771.93125	801.93125	
	General Use	Voice 12.5KHz	471-472	771.94375	801.94375	
	General Use	Voice 12.5KHz	533-534	772.33125	802.33125	
	General Use	Voice 12.5KHz	535-536	772.34375	802.34375	
	General Use	Voice 12.5KHz	597-598	772.73125	802.73125	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	599-600	772.74375	802.74375	
	General Use	Voice 12.5KHz	673-674	773.20625	803.20625	
	General Use	Voice 12.5KHz	675-676	773.21875	803.21875	
	General Use	Voice 12.5KHz	745-746	773.65625	803.65625	
	General Use	Voice 12.5KHz	747-748	773.66875	803.66875	
	General Use	Voice 12.5KHz	797-798	773.98125	803.98125	
	General Use	Voice 12.5KHz	799-800	773.99375	803.99375	
	General Use	Voice 12.5KHz	945-946	774.90625	804.90625	
	General Use	Voice 12.5KHz	947-948	774.91875	804.91875	
	State License	Voice 25.0KHz	109-112	769.6875	799.6875	
	State License	Voice 25.0KHz	269-272	770.6875	800.6875	
	State License	Voice 25.0KHz	313-316	770.9625	800.9625	
	State License	Voice 25.0KHz	725-728	773.5375	803.5375	
	State License	Voice 25.0KHz	769-772	773.8125	803.8125	
	State License	Voice 25.0KHz	845-848	774.2875	804.2875	
Leflore	General Use	Voice 12.5KHz	89-90	769.55625	799.55625	
	General Use	Voice 12.5KHz	91-92	769.56875	799.56875	
	General Use	Voice 12.5KHz	161-162	770.00625	800.00625	
	General Use	Voice 12.5KHz	163-164	770.01875	800.01875	
	General Use	Voice 12.5KHz	201-202	770.25625	800.25625	
	General Use	Voice 12.5KHz	203-204	770.26875	800.26875	
	General Use	Voice 12.5KHz	249-250	770.55625	800.55625	
	General Use	Voice 12.5KHz	251-252	770.56875	800.56875	
	General Use	Voice 12.5KHz	297-298	770.85625	800.85625	
	General Use	Voice 12.5KHz	299-300	770.86875	800.86875	
	General Use	Voice 12.5KHz	377-378	771.35625	801.35625	
	General Use	Voice 12.5KHz	379-380	771.36875	801.36875	
	General Use	Voice 12.5KHz	417-418	771.60625	801.60625	
	General Use	Voice 12.5KHz	419-420	771.61875	801.61875	
	General Use	Voice 12.5KHz	473-474	771.95625	801.95625	
	General Use	Voice 12.5KHz	475-476	771.96875	801.96875	
	General Use	Voice 12.5KHz	525-526	772.28125	802.28125	
	General Use	Voice 12.5KHz	527-528	772.29375	802.29375	
	General Use	Voice 12.5KHz	589-590	772.68125	802.68125	
	General Use	Voice 12.5KHz	591-592	772.69375	802.69375	
	General Use	Voice 12.5KHz	629-630	772.93125	802.93125	
	General Use	Voice 12.5KHz	631-632	772.94375	802.94375	
	General Use	Voice 12.5KHz	749-750	773.68125	803.68125	
	General Use	Voice 12.5KHz	751-752	773.69375	803.69375	
	General Use	Voice 12.5KHz	825-826	774.15625	804.15625	
	General Use	Voice 12.5KHz	827-828	774.16875	804.16875	
	State License	Voice 25.0KHz	25-28	769.1625	799.1625	
	State License	Voice 25.0KHz	185-188	770.1625	800.1625	
	State License	Voice 25.0KHz	693-696	773.3375	803.3375	
	State License	Voice 25.0KHz	773-776	773.8375	803.8375	
	State License	Voice 25.0KHz	929-932	774.8125	804.8125	
Lincoln	General Use	Voice 12.5KHz	17-18	769.10625	799.10625	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	19-20	769.11875	799.11875	
	General Use	Voice 12.5KHz	89-90	769.55625	799.55625	
	General Use	Voice 12.5KHz	91-92	769.56875	799.56875	
	General Use	Voice 12.5KHz	249-250	770.55625	800.55625	
	General Use	Voice 12.5KHz	251-252	770.56875	800.56875	
	General Use	Voice 12.5KHz	341-342	771.13125	801.13125	
	General Use	Voice 12.5KHz	343-344	771.14375	801.14375	
	General Use	Voice 12.5KHz	409-410	771.55625	801.55625	
	General Use	Voice 12.5KHz	411-412	771.56875	801.56875	
	General Use	Voice 12.5KHz	453-454	771.83125	801.83125	
	General Use	Voice 12.5KHz	455-456	771.84375	801.84375	
	General Use	Voice 12.5KHz	493-494	772.08125	802.08125	
	General Use	Voice 12.5KHz	495-496	772.09375	802.09375	
	General Use	Voice 12.5KHz	549-550	772.43125	802.43125	
	General Use	Voice 12.5KHz	551-552	772.44375	802.44375	
	General Use	Voice 12.5KHz	601-602	772.75625	802.75625	
	General Use	Voice 12.5KHz	603-604	772.76875	802.76875	
	General Use	Voice 12.5KHz	837-838	774.23125	804.23125	
	General Use	Voice 12.5KHz	839-840	774.24375	804.24375	
	General Use	Voice 12.5KHz	941-942	774.88125	804.88125	
	General Use	Voice 12.5KHz	943-944	774.89375	804.89375	
	State License	Voice 25.0KHz	113-116	769.7125	799.7125	
	State License	Voice 25.0KHz	269-272	770.6875	800.6875	
	State License	Voice 25.0KHz	309-312	770.9375	800.9375	
	State License	Voice 25.0KHz	649-652	773.0625	803.0625	
	State License	Voice 25.0KHz	929-932	774.8125	804.8125	
Lowndes	General Use	Voice 12.5KHz	89-90	769.55625	799.55625	
	General Use	Voice 12.5KHz	91-92	769.56875	799.56875	
	General Use	Voice 12.5KHz	137-138	769.85625	799.85625	
	General Use	Voice 12.5KHz	139-140	769.86875	799.86875	
	General Use	Voice 12.5KHz	209-210	770.30625	800.30625	
	General Use	Voice 12.5KHz	211-212	770.31875	800.31875	
	General Use	Voice 12.5KHz	285-286	770.78125	800.78125	
	General Use	Voice 12.5KHz	287-288	770.79375	800.79375	
	General Use	Voice 12.5KHz	353-354	771.20625	801.20625	
	General Use	Voice 12.5KHz	355-356	771.21875	801.21875	
	General Use	Voice 12.5KHz	401-402	771.50625	801.50625	
	General Use	Voice 12.5KHz	403-404	771.51875	801.51875	
	General Use	Voice 12.5KHz	461-462	771.88125	801.88125	
	General Use	Voice 12.5KHz	463-464	771.89375	801.89375	
	General Use	Voice 12.5KHz	537-538	772.35625	802.35625	
	General Use	Voice 12.5KHz	539-540	772.36875	802.36875	
	General Use	Voice 12.5KHz	581-582	772.63125	802.63125	
	General Use	Voice 12.5KHz	583-584	772.64375	802.64375	
	General Use	Voice 12.5KHz	625-626	772.90625	802.90625	
	General Use	Voice 12.5KHz	627-628	772.91875	802.91875	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	669-670	773.18125	803.18125	
	General Use	Voice 12.5KHz	671-672	773.19375	803.19375	
	General Use	Voice 12.5KHz	709-710	773.43125	803.43125	
	General Use	Voice 12.5KHz	711-712	773.44375	803.44375	
	General Use	Voice 12.5KHz	749-750	773.68125	803.68125	
	General Use	Voice 12.5KHz	751-752	773.69375	803.69375	
	General Use	Voice 12.5KHz	833-834	774.20625	804.20625	
	General Use	Voice 12.5KHz	835-836	774.21875	804.21875	
	General Use	Voice 12.5KHz	873-874	774.45625	804.45625	
	General Use	Voice 12.5KHz	875-876	774.46875	804.46875	
	General Use	Voice 12.5KHz	917-918	774.73125	804.73125	
	General Use	Voice 12.5KHz	919-920	774.74375	804.74375	
	State License	Voice 25.0KHz	25-28	769.1625	799.1625	
	State License	Voice 25.0KHz	105-108	769.6625	799.6625	
	State License	Voice 25.0KHz	225-228	770.4125	800.4125	
	State License	Voice 25.0KHz	265-268	770.6625	800.6625	
	State License	Voice 25.0KHz	649-652	773.0625	803.0625	
	State License	Voice 25.0KHz	729-732	773.5625	803.5625	
	State License	Voice 25.0KHz	885-888	774.5375	804.5375	
Madison	General Use	Voice 12.5KHz	285-286	770.78125	800.78125	
	General Use	Voice 12.5KHz	287-288	770.79375	800.79375	
	General Use	Voice 12.5KHz	329-330	771.05625	801.05625	
	General Use	Voice 12.5KHz	331-332	771.06875	801.06875	
	General Use	Voice 12.5KHz	385-386	771.40625	801.40625	
	General Use	Voice 12.5KHz	387-388	771.41875	801.41875	
	General Use	Voice 12.5KHz	437-438	771.73125	801.73125	
	General Use	Voice 12.5KHz	439-440	771.74375	801.74375	
	General Use	Voice 12.5KHz	537-538	772.35625	802.35625	
	General Use	Voice 12.5KHz	539-540	772.36875	802.36875	
	General Use	Voice 12.5KHz	605-606	772.78125	802.78125	
	General Use	Voice 12.5KHz	607-608	772.79375	802.79375	
	General Use	Voice 12.5KHz	677-678	773.23125	803.23125	
	General Use	Voice 12.5KHz	679-680	773.24375	803.24375	
	General Use	Voice 12.5KHz	717-718	773.48125	803.48125	
	General Use	Voice 12.5KHz	719-720	773.49375	803.49375	
	General Use	Voice 12.5KHz	757-758	773.73125	803.73125	
	General Use	Voice 12.5KHz	759-760	773.74375	803.74375	
	General Use	Voice 12.5KHz	797-798	773.98125	803.98125	
	General Use	Voice 12.5KHz	799-800	773.99375	803.99375	
	General Use	Voice 12.5KHz	837-838	774.23125	804.23125	
	General Use	Voice 12.5KHz	839-840	774.24375	804.24375	
	General Use	Voice 12.5KHz	917-918	774.73125	804.73125	
	General Use	Voice 12.5KHz	919-920	774.74375	804.74375	
	State License	Voice 25.0KHz	65-68	769.4125	799.4125	
	State License	Voice 25.0KHz	113-116	769.7125	799.7125	
	State License	Voice 25.0KHz	189-192	770.1875	800.1875	
	State License	Voice 25.0KHz	725-728	773.5375	803.5375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	State License	Voice 25.0KHz	845-848	774.2875	804.2875	
Marion	General Use	Voice 12.5KHz	129-130	769.80625	799.80625	
	General Use	Voice 12.5KHz	131-132	769.81875	799.81875	
	General Use	Voice 12.5KHz	245-246	770.53125	800.53125	
	General Use	Voice 12.5KHz	247-248	770.54375	800.54375	
	General Use	Voice 12.5KHz	349-350	771.18125	801.18125	
	General Use	Voice 12.5KHz	351-352	771.19375	801.19375	
	General Use	Voice 12.5KHz	425-426	771.65625	801.65625	
	General Use	Voice 12.5KHz	427-428	771.66875	801.66875	
	General Use	Voice 12.5KHz	465-466	771.90625	801.90625	
	General Use	Voice 12.5KHz	467-468	771.91875	801.91875	
	General Use	Voice 12.5KHz	521-522	772.25625	802.25625	
	General Use	Voice 12.5KHz	523-524	772.26875	802.26875	
	General Use	Voice 12.5KHz	605-606	772.78125	802.78125	
	General Use	Voice 12.5KHz	607-608	772.79375	802.79375	
	General Use	Voice 12.5KHz	793-794	773.95625	803.95625	
	General Use	Voice 12.5KHz	795-796	773.96875	803.96875	
	General Use	Voice 12.5KHz	905-906	774.65625	804.65625	
	General Use	Voice 12.5KHz	907-908	774.66875	804.66875	
	State License	Voice 25.0KHz	305-308	770.9125	800.9125	
	State License	Voice 25.0KHz	653-656	773.0875	803.0875	
Marshall	General Use	Voice 12.5KHz	137-138	769.85625	799.85625	
	General Use	Voice 12.5KHz	139-140	769.86875	799.86875	
	General Use	Voice 12.5KHz	353-354	771.20625	801.20625	
	General Use	Voice 12.5KHz	355-356	771.21875	801.21875	
	General Use	Voice 12.5KHz	401-402	771.50625	801.50625	
	General Use	Voice 12.5KHz	403-404	771.51875	801.51875	
	General Use	Voice 12.5KHz	449-450	771.80625	801.80625	
	General Use	Voice 12.5KHz	451-452	771.81875	801.81875	
	General Use	Voice 12.5KHz	517-518	772.23125	802.23125	
	General Use	Voice 12.5KHz	519-520	772.24375	802.24375	
	General Use	Voice 12.5KHz	573-574	772.58125	802.58125	
	General Use	Voice 12.5KHz	575-576	772.59375	802.59375	
	General Use	Voice 12.5KHz	621-622	772.88125	802.88125	
	General Use	Voice 12.5KHz	623-624	772.89375	802.89375	
	General Use	Voice 12.5KHz	705-706	773.40625	803.40625	
	General Use	Voice 12.5KHz	707-708	773.41875	803.41875	
	General Use	Voice 12.5KHz	877-878	774.48125	804.48125	
	General Use	Voice 12.5KHz	879-880	774.49375	804.49375	
	State License	Voice 25.0KHz	65-68	769.4125	799.4125	
	State License	Voice 25.0KHz	185-188	770.1625	800.1625	
	State License	Voice 25.0KHz	773-776	773.8375	803.8375	
Monroe	General Use	Voice 12.5KHz	41-42	769.25625	799.25625	
	General Use	Voice 12.5KHz	43-44	769.26875	799.26875	
	General Use	Voice 12.5KHz	169-170	770.05625	800.05625	
	General Use	Voice 12.5KHz	171-172	770.06875	800.06875	
	General Use	Voice 12.5KHz	297-298	770.85625	800.85625	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	299-300	770.86875	800.86875	
	General Use	Voice 12.5KHz	361-362	771.25625	801.25625	
	General Use	Voice 12.5KHz	363-364	771.26875	801.26875	
	General Use	Voice 12.5KHz	425-426	771.65625	801.65625	
	General Use	Voice 12.5KHz	427-428	771.66875	801.66875	
	General Use	Voice 12.5KHz	477-478	771.98125	801.98125	
	General Use	Voice 12.5KHz	479-480	771.99375	801.99375	
	General Use	Voice 12.5KHz	573-574	772.58125	802.58125	
	General Use	Voice 12.5KHz	575-576	772.59375	802.59375	
	General Use	Voice 12.5KHz	633-634	772.95625	802.95625	
	General Use	Voice 12.5KHz	635-636	772.96875	802.96875	
	General Use	Voice 12.5KHz	717-718	773.48125	803.48125	
	General Use	Voice 12.5KHz	719-720	773.49375	803.49375	
	General Use	Voice 12.5KHz	821-822	774.13125	804.13125	
	General Use	Voice 12.5KHz	823-824	774.14375	804.14375	
	General Use	Voice 12.5KHz	905-906	774.65625	804.65625	
	General Use	Voice 12.5KHz	907-908	774.66875	804.66875	
	State License	Voice 25.0KHz	65-68	769.4125	799.4125	
	State License	Voice 25.0KHz	149-152	769.9375	799.9375	
	State License	Voice 25.0KHz	925-928	774.7875	804.7875	
Montgomery	General Use	Voice 12.5KHz	81-82	769.50625	799.50625	
	General Use	Voice 12.5KHz	83-84	769.51875	799.51875	
	General Use	Voice 12.5KHz	205-206	770.28125	800.28125	
	General Use	Voice 12.5KHz	207-208	770.29375	800.29375	
	General Use	Voice 12.5KHz	373-374	771.33125	801.33125	
	General Use	Voice 12.5KHz	375-376	771.34375	801.34375	
	General Use	Voice 12.5KHz	477-478	771.98125	801.98125	
	General Use	Voice 12.5KHz	479-480	771.99375	801.99375	
	General Use	Voice 12.5KHz	533-534	772.33125	802.33125	
	General Use	Voice 12.5KHz	535-536	772.34375	802.34375	
	General Use	Voice 12.5KHz	665-666	773.15625	803.15625	
	General Use	Voice 12.5KHz	667-668	773.16875	803.16875	
	General Use	Voice 12.5KHz	821-822	774.13125	804.13125	
	General Use	Voice 12.5KHz	823-824	774.14375	804.14375	
	State License	Voice 25.0KHz	265-268	770.6625	800.6625	
	State License	Voice 25.0KHz	885-888	774.5375	804.5375	
Neshoba	General Use	Voice 12.5KHz	93-94	769.58125	799.58125	
	General Use	Voice 12.5KHz	95-96	769.59375	799.59375	
	General Use	Voice 12.5KHz	249-250	770.55625	800.55625	
	General Use	Voice 12.5KHz	251-252	770.56875	800.56875	
	General Use	Voice 12.5KHz	357-358	771.23125	801.23125	
	General Use	Voice 12.5KHz	359-360	771.24375	801.24375	
	General Use	Voice 12.5KHz	425-426	771.65625	801.65625	
	General Use	Voice 12.5KHz	427-428	771.66875	801.66875	
	General Use	Voice 12.5KHz	481-482	772.00625	802.00625	
	General Use	Voice 12.5KHz	483-484	772.01875	802.01875	
	General Use	Voice 12.5KHz	521-522	772.25625	802.25625	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	523-524	772.26875	802.26875	
	General Use	Voice 12.5KHz	569-570	772.55625	802.55625	
	General Use	Voice 12.5KHz	571-572	772.56875	802.56875	
	General Use	Voice 12.5KHz	713-714	773.45625	803.45625	
	General Use	Voice 12.5KHz	715-716	773.46875	803.46875	
	General Use	Voice 12.5KHz	753-754	773.70625	803.70625	
	General Use	Voice 12.5KHz	755-756	773.71875	803.71875	
	General Use	Voice 12.5KHz	825-826	774.15625	804.15625	
	General Use	Voice 12.5KHz	827-828	774.16875	804.16875	
	General Use	Voice 12.5KHz	913-914	774.70625	804.70625	
	General Use	Voice 12.5KHz	915-916	774.71875	804.71875	
	State License	Voice 25.0KHz	33-36	769.2125	799.2125	
	State License	Voice 25.0KHz	305-308	770.9125	800.9125	
	State License	Voice 25.0KHz	653-656	773.0875	803.0875	
	State License	Voice 25.0KHz	773-776	773.8375	803.8375	
Newton	General Use	Voice 12.5KHz	41-42	769.25625	799.25625	
	General Use	Voice 12.5KHz	43-44	769.26875	799.26875	
	General Use	Voice 12.5KHz	81-82	769.50625	799.50625	
	General Use	Voice 12.5KHz	83-84	769.51875	799.51875	
	General Use	Voice 12.5KHz	161-162	770.00625	800.00625	
	General Use	Voice 12.5KHz	163-164	770.01875	800.01875	
	General Use	Voice 12.5KHz	381-382	771.38125	801.38125	
	General Use	Voice 12.5KHz	383-384	771.39375	801.39375	
	General Use	Voice 12.5KHz	433-434	771.70625	801.70625	
	General Use	Voice 12.5KHz	435-436	771.71875	801.71875	
	General Use	Voice 12.5KHz	501-502	772.13125	802.13125	
	General Use	Voice 12.5KHz	503-504	772.14375	802.14375	
	General Use	Voice 12.5KHz	541-542	772.38125	802.38125	
	General Use	Voice 12.5KHz	543-544	772.39375	802.39375	
	General Use	Voice 12.5KHz	601-602	772.75625	802.75625	
	General Use	Voice 12.5KHz	603-604	772.76875	802.76875	
	General Use	Voice 12.5KHz	785-786	773.90625	803.90625	
	General Use	Voice 12.5KHz	787-788	773.91875	803.91875	
	State License	Voice 25.0KHz	185-188	770.1625	800.1625	
	State License	Voice 25.0KHz	729-732	773.5625	803.5625	
	State License	Voice 25.0KHz	813-816	774.0875	804.0875	
Noxubee	General Use	Voice 12.5KHz	53-54	769.33125	799.33125	
	General Use	Voice 12.5KHz	55-56	769.34375	799.34375	
	General Use	Voice 12.5KHz	413-414	771.58125	801.58125	
	General Use	Voice 12.5KHz	415-416	771.59375	801.59375	
	General Use	Voice 12.5KHz	453-454	771.83125	801.83125	
	General Use	Voice 12.5KHz	455-456	771.84375	801.84375	
	General Use	Voice 12.5KHz	509-510	772.18125	802.18125	
	General Use	Voice 12.5KHz	511-512	772.19375	802.19375	
	General Use	Voice 12.5KHz	637-638	772.98125	802.98125	
	General Use	Voice 12.5KHz	639-640	772.99375	802.99375	
	General Use	Voice 12.5KHz	797-798	773.98125	803.98125	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	799-800	773.99375	803.99375	
	General Use	Voice 12.5KHz	865-866	774.40625	804.40625	
	General Use	Voice 12.5KHz	867-868	774.41875	804.41875	
	State License	Voice 25.0KHz	233-236	770.4625	800.4625	
	State License	Voice 25.0KHz	929-932	774.8125	804.8125	
Oktibbeha	General Use	Voice 12.5KHz	17-18	769.10625	799.10625	
	General Use	Voice 12.5KHz	19-20	769.11875	799.11875	
	General Use	Voice 12.5KHz	97-98	769.60625	799.60625	
	General Use	Voice 12.5KHz	99-100	769.61875	799.61875	
	General Use	Voice 12.5KHz	161-162	770.00625	800.00625	
	General Use	Voice 12.5KHz	163-164	770.01875	800.01875	
	General Use	Voice 12.5KHz	257-258	770.60625	800.60625	
	General Use	Voice 12.5KHz	259-260	770.61875	800.61875	
	General Use	Voice 12.5KHz	337-338	771.10625	801.10625	
	General Use	Voice 12.5KHz	339-340	771.11875	801.11875	
	General Use	Voice 12.5KHz	385-386	771.40625	801.40625	
	General Use	Voice 12.5KHz	387-388	771.41875	801.41875	
	General Use	Voice 12.5KHz	441-442	771.75625	801.75625	
	General Use	Voice 12.5KHz	443-444	771.76875	801.76875	
	General Use	Voice 12.5KHz	485-486	772.03125	802.03125	
	General Use	Voice 12.5KHz	487-488	772.04375	802.04375	
	General Use	Voice 12.5KHz	525-526	772.28125	802.28125	
	General Use	Voice 12.5KHz	527-528	772.29375	802.29375	
	General Use	Voice 12.5KHz	593-594	772.70625	802.70625	
	General Use	Voice 12.5KHz	595-596	772.71875	802.71875	
	General Use	Voice 12.5KHz	661-662	773.13125	803.13125	
	General Use	Voice 12.5KHz	663-664	773.14375	803.14375	
	General Use	Voice 12.5KHz	701-702	773.38125	803.38125	
	General Use	Voice 12.5KHz	703-704	773.39375	803.39375	
	General Use	Voice 12.5KHz	741-742	773.63125	803.63125	
	General Use	Voice 12.5KHz	743-744	773.64375	803.64375	
	General Use	Voice 12.5KHz	781-782	773.88125	803.88125	
	General Use	Voice 12.5KHz	783-784	773.89375	803.89375	
	State License	Voice 25.0KHz	185-188	770.1625	800.1625	
	State License	Voice 25.0KHz	309-312	770.9375	800.9375	
	State License	Voice 25.0KHz	693-696	773.3375	803.3375	
	State License	Voice 25.0KHz	813-816	774.0875	804.0875	
	State License	Voice 25.0KHz	893-896	774.5875	804.5875	
Panola	General Use	Voice 12.5KHz	45-46	769.28125	799.28125	
	General Use	Voice 12.5KHz	47-48	769.29375	799.29375	
	General Use	Voice 12.5KHz	85-86	769.53125	799.53125	
	General Use	Voice 12.5KHz	87-88	769.54375	799.54375	
	General Use	Voice 12.5KHz	173-174	770.08125	800.08125	
	General Use	Voice 12.5KHz	175-176	770.09375	800.09375	
	General Use	Voice 12.5KHz	361-362	771.25625	801.25625	
	General Use	Voice 12.5KHz	363-364	771.26875	801.26875	
	General Use	Voice 12.5KHz	497-498	772.10625	802.10625	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	499-500	772.11875	802.11875	
	General Use	Voice 12.5KHz	561-562	772.50625	802.50625	
	General Use	Voice 12.5KHz	563-564	772.51875	802.51875	
	General Use	Voice 12.5KHz	609-610	772.80625	802.80625	
	General Use	Voice 12.5KHz	611-612	772.81875	802.81875	
	General Use	Voice 12.5KHz	669-670	773.18125	803.18125	
	General Use	Voice 12.5KHz	671-672	773.19375	803.19375	
	General Use	Voice 12.5KHz	797-798	773.98125	803.98125	
	General Use	Voice 12.5KHz	799-800	773.99375	803.99375	
	General Use	Voice 12.5KHz	861-862	774.38125	804.38125	
	General Use	Voice 12.5KHz	863-864	774.39375	804.39375	
	General Use	Voice 12.5KHz	901-902	774.63125	804.63125	
	General Use	Voice 12.5KHz	903-904	774.64375	804.64375	
	General Use	Voice 12.5KHz	941-942	774.88125	804.88125	
	General Use	Voice 12.5KHz	943-944	774.89375	804.89375	
	State License	Voice 25.0KHz	269-272	770.6875	800.6875	
	State License	Voice 25.0KHz	649-652	773.0625	803.0625	
	State License	Voice 25.0KHz	809-812	774.0625	804.0625	
Pearl River	General Use	Voice 12.5KHz	173-174	770.08125	800.08125	
	General Use	Voice 12.5KHz	175-176	770.09375	800.09375	
	General Use	Voice 12.5KHz	281-282	770.75625	800.75625	
	General Use	Voice 12.5KHz	283-284	770.76875	800.76875	
	General Use	Voice 12.5KHz	401-402	771.50625	801.50625	
	General Use	Voice 12.5KHz	403-404	771.51875	801.51875	
	General Use	Voice 12.5KHz	441-442	771.75625	801.75625	
	General Use	Voice 12.5KHz	443-444	771.76875	801.76875	
	General Use	Voice 12.5KHz	545-546	772.40625	802.40625	
	General Use	Voice 12.5KHz	547-548	772.41875	802.41875	
	General Use	Voice 12.5KHz	589-590	772.68125	802.68125	
	General Use	Voice 12.5KHz	591-592	772.69375	802.69375	
	General Use	Voice 12.5KHz	705-706	773.40625	803.40625	
	General Use	Voice 12.5KHz	707-708	773.41875	803.41875	
	General Use	Voice 12.5KHz	829-830	774.18125	804.18125	
	General Use	Voice 12.5KHz	831-832	774.19375	804.19375	
	General Use	Voice 12.5KHz	941-942	774.88125	804.88125	
	General Use	Voice 12.5KHz	943-944	774.89375	804.89375	
	State License	Voice 25.0KHz	189-192	770.1875	800.1875	
	State License	Voice 25.0KHz	729-732	773.5625	803.5625	
	State License	Voice 25.0KHz	885-888	774.5375	804.5375	
Perry	General Use	Voice 12.5KHz	125-126	769.78125	799.78125	
	General Use	Voice 12.5KHz	127-128	769.79375	799.79375	
	General Use	Voice 12.5KHz	165-166	770.03125	800.03125	
	General Use	Voice 12.5KHz	167-168	770.04375	800.04375	
	General Use	Voice 12.5KHz	345-346	771.15625	801.15625	
	General Use	Voice 12.5KHz	347-348	771.16875	801.16875	
	General Use	Voice 12.5KHz	393-394	771.45625	801.45625	
	General Use	Voice 12.5KHz	395-396	771.46875	801.46875	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	505-506	772.15625	802.15625	
	General Use	Voice 12.5KHz	507-508	772.16875	802.16875	
	General Use	Voice 12.5KHz	601-602	772.75625	802.75625	
	General Use	Voice 12.5KHz	603-604	772.76875	802.76875	
	State License	Voice 25.0KHz	689-692	773.3125	803.3125	
	State License	Voice 25.0KHz	889-892	774.5625	804.5625	
Pike	General Use	Voice 12.5KHz	41-42	769.25625	799.25625	
	General Use	Voice 12.5KHz	43-44	769.26875	799.26875	
	General Use	Voice 12.5KHz	81-82	769.50625	799.50625	
	General Use	Voice 12.5KHz	83-84	769.51875	799.51875	
	General Use	Voice 12.5KHz	137-138	769.85625	799.85625	
	General Use	Voice 12.5KHz	139-140	769.86875	799.86875	
	General Use	Voice 12.5KHz	177-178	770.10625	800.10625	
	General Use	Voice 12.5KHz	179-180	770.11875	800.11875	
	General Use	Voice 12.5KHz	285-286	770.78125	800.78125	
	General Use	Voice 12.5KHz	287-288	770.79375	800.79375	
	General Use	Voice 12.5KHz	429-430	771.68125	801.68125	
	General Use	Voice 12.5KHz	431-432	771.69375	801.69375	
	General Use	Voice 12.5KHz	469-470	771.93125	801.93125	
	General Use	Voice 12.5KHz	471-472	771.94375	801.94375	
	General Use	Voice 12.5KHz	525-526	772.28125	802.28125	
	General Use	Voice 12.5KHz	527-528	772.29375	802.29375	
	General Use	Voice 12.5KHz	573-574	772.58125	802.58125	
	General Use	Voice 12.5KHz	575-576	772.59375	802.59375	
	General Use	Voice 12.5KHz	613-614	772.83125	802.83125	
	General Use	Voice 12.5KHz	615-616	772.84375	802.84375	
	General Use	Voice 12.5KHz	717-718	773.48125	803.48125	
	General Use	Voice 12.5KHz	719-720	773.49375	803.49375	
	General Use	Voice 12.5KHz	789-790	773.93125	803.93125	
	General Use	Voice 12.5KHz	791-792	773.94375	803.94375	
	State License	Voice 25.0KHz	105-108	769.6625	799.6625	
	State License	Voice 25.0KHz	725-728	773.5375	803.5375	
	State License	Voice 25.0KHz	893-896	774.5875	804.5875	
Pontotoc	General Use	Voice 12.5KHz	93-94	769.58125	799.58125	
	General Use	Voice 12.5KHz	95-96	769.59375	799.59375	
	General Use	Voice 12.5KHz	369-370	771.30625	801.30625	
	General Use	Voice 12.5KHz	371-372	771.31875	801.31875	
	General Use	Voice 12.5KHz	409-410	771.55625	801.55625	
	General Use	Voice 12.5KHz	411-412	771.56875	801.56875	
	General Use	Voice 12.5KHz	453-454	771.83125	801.83125	
	General Use	Voice 12.5KHz	455-456	771.84375	801.84375	
	General Use	Voice 12.5KHz	521-522	772.25625	802.25625	
	General Use	Voice 12.5KHz	523-524	772.26875	802.26875	
	General Use	Voice 12.5KHz	565-566	772.53125	802.53125	
	General Use	Voice 12.5KHz	567-568	772.54375	802.54375	
	General Use	Voice 12.5KHz	613-614	772.83125	802.83125	
	General Use	Voice 12.5KHz	615-616	772.84375	802.84375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	789-790	773.93125	803.93125	
	General Use	Voice 12.5KHz	791-792	773.94375	803.94375	
	General Use	Voice 12.5KHz	829-830	774.18125	804.18125	
	General Use	Voice 12.5KHz	831-832	774.19375	804.19375	
	State License	Voice 25.0KHz	645-648	773.0375	803.0375	
	State License	Voice 25.0KHz	689-692	773.3125	803.3125	
	State License	Voice 25.0KHz	733-736	773.5875	803.5875	
Prentiss	General Use	Voice 12.5KHz	81-82	769.50625	799.50625	
	General Use	Voice 12.5KHz	83-84	769.51875	799.51875	
	General Use	Voice 12.5KHz	121-122	769.75625	799.75625	
	General Use	Voice 12.5KHz	123-124	769.76875	799.76875	
	General Use	Voice 12.5KHz	173-174	770.08125	800.08125	
	General Use	Voice 12.5KHz	175-176	770.09375	800.09375	
	General Use	Voice 12.5KHz	413-414	771.58125	801.58125	
	General Use	Voice 12.5KHz	415-416	771.59375	801.59375	
	General Use	Voice 12.5KHz	505-506	772.15625	802.15625	
	General Use	Voice 12.5KHz	507-508	772.16875	802.16875	
	General Use	Voice 12.5KHz	589-590	772.68125	802.68125	
	General Use	Voice 12.5KHz	591-592	772.69375	802.69375	
	General Use	Voice 12.5KHz	637-638	772.98125	802.98125	
	General Use	Voice 12.5KHz	639-640	772.99375	802.99375	
	General Use	Voice 12.5KHz	757-758	773.73125	803.73125	
	General Use	Voice 12.5KHz	759-760	773.74375	803.74375	
	State License	Voice 25.0KHz	649-652	773.0625	803.0625	
	State License	Voice 25.0KHz	693-696	773.3375	803.3375	
	State License	Voice 25.0KHz	809-812	774.0625	804.0625	
Quitman	General Use	Voice 12.5KHz	165-166	770.03125	800.03125	
	General Use	Voice 12.5KHz	167-168	770.04375	800.04375	
	General Use	Voice 12.5KHz	349-350	771.18125	801.18125	
	General Use	Voice 12.5KHz	351-352	771.19375	801.19375	
	General Use	Voice 12.5KHz	441-442	771.75625	801.75625	
	General Use	Voice 12.5KHz	443-444	771.76875	801.76875	
	General Use	Voice 12.5KHz	569-570	772.55625	802.55625	
	General Use	Voice 12.5KHz	571-572	772.56875	802.56875	
	General Use	Voice 12.5KHz	661-662	773.13125	803.13125	
	General Use	Voice 12.5KHz	663-664	773.14375	803.14375	
	General Use	Voice 12.5KHz	741-742	773.63125	803.63125	
	General Use	Voice 12.5KHz	743-744	773.64375	803.64375	
	General Use	Voice 12.5KHz	781-782	773.88125	803.88125	
	General Use	Voice 12.5KHz	783-784	773.89375	803.89375	
	State License	Voice 25.0KHz	109-112	769.6875	799.6875	
	State License	Voice 25.0KHz	729-732	773.5625	803.5625	
Rankin	General Use	Voice 12.5KHz	45-46	769.28125	799.28125	
	General Use	Voice 12.5KHz	47-48	769.29375	799.29375	
	General Use	Voice 12.5KHz	85-86	769.53125	799.53125	
	General Use	Voice 12.5KHz	87-88	769.54375	799.54375	
	General Use	Voice 12.5KHz	125-126	769.78125	799.78125	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	127-128	769.79375	799.79375	
	General Use	Voice 12.5KHz	165-166	770.03125	800.03125	
	General Use	Voice 12.5KHz	167-168	770.04375	800.04375	
	General Use	Voice 12.5KHz	205-206	770.28125	800.28125	
	General Use	Voice 12.5KHz	207-208	770.29375	800.29375	
	General Use	Voice 12.5KHz	245-246	770.53125	800.53125	
	General Use	Voice 12.5KHz	247-248	770.54375	800.54375	
	General Use	Voice 12.5KHz	321-322	771.00625	801.00625	
	General Use	Voice 12.5KHz	323-324	771.01875	801.01875	
	General Use	Voice 12.5KHz	361-362	771.25625	801.25625	
	General Use	Voice 12.5KHz	363-364	771.26875	801.26875	
	General Use	Voice 12.5KHz	405-406	771.53125	801.53125	
	General Use	Voice 12.5KHz	407-408	771.54375	801.54375	
	General Use	Voice 12.5KHz	469-470	771.93125	801.93125	
	General Use	Voice 12.5KHz	471-472	771.94375	801.94375	
	General Use	Voice 12.5KHz	525-526	772.28125	802.28125	
	General Use	Voice 12.5KHz	527-528	772.29375	802.29375	
	General Use	Voice 12.5KHz	585-586	772.65625	802.65625	
	General Use	Voice 12.5KHz	587-588	772.66875	802.66875	
	General Use	Voice 12.5KHz	661-662	773.13125	803.13125	
	General Use	Voice 12.5KHz	663-664	773.14375	803.14375	
	General Use	Voice 12.5KHz	701-702	773.38125	803.38125	
	General Use	Voice 12.5KHz	703-704	773.39375	803.39375	
	General Use	Voice 12.5KHz	741-742	773.63125	803.63125	
	General Use	Voice 12.5KHz	743-744	773.64375	803.64375	
	General Use	Voice 12.5KHz	781-782	773.88125	803.88125	
	General Use	Voice 12.5KHz	783-784	773.89375	803.89375	
	General Use	Voice 12.5KHz	821-822	774.13125	804.13125	
	General Use	Voice 12.5KHz	823-824	774.14375	804.14375	
	General Use	Voice 12.5KHz	861-862	774.38125	804.38125	
	General Use	Voice 12.5KHz	863-864	774.39375	804.39375	
	General Use	Voice 12.5KHz	905-906	774.65625	804.65625	
	General Use	Voice 12.5KHz	907-908	774.66875	804.66875	
	State License	Voice 25.0KHz	233-236	770.4625	800.4625	
	State License	Voice 25.0KHz	273-276	770.7125	800.7125	
	State License	Voice 25.0KHz	645-648	773.0375	803.0375	
	State License	Voice 25.0KHz	765-768	773.7875	803.7875	
	State License	Voice 25.0KHz	805-808	774.0375	804.0375	
	State License	Voice 25.0KHz	885-888	774.5375	804.5375	
Scott	General Use	Voice 12.5KHz	137-138	769.85625	799.85625	
	General Use	Voice 12.5KHz	139-140	769.86875	799.86875	
	General Use	Voice 12.5KHz	213-214	770.33125	800.33125	
	General Use	Voice 12.5KHz	215-216	770.34375	800.34375	
	General Use	Voice 12.5KHz	373-374	771.33125	801.33125	
	General Use	Voice 12.5KHz	375-376	771.34375	801.34375	
	General Use	Voice 12.5KHz	413-414	771.58125	801.58125	
	General Use	Voice 12.5KHz	415-416	771.59375	801.59375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	453-454	771.83125	801.83125	
	General Use	Voice 12.5KHz	455-456	771.84375	801.84375	
	General Use	Voice 12.5KHz	493-494	772.08125	802.08125	
	General Use	Voice 12.5KHz	495-496	772.09375	802.09375	
	General Use	Voice 12.5KHz	577-578	772.60625	802.60625	
	General Use	Voice 12.5KHz	579-580	772.61875	802.61875	
	General Use	Voice 12.5KHz	637-638	772.98125	802.98125	
	General Use	Voice 12.5KHz	639-640	772.99375	802.99375	
	General Use	Voice 12.5KHz	941-942	774.88125	804.88125	
	General Use	Voice 12.5KHz	943-944	774.89375	804.89375	
	State License	Voice 25.0KHz	73-76	769.4625	799.4625	
	State License	Voice 25.0KHz	689-692	773.3125	803.3125	
	State License	Voice 25.0KHz	929-932	774.8125	804.8125	
Sharkey	General Use	Voice 12.5KHz	325-326	771.03125	801.03125	
	General Use	Voice 12.5KHz	327-328	771.04375	801.04375	
	General Use	Voice 12.5KHz	373-374	771.33125	801.33125	
	General Use	Voice 12.5KHz	375-376	771.34375	801.34375	
	General Use	Voice 12.5KHz	441-442	771.75625	801.75625	
	General Use	Voice 12.5KHz	443-444	771.76875	801.76875	
	General Use	Voice 12.5KHz	557-558	772.48125	802.48125	
	General Use	Voice 12.5KHz	559-560	772.49375	802.49375	
	General Use	Voice 12.5KHz	869-870	774.43125	804.43125	
	General Use	Voice 12.5KHz	871-872	774.44375	804.44375	
	State License	Voice 25.0KHz	233-236	770.4625	800.4625	
	State License	Voice 25.0KHz	809-812	774.0625	804.0625	
Simpson	General Use	Voice 12.5KHz	281-282	770.75625	800.75625	
	General Use	Voice 12.5KHz	283-284	770.76875	800.76875	
	General Use	Voice 12.5KHz	345-346	771.15625	801.15625	
	General Use	Voice 12.5KHz	347-348	771.16875	801.16875	
	General Use	Voice 12.5KHz	417-418	771.60625	801.60625	
	General Use	Voice 12.5KHz	419-420	771.61875	801.61875	
	General Use	Voice 12.5KHz	457-458	771.85625	801.85625	
	General Use	Voice 12.5KHz	459-460	771.86875	801.86875	
	General Use	Voice 12.5KHz	497-498	772.10625	802.10625	
	General Use	Voice 12.5KHz	499-500	772.11875	802.11875	
	General Use	Voice 12.5KHz	545-546	772.40625	802.40625	
	General Use	Voice 12.5KHz	547-548	772.41875	802.41875	
	General Use	Voice 12.5KHz	617-618	772.85625	802.85625	
	General Use	Voice 12.5KHz	619-620	772.86875	802.86875	
	State License	Voice 25.0KHz	29-32	769.1875	799.1875	
	State License	Voice 25.0KHz	686-688	773.2875	803.2875	
	State License	Voice 25.0KHz	925-928	774.7875	804.7875	
Smith	General Use	Voice 12.5KHz	253-254	770.58125	800.58125	
	General Use	Voice 12.5KHz	255-256	770.59375	800.59375	
	General Use	Voice 12.5KHz	353-354	771.20625	801.20625	
	General Use	Voice 12.5KHz	355-356	771.21875	801.21875	
	General Use	Voice 12.5KHz	397-398	771.48125	801.48125	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	399-400	771.49375	801.49375	
	General Use	Voice 12.5KHz	445-446	771.78125	801.78125	
	General Use	Voice 12.5KHz	447-448	771.79375	801.79375	
	General Use	Voice 12.5KHz	533-534	772.33125	802.33125	
	General Use	Voice 12.5KHz	535-536	772.34375	802.34375	
	General Use	Voice 12.5KHz	629-630	772.93125	802.93125	
	General Use	Voice 12.5KHz	631-632	772.94375	802.94375	
	State License	Voice 25.0KHz	109-112	769.6875	799.6875	
	State License	Voice 25.0KHz	309-312	770.9375	800.9375	
	State License	Voice 25.0KHz	849-852	774.3125	804.3125	
Stone	General Use	Voice 12.5KHz	369-370	771.30625	801.30625	
	General Use	Voice 12.5KHz	371-372	771.31875	801.31875	
	General Use	Voice 12.5KHz	485-486	772.03125	802.03125	
	General Use	Voice 12.5KHz	487-488	772.04375	802.04375	
	General Use	Voice 12.5KHz	525-526	772.28125	802.28125	
	General Use	Voice 12.5KHz	527-528	772.29375	802.29375	
	General Use	Voice 12.5KHz	569-570	772.55625	802.55625	
	General Use	Voice 12.5KHz	571-572	772.56875	802.56875	
	General Use	Voice 12.5KHz	909-910	774.68125	804.68125	
	General Use	Voice 12.5KHz	911-912	774.69375	804.69375	
	State License	Voice 25.0KHz	145-148	769.9125	799.9125	
Sunflower	General Use	Voice 12.5KHz	53-54	769.33125	799.33125	
	General Use	Voice 12.5KHz	55-56	769.34375	799.34375	
	General Use	Voice 12.5KHz	177-178	770.10625	800.10625	
	General Use	Voice 12.5KHz	179-180	770.11875	800.11875	
	General Use	Voice 12.5KHz	257-258	770.60625	800.60625	
	General Use	Voice 12.5KHz	259-260	770.61875	800.61875	
	General Use	Voice 12.5KHz	329-330	771.05625	801.05625	
	General Use	Voice 12.5KHz	331-332	771.06875	801.06875	
	General Use	Voice 12.5KHz	389-390	771.43125	801.43125	
	General Use	Voice 12.5KHz	391-392	771.44375	801.44375	
	General Use	Voice 12.5KHz	457-458	771.85625	801.85625	
	General Use	Voice 12.5KHz	459-460	771.86875	801.86875	
	General Use	Voice 12.5KHz	501-502	772.13125	802.13125	
	General Use	Voice 12.5KHz	503-504	772.14375	802.14375	
	General Use	Voice 12.5KHz	577-578	772.60625	802.60625	
	General Use	Voice 12.5KHz	579-580	772.61875	802.61875	
	General Use	Voice 12.5KHz	617-618	772.85625	802.85625	
	General Use	Voice 12.5KHz	619-620	772.86875	802.86875	
	General Use	Voice 12.5KHz	705-706	773.40625	803.40625	
	General Use	Voice 12.5KHz	707-708	773.41875	803.41875	
	General Use	Voice 12.5KHz	865-866	774.40625	804.40625	
	General Use	Voice 12.5KHz	867-868	774.41875	804.41875	
	General Use	Voice 12.5KHz	909-910	774.68125	804.68125	
	General Use	Voice 12.5KHz	911-912	774.69375	804.69375	
	State License	Voice 25.0KHz	229-232	770.4375	800.4375	
	State License	Voice 25.0KHz	273-276	770.7125	800.7125	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	State License	Voice 25.0KHz	313-316	770.9625	800.9625	
	State License	Voice 25.0KHz	663-666	773.0875	803.0875	
	State License	Voice 25.0KHz	885-888	774.5375	804.5375	
Tallahatchie	General Use	Voice 12.5KHz	209-210	770.30625	800.30625	
	General Use	Voice 12.5KHz	211-212	770.31875	800.31875	
	General Use	Voice 12.5KHz	281-282	770.75625	800.75625	
	General Use	Voice 12.5KHz	283-284	770.76875	800.76875	
	General Use	Voice 12.5KHz	369-370	771.30625	801.30625	
	General Use	Voice 12.5KHz	371-372	771.31875	801.31875	
	General Use	Voice 12.5KHz	429-430	771.68125	801.68125	
	General Use	Voice 12.5KHz	431-432	771.69375	801.69375	
	General Use	Voice 12.5KHz	481-482	772.00625	802.00625	
	General Use	Voice 12.5KHz	483-484	772.01875	802.01875	
	General Use	Voice 12.5KHz	549-550	772.43125	802.43125	
	General Use	Voice 12.5KHz	551-552	772.44375	802.44375	
	General Use	Voice 12.5KHz	597-598	772.73125	802.73125	
	General Use	Voice 12.5KHz	599-600	772.74375	802.74375	
	General Use	Voice 12.5KHz	789-790	773.93125	803.93125	
	General Use	Voice 12.5KHz	791-792	773.94375	803.94375	
	General Use	Voice 12.5KHz	917-918	774.73125	804.73125	
	General Use	Voice 12.5KHz	919-920	774.74375	804.74375	
	State License	Voice 25.0KHz	33-36	769.2125	799.2125	
	State License	Voice 25.0KHz	193-196	770.2125	800.2125	
	State License	Voice 25.0KHz	863-866	774.3375	804.3375	
Tate	General Use	Voice 12.5KHz	97-98	769.60625	799.60625	
	General Use	Voice 12.5KHz	99-100	769.61875	799.61875	
	General Use	Voice 12.5KHz	257-258	770.60625	800.60625	
	General Use	Voice 12.5KHz	259-260	770.61875	800.61875	
	General Use	Voice 12.5KHz	325-326	771.03125	801.03125	
	General Use	Voice 12.5KHz	327-328	771.04375	801.04375	
	General Use	Voice 12.5KHz	373-374	771.33125	801.33125	
	General Use	Voice 12.5KHz	375-376	771.34375	801.34375	
	General Use	Voice 12.5KHz	433-434	771.70625	801.70625	
	General Use	Voice 12.5KHz	435-436	771.71875	801.71875	
	General Use	Voice 12.5KHz	485-486	772.03125	802.03125	
	General Use	Voice 12.5KHz	487-488	772.04375	802.04375	
	General Use	Voice 12.5KHz	537-538	772.35625	802.35625	
	General Use	Voice 12.5KHz	539-540	772.36875	802.36875	
	General Use	Voice 12.5KHz	585-586	772.65625	802.65625	
	General Use	Voice 12.5KHz	587-588	772.66875	802.66875	
	General Use	Voice 12.5KHz	637-638	772.98125	802.98125	
	General Use	Voice 12.5KHz	639-640	772.99375	802.99375	
	General Use	Voice 12.5KHz	717-718	773.48125	803.48125	
	General Use	Voice 12.5KHz	719-720	773.49375	803.49375	
	State License	Voice 25.0KHz	29-32	769.1875	799.1875	
	State License	Voice 25.0KHz	229-232	770.4375	800.4375	
	State License	Voice 25.0KHz	929-932	774.8125	804.8125	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
Tippah	General Use	Voice 12.5KHz	253-254	770.58125	800.58125	
	General Use	Voice 12.5KHz	255-256	770.59375	800.59375	
	General Use	Voice 12.5KHz	357-358	771.23125	801.23125	
	General Use	Voice 12.5KHz	359-360	771.24375	801.24375	
	General Use	Voice 12.5KHz	493-494	772.08125	802.08125	
	General Use	Voice 12.5KHz	495-496	772.09375	802.09375	
	General Use	Voice 12.5KHz	553-554	772.45625	802.45625	
	General Use	Voice 12.5KHz	555-556	772.46875	802.46875	
	General Use	Voice 12.5KHz	617-618	772.85625	802.85625	
	General Use	Voice 12.5KHz	619-620	772.86875	802.86875	
	General Use	Voice 12.5KHz	781-782	773.88125	803.88125	
	General Use	Voice 12.5KHz	783-784	773.89375	803.89375	
	General Use	Voice 12.5KHz	865-866	774.40625	804.40625	
	General Use	Voice 12.5KHz	867-868	774.41875	804.41875	
	State License	Voice 25.0KHz	25-28	769.1625	799.1625	
	State License	Voice 25.0KHz	225-228	770.4125	800.4125	
	State License	Voice 25.0KHz	933-936	774.8375	804.8375	
Tishomingo	General Use	Voice 12.5KHz	201-202	770.25625	800.25625	
	General Use	Voice 12.5KHz	203-204	770.26875	800.26875	
	General Use	Voice 12.5KHz	337-338	771.10625	801.10625	
	General Use	Voice 12.5KHz	339-340	771.11875	801.11875	
	General Use	Voice 12.5KHz	393-394	771.45625	801.45625	
	General Use	Voice 12.5KHz	395-396	771.46875	801.46875	
	General Use	Voice 12.5KHz	457-458	771.85625	801.85625	
	General Use	Voice 12.5KHz	459-460	771.86875	801.86875	
	General Use	Voice 12.5KHz	549-550	772.43125	802.43125	
	General Use	Voice 12.5KHz	551-552	772.44375	802.44375	
	General Use	Voice 12.5KHz	741-742	773.63125	803.63125	
	General Use	Voice 12.5KHz	743-744	773.64375	803.64375	
	General Use	Voice 12.5KHz	825-826	774.15625	804.15625	
	General Use	Voice 12.5KHz	827-828	774.16875	804.16875	
	State License	Voice 25.0KHz	113-116	769.7125	799.7125	
	State License	Voice 25.0KHz	773-776	773.8375	803.8375	
Tunica	General Use	Voice 12.5KHz	333-334	771.08125	801.08125	
	General Use	Voice 12.5KHz	335-336	771.09375	801.09375	
	General Use	Voice 12.5KHz	381-382	771.38125	801.38125	
	General Use	Voice 12.5KHz	383-384	771.39375	801.39375	
	General Use	Voice 12.5KHz	421-422	771.63125	801.63125	
	General Use	Voice 12.5KHz	423-424	771.64375	801.64375	
	General Use	Voice 12.5KHz	473-474	771.95625	801.95625	
	General Use	Voice 12.5KHz	475-476	771.96875	801.96875	
	General Use	Voice 12.5KHz	625-626	772.90625	802.90625	
	General Use	Voice 12.5KHz	627-628	772.91875	802.91875	
	State License	Voice 25.0KHz	305-308	770.9125	800.9125	
	State License	Voice 25.0KHz	893-896	774.5875	804.5875	
Union	General Use	Voice 12.5KHz	165-166	770.03125	800.03125	
	General Use	Voice 12.5KHz	167-168	770.04375	800.04375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	329-330	771.05625	801.05625	
	General Use	Voice 12.5KHz	331-332	771.06875	801.06875	
	General Use	Voice 12.5KHz	377-378	771.35625	801.35625	
	General Use	Voice 12.5KHz	379-380	771.36875	801.36875	
	General Use	Voice 12.5KHz	481-482	772.00625	802.00625	
	General Use	Voice 12.5KHz	483-484	772.01875	802.01875	
	General Use	Voice 12.5KHz	545-546	772.40625	802.40625	
	General Use	Voice 12.5KHz	547-548	772.41875	802.41875	
	General Use	Voice 12.5KHz	605-606	772.78125	802.78125	
	General Use	Voice 12.5KHz	607-608	772.79375	802.79375	
	General Use	Voice 12.5KHz	661-662	773.13125	803.13125	
	General Use	Voice 12.5KHz	663-664	773.14375	803.14375	
	General Use	Voice 12.5KHz	837-838	774.23125	804.23125	
	General Use	Voice 12.5KHz	839-840	774.24375	804.24375	
	General Use	Voice 12.5KHz	917-918	774.73125	804.73125	
	General Use	Voice 12.5KHz	919-920	774.74375	804.74375	
	State License	Voice 25.0KHz	145-148	769.9125	799.9125	
	State License	Voice 25.0KHz	233-236	770.4625	800.4625	
	State License	Voice 25.0KHz	893-896	774.5875	804.5875	
Walthall	General Use	Voice 12.5KHz	357-358	771.23125	801.23125	
	General Use	Voice 12.5KHz	359-360	771.24375	801.24375	
	General Use	Voice 12.5KHz	477-478	771.98125	801.98125	
	General Use	Voice 12.5KHz	479-480	771.99375	801.99375	
	General Use	Voice 12.5KHz	557-558	772.48125	802.48125	
	General Use	Voice 12.5KHz	559-560	772.49375	802.49375	
	General Use	Voice 12.5KHz	637-638	772.98125	802.98125	
	General Use	Voice 12.5KHz	639-640	772.99375	802.99375	
	General Use	Voice 12.5KHz	821-822	774.13125	804.13125	
	General Use	Voice 12.5KHz	823-824	774.14375	804.14375	
	General Use	Voice 12.5KHz	873-874	774.45625	804.45625	
	General Use	Voice 12.5KHz	875-876	774.46875	804.46875	
	State License	Voice 25.0KHz	25-28	769.1625	799.1625	
	State License	Voice 25.0KHz	693-696	773.3375	803.3375	
Warren	General Use	Voice 12.5KHz	81-82	769.50625	799.50625	
	General Use	Voice 12.5KHz	83-84	769.51875	799.51875	
	General Use	Voice 12.5KHz	121-122	769.75625	799.75625	
	General Use	Voice 12.5KHz	123-124	769.76875	799.76875	
	General Use	Voice 12.5KHz	161-162	770.00625	800.00625	
	General Use	Voice 12.5KHz	163-164	770.01875	800.01875	
	General Use	Voice 12.5KHz	201-202	770.25625	800.25625	
	General Use	Voice 12.5KHz	203-204	770.26875	800.26875	
	General Use	Voice 12.5KHz	241-242	770.50625	800.50625	
	General Use	Voice 12.5KHz	243-244	770.51875	800.51875	
	General Use	Voice 12.5KHz	349-350	771.18125	801.18125	
	General Use	Voice 12.5KHz	351-352	771.19375	801.19375	
	General Use	Voice 12.5KHz	413-414	771.58125	801.58125	
	General Use	Voice 12.5KHz	415-416	771.59375	801.59375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	461-462	771.88125	801.88125	
	General Use	Voice 12.5KHz	463-464	771.89375	801.89375	
	General Use	Voice 12.5KHz	505-506	772.15625	802.15625	
	General Use	Voice 12.5KHz	507-508	772.16875	802.16875	
	General Use	Voice 12.5KHz	581-582	772.63125	802.63125	
	General Use	Voice 12.5KHz	583-584	772.64375	802.64375	
	General Use	Voice 12.5KHz	621-622	772.88125	802.88125	
	General Use	Voice 12.5KHz	623-624	772.89375	802.89375	
	General Use	Voice 12.5KHz	665-666	773.15625	803.15625	
	General Use	Voice 12.5KHz	667-668	773.16875	803.16875	
	General Use	Voice 12.5KHz	909-910	774.68125	804.68125	
	General Use	Voice 12.5KHz	911-912	774.69375	804.69375	
	State License	Voice 25.0KHz	25-28	769.1625	799.1625	
	State License	Voice 25.0KHz	145-148	769.9125	799.9125	
	State License	Voice 25.0KHz	313-316	770.9625	800.9625	
	State License	Voice 25.0KHz	733-736	773.5875	803.5875	
Washington	General Use	Voice 12.5KHz	13-14	769.08125	799.08125	
	General Use	Voice 12.5KHz	15-16	769.09375	799.09375	
	General Use	Voice 12.5KHz	93-94	769.58125	799.58125	
	General Use	Voice 12.5KHz	95-96	769.59375	799.59375	
	General Use	Voice 12.5KHz	137-138	769.85625	799.85625	
	General Use	Voice 12.5KHz	139-140	769.86875	799.86875	
	General Use	Voice 12.5KHz	217-218	770.35625	800.35625	
	General Use	Voice 12.5KHz	219-220	770.36875	800.36875	
	General Use	Voice 12.5KHz	285-286	770.78125	800.78125	
	General Use	Voice 12.5KHz	287-288	770.79375	800.79375	
	General Use	Voice 12.5KHz	337-338	771.10625	801.10625	
	General Use	Voice 12.5KHz	339-340	771.11875	801.11875	
	General Use	Voice 12.5KHz	381-382	771.38125	801.38125	
	General Use	Voice 12.5KHz	383-384	771.39375	801.39375	
	General Use	Voice 12.5KHz	469-470	771.93125	801.93125	
	General Use	Voice 12.5KHz	471-472	771.94375	801.94375	
	General Use	Voice 12.5KHz	533-534	772.33125	802.33125	
	General Use	Voice 12.5KHz	535-536	772.34375	802.34375	
	General Use	Voice 12.5KHz	585-586	772.65625	802.65625	
	General Use	Voice 12.5KHz	587-588	772.66875	802.66875	
	General Use	Voice 12.5KHz	625-626	772.90625	802.90625	
	General Use	Voice 12.5KHz	627-628	772.91875	802.91875	
	General Use	Voice 12.5KHz	673-674	773.20625	803.20625	
	General Use	Voice 12.5KHz	675-676	773.21875	803.21875	
	General Use	Voice 12.5KHz	713-714	773.45625	803.45625	
	General Use	Voice 12.5KHz	715-716	773.46875	803.46875	
	General Use	Voice 12.5KHz	753-754	773.70625	803.70625	
	General Use	Voice 12.5KHz	755-756	773.71875	803.71875	
	General Use	Voice 12.5KHz	793-794	773.95625	803.95625	
	General Use	Voice 12.5KHz	795-796	773.96875	803.96875	
	General Use	Voice 12.5KHz	833-834	774.20625	804.20625	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	835-836	774.21875	804.21875	
	General Use	Voice 12.5KHz	877-878	774.48125	804.48125	
	General Use	Voice 12.5KHz	879-880	774.49375	804.49375	
	General Use	Voice 12.5KHz	945-946	774.90625	804.90625	
	General Use	Voice 12.5KHz	947-948	774.91875	804.91875	
	State License	Voice 25.0KHz	29-32	769.1875	799.1875	
	State License	Voice 25.0KHz	73-76	769.4625	799.4625	
	State License	Voice 25.0KHz	189-192	770.1875	800.1875	
	State License	Voice 25.0KHz	305-308	770.9125	800.9125	
	State License	Voice 25.0KHz	845-848	774.2875	804.2875	
	State License	Voice 25.0KHz	893-896	774.5875	804.5875	
	State License	Voice 25.0KHz	933-936	774.8375	804.8375	
Wayne	General Use	Voice 12.5KHz	137-138	769.85625	799.85625	
	General Use	Voice 12.5KHz	139-140	769.86875	799.86875	
	General Use	Voice 12.5KHz	209-210	770.30625	800.30625	
	General Use	Voice 12.5KHz	211-212	770.31875	800.31875	
	General Use	Voice 12.5KHz	249-250	770.55625	800.55625	
	General Use	Voice 12.5KHz	251-252	770.56875	800.56875	
	General Use	Voice 12.5KHz	293-294	770.83125	800.83125	
	General Use	Voice 12.5KHz	295-296	770.84375	800.84375	
	General Use	Voice 12.5KHz	401-402	771.50625	801.50625	
	General Use	Voice 12.5KHz	403-404	771.51875	801.51875	
	General Use	Voice 12.5KHz	469-470	771.93125	801.93125	
	General Use	Voice 12.5KHz	471-472	771.94375	801.94375	
	General Use	Voice 12.5KHz	537-538	772.35625	802.35625	
	General Use	Voice 12.5KHz	539-540	772.36875	802.36875	
	General Use	Voice 12.5KHz	589-590	772.68125	802.68125	
	General Use	Voice 12.5KHz	591-592	772.69375	802.69375	
	General Use	Voice 12.5KHz	665-666	773.15625	803.15625	
	General Use	Voice 12.5KHz	667-668	773.16875	803.16875	
	General Use	Voice 12.5KHz	705-706	773.40625	803.40625	
	General Use	Voice 12.5KHz	707-708	773.41875	803.41875	
	General Use	Voice 12.5KHz	749-750	773.68125	803.68125	
	General Use	Voice 12.5KHz	751-752	773.69375	803.69375	
	General Use	Voice 12.5KHz	829-830	774.18125	804.18125	
	General Use	Voice 12.5KHz	831-832	774.19375	804.19375	
	State License	Voice 25.0KHz	73-76	769.4625	799.4625	
	State License	Voice 25.0KHz	189-192	770.1875	800.1875	
	State License	Voice 25.0KHz	809-812	774.0625	804.0625	
	State License	Voice 25.0KHz	929-932	774.8125	804.8125	
Webster	General Use	Voice 12.5KHz	177-178	770.10625	800.10625	
	General Use	Voice 12.5KHz	179-180	770.11875	800.11875	
	General Use	Voice 12.5KHz	365-366	771.28125	801.28125	
	General Use	Voice 12.5KHz	367-368	771.29375	801.29375	
	General Use	Voice 12.5KHz	405-406	771.53125	801.53125	
	General Use	Voice 12.5KHz	407-408	771.54375	801.54375	
	General Use	Voice 12.5KHz	513-514	772.20625	802.20625	

Region 23 - Mississippi
Channel Allotments by County

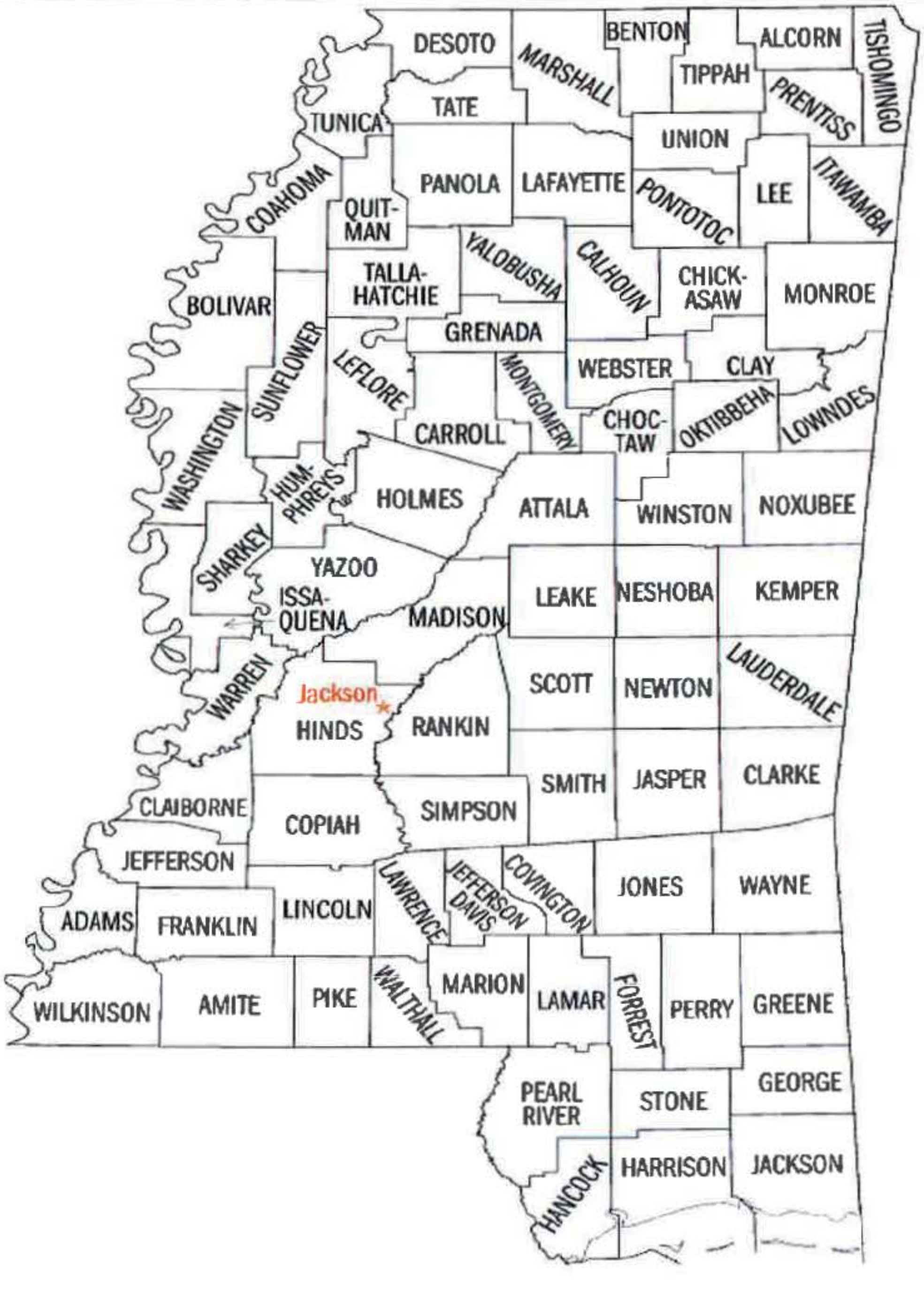
County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	515-516	772.21875	802.21875	
	General Use	Voice 12.5KHz	569-570	772.55625	802.55625	
	General Use	Voice 12.5KHz	571-572	772.56875	802.56875	
	General Use	Voice 12.5KHz	793-794	773.95625	803.95625	
	General Use	Voice 12.5KHz	795-796	773.96875	803.96875	
	General Use	Voice 12.5KHz	837-838	774.23125	804.23125	
	General Use	Voice 12.5KHz	839-840	774.24375	804.24375	
	General Use	Voice 12.5KHz	913-914	774.70625	804.70625	
	General Use	Voice 12.5KHz	915-916	774.71875	804.71875	
	State License	Voice 25.0KHz	145-148	769.9125	799.9125	
	State License	Voice 25.0KHz	273-276	770.7125	800.7125	
Wilkinson	General Use	Voice 12.5KHz	125-126	769.78125	799.78125	
	General Use	Voice 12.5KHz	127-128	769.79375	799.79375	
	General Use	Voice 12.5KHz	209-210	770.30625	800.30625	
	General Use	Voice 12.5KHz	211-212	770.31875	800.31875	
	General Use	Voice 12.5KHz	257-258	770.60625	800.60625	
	General Use	Voice 12.5KHz	259-260	770.61875	800.61875	
	General Use	Voice 12.5KHz	349-350	771.18125	801.18125	
	General Use	Voice 12.5KHz	351-352	771.19375	801.19375	
	General Use	Voice 12.5KHz	353-354	771.20625	801.20625	
	General Use	Voice 12.5KHz	355-356	771.21875	801.21875	
	General Use	Voice 12.5KHz	597-598	772.73125	802.73125	
	General Use	Voice 12.5KHz	599-600	772.74375	802.74375	
	State License	Voice 25.0KHz	25-28	769.1625	799.1625	
	State License	Voice 25.0KHz	189-192	770.1875	800.1875	
Winston	General Use	Voice 12.5KHz	121-122	769.75625	799.75625	
	General Use	Voice 12.5KHz	123-124	769.76875	799.76875	
	General Use	Voice 12.5KHz	281-282	770.75625	800.75625	
	General Use	Voice 12.5KHz	283-284	770.76875	800.76875	
	General Use	Voice 12.5KHz	325-326	771.03125	801.03125	
	General Use	Voice 12.5KHz	327-328	771.04375	801.04375	
	General Use	Voice 12.5KHz	397-398	771.48125	801.48125	
	General Use	Voice 12.5KHz	399-400	771.49375	801.49375	
	General Use	Voice 12.5KHz	473-474	771.95625	801.95625	
	General Use	Voice 12.5KHz	475-476	771.96875	801.96875	
	General Use	Voice 12.5KHz	549-550	772.43125	802.43125	
	General Use	Voice 12.5KHz	551-552	772.44375	802.44375	
	General Use	Voice 12.5KHz	609-610	772.80625	802.80625	
	General Use	Voice 12.5KHz	611-612	772.81875	802.81875	
	General Use	Voice 12.5KHz	789-790	773.93125	803.93125	
	General Use	Voice 12.5KHz	791-792	773.94375	803.94375	
	State License	Voice 25.0KHz	109-112	769.6875	799.6875	
	State License	Voice 25.0KHz	153-156	769.9625	799.9625	
	State License	Voice 25.0KHz	849-852	774.3125	804.3125	
Yalobusha	General Use	Voice 12.5KHz	253-254	770.58125	800.58125	
	General Use	Voice 12.5KHz	255-256	770.59375	800.59375	

Region 23 - Mississippi
Channel Allotments by County

County	Class	Band Width	Channel	Base Frequency	Mobile Frequency	Notation
	General Use	Voice 12.5KHz	437-438	771.73125	801.73125	
	General Use	Voice 12.5KHz	439-440	771.74375	801.74375	
	General Use	Voice 12.5KHz	509-510	772.18125	802.18125	
	General Use	Voice 12.5KHz	511-512	772.19375	802.19375	
	General Use	Voice 12.5KHz	581-582	772.63125	802.63125	
	General Use	Voice 12.5KHz	583-584	772.64375	802.64375	
	General Use	Voice 12.5KHz	633-634	772.95625	802.95625	
	General Use	Voice 12.5KHz	635-636	772.96875	802.96875	
	General Use	Voice 12.5KHz	713-714	773.45625	803.45625	
	General Use	Voice 12.5KHz	715-716	773.46875	803.46875	
	General Use	Voice 12.5KHz	833-834	774.20625	804.20625	
	General Use	Voice 12.5KHz	835-836	774.21875	804.21875	
	State License	Voice 25.0KHz	225-228	770.4125	800.4125	
	State License	Voice 25.0KHz	925-928	774.7875	804.7875	
Yazoo	General Use	Voice 12.5KHz	41-42	769.25625	799.25625	
	General Use	Voice 12.5KHz	43-44	769.26875	799.26875	
	General Use	Voice 12.5KHz	209-210	770.30625	800.30625	
	General Use	Voice 12.5KHz	211-212	770.31875	800.31875	
	General Use	Voice 12.5KHz	365-366	771.28125	801.28125	
	General Use	Voice 12.5KHz	367-368	771.29375	801.29375	
	General Use	Voice 12.5KHz	449-450	771.80625	801.80625	
	General Use	Voice 12.5KHz	451-452	771.81875	801.81875	
	General Use	Voice 12.5KHz	489-490	772.05625	802.05625	
	General Use	Voice 12.5KHz	491-492	772.06875	802.06875	
	General Use	Voice 12.5KHz	529-530	772.30625	802.30625	
	General Use	Voice 12.5KHz	531-532	772.31875	802.31875	
	General Use	Voice 12.5KHz	569-570	772.55625	802.55625	
	General Use	Voice 12.5KHz	571-572	772.56875	802.56875	
	General Use	Voice 12.5KHz	613-614	772.83125	802.83125	
	General Use	Voice 12.5KHz	615-616	772.84375	802.84375	
	General Use	Voice 12.5KHz	901-902	774.63125	804.63125	
	General Use	Voice 12.5KHz	903-904	774.64375	804.64375	
	State License	Voice 25.0KHz	33-36	769.2125	799.2125	
	State License	Voice 25.0KHz	685-688	773.2875	803.2875	
	State License	Voice 25.0KHz	925-928	774.7875	804.7875	

Region 23 - Mississippi
Channel Allotments by County

REGION 23 – MISSISSIPPI COUNTIES



REGION 23 700 MHz PLAN
APPENDIX O - NPSTC SPECTRUM MANAGEMENT REFERENCE

This Appendix Contains

1. A document for reference purposes which addresses spectrum management and other issues of importance with respect to the development of any 700 MHz Plan.

Note: The referenced document is identified was produced by the New York State Technology Enterprise Corporation and presented to the National Public Safety Telecommunications Council (NPSTC) and is dated August 7, 2001

Contents

List of Figures

Introduction

The NYSTEC/SRC team is pleased to present this proposal to the National Public Safety Telecommunications Council (NPSTC). The purpose of the proposal is to illustrate the need for, and the issues relating to, the generation of initial 700-MHz general-pool frequency allotments. It outlines a proposed conceptual methodology for generating these pre-allotments, and identifies areas that may require further discussion with the stakeholders within the process. The NYSTEC/SRC team is uniquely qualified to address these issues through innovative approaches and the application of advanced modeling concepts and tools.

The New York State Technology Enterprise Corporation, NYSTEC[1], is a private not-for-profit technology-engineering company whose mission is to provide systems engineering and technical assistance to government clients on a wide range of information and communication technologies. NYSTEC prides itself on remaining independent from manufacturers and system integrators, which allows it to be an independent trusted partner for its clients. Since its founding in 1995, NYSTEC has developed proven skills in working in diverse, multi-agency environments at the state, local, and federal levels. NYSTEC has a strong focus on the public-safety land-mobile radio market and is well versed in radio propagation measurement and analysis as well as the regulatory aspects. NYSTEC has a staff of about 45 people and is headquartered in Rome, New York.

The other member of the team is NYSTEC's sister company, Syracuse Research Corporation (SRC)[2]. SRC is also a not-for-profit, independent R&D organization serving both government and industry since 1957. The unique expertise of SRC scientists and engineers lies in their ability to analyze complex technological problems and to develop innovative, practical solutions. SRC's approximately 340 staff members hold more than 100 advanced degrees in 40-plus technical disciplines. SRC is headquartered in North Syracuse NY and maintains 10 offices across the US to serve a wide range of federal agencies. NYSTEC and SRC are affiliates of SRC Management, Inc. (SMI). SMI is a separate not-for profit corporation that provides general and administrative support services and acts as a holding company for NYSTEC and SRC. The three corporations all share a common Board of Trustees and Corporate Officers, so they are tightly linked together enabling strong partnerships on projects.

As this proposal will discuss, the NYSTEC/SRC team recommends that NPSTC work towards the generation of nationwide geographic pre-allotments for the general-use 700-MHz public-safety spectrum and that these allotments be used to populate the NPSTC pre-coordination database. NYSTEC/SRC have gone through considerable review of this proposed effort with the NPSTC Database Subcommittee, and the methodologies proposed herein reflect the consensus of the subcommittee in regards to this undertaking.

1 More information can be found at the Web site http://www.nystec.com
2 More information can be found at the Web site http://www.syrres.com

NYSTEC

Pre-Allotment of 700-MHz Spectrum

The 700-MHz spectrum has never before been available for use by land-mobile radio operations. Because of this, it offers many exciting possibilities for creating new paradigms in the way that it is allotted, and used. In particular, the use of more detailed models within the pre-allotment and regulatory realms could allow for a higher level of spectral efficiency than has previously been achievable.

Regulatory and Rule-making procedures for the 700-MHz Public Safety Narrowband spectrum are drawing near completion. Once these processes are completed, many areas of the country will be able to make immediate use of the 700-MHz spectrum (pending equipment availability). In addition to this, statewide reserve allocations of this spectrum might be made available for licensing later this year. Because of these factors, there is a genuine need for pre-allotment of the spectrum, especially for frequency coordination and Regional Planning purposes. Pre-allotment produces "pools" of channels that may be used in a given area. As actual application data is received from Regional Planning Committees, the process can be run again to re-optimize the "pool" allotments that would remain available within a Planning Region.

The Need for Pre-Allotment

NPSTC has made a pre-allotment database available to all authorized frequency coordinators for the new 700-MHz narrowband public-safety spectrum. In order to maximize the utility of NPSTC's pre-coordination database, and to effectuate its use within frequency coordination and regional planning, it is imperative to completely populate the database as soon as possible. In order to accomplish this, it will be necessary to perform the allotments on a national basis.

This database is in its final stages of acceptance — from both NPSTC and its intended user base — and therefore is nearly ready to be populated with initial "pool" allotments. It was anticipated that the allotments would be provided over time on a regional basis — but with input required from around 55 individual regional planning committees. NYSTEC/SRC propose that the allotments be developed all at once, on a national basis, and without the need for massive collaborative efforts from the individual regional committees – many of which have not yet formed. However, NYSTEC/SRC also propose that actual allotment application data from those 700 MHz Regional Planning committees, which have already been formed, should be solicited early in the pre-allotment process.

Pre-Allotment Boundaries

In general, the geographical structure of the 700-MHz Regional Planning Committees (RPCs) will be based upon state borders, and will be similar to the structure shown in Figure 1 (depicting the 800-MHz National Public Safety Planning boundaries). Note that some large states are broken into multiple regions.

Site-specific parameters are generally not available during the pre-allotment process. However, the spectrum must be allotted based upon some type of bounded area. An obvious choice (and with precedent set from past processes) is to allot the spectrum based upon county-type boundaries. It is the recommendation of the NYSTEC/SRC team that the 700-MHz narrowband spectrum be pre-allotted according to these boundaries — especially since *most* public-safety usage falls naturally into these subdivisions. A map of the suggested county-type divisions is shown as Figure 2. Note that, while the figure mainly depicts county boundaries, many cities that are not incorporated within counties are also depicted. These will be treated as their own individual allocable areas.

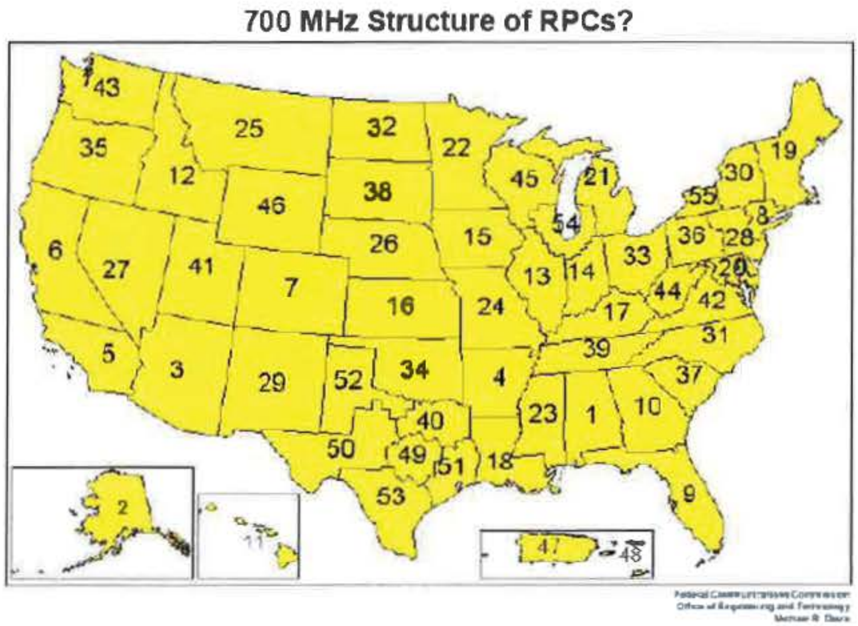


Figure 1, Regional Boundaries

Figure 2, County and Large Municipal Boundaries

NYSTEC

Proposed Methodology

It should again be stressed that the opportunity exists for implementing more detailed models and processes when allocating the spectrum. This allows for a higher level of spectral efficiency than has been possible in past efforts of this nature.

Spectral Needs Assessment

Based upon discussions with the NPSTC database subcommittee, it has been decided that each indicated county/area receive some minimum allotment (e.g., three 25 kHz channel pairs for voice, and one 25 kHz channel pair for data - see Allotted Bandwidth Section on pages 8-9), regardless of aggregate capacity needs. Beyond this, the pre-allotment process will provide additional spectrum based upon some measure of individual capacity needs. In the past, this additional capacity assessment was based solely on population. This proposal recommends that the past approach be modified.

In the NYSTEC/SRC team's analysis of public-safety capacity needs within New York, it was found that these needs varied tremendously across the State. It was clear that there was a strong correlation between population and public-safety capacity needs. However, it was also found that, when only considering county populations, a large number of public-safety and public service users were not accurately represented in the rural areas. This is illustrated in Figure 3.

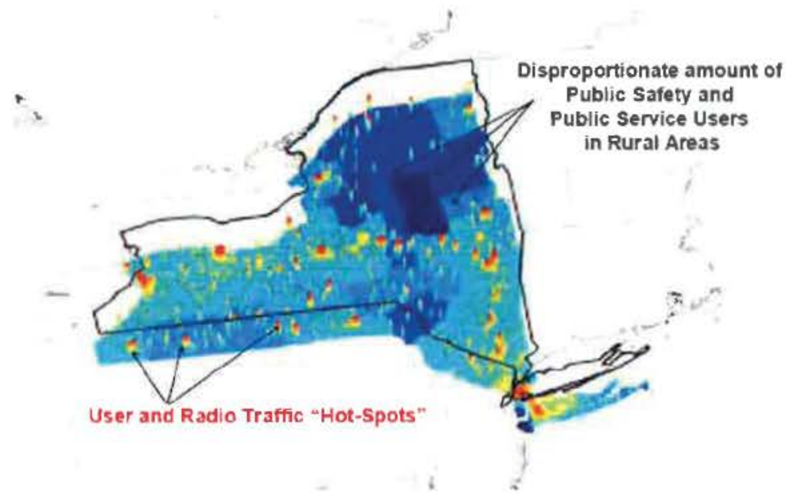


Figure 3, Distribution of Spectral Needs

The NYSTEC/SRC team proposes an approach similar to PSWAC's approach, in which both population and population-density are used to predict the total number of public-safety users within a specific area to be allotted spectrum. The most recent population data available will be used, and can be projected out to a future date (such as 2010). Modifications to PSWAC's models will need to be incorporated — since the original models incorporated little data from rural areas. This algorithm would be submitted for approval to NPSTC. In addition to this, a statewide law-enforcement component must also be integrated into the models. Similar models, developed by SRC/NYSTEC, are shown in Figure 4.

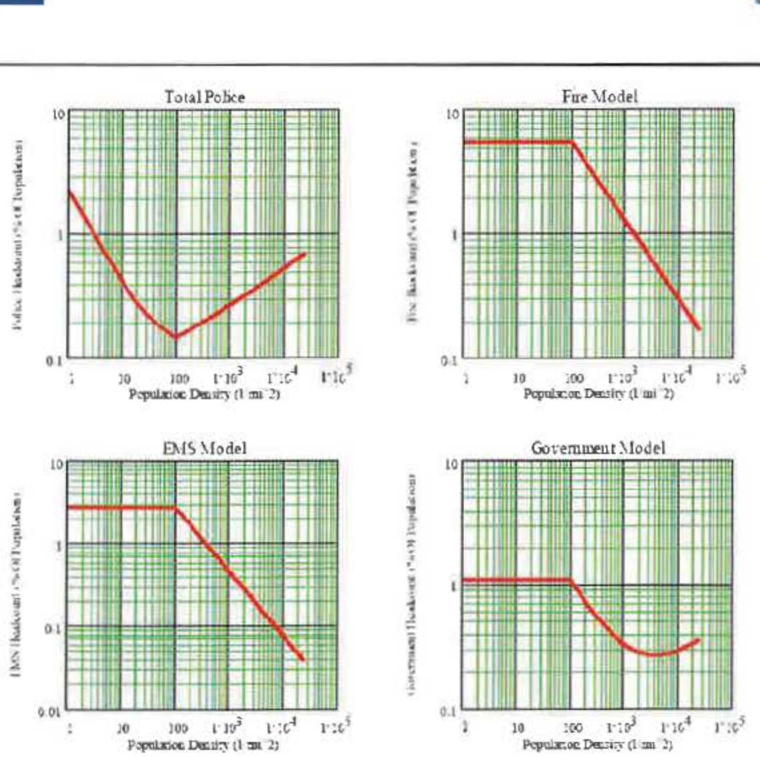


Figure 4, Modified PSWAC User Density Models

Once public-safety and public service user populations are projected for a given area, they will be used to distribute the spectrum pre-allotments, normalized by the total amount of available spectrum (with reuse), and by the total national public-safety user projections.

It should be noted that more detail could be included in the capacity-assessment models by applying service-based usage and voice/data penetration levels to the projected user group populations. By using service-group-based models in summing the resulting Erlang loads, estimates of aggregate capacity needs can created for all of the various user groups. These will then provide Erlang load projections that could be incorporated with traffic models[3] to estimate channel needs.[4] After this process, similar normalization methods would be applied.

Service Area Evaluation and Interference Prediction

It is clear that accurate modeling of coverage and interference effects allows for tighter site/frequency "packing" and greater spectral efficiency. Again, since this frequency band is a new allocation, the ability exists to utilize more accurate methods of assessing these effects during the pre-allotment stages of spectrum planning and plan development. The NYSTEC/SRC team has experience in developing innovative techniques for spectral assignment processes, and continues to work with Telecommunications Industry Association (TIA) TR-8.18's working groups in developing the next generation of coverage- and interference-assessment methodologies.

For the 700 MHz pre-allotments, the service area/contour for each of the counties will be represented by a bounding polygon that extends beyond the county border by 3 to 5 miles. This actual

3 For example, Erlang-C, or extended-Erlang-B for trunked networks, Erlang-B or Engset/Molina for conventional networks.
4 This process was followed in New York State, and culminated in the generation of a statewide 250x250-meter resolution traffic density/ capacity grid. Details available upon request.

distance from the county border can be a uniform decision, affecting all service areas, or can be individually based upon population-density metrics (TIA recommendations call for 3 miles for rural areas and 5 miles for urban areas).

There are several possibilities for generating the interference contour(s), all utilizing some measures of local terrain characteristics. From Figure 5 it is apparent that there is a tremendous variance in terrain roughness in the US (Northwest US shown). It is also clear that utilization of terrain features allows for a much more accurate representation of signal propagation and interference prediction, especially when compared to simple "rule-of-thumb" reuse distances.

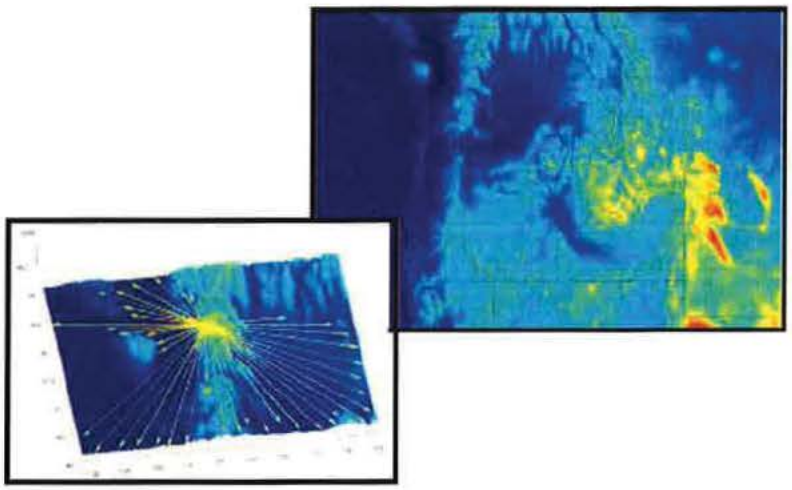


Figure 5, National Terrain Variance and Increased Accuracy through the use of Terrain Features

With no site-specific information available, several options are possible for predicting frequency reuse parameters. An example, shown in Figure 6, places a site location at the highest terrain elevation within a given county, then uses directional height above average terrain (HAAT) calculations to compute the interference range in each direction outward from the site. The model used to compute these distances can be Okumura-Hata-Davidson-based (as in NPSPAC), Carey-based (i.e. R6602, F(50,50)), or new models, such as the "TIA-6602" method (proposed modification to FCC R-6602) under consideration by TR-8.18.[5] Examples of the Okumura-based contours are shown in this figure, with ray-traced radio horizon limits included for reference.

[5] All interference contours utilizing standard values (such as 5 dBu), and with all contours being median levels (i.e. 50,50).

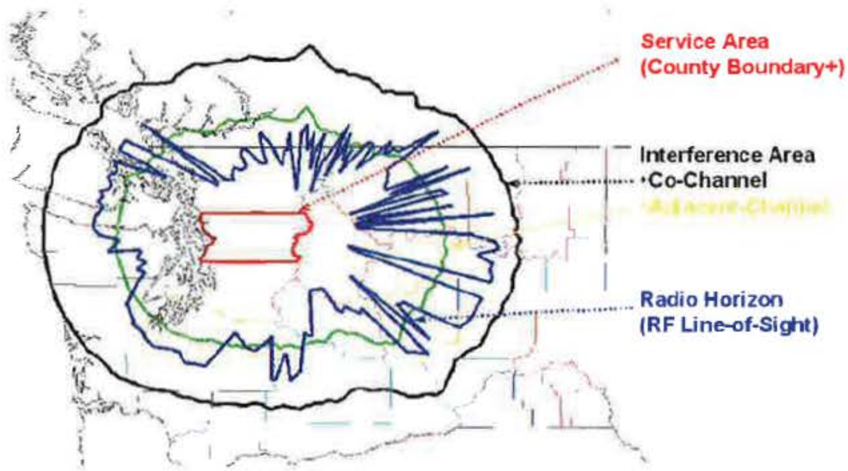


Figure 6, Example of a Possible Contour Methodology

Allotment Approach

NYSTEC and SRC also have experience in generating spectrally efficient frequency assignment methodologies - as evidenced by recent work generating spectrum plans for a statewide wireless network, and generating and proposing alternative Digital Television Transition plans for Canada[6].

Basic Allotment Process

The recommended spectrum-allotment approach is based upon the non-intersection of contours — an approach familiar to regulators and frequency coordinators alike. Specifically it will apply rules within the allotment process that specify that service and interference contours for co-channel frequency allotments cannot intersect. In addition to this, it may specify that adjacent-channel interference contours cannot intersect the service contours on an adjacent-channel examination.[7] The program could iterate, so that, if not enough spectrum is available to meet the recommended levels of any given county, it will spread the load over all counties involved within the allotment process. This ensures that every county reaches a similar level of capacity - relative to its projected needs.

This process provides the ability to pack the spectrum geographically to a very large degree, as illustrated in Figure 8. Note that the NYSTEC/SRC team can also provide periodic re-packing of the spectrum, once site-specific licenses are issued and more detailed models can be applied. Note that, *when* site specific parameters are available, it is important to populate the database with contours that represent coverage and interference parameters as accurately as possible. For this, a tile-based contouring (such as the NYSTEC/SRC team has proposed to TIA[8]) method is recommended.

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6 These Canadian plans would completely eliminate the need for 700 MHz DTV allotments, and essentially align 700 MHz spectrum on both sides of the US/Canadian border.
7 TIA's recommendations of 60 dBu contour values for adjacent-channel interference (based upon 65 dB ACCPR into a 6.0 kHz) may render the adjacent-channel consideration within this process unnecessary.
8 Details available upon request.

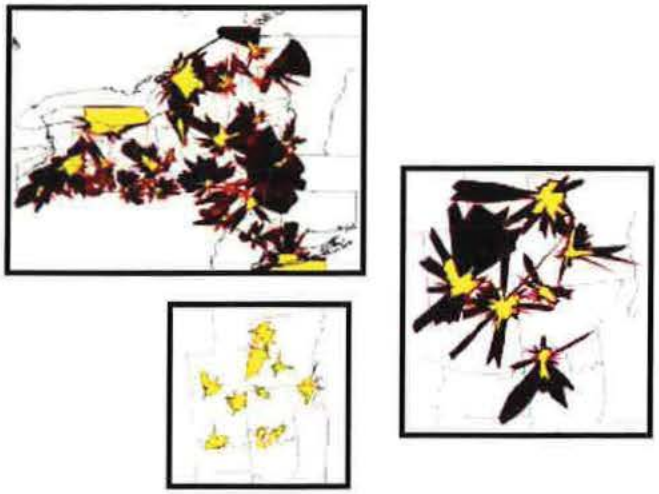

Figure 7, Contour-Intersection Methodologies

Allotted Bandwidth

One very important parameter of the pre-allotment process is the bandwidth of the pre-allotted voice and data channels. This has proved to be a strongly debated topic of discussion.

Figure 8 shows a portion of the 700-MHz narrowband spectral layout. The potential for many diverse technologies within the same spectrum is troublesome in regards to determining the smallest building blocks to allot. It is clear to see that the spectrum may be allotted in either 6.25-kHz (allowing the use of future FDMA technologies) allotments, 12.5-kHz (allowing the use of current FDMA and future TDMA technologies) "bundles", and 25-kHz "blocks" (allowing the use of 25 kHz TDMA technologies). The inherent problem is that allotting anything smaller than 25-kHz blocks precludes the future use of 25- kHz technologies on the pre-allotted channel sets. Presently, no US 25-kHz TDMA technology product is available for operation in this band, although FCC Rules allow such operation.

NPSTC and TIA have previously recommended that 25-kHz blocks be pre-allotted for both voice and data applications. At the May 2001 NCC meeting it was proposed that three (3) 25-kHz voice channels and one (1) 25-kHz data channel would be the minimum default allotments in the absence of actual specific applications for channel allotment. This would permit different technologies to be implemented using 6.25, 12.5, or 25 kHz channel widths at some future date. Therefore, the pre-allotments will be generated based upon aggregating 25-kHz blocks of spectrum.

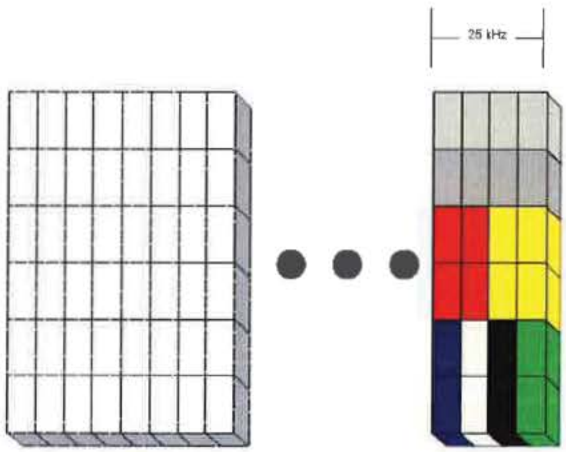

Figure 8, Channel Allotment Possibilities

The pre-allotment process will also account for realistically achievable multi-coupler spacing. For this reason, all-individual pre-allotment channel sets will have an internal separation of no less than 250 kHz.

Geographic Boundaries and Regional Penetration of Pre-allotments

NPSTC has previously recommended that the pre-allotments be performed only along the borders of each region. After discussions with the NYSTEC/SRC team, it was seen that better spectral efficiency could result from allotting all areas of all regions during the pre-allotment process. Pre-allotment of all areas, even within regions, can also result in significantly faster availability of channels to an applicant, since the regional planning process has already taken place. Otherwise one might have to wait for a regional planning process to follow an application.

NYSTEC/SRC proposes that the pre-allotments be performed throughout all of the regions, but that allotments outside of the border areas could be modified without restriction by individual regional planning committees without the need for inter-regional coordination. However, if such change results in an interference contour impact upon any adjacent region, inter-regional concurrence is required.

Treatment of Television Services

There are many additional constraints that can be imposed upon the pre-allotment process; most are based upon the existence of current and future television broadcast services within the 700-MHz band. These include incumbent US analog stations as well as US digital allotments that occur in certain areas of the nation. Aggravating the problem is the uncertainly related to international broadcast services (in particular Canada and Mexico) that may claim protection from, and cause interference to, US operations within the spectrum. An illustration of this is in Figure 9, where the locations of primary-class 700-MHz digital and analog broadcast television services within 400 km of the US/Canadian border are depicted.

While it is possible to alter the allotment process to take all of these broadcast services into account, the final result will not provide the same spectral efficiency that would otherwise be possible. It is also possible that consideration of all of the stations may over-constrain the problem, generating inefficient results for no valid reason. An example of the process of considering these television services is illustrated in Figure 10, where similar tools were used to generate spectrum assignments in New York, while working around existing and proposed television services from both the US and Canada.

The actual selection of allotment criteria and stations to consider during the allotment process depends on many factors — among them US 700-MHz spectrum availability; the DTV transition timelines of the US, Mexico, and Canada; and international negotiations and treaties. The NYSTEC/SRC team has a firm understanding of these issues, and would be pleased to assist in any discussions regarding their resolution — or in recommending the best course of action to take for the pre-allotment process. However, for the purposes of this proposal, NYSTEC/SRC propose that no consideration be given to allotting spectrum based upon broadcast television services emanating from within the US or abroad.

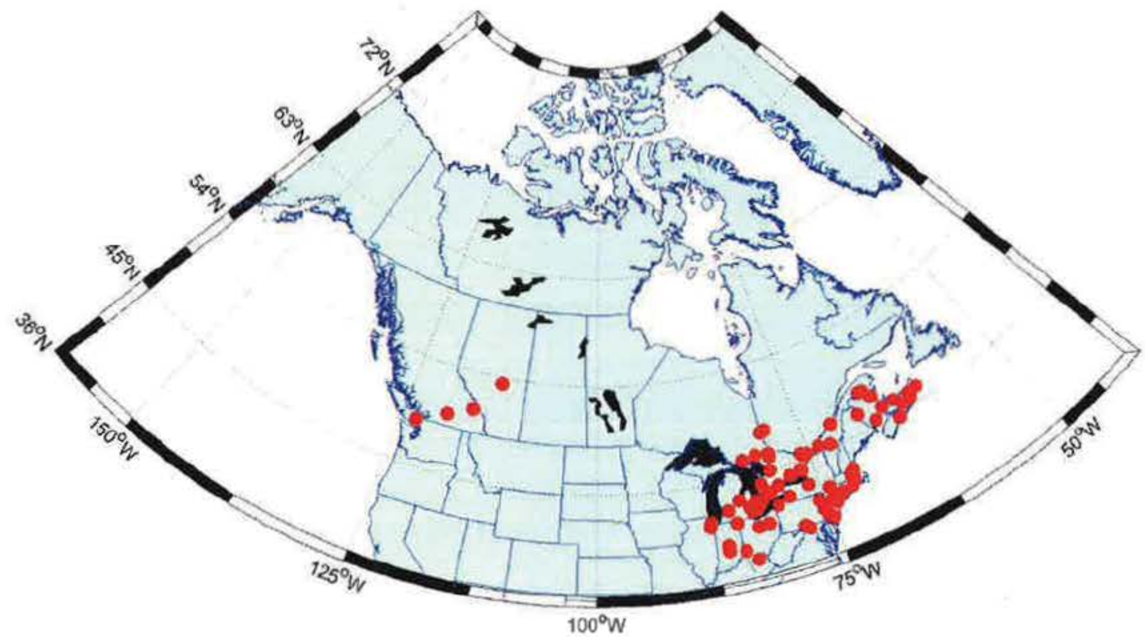

Figure 9, Canadian Border Area Television, Channels 62 through 69

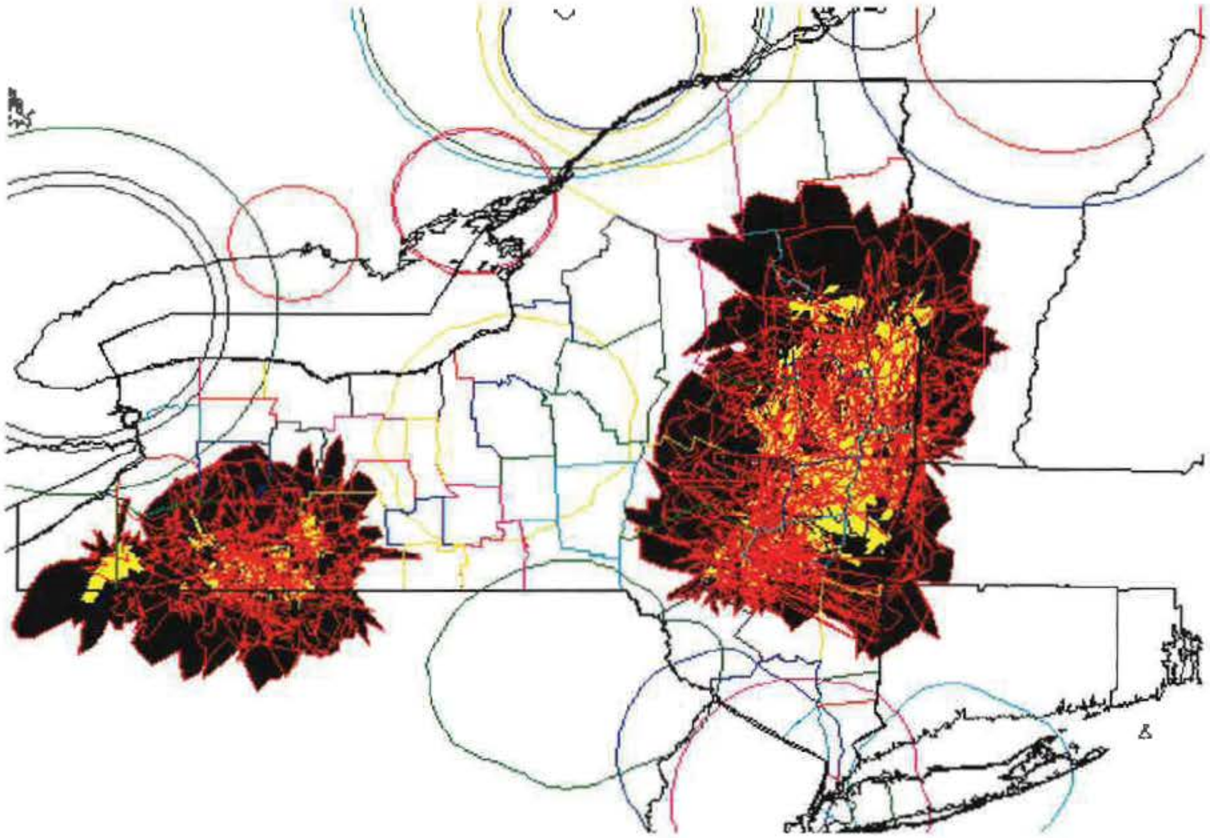

Figure 10, Example of Consideration of Analog and Digital Television Factors

Consideration of Regional Planning Committee Efforts

It must be noted that many 700 MHz regional Planning Committees (RPCs) have now formed and commenced their meetings. Therefore, it is appropriate to solicit input from the 700 MHz Regional Planning committees that have already been formed; and that this should be done at the very beginning of the pre-allotment process.

NYSTEC/SRC will assist NPSTC in the solicitation of this information, and will attempt to utilize any efforts completed by the RPCs. If possible, NYSTEC/SRC will alter the allotment process to better conform to the needs of these individual RPCs. However, note that this may lead to essentially unbounded efforts that cannot be defined at this point. These will need to be carefully considered, and will require further discussion between NPSTC and NYSTEC/SRC to resolve scope and compensatory issues relating to these portions of the re-allotment efforts.

NYSTEC

Summary

The NYSTEC/SRC team believes that, in order to maximize the utility of NPSTC's 700-MHz public safety pre-coordination database, and to effectuate its use for regional planning and frequency coordination in a multiple vendor environment, it is imperative to completely populate the database as soon as possible. In order to accomplish this with optimal spectral efficiency, it will be necessary to perform the allotments on a national basis, and to utilize accurate models and spectral assignment strategies.

A summary of the proposed methodologies is as follows:

- Utilize population and population density characteristics in the evaluation of capacity needs. Employ PSWAC-like capacity requirement models to introduce increased accuracy in the modeling process.
- Utilize terrain data for service area evaluation and interference prediction. This will allow greater accuracy in the pre-allotment process, and will result in better reuse of the spectrum.
- Use contour intersections to evaluate the validity of pre-allotment channel sets. Build upon past experience in developing quasi-optimal spectral allotment solutions.
- Solicit input from the 700 MHz Regional Planning committees that have already formed. NYSTEC/SRC will assist NPSTC in the solicitation of this information, and will use Regional Planning Committee allotment application data where available. Such data will specify the channel bandwidth (6.25, 12.5, or 25 kHz)
- Pre-allot "pool" channels in aggregate 25 kHz blocks around any initial Regional Plan allotments. Allow a minimum of four blocks per allotted (county-like) area, three for voice, and one for data. Allot additional spectrum based upon projected need, and normalized by the spectrum available (considering reuse).
- Upon request at a later time, re-run the program in order to update it with additional Regional Planning Committee allotment application data, and revise the "pool" pre-allotments within those regions accordingly.
- Allot all areas. Pre-allotments may be altered without the need for inter-regional coordination as long as adjacent regions are not impacted. Changes that impact adjacent region(s) can only be made with inter-regional concurrence(s).
- When considering allotable spectrum blocks, do not attempt to work around either US or International broadcast-television services. Many of these station assignments are either temporary, or subject to change, and working around them will result in allotment inefficiencies.

NYSTEC/SRC will be pleased to provide NPSTC with a separate Statement of Work and Cost Proposal that addresses the entire scope of this effort.

REGION 23 700 MHz LAN APPENDIX P - MOU TEMPLATE AND SHARING AGREEMENT TEMPLATE

This Appendix Contains

1. A template ("SHARING AGREEMENT TEMPLATE") which addresses spectrum management in situations where multiple users may be requesting spectrum

2. A template for a Memorandum of Understanding (M.O.U.) for operating the 700 MHz Interoperability Channels

NCC Implementation Subcommittee
IM00027-20010202 (P012)

February 2, 2001

Appendix P

SHARING AGREEMENT TEMPLATE

(Agency letterhead of Licensee)

TO: (recipient person and title)
(recipient agency)

FROM: (authorizing person and title)
(authorizing agency)

DATE: (mm/dd/yyyy)

SUBJECT: Sharing Agreement

_______________(grantor) authorizes _______________(grantee) to operate __________ (quantity) mobile (vehicular or hand-held) radios. Such operation shall be per the following parameters.

Call Sign	Frequency(ies)	Max. Power	Channel Description

(Use additional attachments as necessary for more frequencies/channels)

This written agreement applies to operations in cooperation and coordination with activities of the licensee per Region (#) Plan, FCC Rules 47 CFR Parts 2.102(c), 2.103 and 90.421 and Part 7.12 of the NTIA Manual. Furthermore, grantor reserves the right to effectively eliminate the possibility of unauthorized operation, which ultimately could result in terminating this written agreement.

_______________ (typed or printed name of authorized signer)
_______________ (authorized signer identified above)
_______________ (date)
_______________ (agency name)
_______________ (agency address)
_______________ (agency address)
_______________ (agency address)
_______________ (signer's phone)
_______________ (signer's email address, if available)

Mississippi Public Safety Frequency Advisory Committee

Region 23 Public Safety National Plan
Application Review

MEMORANDUM OF UNDERSTANDING

TO: (signer of application and title)
(agency name)

FROM: (name), Chairman

DATE: (mm/dd/yyyy)

SUBJECT: Memorandum of Understanding for Operating the 700 MHz Interoperability Channels

This memorandum of understanding (hereafter referred to as MOU) shall be attached to the application when submitting it. By virtue of signing and submitting the application and this MOU, (agency name) (hereafter referred to as APPLICANT) affirms its willingness to comply with the proper operation of the Interoperability (interoperability) channels as dictated by the Region Planning Committee (here after referred to as RPC) as approved by the Federal Communications Commission (hereafter referred to as FCC) and by the conditions of this MOU.

The APPLICANT shall abide by the conditions of this MOU which are as follows:

- To operate by all applicable State, County, and City laws/ordinances.
- To utilize "plain language" for all transmissions.
- To monitor the Calling Channel(s) as may be appropriate.
- To coordinate use of the Tactical Channels.
- To identify and eliminate inappropriate use.
- To limit secondary Trunked operation to the interoperability channels specifically approved on the application and limited to channels listed below.
- To relinquish secondary Trunked operation of interoperability channels to requests for primary conventional access.
- To grant access to channels according to the Priority Levels identified in this MOU.

The preceding conditions are the primary, though not complete, requirements for operating in the interoperability channels. Refer to the Region Plan for the complete requirements list.

Priority Levels:

1. Disaster or 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.

To resolve contention within the same priority, the channel should go to the organization with the wider span of control/authority. This shall be determined by the State Interoperability Executive Committee or RPC for the operation or by the levels of authority/government identified in the contention.

For clarification purposes and an aid to operate as authorized, any fixed base or mobile relay stations identified on the license for temporary locations (FCC station class FBT or FB2T, respectively) shall remain within the licensed area of operation. Similarly, vehicular/mobile repeater stations (FCC station class MO3) shall remain within the licensed area of operation. Federal agencies are permitted access to interoperability channels only as authorized by 47 CFR 2.102 (c) & 2.103 and Part 7.12 of the NTIA Manual.

Any violation of this MOU, the Region Plan, or FCC Rule shall be addressed immediately. The first level of resolution shall be between the parties involved, next the State Interoperability Executive Committee or RPC, and finally the FCC.

Secondary Trunked Channels

GTAC5 - Channel 54 & 55 GTAC35 - Channel 534 & 535
GTAC7 - Channel 134 & 135 GTAC37 - Channel 614 & 615
GTAC9 - Channel 214 & 215 GTAC39 - Channel 694 & 695
GTAC11 - Channel 294 & 295 GTAC41 - Channel 774 & 775
GTAC13 - Channel 374 & 375 GTAC43 - Channel 854 & 855

________________ (typed or printed name of authorized signer)
________________ (authorized signer identified above and consistent with application)
________________ (date)
________________ (agency name)
________________ (agency address)
________________ (agency address)
________________ (agency address)
________________ (signer's phone)
________________ (signer's email address, if available)

Note: MSPSFAC membership includes but is not limited to the following entities: APCO representative, EMS Service Providers, FCCA, Mississippi APCO Frequency Advisor, Fire Department Representative, Mississippi Association of Chiefs of Police, Mississippi Department of Wildlife Fisheries & Parks, Mississippi Department of Public Health, Mississippi Department of Transportation, Mississippi Municipal League, Mississippi Sheriff's Association, Mississippi Highway Patrol and at-large APCO representatives from city and county public safety agencies

APPENDIX P S-160

S-160 refers to the use of frequencies that are licensed under Part 90 of the FCC rules by federal Government radio stations for intercommunication with non- Government radio stations. Any frequency authorized under Part 90 may be used by the Government, provided that a suitable, mutually approved, agreement has been reached between the FCC, the Government agency involved, and the affected non-Governmental user.

The conditions and terms of operation under an S-160 assignment are given in the NTIA Manual, section 7.12 and 8.3.3.

REGION 23 700 MHz PLAN
APPENDIX Q - NCC PLANNING DOCUMENTS AND SIEC REFERENCE

This Appendix Contains

1. The Plan's reference for a proper methodology to establish the Region 23 700 MHz RPC and the Region 23 Plan

NOTE: The state of Mississippi did establish a formal "State Interoperability Executive Committee" (SIEC) pursuant to federal requirements and guidelines.

IV NATIONAL/REGIONAL PLAN TEMPLATE OUTLINE FOR 764-776/794-806 NATIONAL/REGIONAL PLANS

1. REGIONAL CHAIRPERSON

The Regional Planning Committee shall designate a Chairperson. The plan shall include the chairperson's name, title, address, phone number, agency affiliation, e-mail address and/or any additional contact information.

2. RPC MEMBERSHIP

The Plan shall list all RPC members and include agency affiliation and contact information such as: mailing addresses, phone numbers, email addresses (if available), etc. The officers of the RPC shall be noted , such as Secretary, 1st Vice Chairperson, etc.

3. DESCRIPTION OF THE REGION

This section of the plan shall include the following information:

- Definition of the region and its boundaries, a list of the counties and cities within the boundaries.
- Description of existing interoperability contracts, compacts, mutual aid agreements, etc.[1]
- Description of the effect of the addition of 700 MHz channels and interoperability requirements will affect existing plans.[2]
- Overview of public safety entities that have jurisdiction within or over any or all portions of the region (e.g. state agencies, federal agencies).
- Description of the types of public safety, law enforcement, government, public service, or other entities (federal, county, regional, city, town, etc.) that are included in the region.

4. NOTIFICATION PROCESS

This section shall contain a complete description of the process used by the Regional Planning Committee to notify the eligible entities within the region. This section shall contain at a minimum:

1 In the 4th R&O in Docket 96-86, the FCC decided that each State would to be responsible for administering the I/O channels and gave a deadline of 12/31/01 for each State to notify the Commission whether it would accept that responsibility. If notification from the state is not received by 12/31/01, the administration of the I/O channels reverts to the RPC on 1/01/02. The NCC recommends that States who choose to administer the 700 MHz I/O channels use the recommendations provided in the Guidelines for 764-776/794-806 Regional Planning Committees, Document IM0020-H-20010322-(P009-H). If the State is administering the I/O channels, the RPC need not include this information. A statement to the effect that the State is administering the I/O channels will suffice. If administration of the I/O channels has reverted to the RPC, this information must be included in the Regional Plan.

2 Ibid.

- The dates and publications in which the meetings were announced
- The dates and websites on which the meetings were announced.
- A description of the process by which comments were solicited from all eligible parties
- Copies of all notices, comments and submissions obtained through the process
- A description of the process used to consider the comments submitted by concerned parties,

5. REGIONAL PLAN SUMMARY

This section shall include:

- The guidelines and procedures for operation of the RPC;
- The procedures for requesting channels;
- The procedures for frequency coordination;
- Guidelines and procedures for protection of incumbent TV/DTV stations within the Region or near the Region's border during the DTV transition period.
- Descriptions of the region's applicable interoperability plans and interoperability requirements[3]
- Bylaws
- Spectrum Utilization agreements with other regions
- Description of the pre-coordination allocation method used at the region's borders.
- An overview of the "700 MHz Public Safety Frequency Coordination Database" and application flowchart

6. UTILIZATION OF INTEROPERABILITY CHANNELS[4,5]

[PLEASE NOTE: This section is updated as I/O sub-committee changes verbiage of IO-0062. Current verbiage is per IO-0062D020010118.]

The narrowband voice & data interoperability channels (sixty-four at 6.25 kHz bandwidth) are defined on a nationwide basis. Appendix A shows the designation of these channels as defined by the 700 MHz National Coordination Committee (NCC). Since they are nationwide channels, each channel must have the same usage within each region and across regional borders. They have been sub-divided into different service categories.

The current proposal, adopted by the NCC, is to use the ANSI/TIA 102 Standards (i.e., Project 25 digital protocols) as the Digital Interoperability Standard for the conventional-only mode of operation on the narrowband voice & data interoperability channels. [6]

3 Ibid.

4 Ibid.

5 The FCC adopted many, but not all, the NCC's recommendations for the I/O channels and incorporated those recommendations into the 700 MHz rules. The FCC encouraged States (or RPCs) to follow the NCC recommendations that were not included in Part 90.

6 Voice and Data Interoperability standards were decided in the 4th R&O ini 96-86 and can be found in Part 90 of the Code of Federal Regulations (CFR). Voice I/O standard documents are listed in 90.548(a)(i); data I/O standard documents are listed in 90.548(a)(ii).

There are 2 Calling channel sets and 30 Tactical channel sets. Channel Sets are comprised of two 6.25 kHz channels each.

The Tactical channel sets are subdivided into the following recommended categories: [7]

4	for Emergency Medical Services,
4	for Fire Services,
4	for Law Enforcement Services,
2	for Mobile Repeater operation,
2	for Other Public Services, and
12	for General Services.
2	for Data

Calling Channels

Because the 700 MHz band will be initially encumbered by broadcast television, two of the interoperability channels sets are reserved as "Calling Channels".[8] The State (or RPC)[9] must define when and where the two calling channels are to be used. These calling channels, which appear in the Table of Interoperability Channels (Appendix A) as "7CALL A" and "7CALLB"[10] must be monitored, as appropriate, by licensees who employ interoperability infrastructure in the associated channel group .[11] When calling channels are integrated into infrastructure, their coverage must at least match the coverage of the other interoperability channels in the system. In addition to the usual calling channel functions, the calling channels may to be used to notify users when a priority is declared on one or more of the tactical interoperability channels

Tactical Channels

All Interoperability channels, except as described below, shall be used for conventional-only operation. Normally, users will 'call' a dispatch center on one of the "Calling Channels" and be assigned an available tactical channel. Deployable narrowband operations (voice, data, trunking) shall be afforded access to the same pool of channels used for similar fixed infrastructure operations. In the event of conflict between multiple activities, prioritized use shall occur.

7 In the 4th R&O, the Commission declined to adopt the NCC's recommended channel designations into the rules. The categories listed above were recommended by the Interoperability Subcommittee (IOSC) . The Implementation Subcommittee supports the IOSC's recommendations.

8 The 764-776 and 794-806 MHz spectrum was re-allocated from television broadcasting (channels 63, 64, 68, & 69) to Public Safety. Until incumbent broadcasters move out of this spectrum, Public Safety may be blocked from implementing systems. Therefore, two channel groups have been established, 63 paired with 68 and 64 paired with 69. Anticipating that one of these channel groups may become available prior to the other, two Calling Channels were defined, one in each channel group.

9 See Footnote 1.

10 The 700 MHz calling channels are listed in 90.531(b)(1)(ii)

11 In the 4th R&O, the FCC declined to mandate monitoring or other administrative requirements for the I/O channels. Instead, the State (or RPC) is tasked with addressing those issues.

Encryption

Use of encryption is prohibited on Calling channels and permitted on all other interoperability channels. A standardized encryption algorithm for use on the interoperability channels must be TIA/EIA IS AAAAA Project 25 DES encryption protocol. [12]

Deployable Systems

General Public Safety Services Channels labeled 7TAC01 through 7TAC07, 7TAC15 through 7TAC21, or both, shall be made available for "deployable" equipment used during disasters and other emergency events that place a heavy, unplanned burden upon in-place radio systems. States (or Regional Planning Committees)[13] shall consider the need for both "deployable trunked" and "deployable conventional" systems and make those channels available to all entities in their State/region.

Trunking on the Interoperability Channels

Trunking the Interoperability channels on a secondary basis shall be limited to operation on eight specific 12.5 kHz channel sets, divided into two subsets of four 12.5 kHz channels. One subset is defined by 7TAC01 through 7TAC07 and the other by 7TAC15 through 7TAC21.[14]

Any licensee implementing base station operation in a trunking mode on Interoperability Channels shall provide and maintain on a continuous (24 hr x 7 day) basis at its primary dispatch facility the capability to easily remove one or more of these interoperability channels, up to the maximum number of such trunking channels implemented, from trunking operation when a conventional access priority that is equal to or higher than their current priority is implemented.[15]

While it may be desirable for the States (or Regional Planning Committees)[16] to permit trunked radio systems to incorporate one or more of the Interoperability channels into a single trunking system as a means of enhancing the use of the system for interoperability purposes (and by implication allow those channels to be routinely used for normal day-to-day communications), care must also be given to ensure that those channels do not become such an integral part of the trunked system operation that it becomes politically and technically impossible to extract them from the trunked system in the event of an emergency event having higher priority. For this reason, the Interoperability Subcommittee recommends that States (or Regional Planning Committees)[17] limit the number of Interoperability channels that may be integrated into any single trunked system to the following amounts:

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[12] Prohibition of encryption on the calling channels and the encryption protocol to be used on the other I/O channels was determined in the 4th R&O. Information on encryption may be found in 90.553 of the CFR.

[13] See Footnote 1.

[14] Trunking recommendations adopted in the 4th R&O. A list of the channels that may be used for secondary trunking may be found in 90.531(b)(1)(iii)

[15] In the 4th R&O, the FCC stated it was 'appropriate to require such monitoring' but delegated to the States (or RPCs) the task of determining how monitoring would be accomplished.

[16] See Footnote 1.

[17] Ibid.

For systems having 10 or fewer "general use" voice paths allocated, one (1) trunked Interoperability Channel set is permitted. For systems having more than 10 "general use" voice paths allocated, two (2) trunked Interoperability Channel sets are permitted.

States (or Regional Planning Committees)[18] may consider allotting additional Interoperability Channel set(s) for trunked systems having more than 20 "general use" voice paths allocated upon a showing of need and upon a determination that assignment of the Interoperability Channel set(s) will not adversely impact availability of those channels to other trunked and/or conventional radio systems in the area (e.g. a single consolidated trunked system servicing all public safety agencies in an area might satisfy this criterion). The maximum number of Interoperability channel sets for trunked systems permitted for use by an individual licensee is four.[19]

The channels (two 6.25 kHz pairs) in Reserve Spectrum immediately adjacent to the 7TAC channels where secondary trunking is permitted [(21, 22), (101, 102), etc. are available for secondary trunking, but only in conjunction with the adjacent Interoperability 12.5 kHz channel pair in a trunked system[20] and will be administered by the State (or RPC)[21]. If a State (or Regional Planning Committee)[22] elects to permit 25 kHz trunking on interoperability channels, these Reserve Spectrum guard channels would become part of those trunking channels. In making a decision to allow 25 kHz trunking on these interoperability channels, States (or Regional Planning Committees)[23] must consider the impact on the channels adjacent to these 25 kHz trunking channels. Additionally, the State (or RPC)[24] must consider the impact to the ability of these 25 kHz trunking channels to be immediately reverted to 12.5 kHz conventional interoperability use.

Standard Operating Procedures on the Trunked I/O Channels For I/O Situations Above Level 4

The safety and security of life and property determines appropriate interoperable priorities of access and/or reverting from secondary trunked to conventional operation. In the event secondary trunked access conflicts with conventional access for the same priority, conventional access shall take precedence. Access priority for "mission critical"[25] communications is recommended[26] as follows:[27]

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18 Ibid.
19 See 90.531(b)(1)(iii).
20 In the 4th R&O, the FCC adopted this recommendation. See 90.531(b)(7).
21 See Footnote 1.
22 Ibid.
23 Ibid.
24 Ibid.
25 Mission critical use shall not include nor imply administrative or non-mission critical applications.
26 In the 4th R&O the FCC declined to adopt the NCC's recommended priority access procedures. The state (or RPC) should develop priority access procedures and resolve disputes. The Priority Access procedures recommended by the NCC are presented here as a model for use by the States (or RPCs).
27 These access priorities are taken from the §4.1.21 of the Final Report of the Public Safety Wireless Advisory Committee dated September 11, 1996.

1. Disaster and extreme emergency operations 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.[28]

[Priority 4 is the default priority when no higher priority has been declared.]

For those systems employing I/O channels in the trunked mode, the State (or RPC)[29] must set up interoperability talk groups and priority levels for those talk groups so that it is easy for dispatch to determine whether the trunked I/O conversation in progress has priority over the requested conventional I/O use. States (or RPCs)[30] must also determine whether a wide-area I/O conversation has priority over a local I/O conversation.

Standardized Nomenclature

Standardized nomenclature is recommended nationwide such that all 700 MHz public safety subscriber equipment using an alphanumeric display only be permitted to show the recommended label from the Table in Appendix A when the radio is 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" appended to the end of the label is recommended.[31]

Data Only Use of the I/O Channels

Narrowband data-only interoperability operation on the Interoperability channels on a secondary basis shall be limited to two specific 12.5 kHz channel sets. One set is defined by 7DTAC13 and the other by 7DTAC51. [32]

Wideband Data Standards

Within the 12 MHz of spectrum designated for high capacity, wide bandwidth (50 to 150 kHz) channel usage, there are eighteen 50 kHz (or six 150 kHz) channels designated for wideband interoperability use.

[PLEASE NOTE: The Technology Subcommittee has determined that there is no existing wideband standard that could be recommended for interoperability. The Technology Subcommittee has asked the Telecommunications Industry Association (TIA) to develop a wideband data standard. TIA TR-8 subcommittee is currently working on the development of a wideband data standard.]

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28 This fourth priority would allow shedding traffic long in duration or overloading the non-interoperable system; but is not " two or more different entities" as defined in paragraph 76 of FCC 98-191. Overloading conditions should identify a potential need for expansion of the associated non-interoperable system.

29 See Footnote 1.

30 Ibid.

31 In the 4th R&O, the FCC declined to require labeling nomenclature on radios with alphanumeric labeling. NCC was directed to consider developing an industry standard for display labeling. The NCC's recommendations are offered here as a model for State (or RPC) planning.

32 See 90.548(a)(ii) for data interoperability standard documents.

State Interoperability Executive Committees [33]

State Interoperability Executive Committees should be formed to administer a State Interoperability Plan in each state or territory. These plans should include, but not be limited to, interoperability operations on the 700 MHz interoperability channels. These committees should include an equal number of representatives each providing regional representation from state, county/parish (where applicable), and local governments, with additional representation from special districts and federal agencies, as appropriate. Such committees may represent all disciplines, in which case emergency medical, fire, forestry, general government, law enforcement, and transportation agencies from each level of government shall be represented equally. Alternatively, Committees may represent a single discipline in which case it is only necessary to have membership from the different levels of government previously described.

The state or states within a region or multiple regions should use the Incident Command System (ICS) as a guideline in developing their regional interoperability plans. (See Appendix N) In the event that the state will not accept this responsibility, the RPC shall develop such plans.

The individual States may hold licenses on interoperability channels for all infrastructure and subscriber units within their state. In the event that a State declines to do so, it may delegate this responsibility to the RPC. [34]

The State (or RPC)[35] would have oversight of the administration and technical parameters of the infrastructure for the interoperability channels within their state (or region)[36].

Recommended templates for a *Memorandum of Understanding for Operating the 700 MHz Interoperability Channels* and a *Sharing Agreement* are attached. The MOU shall be typed on appropriate committee letterhead and the Sharing Agreement on agency letterhead.[37] (See Appendices B&C)

Minimum Channel Quantity

The minimum channel quantity for Calling and tactical channel sets requires 8 I/O channel slots in each subscriber unit. Including Direct (simplex) mode on these channel sets, up to 16 slots in each radio will be programmed for I/O purposes. Backbone issues are deferred to the SIECs and/or RPCs.[38] Subscriber units, which routinely roam through more than one jurisdiction up to nationwide travel will require more than the minimum channel quantity.

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33 In the 4th R&O, the FCC determined that administration of the I/O channels should be done at the state level. While it supported the concept of SIECs, the Commission did not mandate that they be formed if a state already had a similar structure in place. See 90.525(a)

34 See 90.525(b)

35 See Footnote 1.

36 Ibid.

37 In the 4th R&O the FCC endorsed but did not require the use of the recommended MOU and Sharing Agreement templates.

38 See Footnote 1

The "CALL"ing channel sets (7CALLA and 7CALLB) shall be implemented in all voice subscriber units in repeat-mode and direct (simplex) mode. "Direct" mode is permitted in the absence of repeat operation or upon prior dispatch center coordination. If the local CALLing channel set is not known, 7CALLA shall be attempted first, then 7CALLB. Attempts shall be made on the repeater mode first then on the direct (simplex) mode.

A minimum set of "TAC"tical channels shall be implemented in every voice subscriber unit in the direct (simplex) mode. Specific channel sets are shown below (SIECs or RPCs[39] will have the option to exceed this minimum requirement.)

- 7TAC11 & 7TAC49 channel sets (previously known an OTAC33 and 63)
- 7TAC09 & 7TAC47 channel sets (previously known as MTAC23 & 53)
- 7TAC29 & 7TAC59 channel sets (previously known as GTAC31 & 61)

NOTE: Selection of the above TAC channels based on revised Table of Interoperability Channels. Channel labels are compromise between 4th R&O and IO-0062D-20010118.

Voice subscriber units subject to multi-jurisdictional or nationwide roaming should have all I/O voice channels, including direct (simplex) mode, programmed for use.

Direct (Simplex) Mode

In direct (simplex) mode, transmitting and receiving on the output (transmit) side of the repeater pair for subscriber unit-to-subscriber unit communications at the scene does not congest the repeater station with unnecessary traffic. However, should someone need the repeater to communicate with the party who is in "direct" mode, the party would hear the repeated message, switch back to the repeater channel, and join the communications. Therefore, operating in direct (simplex) mode shall only be permitted on the repeater output side of the voice I/O channel sets.

Common Channel Access Parameters

Common channel access parameters will provide uniform I/O communications regardless of jurisdiction, system, manufacturer, etc. Thus, the Calling and Tac channels (all of them) should include a common Network Access Code (NAC) as the national standard. The secondary, trunked I/O channels would be excluded in the trunked mode. However, when reverted to conventional I/O, the common NAC would then apply. This national requirement should apply to base stations and subscriber units. This should apply to fixed or temporary operations. This should apply to tactical, vice, or other mutual aide conventional I/O use.

Common channel access parameters for all voice I/O shall utilize the default values (ANSI/TIA/EIA-102,BAAC-2000, approved April 25, 2000) provided in every radio regardless of manufacturer. Any common channel access parameters not provided shall be programmed accordingly. These parameters include the following:

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39 Ibid.

P25 Network Access Code - $293 (default value)
P25 Manufacturers ID - $00 (default value)
P25 Designation ID - $FFFFFF (designates everyone)
P25 Talkgroup ID - $0001 (default value)
P25 Message Indicator $000000...0, out to 24 zeros (unencrypted)
P25 Key ID - $0000 (default value)
P25 Algorithm ID - $80 (unencrypted)

Any deviation from $293 will not be permitted unless the SIEC (or the RPC)[40] can demonstrate in Plan amendment through the FCC-approved process that the intent of $293 will be preserved on ALL conventional voice I/O channels – transmit and receive.

7. ADDITIONAL SPECTRUM SET ASIDE FOR INTEROPERABILITY WITHIN THE REGION

An individual region shall have the ability to assign additional spectrum within that region for Interoperability. The spectrum will only be available for use within that Region. The RPC must designate which channels will be used out of the General Use spectrum, and must update the NIJ database. The RPC shall justify the assignment of this additional spectrum and include operational guidelines as well as user criteria with eligibility requirements. A Region requesting additional Interoperability spectrum must get concurrence from adjoining regions and must include a letter of concurrence from the adjoining regions.

8. ALLOCATION OF GENERAL USE SPECTRUM

This section shall contain a list of requirements and/or limitations including spectrum utilization, agreements with adjacent 700 MHz RPCs, slow growth, pre-coordination, re-assignment, recovery, etc See Guidelines, Item 8 for details.

9. AN EXPLANATION OF HOW NEEDS WERE ASSIGNED PRIORITIES IN AREAS WHERE NOT ALL ELIGIBLES COULD RECEIVE LICENSES.

A methodology shall be adopted to evaluate applicants when there is not enough spectrum to satisfy all requests. See guidelines, Item 9 for a suggested matrix.

10. AN EXPLANATION OF HOW ALL THE REGION ELIGIBLES' NEEDS WERE CONSIDERED, AND TO THE EXTENT POSSIBLE, MET.

Define how and where eligibles submit requests and/or applications for frequencies. When and where public review of applications takes place. Documentation of how the Region applied the matrix developed in Item 9, especially to mutually exclusive applications.

40 See Footnote 1

11. ADJACENT REGION COORDINATION

The RPC shall describe the process by which their plan was coordinated with adjacent regions. The description shall include the method of contact, letters of understanding, agreements, correspondence, and all pertinent documents. If an adjacent region has not yet formed, the Region must use the pre-planning methods outlined in Item 11 of the Guidelines. If this method is used, the Region will be exempt from adjacent region concurrence until such time as the adjacent region forms and develops its own plan.

12. A DETAILED DESCRIPTION OF HOW THE PLAN PUT SPECTRUM TO THE BEST POSSIBLE USE

The plan shall describe the measures taken to ensure that applicants designed their systems to minimize coverage beyond their borders, e.g., only cover their jurisdictions. Applicants should be required to design their systems to maximize spectrum utilization, e.g., utilize simulcast or spectrum efficient technology. The 700 MHz FCC rules require trunking when using 6 or more channels unless the applicant can demonstrate that conventional use of the channels was at least as efficient as trunking. Multiple users within a given political subdivision should be required to use a common system whenever possible.

13. A DETAILED DESCRIPTION OF THE FUTURE PLANNING PROCEDURES

The plan shall include the future planning process, database maintenance and dispute resolution process selected. See Guidelines #13 for details.

14. A CERTIFICATION BY THE REGIONAL PLANNING CHAIRPERSON THAT ALL PLANNING COMMITTEE MEETINGS, INCLUDING SUBCOMMITTEE OR EXECUTIVE COMMITTEE MEETINGS WERE OPEN TO THE PUBLIC.

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

Signed ______________________________

REGION 23 700 MHz PLAN
APPENDIX R - REGIONAL SURVEY DOCUMENT AND MEMBERSHIP APPLICATION

This Appendix Contains

1. A copy of a survey listing any interested party.
2. A copy of the 700 MHz RPC Membership Application

August 3, 2004

Dear Chief:

The terrorist attack on September 11, 2001, sent a clear and convincing message that America is vulnerable to catastrophic man-made events. In Mississippi we struggle with natural catastrophic events in all areas of the state annually. Both types of events demonstrate the need for reliable and functional communications between responding agencies.

Currently emergency response agencies in Mississippi have many radio communication systems that cannot communicate with other agencies. New York City had this problem at the Twin Towers resulting in needless deaths of first responders.

We are desperately in need of modern, effective, reliable, and interoperable communications equipment, not only for state agencies, but local agencies as well. MDOT and other state agencies are urgently researching possible solutions to this problem. Many states have already provided a solution.

Some states are funding the basic infrastructure and local agencies are replacing old worn equipment and systems by using the state's infrastructure, while maintaining management control over that agency's communications. Some states are partnering with local governments on the infrastructure build out. Research is being conducted on a solution, but we know without local involvement the system will not be cost effective.

I know many local agencies have outdated, old, non-repairable equipment and could benefit from a state radio infrastructure. Information is needed to determine what systems are in existence, if agencies are interested in participating and number of units in existence, currently.

I have enclosed a short survey and stamped envelope. Please complete and return the survey as soon as possible. If you share your system with volunteer fire departments, street or road departments, and other agencies, or if each has their own system, please note. These groups would benefit from this system also.

Updates will be furnished to your association, but, contact me if you have any questions. I appreciate your assistance with this survey.

Sincerely yours,

Willie Huff
Director of Enforcement
Mississippi Department of Transportation
601-359-1707
whuff@mdot.state.ms.us

Statewide Communications Network Survey

Agency	County	System Type: H	L	Tr	Other	Plan to Upgrade	State Sytem	Cont Homeland Sec Money	Comments
PD - Aberdeen	Monroe	x				YES	YES	YES	no added comments
PD - Alligator	Bolivar					NO	NO	NO	Radios owned by Bolivar S. O.
PD - Batesville	Panola	x	x			YES	YES	YES	no added comments
PD - Blue Mountain	Tippah	x				NO	YES	NO	no added comments
PD - Booneville	Prentiss	x			*see comments*	NO	YES	NO	Low band compatible
PD - Brookhaven	Lincoln	x				YES	YES	YES	no added comments
PD - Bruce	Calhoun	x				YES	YES	YES	no added comments
PD - Burnsville	Tishomingo	x	x			NO	YES	YES	no added comments
PD - Coahoma	Coahoma	x				NO	YES	YES	no added comments
PD - Coffeeville	Yalobusha	x				NO	YES	YES	no added comments
PD - Collins	Covington	x	x			NO	NO	NO	no added comments
PD - Columbus	Lowndes				*UHF*	YES	YES	YES	UHF
PD - Como	Panola	x	x			YES	YES	YES	no added comments
PD - Corinth	Alcorn	x				YES	YES	YES	no added comments
PD - Crowder	Quitman	x				NO	YES	YES	no added comments
PD - Crystal Springs	Copiah	x	x			YES	YES	YES	no added comments
PD - Derma	Calhoun	x				YES	YES	YES	no added comments

Statewide Communications Network Survey

Agency	County	System Type: H	L	Tr	Other	Plan to Upgrade	State Sytem	Cont Homeland Sec Money	Comments
PD - Farmington	Alcorn	x				YES	YES	YES	no added comments
PD - Florence	Rankin	x	x	800		YES	YES	YES	800 Trunking
PD - Forest	Scott	x				NO	YES	YES	no added comments
PD - Friars Point	Coahoma	x				YES	YES	YES	no added comments
PD - Fulton	Itawamba	x				YES	YES	YES	no added comments
PD - Gautier	Jackson			800		NO	NO	NO	800 Trunking
PD - Greenwood	Leflore	x				YES	YES	YES	no added comments
PD - Guntown	Lee			800		YES	YES	NO	800 Trunking
PD - Hattiesburg	Forrest			800		NO	NO	NO	800 Trunking
PD - Heidelberg	Jasper	x	x			NO	YES	NO	no added comments
PD - Indianola	Sunflower	x				YES	YES	YES	no added comments
PD - Inverness	Sunflower	x	x			YES	YES	YES	no added comments
PD - Iuka	Tishomingo	x				NO	YES	YES	no added comments
PD - Jackson	Hinds			800		YES	YES	NO	800 Trunking
PD - Jumpertown	Prentiss	x	x			YES	NO	NO	no added comments
PD - Kosciusko	Attala	x				NO	YES	YES	no added comments
PD - Louise	Humphreys	x				YES	YES	YES	no added comments
PD - Lucedale	George	x				NO	YES	YES	no added comments

Statewide Communications Network Survey

Agency	County	System Type: H	System Type: L	System Type: Tr	System Type: Other	Plan to Upgrade	State Sytem	Cont Homeland Sec Money	Comments
PD - Lula	Coahoma		x			YES	YES	YES	no added comments
PD - Madison	Madison			800		YES	YES	NO	800 Trunking
PD - Mantachie	Itawamba	x				NO	YES	NO	no added comments
PD - Marietta	Prentiss	x	x			NO	YES	NO	no added comments
PD - Mathiston	Webster/Choctaw	x	x			NO	NO	NO	no added comments
PD - Meadville	Franklin	x	x			YES	YES	NO	no added comments
PD - Mendenhall	Simpson	x	x			NO	YES	YES	no added comments
PD - Meridian	Lauderdale	x				YES	YES	YES	no added comments
PD - Morton	Scott	x				YES	YES	YES	no added comments
PD - Mound Bayou	Bolivar	x	x	800	*decoder sys*	YES	YES	YES	800 Trunking/O= decoder system
PD - Myrtle	Union	x				YES	YES	YES	no added comments
PD - Natchez	Adams				*450 Passport Tr*	NO	NO	NO	Motorola 450 Passport Trunking
PD - New Hebron	Lawrence	x	x			YES	YES	YES	no added comments
PD - Olive Branch	Desoto			800		YES	YES	YES	800 Trunking
PD - Osyka	Pike	x				NO	NO	NO	Dispatch comes from Pike SO
PD - Oxford	Lafayette	x				YES	YES	YES	no added comments
PD - Pearl	Rankin	x		800		NO	YES	NO	800 Trunking

Statewide Communications Network Survey

Agency	County	System Type: H	L	Tr	Other	Plan to Upgrade	State Sytem	Cont Homeland Sec Money	Comments
PD - Petal	Forrest	x				NO	YES	YES	no added comments
PD - Philadelphia	Neshoba	x				YES	YES	YES	no added comments
PD - Pontotoc	Pontotoc				*ultra high band*	NO	YES	YES	Ultra High Band
PD - Poplarville	Pearl River	x	x			YES	YES	YES	no added comments
PD - Port Gibson	Claiborne	x	x			YES	YES	YES	no added comments
PD - Prentiss	Jefferson Davis	x	x			NO	YES	YES	no added comments
PD - Purvis	Lamar			800		NO	YES	YES	800 Trunking
PD - Quitman	Clarke	x				NO	YES	YES	no added comments
PD - Raleigh	Smith	x	x			NO	YES	YES	no added comments
PD - Raymond	Hinds			800	*see comments*	NO	YES	YES	800 Tr/Nextel cell & walkie
PD - Richland	Rankin			800		YES	YES	YES	800 Trunking
PD - Ridgeland	Hinds	x				YES	YES	YES	no added comments
PD - Ripley	Tippah	x				NO	YES	NO	no added comments
PD - Saltillo	Lee			800		NO	YES	YES	800 Trunking
PD - Sardis	Panola	x	x			YES	YES	NO	no added comments
PD - Senatobia	Tate	x	x			NO	YES	YES	no added comments
PD - Shannon	Lee		x	800		NO	YES	YES	800 Trunking

Statewide Communications Network Survey

Agency	County	System Type				Plan to Upgrade	State Sytem	Cont Homeland Sec Money	Comments
		H	L	Tr	Other				
PD - Slate Springs	Calhoun					NO	NO	NO	No PD or FD or comm. equipment
PD - Smithville	Monroe	x				NO	NO	NO	no added comments
PD - Soso	Jones	x				YES	YES	YES	no added comments
PD - Southaven	Desoto			800		YES	YES	YES	800 Trunking
PD - Starkville	Oktibbeha					NO	YES	YES	no added comments
PD - Taylorsville	Smith	x	x		*800 non-Tr*	YES	YES	YES	800 Non-Trunking
PD - Tishomingo	Tishomingo	x				YES	YES	YES	no added comments
PD - Tupelo	Lee	x		800		YES	YES	YES	no added comments
PD - Utica	Hinds			800		NO	YES	YES	800 Trunking
PD - Vaiden	Carroll	x	x			NO	YES	NO	Volunteer PD and FD
PD - Vicksburg	Warren			800		YES	YES	YES	800 Trunking
PD - Water Valley	Yalobusha	x	x			YES	YES	YES	no added comments
PD - Waynesboro	Wayne	x				YES	YES	YES	no added comments
PD - Wesson	Copiah	x	x			NO	NO	NO	no added comments
PD - Wiggins	Stone	x				YES	YES	YES	no added comments
PD - Yazoo City	Yazoo	x				YES	YES	YES	no added comments

Statewide Communications Network Survey

Agency	County	System Type: H	L	Tr	Other	Plan to Upgrade	State Sytem	Cont Homeland Sec Money	Comments

Number of PD's responding: 85

Number of PD's with:

H	*L*	*Tr*	*O*
39	2	18	7

H/L
25

Percentage of PD's that:

Plan to Upgrade	54.1%
Want to share in State System	87.0%
Are willing to commit HS money	71.8%

H = High band
L = Low band
H/L = High & Low bands
Tr = Trunking
O = Other

REGION 23

700 MHz Membership Application

NAME ______________________________

AGENCY ______________________________

ADDRESS ______________________________

____

____

PHONE ______________________________ ______________________________

E-MAIL ____

Your primary responsibilities are ____

____

____

____

Your agency is (please check one)

_____ Government agency/authority

_____ Company that provides public safety or public service to a government agency

_____ Non-public safety or public service agency or organization

Public safety and public service definitions follow:

Public safety – the public's right, exercised through Federal, State or Local government as prescribed by law, to protect and preserve life, property, and natural resources and to serve the public welfare.

Public safety services – those services rendered by or through Federal, State or Local government entities in support of Public Safety duties.

Public safety services provider – governmental and public entities or those non-governmental, private organizations, which are properly authorized by the appropriate governmental authority whose primary mission is providing Public Safety services.

REGION 23 700 MHz PLAN
APPENDIX S - INTERFERENCE INFORMATION

This Appendix Contains

1. The Plan's reference for technical information related to potential interference issues.

NOTE: The Region 23 700 MHz Plan's Appendix "S" may also be identified as "Motorola's Interference Technical Appendix Issue 1.21 (November 2000)"

MOTOROLA'S INTERFERENCE TECHNICAL APPENDIX

1 INTRODUCTION

With the advent of cellular type system deployments in the 800 MHz band and the future 700 MHz band, system operators are faced with having to create highly reliable communications for noise limited systems while interference limited systems are interspersed in the design service area. At this time we are seeing an increasing number of subscriber coverage holes when the radios are in close proximity to high density SMR or cellular base station sites. As more and more radio systems are fielded with varying channel bandwidths and different types of modulation, the prevention, identification and remediation of interference is increasingly important.

•With the newer digital radio systems, interference is often reported as a los of coverage or no coverage in areas where good coverage was predicted.
•With analog radios, the interference often audibly manifests itself, making the identification somewhat easier.
•Interference can be intermittent or constant. Intermittent interference is more difficult to identify and remedy due to its inconsistent appearance.
•Trunking systems make this more difficult as often interference is for a specific channel and that channel may or may not be assigned while the interference mechanism is active. When the trunking system' s control channel is interfered with, system access and Grade of Service on alternate system resources may be affected.
•For data systems, interference from other systems may cause increased loading and response times due to the additional retires, and may affect subscriber roaming.
•The introduction of new radio systems in an existing coverage area may cause a critical point to be reached and suddenly cause degradation of system performance or complete los of coverage in specific areas.

The purpose of this document is to sensitize system designers and maintenance personnel to these issues. First, there is a review of how the history of various band plans and hardware changes have increased the probability of interference. Next, the various mechanisms that can produce interference are defined. Common scenarios are provided to aid in identification of interference. The document closes with recommendations of hardware, procedures and actions that can greatly reduce the probability of interference both initially and in the future.

2 BACKGROUND

2.1 BAND STRUCTURE

In the early days of Land Mobile Radio there was only Low Band (25 - 50 MHz) followed later by High Band (132 - 174 MHz). The use of mobile relay (repeater) operation was quite restricted in low band, and simplex operation was the most common configuration. Simplex operation creates a higher potential for base station to base station interference, even with large physical separation. To prevent this type of interference, many systems went to two- frequency simplex, transmitting on one frequency while receiving on a second frequency. This minimizes the base-to- base interference, but prevents mobile units from being able to monitor the channel for activity prior to transmitting. This requires a highly disciplined system, as a dispatcher is the only one that can relay messages between mobile units. Unfortunately, because the mobile units can't monitor the channel before transmitting, they cause intra system interference when more than one radio at a time contends for the channel.

High band operation had more opportunities for mobile relay operation. Unfortunately the band wasn't developed in a standardized fashion. Over time this resulted in mobile relay operation with some systems using reversed frequency plans relative to the other systems. This mixed with various combinations of " close and wide spaced" mobile relay configurations made frequency coordination and interference prevention a difficult process. In fact, before the introduction of the higher frequency bands, much of the system engineering involved designing sites to accommodate the nearly incompatible frequencies and configurations.

The UHF, 450 - 470 MHz, band was an opportunity to organize the new spectrum and prevent many of the problems systemic to the older bands. However at that time the state of the art for mobile and portable transmitter bandwidth was around 6 MHz So it was decided to organize the band in such a manner that mobile relay systems would be quite common and that mobile radios could switch to the base station transmit frequency and talk directly to another mobile radio in close proximity (talk-around). This allows radios that are out of range of the repeater to still communicate in a simplex mode on the base station talk-out frequency. The protocol was quite simple. The first mobile to transmit would simply switch to the talk-around mode and transmit. The other mobile was already monitoring the correct frequency so the initiating mobile would simply tell the receiving mobile to switch to talk-around. Once accomplished, they could communicate in a simplex mode. No matter what they did, they were always monitoring the base talk-out frequency.

To facilitate this, the band was organized into four 5 MHz blocks with three interfaces between base transmitters and mobile transmitters. Figure 1 shows how the band was organized.

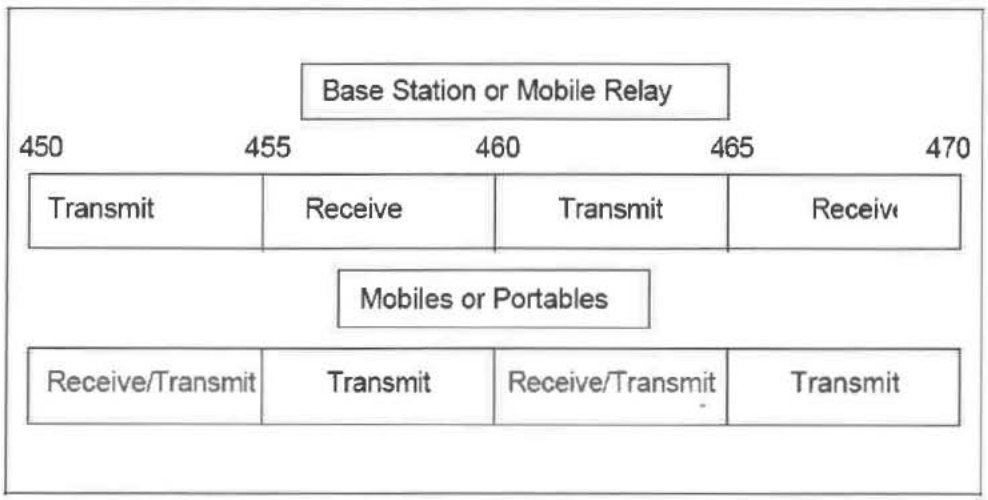


Figure 1450 MHz Band

Later the UHF band was expanded to include sharing with UHF TV channels 14 through 20 (470 MHz - 512 MHz) in the top 13 US markets. Initially, the top ten markets got 2 TV channels each while the next three received a single TV channel. There have been additional allocations for Public Safety in Los Angeles, and some Canadian border issues preclude deployment. Se CFR 47§90.303for specifics. To handle the different blocks of spectrum, each TV channel' s band was divided in half, with land mobile base transmitters on the low half and base receivers on the high half. As a result the transmitter to receiver spacing is only 3 MHz in this portion of the band.

The next band to be allocated was the " take back" of UHF TV channels 70 - 83.This created large amounts of spectrum for private land mobile systems and for the new cellular industry. Once again, lessons from the older bands were incorporated to minimize interference potential. Transmitter/Receiver spacing was standardized at 45 MHz. To minimize the cost of subscriber units, the band was inverted from the 450MHzband with the subscriber units transmitting on the low portion of the band.

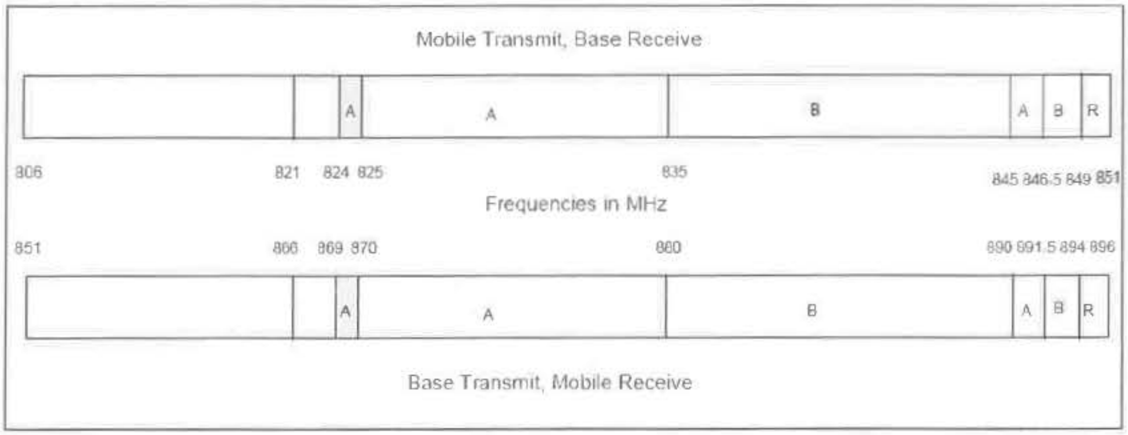


Figure 2 800 MHz Band

For trunked systems, channel assignments were made in blocks of up to five, with a constant 1 MHz separation between channels. This allowed for easy transmitter combining and minimizes some potential intermodulation. The cellular band was immediately adjacent to the land mobile band. Some reserve channels were held and later allocated to public safety and expansion of the cellular frequencies.

Later, around 1988, additional 800 MHz channels were made available exclusively for Public Safety. These new frequencies are often referred to as " 821 MHz" rather than the more accurate but complex name 821-824/866-869 MHz bands. Five interoperable channels were assigned on a national basis. At that time, narrow banding to 12.5 kHz channels was difficult and operability with the existing800MHzchannels was a requirement, so a compromise solution was developed. The channels would be 25 kHz wide, but channel assignments would be granted every 12.5 kHz. Interference would be administratively controlled by a group of Regional Frequency Coordinators. The assumption is that a receiver would provide20 dB ACIPR and this would be considered a requirement by the frequency coordinators, but not by the FCC. Co channel frequency reuse was generally based on a 35 dB C/I, but local regional frequency planning committees policies may alter this requirement slightly. Local planning committee recommendations must be adhered to.

The last block of frequencies allocated to private land mobile is in the 900MHz band. This was the first real narrowband allocation. Channels are 12.5 kHz wide. This creates the potential for " near-far" interference scenarios.

The " near-far" situation has two different scenarios, as shown in Figure 3.

•A unit close (near) to a site on a nearby or adjacent undesired channel interferes with a weak (far) unit talking inbound on the desired channel.

•A unit far from its desired site is interfered with when close (near) to a nearby or adjacent undesired channel base.

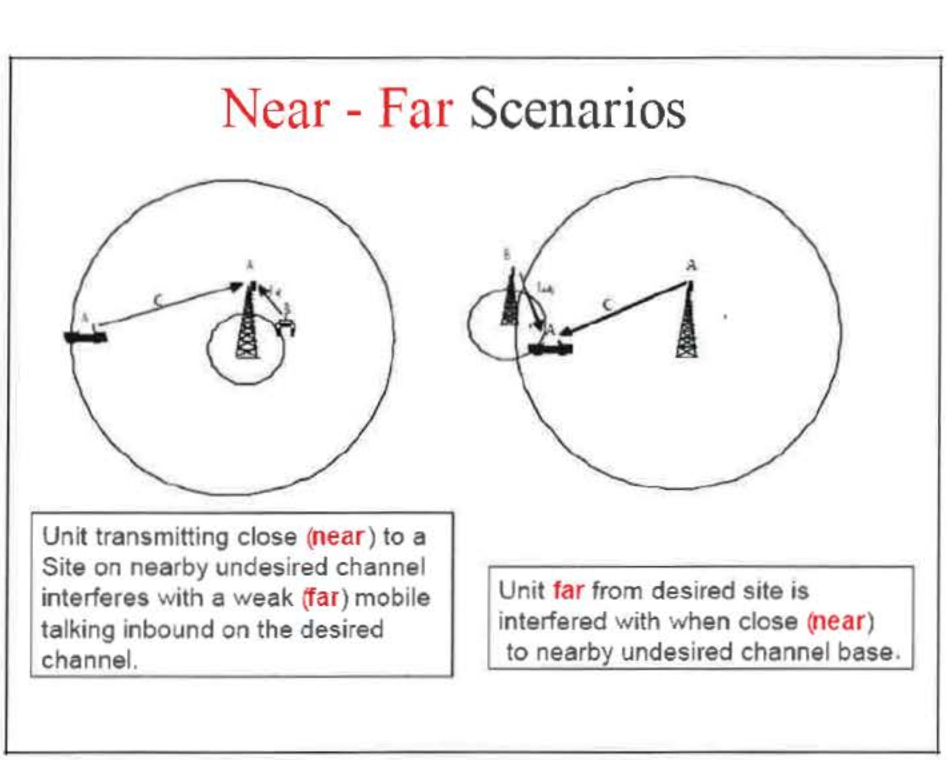


Figure 3 Near - Far Scenarios

To compensate for this possibility, the channels were allocated in blocks of 10 adjacent channels. The concept was that any money spent to be a " good neighbor" should result in improved system performance for the person that spent the money. Thus this assignment policy created the situation where a users adjacent channel assignment belonged to themselves, except for the two end channels of a block.

Channels were assigned with a transmit to receive separation of 39 MHz with the same configuration as 80 MHz, base stations transmit on the high split, and mobiles transmit on the lower split. This minimizes the cost of power transistors for the subscriber units as they operate on the lower frequencies.

2.2 HARDWARE HISTORY

Older radios used crystals or channel elements to derive its transmit and local oscillator frequencies. As a result, if a radio had four-frequency capability, it had to have a total of eight crystals or channel elements to generate the correct frequency sources. This resulted in considerable cost and space being devoted for just the frequency generation. Crystals are a very high Q component, ~50,000, so they generate a very clean response. To stabilize their performance, heated ovens were used to keep the crystals at a constant temperature. This was a considerable current drain, even in mobiles. As greater frequency stability was required the channel element became the preferred solution. A channel element is a crystal with a temperature compensating circuit that has been calibrated for that specific crystal, thereby eliminating the requirement for heating and its current drain .

The channel element eliminated the current drain that was had been necessary to provide the temperature stability. However, they were still large and made radios quite large. The next step was to eliminate some of the channel elements by providing an offset oscillator for the receive frequency. In bands where a constant frequency difference from transmitter to receiver exists, one oscillator can be used for the specific transmit oscillator and offset it in frequency to become that pairs associated receiver local oscillator. When talk-around operation was needed, a second offset oscillator was optionally available. Thus a normal 4-frequency radio would have 4 channel elements and one offset oscillator. When equipped with Wide Space Transmit, it would have 4 channel elements and two offset oscillators. Note that the frequency stability was decreased by the additional frequency error of the offset oscillator. The channel element size limitation allowed receivers to be designed with relatively narrow bandwidths. As a result, helical resonators were commonly used in receiver preselectors. They provided good front-end selectivity, which provided excellent protection from undesired signals. However the next step in providing increased frequency capabilities required more flexibility, which resulted in the replacement of the highly selective front-end with one with a greater bandwidth.

The frequency synthesizer was introduced in the early 1980's. The frequency synthesizer is a lower Q device, and only requires a single channel element at its fundamental frequency. The instructions for the synthesizer to be able to generate the appropriate frequencies are stored in a memory module that could be a PROM or code-plug. A frequency synthesizer costs more than separate channel elements until a critical number of channels is reached. Radios were introduced with more memory to hold the additional instructions and user interfaces were developed to allow the users to keep track of what channels they are on.

To be able to use the increased frequency capability, radios had to have increased bandwidth. Transmitters were widened, as were receivers. Some representative values from that era are shown below in Figure 4.

Radio Type	Transmitter BW (MHz)	Receiver BW (MHz)
High Band Mocom 70	1. 2 w/ center tuned[1]	2
UHF Mocom 70	5	1
High Band Syntor	12	2
UHF Syntor	10	2
High Band Syntor X	24	24
800 MHz Syntor X	19	19
High Band MCX100	26/28[2]	4/12[3]
High Band MX300S	6	2
UHF MX300S	12	2

Figure 4 1980 Era Radio Frequency Limitations

1 A special channel element was used to tune at the average frequency of the highest and lowest frequency.

2 Low portion of band / high portion of the band

3 Dual front ends. Two at 4 MHz each, with 12 MHz separation.

3 INTERFERENCE MECHANISMS

There are a large number of different interference mechanisms that can cause a radio to have degraded performance. To properly determine the root cause or predominant mechanism, field measurements are normally required. By the proper introduction of a step attenuator and/or cavity filter in the receiver' s lineup or cavities into the suspect transmitter' s lineup, the effect can be measured and from that the root cause determined.

There are several important reference standards that should be considered in making measurements of interference. They are all published by the TIA/EIA:

1. TIA/EIA-603 " Land Mobile FM or PM Measurement and Performance Standards."
2. TIA/EIA/IS-102.CAAA, " Digital C4FM/CQPSK Transceiver Measurement Methods"
3. TIA/EIA/IS-102.CAAB, " Digital C4FM/CQPSK Transceiver Performance Recommendations."
4. TIA/EIA/TSB-88A, " Wireless Communications Systems – Performance in Noise and Interference-Limited Situations – Recommended Methods for Technology-Independent Modeling, Simulation, and Verification."

The following mechanisms are the most common and will be discussed as well as recommended methods of measurement.

- Receiver Desensitization
  - ACR - Adjacent Channel Rejection Ratio
  - ACCPR - Adjacent Channel Coupled Power Ratio
  - ACIPR - Adjacent Chanel Interference Power Ratio
  - Overload
  - Local Oscillator
    - Sideband Noise
    - Radiation
  - Spurious Responses
- Intermodulation (IM)
  - Receiver
  - Transmitter
  - External
- Transmitter
  - Sideband Noise (adjacent/alternate channels)
  - OOB Emissions (>250% of channel bandwidth)
  - Spurious Emissions (Discrete frequencies)

4 EFFECTIVE RECEIVER SENSITIVITY

Receiver Desensitization occurs when a receiver requires higher signal levels to provide the same performance as when the interference source isn't present. The result is referred to as " Effective Receiver Sensitivity" as it determines what the sensitivity is in the presence of the interference mechanism and compares that to the sensitivity of a receiver when using only a signal generator, eliminating all external sources of interference. The difference between the Effective Sensitivity and the Normal Sensitivity is call Desensitization.

The Effective Receiver Sensitivity method of measurement is shown in Figure 5.

1. Measure and record the reference sensitivity of the receiver. The reference sensitivity is typically 12 dB SINAD for analog receivers or 5% static BER for digital receivers.

2. The receiver under test is connected to an " iso-tee" or directional coupler. Through the isolated leg, a signal generator is connected and the main input leg is terminated in the correct impedance (50&).
3. The receiver' s reference sensitivity is again measured and recorded.
4. The termination is removed and the input port is connected to the normal external antenna system.
5. The signal generator is increased until the reference sensitivity is once again achieved and the value recorded.

The Effective Sensitivity is determined by determining the increase in required signal level to regain the performance provided at the reference sensitivity [Cs/N]. In this case the Cs/N is now Cs/(I+N).

Effective Sensitivity = Direct Reference Sensitivity (Step 1) x $\frac{Sensitivity(Step5)}{Sensitivity(Step3)}$

For example, if the direct reference sensitivity is -119 dBm and the value in steps 3 and 5 are -99 dBm and -80 dBm then the effective sensitivity is -119 dBm + (-80 -(-99)) = -100 dBm, or 19 dB of desensitization.

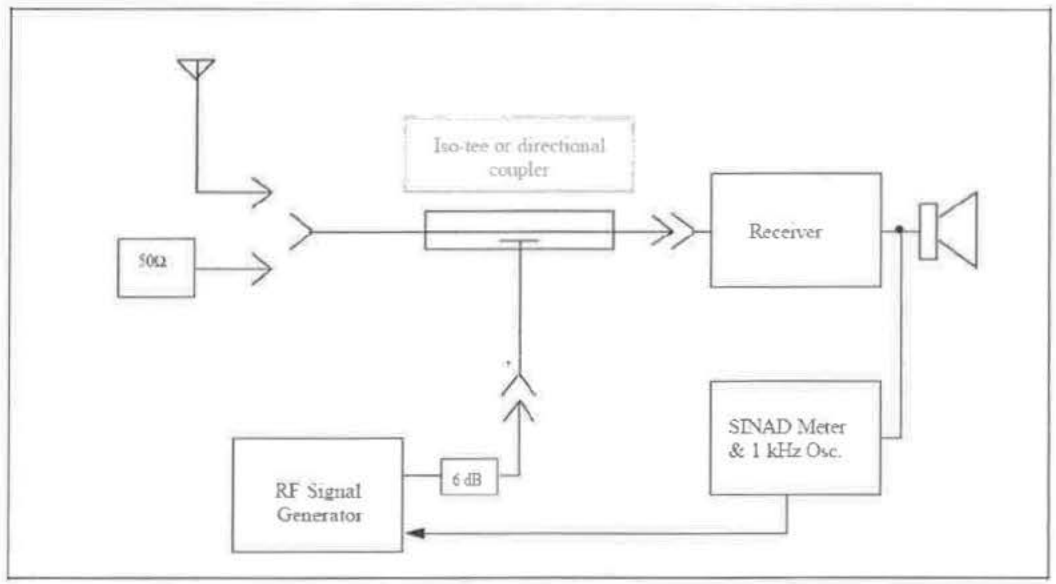


Figure 5 Receiver Desensitization Measurement

4.1 RECEIVER INTERFERENCEMEASUREMENT THEORY

Some receiver specifications are only valid when the desired signal is at reference sensitivity. When the desired is at this weak signal level, the noise floor becomes part of the consideration. As a result, it is commonly measured by injecting a desired signal into a receiver at its reference sensitivity and then boosting the desired signal by 3 dB. The potential interference is introduced and increased in level so that the original reference sensitivity is regained. This is essentially causing the interference to produce the same effect as the thermal noise floor of the receiver. The two noise floors ad up to 3 dB greater than the original noise floor. Then the effect of the interference is equivalent to an on-frequency interferer reduced by the difference between the original reference sensitivity and the level of the interferer.

As will be shown later, when the desired signal is considerably above the reference sensitivity, the 3 dB boost is no longer required.

4.1.1Receiver Overload

When a receiver is exposed to very strong signal levels, enough undesired energy could potentially force its way past the selectivity elements to cause limiters or AGC circuits to be activated. This reduces the available gain for the desired signal resulting in a los of sensitivity. Figure 6 represents a " typical" receiver. It is general enough so it can be used for most of the receiver examples.

In this case a strong signal passes easily through the preselector and is amplified and then down converted in frequency. The Intermediate Frequency Filters reduce the amplitude of the desired signal in addition to filtering the undesired signals. Typically its amplified again and then filtered again. Some receivers have two Local Oscillators. This is not always the case, but for the " typical" case it is included. When two Local Oscillators are being used, there is typically additional filtering at the second IF frequency. In most modern receivers, this filtering is done with Digital Signal Processors (DSP).

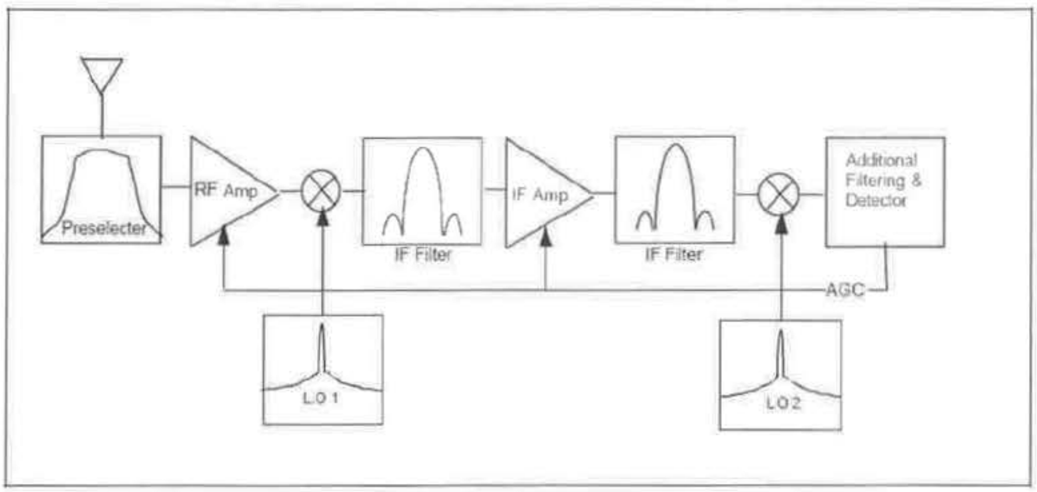


Figure 6 Typical Receiver

5 RECEIVER DESENSITIZATION

Desensitization is the measure of a receiver' s ability to reject signals that are offset from the desired signal's frequency. Desensitization of a desired signal at the reference sensitivity level due to an adjacent channel signal is defined as Adjacent Channel Rejection (ACR)in the TIA-603andIS-102CAAAdocuments. The measurement procedure detailed in the TIA documents for measuring ACR can be used to quantify receiver desensitization at any frequency offset and for higher desired signal levels. [Note that the TIA frequently uses a convention that produces a positive number for specified values. To accomplish this, they use ratios, always placing the largest value in the numerator and then adding an R to the end of the acronym. For example, ACR might be -75 dB, so ACR would be 75 dB.]

There are several factors that may contribute to a receiver' s desensitization characteristic. The receiver IF selectivity may be inadequate to reject strong signals, typically in excess of -50 dBm, on adjacent channels. Historically this has been a major factor determining the receiver's ability to reject strong signals on adjacent channels. With the availability of small and inexpensive ceramic filters and digital signal processing, it is les of an issue with modern equipment.

Receiver local oscillator sideband noise can heterodyne an undesired signal into the IF pas -band by mixing with a single high level signal, typically in excess of -50 dBm, and usually within 500 kHz of the desired signal. This mechanism is often confused with adjacent channel interference, and it is a contributing factor to the receiver's ability to reject strong signals on adjacent channels.

An additional consideration is the spectrum of the interfering signal. If the interfering signal has a broad spectrum, or a high noise floor, the receiver desensitization measurement will indicate poor desensitization performance even for very well designed receivers. As receivers start utilizing very narrow IF bandwidths (12.5 kHz channel bandwidths or less) the effect due to the modulation components becomes more important. Previously receiver ACR measurements only required a single 400 Hz tone at 60% of maximum system deviation. This no longer is considered applicable as it severely under estimates the amount of energy that the victim receiver can intercept from an adjacent channel. Currently the TIA recommendations are undergoing changes that will require that the interfering source be modulated so it simulates the energy distribution under actual operating conditions.

Figure 7 shows sensitivity level desensitization performance for a number of generic radios. Also compared in the figure are the desensitization levels due to the off-channel signal source. One of the sources is a high performance signal generator, modulating a 400 Hz tone at 3 kHz deviation. The other source is an iDEN base radio transmitting iDEN Quad-QAM modulation.

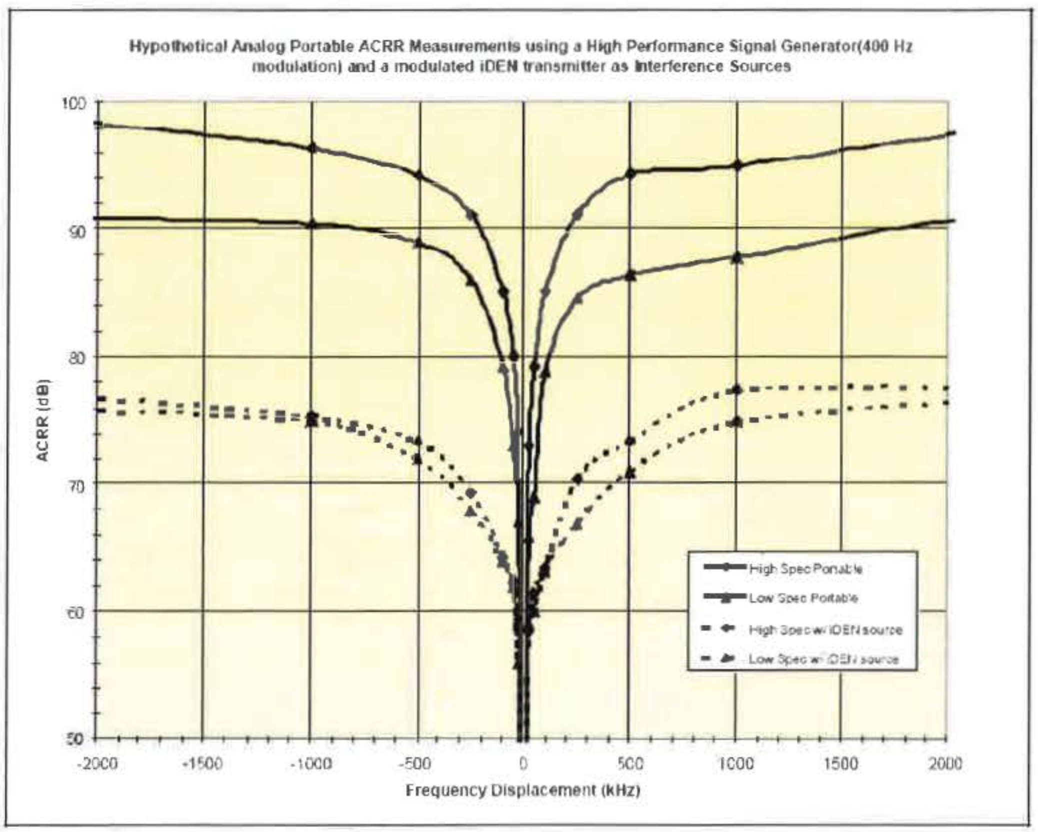


Figure 7 Receiver Desensitization

Figure 7 shows that when a high performance signal generator is used as the interference source, receivers will typically have ε 90 dB rejection of signals that are offset ε 500 kHz from the desired channel. Receivers usually will have better than ε 80 dB rejection for offsets exceeding approximately 50 kHz. When an iDEN base radio is used as the interfering signal source, the ACR desensitization level is approximately 20 dB les than when the high performance signal generator is used. This occurs due to the noise floor characteristic of linear amplifiers. This indicates that high performance receiver designs may not realize improved desensitization performance because the performance is limited by an unfiltered base radio spectrum that contains high OOBE (noise). There is a penalty for noise limited systems in the same or nearby bands where interference limited systems are deployed.

6 RECEIVER BLOCKING

Excessive desired on-channel signal levels can overload the receiver, usually the result of Automatic Gain Control (AGC) design limitations. The receiver front end can be overloaded by a single high level unwanted signal, not on the desired channel, typically in excess of -25dBm, or multiple high-level unwanted signals whose total peak instantaneous power exceeds -25 dBm. This is also known as receiver blocking.

Blocking is measured using a desensitization measurement procedure with progressively higher on-channel signal levels. Figure 8 shows the blocking of a hypothetical portable radio, as a function of frequency offset.

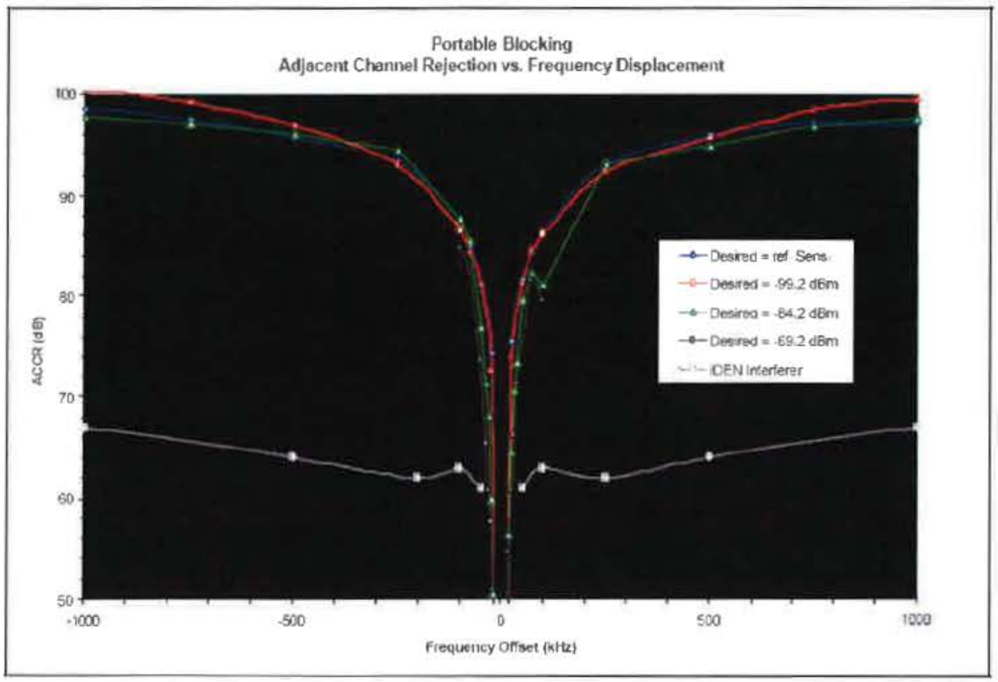


Figure 8 Receiver Blocking

Figure 8 shows that with desired signal levels as high as approximately -70 dBm signal levels, no blocking phenomena occurs. There is a small degradation of the desensitization performance at offsets ε 100 kHz for desired signal levels ofε -85 dBm.

Figure 8 also demonstrates the desensitization performance at sensitivity level due to an iDEN base radio used as the interfering signal. The desensitization limit imposed by the iDEN OOBE is nearly 20 dB worse than that of the hypothetical radio itself at any desired signal level. From this it can be concluded that ***receiver blocking due to high signal levels is not a significant source of interference, at least where the limiting interference source is from the noise contribution of a base radio generating strong OOB emissions.***

7 RECEIVER INTERMODULATION

Receiver front end (RF Amplifier) non-linearity can create intermodulation products on the desired frequency by mixing two or more high level signals, typically ε -50 dBm. Figure 9 shows sensitivity level intermodulation rejection (IMR) for typical receivers, relative to the receiver's reference sensitivity signal level. For practical purposes, IMR is not a function of frequency offset, as the preselector doesn't' t provide additional rejection of potential Intermodulation combinations across the receiver' s desired bandpass. As a result, the IM performance is essentially flat in the desired band. The preselector does provide additional protection from signals outside the pass band. For each additional dB of insertion loss, the IMR products are reduced by the order of the IM product, e.g. 3 dB for 3rd order IM.

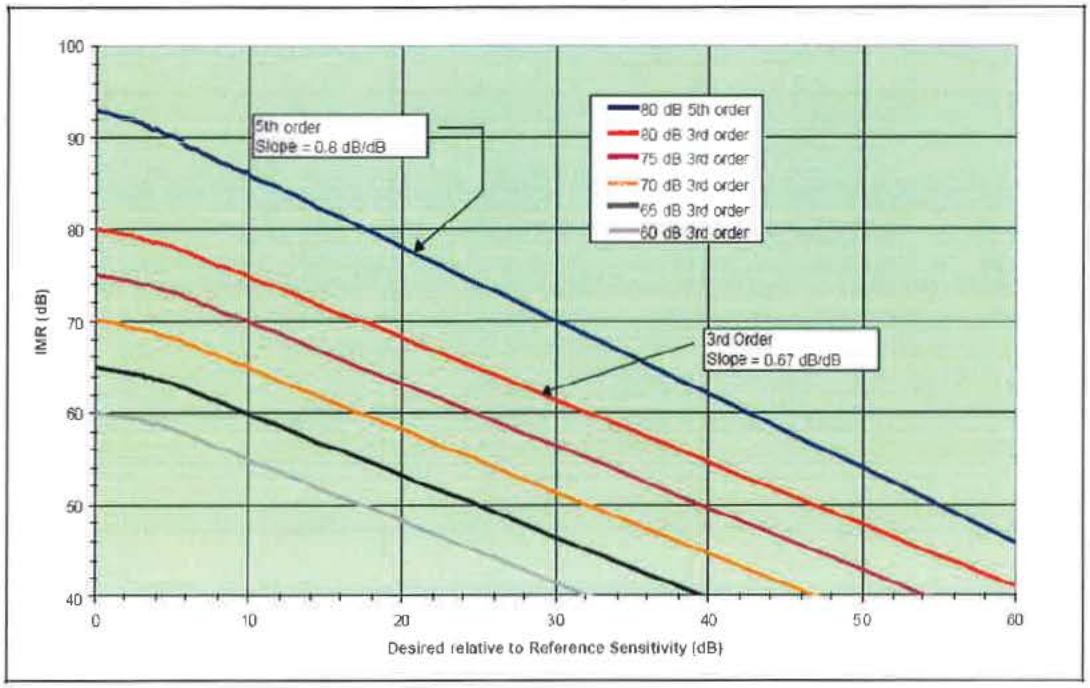


Figure 9 Receiver IM above Reference Sensitivity

While IMR is not a function of frequency offset, it is a function of the level of the desired signal. This is because the signal strength of intermodulation products grows at a rate proportional to the order of the intermodulation product. For example, third order intermodulation products grow 3 dB for every 1 dB increase in signal strengths of the carriers that produce them. Because of this, the IMR is reduced by 2/3 dB for each 1 dB increase in the desired signal level. This effect is shown in Figure 9.

Figure 9 shows that all the products normally follow the 2:3 slope expected for IMR with increasing strength of the desired signal. It is important to note at this point that IMR, as measured using TIA methods, is concerned only with two generator, third order IM processes. Higher order (5th, 7th, 9th, etc., order) processes also exist but are usually of little concern because they usually require much larger interference signal levels than the third order process. Three generator IM processes produce a slightly lower IMR due to the increased power due to the additional signal.

In situations where there is a high concentration of high-powered transmitters with high duty cycles, the higher order IM products can become significant for receivers in close proximity to the site. Figure 9 also shows a 5th order response for an 80 dB (3rd order IMR) receiver. The 5th order IM specification is typically 12 to 15 dB higher than the 3rd order IM specification. Although the 5th order IMR is much higher than the 3rd order IMR, its slope is greater so that 5th order IM can become a problem in situations where there are a large number of carriers. Although not shown, the 1-dB compression point is also very important. The 1-dB compression point exists roughly 10 dB below the IIP_3 and represents where the theoretical slope departs by 1 dB from the linear performance. Signal levels greatly in excess of the 1-dB compression point can cause the amplifier to saturate and eventually burn out.

The use of receiver multicouplers and tower top amplifiers can have a dramatic negative effect on a base station' s receiver IMR performance. This is due to the fact that the IIP_3 is constant. The reserve gain of the amplifiers in the configuration raise both the desired signal and the potential IM signals, resulting in a reduction in the system IMR. Figure 10 demonstrates this.

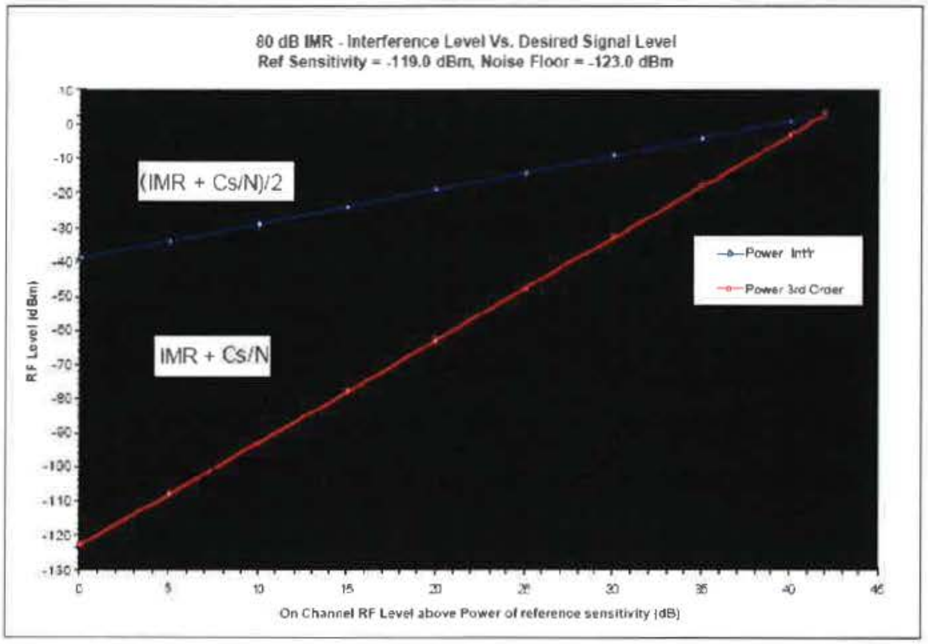


Figure 10 IMR Performance

In Figure 10, the reference sensitivity for 12 dB SINAD is -119 dBm, Cs/N is 4 dB and the IMR is 80 dB. The noise floor calculates to be -123 dBm. The IIP_3 is 1.5*x*(84) or 126 dB above the noise floor (+3 dBm). The individual power level from two equal interferers that produce an IM response on frequency is 42 dB below the IIP_3, -39 dBm.

To review, using the TIA IMR test methodology, consider the previous example. The -119 dBm produces a 4 dB Cs/N that creates the 12 dB SINAD reference sensitivity. The signal is boosted by 3 dB (-116 dBm) and the equal signal level interferers increased until 12 dB SINAD is again reached. This indicates that now a 4 dB Cs/(I+N) has been reached but the desired is now -116 dBm. Thus the composite noise floor is -120 dBm, consisting of -123 dBm from the receiver noise floor and -123 dBm, the equivalent noise from the intermodulating signals. The difference between the original signal (-119 dBm) and the level of the IMR signals (-39 dBm) is the IMR performance of the receiver (80 dB). Note that at higher signal levels, the receiver' s own noise floor becomes insignificant and the ratio is merely the difference between the desired and the IMR signals required producing 12 dB SINAD. This explains why the slope in Figure 9 tends to flat en out in the region where the receiver noise floor is significant.

If the desired signal for the example 80 dB IMR receiver is 20 dB above reference sensitivity, -99 dBm, then the dif erence between the IMR sources and IIP_3 is 102 dB. The level of 2 equal signal IM generating sources 102/3 = 34 dB below the IIP_3. (+3 dBm - 34 dB = -31 dBm). Thus for this example the IMR is now -31 dBm - (-99 dBm) = 68 dB, not 80 dB! In this case the two IMR signals produce an equivalent noise of -102 dBm. The receiver' s own noise floor of -123 dBm is insignificant. What is important to note is that even at -99 dBm, the performance is only equivalent to the static reference sensitivity. This phenomenon supports the recommendation for deploying higher IMR receivers when the victim receiver can be close to the source that can produce IMR.

8 RECEIVER SPURIOUS RESPONSES

Receivers can have spurious responses to strong single signals, typically in excess of -50 dBm, which are on frequencies other than the desired receive frequency. Examples include the 1st IF image response, the 2nd IF image response, and any harmonics of the local oscillator mixing with any harmonics of the undesired signal.

Using the typical receiver in Figure 11, if the IF frequency is 11.7 MHz, and the desired signal is 460.0000 MHz, the Local Oscillator must be either 11.7 MHz above or below to cause an 11.7 MHz signal to be generated in the mixer. If the LO is below by 11.7MHz (448.3MHz)or above (471.7MHz)proper operation can occur. With wider preselectors, the image frequency can easily fall within the pass band of the preselector.To reduce the possibility of this occurring, the IF frequency should be greater than the preselector' s bandwidth. Figure 1 shows how this can occur.

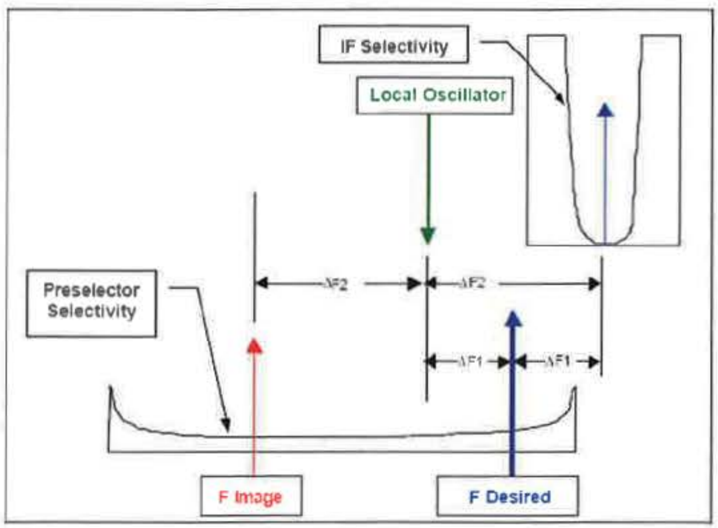


Figure 11 Typical Receiver with a Wide Preselector Pass band

The spurious responses of a receiver can cause significant degradation to the desensitization properties of the receiver, on the order of 20 dB in some cases. In most cases, when the interfering signal is due to a base radio with high OOB Emission, the desensitization performance is dominated by that noise floor rather the spurious responses.

9 DETERMINING THE SOURCE OF INTERFERENCE

9.1TEST EQUIPMENT REQUIRED

1. Spectrum analyzer.
2. Low noise RF amplifier.
3. Step attenuator (pad).
4. Cavity, bandpass filter that has a bandwidth (±3 dB) of at most 300 kHz, an insertion loss of at most 2 dB and that can be tuned to the desired channel.
5. Antenna for the frequency band in question.
6. Subscriber unit that can be connected to a coaxial cable.
7. Motorola Radio Service Software (RSS) , or equivalent, loaded on a suitable PC laptop computer to read receive signal strength; if applicable. This capability may not exist for all radios in which case one must listen to the radio' s speaker and judge the quieting level.

9.2 EVALUATION PROCEDURE FOR INTERFERENCE TO SUBSCRIBER UNITS

The interference evaluation process begins by visiting the affected location, setting up the subscriber unit and connecting the test equipment as shown in Figure 12 below:

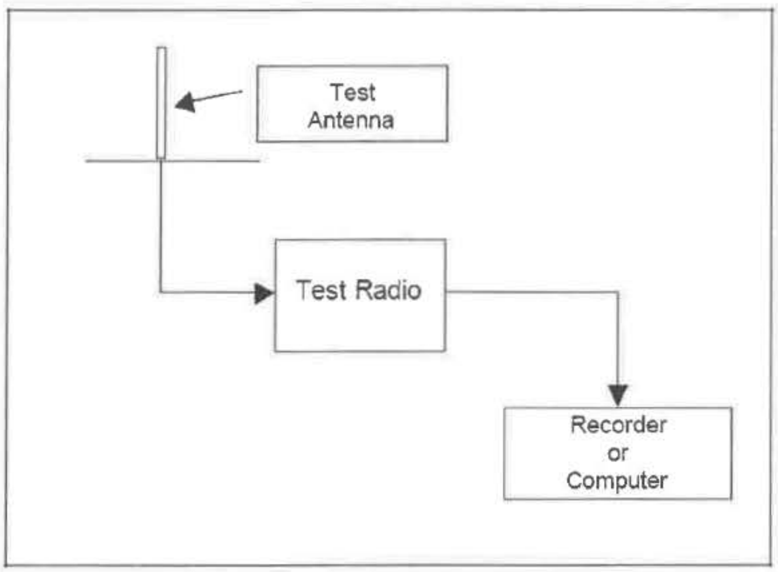


Figure 12Initial Evaluation

Tune analog units to the appropriate RF channel, and observe the recovered audio quality by recording about two minutes of the audio while slowly driving the test vehicle around in at least a 100-foot circle. The audio should have noticeable degradation compared to the normal reception expected in the general area. After the recording has been made, replay it several times to become familiar with the type of audio degradation that is occurring.

If the subscriber unit uses digital modulation, and the Radio Service Software (RSS) package includes a signal quality metric, it may be more appropriate to record the data from that output on a computer for analysis.
Next, connect the spectrum analyzer to the antenna as shown in Figure 13:

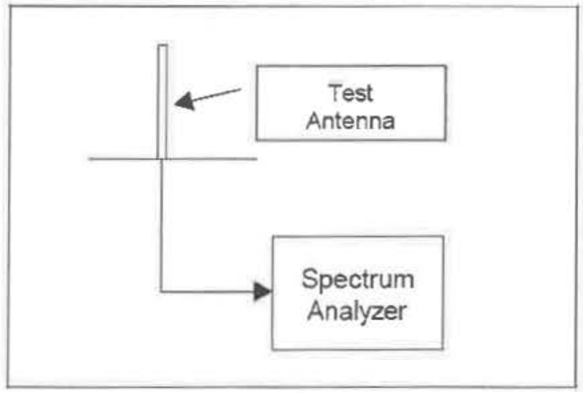


Figure 13Evaluation with Spectrum Analyzer

Record all signals in the frequency bands that are above (stronger than) -50 dBm. Pay particular attention to those above -40 dBm, as they are the most likely to cause problems, particularly if there are several of them within a few MHz of the desired frequency. A rough guideline is to suspect receiver front-end overload if the total instantaneous peak RF power being delivered to the receiver is in excess of -20 dBm.

In order to correctly measure the power of any RF signal with a spectrum analyzer, it is necessary to use a resolution bandwidth in excess of the maximum spectral distribution of RF energy expected. For analog FM signals, this is typically 10 kHz. For narrowband digital modulation formats, this may be up to 30 kHz, and as much as 1.25 MHz for CDMA transmissions. The reason for this is so that the entire signal will be measured at the same time. The best procedure is to adjust the analyzer frequency span range until the desired signal is centered in the display screen and occupies about 20 percent of the width of the display. Then start at a 1 kHz resolution bandwidth and increase it until there is no further increase in the maximum amplitude shown on the display.

Be aware that multiple RF signals of any modulation format will occasionally add in phase, so that four signals each at a level of -25 dBm will have a total peak instantaneous power that is another 12 dB higher, or -13 dBm.

If there are no strong signals, then the cause is either man-made noise, or co-channel interference from another user on the desired frequency. The difference can be resolved by connecting the equipment as shown in Figure 14:

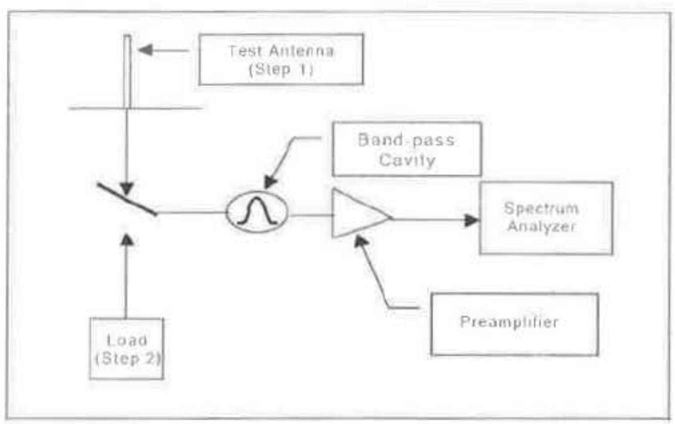


Figure 14RF Noise Measurement Setup

Using a resolution bandwidth no wider than 3 kHz and a frequency span no greater than 3 times the desired RF channel bandwidth, measure the noise present on the channel, then connect a 50 ohm load in place of the antenna. The noise level should decrease less than 1 dB if there is no noise or interference present. If there is a noticeable reduction, note the amount, then reconnect the antenna, and note the spectral content of the noise. If it is not restricted to the desired channel (Figure 15), then it is most likely either from broadband digital services like CDMA systems or from non-RF sources such as power lines, neon signs, ignitions, and the like. If the noise is shaped to fit the channel (Figure 16), or a single frequency carrier appears in the channel, then co-channel interference is the cause.

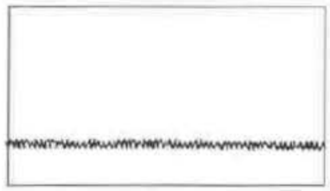


Figure 15 Broadband Noise

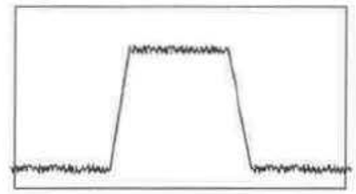


Figure 16Digital Modulation

If there is only one strong signal present, and it is the desired one, then the cause is one of simple receiver overload. The symptoms are a very high desired signal strength, typically in excess of -30 dBm, with some degree of audio distortion. This is rare, but if it occurs, the only solutions are to move the subscriber unit farther away from the transmitter site, place an attenuator in the receiver' s antenna line or reduce the transmit effective radiated power.

If one or more strong signals are present record about two minutes of audio or data on the desired channel using the configuration shown in Figure 17. Listen carefully to the audio recording several times to get familiar with the recovered audio quality.

If the subscriber unit uses digital modulation, compute the average signal strength and signal quality for the entire recording of digital data. Next, add a 5 dB pad in the line between the antenna and the subscriber unit as shown in Figure 17 below:

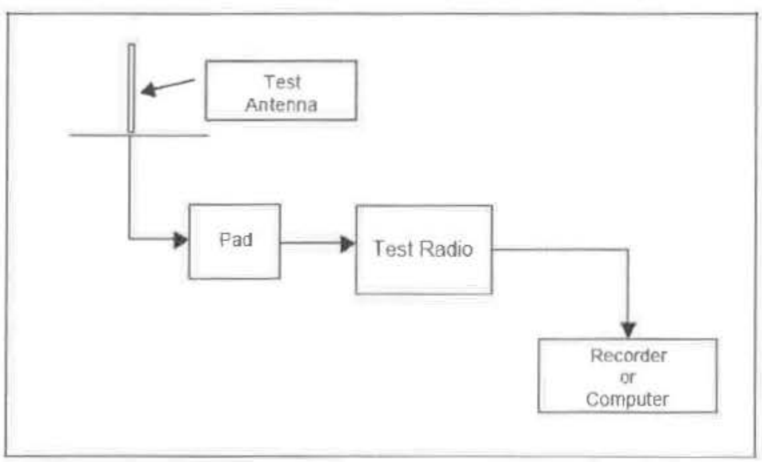


Figure 17 Intermodulation Test

Record another two minutes of audio or data while driving the exact same route as in step 1 and note the differences from the non-attenuated readings. The received signal strength should have been reduced by 5 dB, but if the audio or signal quality ***improved*** noticeably, then the root cause is a high order intermodulation product being generated in the receiver.
Subscriber units using digital modulation will clearly show the reduction in received signal strength while simultaneously indicating the improved signal quality. This type of response usually results from two or more strong signals at the receiver input.

If the received signal strength decreases by 4 dB or less when the 5 dB pad is switched in, the cause is receiver front end overload, resulting from one or more extremely strong signals anywhere in the frequency band. The reason for this is that one of the amplifier stages in the receiver is being driven into saturation by the extremely strong input signals. This effectively reduces the gain of that stage for all signals passing through it. When the strong signals are attenuated by 5 dB, the saturation is reduced, and the effective gain of the amplifier stage increases, so the measured signal strength decreases les than 5 dB. If the audio quality or signal quality remains unchanged when the 5 dB pad is switched in, then the problem is either due to receiver local oscillator noise, or received RF noise from nearby transmitters.

If there are no strong signals closer than 500 kHz away from the desired channel, the cavity filter can resolve whether the receiver is at fault, or the interference is being radiated on frequency from the nearby transmitters. First, connect the external antenna to the analog subscriber unit as shown in Figure 9. Record about two minutes of audio or data on the desired channel. Listen carefully to the audio recording several times to get familiar with the recovered audio quality.

If the subscriber unit uses digital modulation, compute the average signal strength and signal quality for the entire recording of digital data.

Next, connect the antenna through the cavity filter as shown in Figure 18 below:

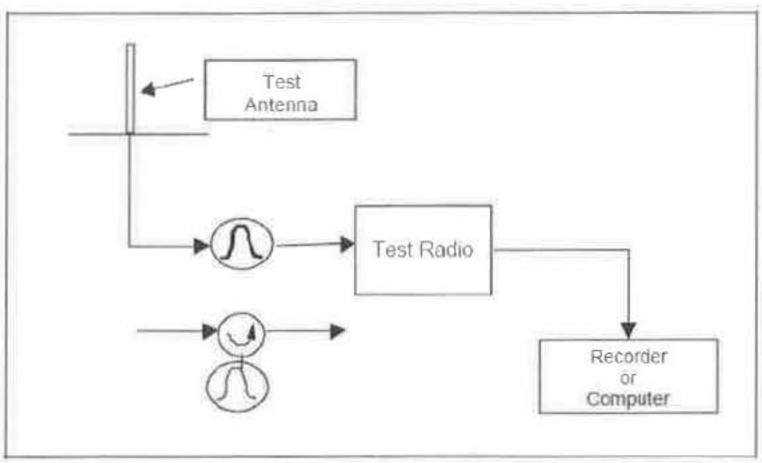


Figure 18 Sideband Noise Determination

Record another two minutes of audio or data on the desired channel. Again listen carefully to the audio recording several times to become familiar with the recovered audio quality. Average the data recorded from digital subscriber units. If the audio quality or average signal quality has improved, the problem is a result of receiver performance limitations. If it remains about the same, the problem is a result of unwanted RF power being radiated on the desired channel.

It is a special case if any strong signals are les than 300 kHz away from the desired channel. If there are, they are under suspicion right away, especially if they are iDEN signals. A high Q notch filter is needed to perform the above procedure instead of a cavity bandpass filter. This can be achieved by using a bandpass cavity and circulator. If the above procedures have determined that the problem lies with nearby transmitters, the usual procedures for identifying the exact one or ones apply: If the transmitters are on continuously, shutting them down one at a time can isolate the offender. As this is unpopular with the system operators, a less intrusive method that can be applied if the transmitters are not continuously keyed is to observe the timing of the interference compared to the activity of the nearby transmitters as observed on the spectrum analyzer display.

10 800 MHz BAND EXAMPLE INTERFERENCE SCENARIOS

In most band plans (except Low Band and High Band) there are transition points where the base transmit block of frequencies are adjacent to the base receive block of frequencies. High band and Low band do not follow this due to their earlier development before mobile relay became the dominant type of system deployment. Across this transition there is the potential for base station T to base station R interference in one direction and mobile T to mobile R in the other direction. Within the blocks there is potential for the classic near/far interference scenarios. This can occur as base – mobile interference or mobile – base interference. Recently the frequency of occurrences in the800 MHz band has become more common, as illustrated in Figure 19.

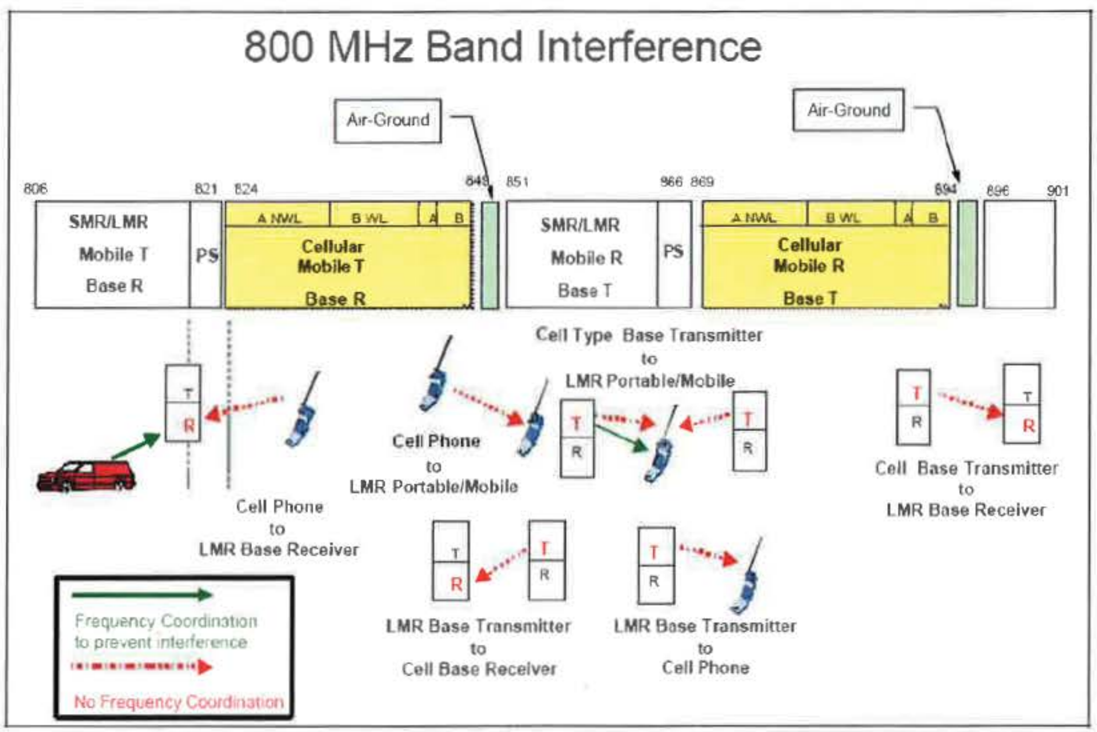


Figure 1 9 800 MHz Band Interference Scenarios

The following examples (Transmitter to Receiver Cases) will be individually diagramed, with a table like Figure 20 to show the factors that can create interference, and methods to minimize or prevent that interference.

The logic of the example groupings is that a number describes the type of interference, e.g. Base to Subscriber, but there are different situations because of band breaks or how the systems are deployed.

1 A) LMR[4] Base to LMR Subscriber
  B) SMR Base to LMR Subscriber
  C) Cellular Carrier Base to Public Safety Subscriber
2 LMR Base to Cellular Phone
3 Cellular Base to 900 MHz Base
4 LMR Base to Cellular Base
5 Cellular Subscriber to LMR Subscriber
6 A) LMR Subscriber to LMR Base
  B) Cellular Subscriber to LMR Base

Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
Duty Cycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			

Victim of interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Possible	Yes	No			

Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Sources Are Physically Close (distance)	Yes	No			

Figure 20 Generic Interference Scenario Table

For each example, only the table sections appropriate for that interference scenario will remain legible. Those not appropriate will be darkened. For understanding the table, the rows contain the important information. The columns are not related to each other, other than representing the specific variables being considered in each raw by remaining unshaded.

4 LMR is Land Mobile Radio

There are two considerations as far as the band is concerned. The cellular band is specifically identified and treated differently than the LMR/SMR band, which includes the exclusive public safety (NPSPAC) portion of the band. For cellular, there are currently three different types of modulations deployed. They include analog, which is referred to as AMPS or NAMPS.AMPS is the original 30 kHz channel bandwidth assignments while NAMPS is a Motorola

narrowband version that limits the channel bandwidth to 10 kHz. The Time Division Multiple Access (TDMA) is the 3:1 - 30 kHz channel bandwidth version. Code Division Multiple Access (CDMA) is the 1.23MegaChip version currently being deployed across markets in the United States. Typically combinations of these modulations can be deployed at any given site. Each cellular carrier selects what they wish to deploy.

In the LMR/SMR band there is currently only analog and some digital, with the digital being principally deployed in the Public Safety band as Project 25 (P-25) systems. However, Nextel has deployed iDEN systems throughout the LMR/SMR band.

Different systems use different transmitter combining techniques. Because LMR systems are narrow band, they typically use Hi-Q cavity combiners, while SMR' s frequently uses broadband hybrid combiners to allow frequent frequency changes without requiring site visits.

The Multiple transmitter indication is there to identify where intermodulation products are the easiest to generate. The duty cycle indicates whether the transmitter(s) are continuous as cellular type deployments require or intermittent as typical of LMR systems use. Note that when a trunking system is involved, the control channel may be continuous while the voice channels are intermittent.

Power Control applies primarily to subscriber units. When power control is available, the subscriber unit limits its output power based on information from the base site. This requires a full duplex path so that the feedback information is constantly updated. For the base station to use power control requires that only a single path be used per base station or that " smart antennas" allow ERP controlled full duplex paths to individual units. This is possible for " interconnect" type calls but isn't possible for dispatch as most of the units are only monitoring the " channel" . The isolation indicated as either High or Low refers to the typical losses involved. There are two different methods used to calculate site isolation. The simplest is to use the port-to-port isolation between the input to one antenna to the output of the other antenna (se the Site Isolation Section 1). The other is to use a propagation model and adjust for the specific antenna gains and propagation losses. The reason for differentiating them is that for the typical scenario being discussed, there is typically between 70 & 75 dB of port-to-port isolation to subscriber units operating in relatively close proximity of the site. Note that the port-to-port isolation eliminates the antenna gains. This makes estimating the effect of OOB emissions much easier. If the OOB emission is -50 dBm, then 70 dB of isolation would produce a -120 dBm interferer at the output of the victim' s antenna. However when base-to-base interference is being analyzed, the paths are typically point to point and the antenna gains and minimal free space losses can dramatically reduce the amount of attenuation experienced by the OOB emission. The recent increased usage of "stealth" sites with very short towers has caused a reduction in the amount of site isolation available.

Antenna types are important due to potential directionality.

The victim receiver flag for IM performance is based on the recommendation that 75 dB IMR be a minimal specification. Portable antennas allow some reduction in this requirement as the loss of efficiency acts like an attenuator to potential IM.

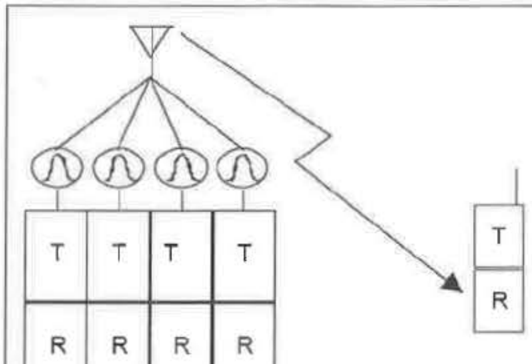
The filtering refers to what can be done at the receiver. Components that are already on frequency cannot be filtered at the victim receiver; they must be filtered at the source. However IM products can be filtered before reaching the active stages of a receiver.

Lastly, the issue of frequency coordination is highlighted. This is an extremely important but not well understood aspect of interference potential. Frequency coordination normally requires that someone (a frequency coordinator) evaluate the use of different candidate frequencies in various defined service areas and then recommends the candidate frequency that doesn't cause interference, or is the best choice from a poor selection. This normally involves evaluating only co-channel usage, but is being expanded to include adjacent channel interference potential. The frequencies are licensed based on the specific site and the ERP being used (referred to as site licensed).SMR' s and cellular carriers have special circumstances where they can use any of their inventory of frequencies anywhere in their defined service area, subject to some co-channel reuse limitations where others may be licensed on the same frequencies. As a result, there is no available database of which and where their frequencies are deployed (referred to as area licensed). This allows them the capability of rapidly changing their frequency plan to allow new sites to be deployed thereby adding capacity. A frequency plan covers a wide area and may be coordinated nationwide. A single change can ripple across the entire system, making exceptions more difficult.

The types of coordination are also listed. In some cases a guard band is provided to take the place of frequency coordination. It is implied that when a different band is used, the requirement for frequency coordination is eliminated. Unfortunately, with the wide band and high OOBE of some of the more complex modulations, this assumption is not longer true. The wide band OOBE is radiated into the adjacent or guard band and must be dealt with to minimize interference potential. Cellular type systems utilize frequency reuse plans. This allows a structured starting point for doing internal frequency coordination. The key point is that they are primarily concerned with their own intra-system interference. This type of frequency planning (interference limited) is based on the fact that when the interference gets strong enough, the system will be able to provide an alternative resource that isn't being interfered with.

The other two references under frequency coordination refer to whether or not the frequencies are close (a small frequency offset) or whether units can get into close physical proximity.

10.1CASE 1A, LMR BASE TO LMR SUBSCRIBER



Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital
Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
Duty Cycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			
Victim of Interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital
Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Possible	Yes	No			
Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Souices Are Physically Close (distance)	Yes	No			

Figure 21 Case 1A LMR Base to LMR Subscriber

This is a very common scenario where a subscriber unit can be very close to a site that generates interference. In this case, the transmitters have Hi-Q cavities to limit the OOBE. The frequency coordination should have eliminated co-channel and adjacent channel interference. If the receiver has an IMR specification of ε75 dB this scenario would normally be interference free. However, it the undesired IM sources are considerably stronger than the desired signal, the IM " Noise" can prevent the required C/(I+N) from being realized.

However there are some situations where intra site interference can occur for users of that site when they are in close proximity. Figure 21 doesn't show the base receive site configuration. If there is low isolation between the base Transmit and base Receive combiners, then when two subscribers in close proximity to the site transmit a temporary lockup scenario can occur.

Consider the simple two-transmitter/receiver configuration shown in Figure 22. When the subscribers are close to the site, they produce strong signals that can enter the transmitter antenna system. Here the difference in frequencies cross modulate at a loose connector producing the necessary products which are re-radiated to keep the receivers satisfied that they are seeing the correct CTCS tone or Trunking Connect Tone. When one subscriber de-keys, the cross modulation generates an on frequency interferer that continues to repeat the weak interferer with the other users audio. It is not until the second subscriber de-keys that the lockup will be released.

This can only be resolved by isolating the Transmit and Receive systems, e.g. by vertical antenna separation, and making sure that there are no extraneous locations for this IM to occur. This can also occur externally on the site, such as on rusted tower bolts, etc. For trunking, the use of transmission trunking forces the repeater to also immediately dekey thereby preventing this phenomenon.

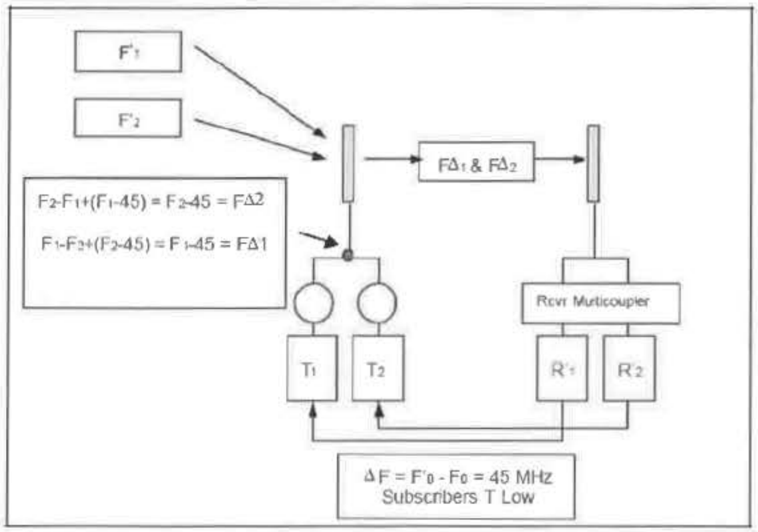
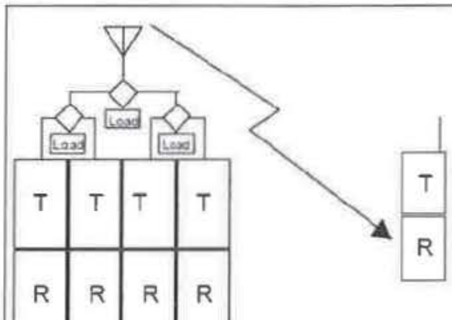


Figure 22 Intermodulation Example

10.2CASE 1B, IDEN SITE TO LMR SUBSCRIBERS

In Case 1B, the interferer is an iDEN site deploying multiple transmitters as shown in Figure 23. This is a high potential interference scenario due to the fact that the transmitters are hybrid combined and therefore only have limited in-band filtering. The carriers are continuously keyed and subscribers can get in close proximity both in frequency and space with no frequency coordination.

The worst case involves combinations of frequencies that cause on-frequency receiver IM products. This is especially detrimental to receivers with low IMR specifications. If there is sufficient desired signal strength, inserting an attenuator in front of the receiver will reduce both the desired and undesired signals but the IM product of the multiple undesired signals will be suppressed more than the desired signal is attenuated. A building acts much as an attenuator. Building attenuation will reduce the desired by a given amount, but it also reduce the IM_3 product by three times the building attenuation, allowing the desired to achieve a usable C/(I+N).



Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
DutyCycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			

Victim of Interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Possible	Yes	No			

Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Sources Are Physically Close (distance)	Yes	No			

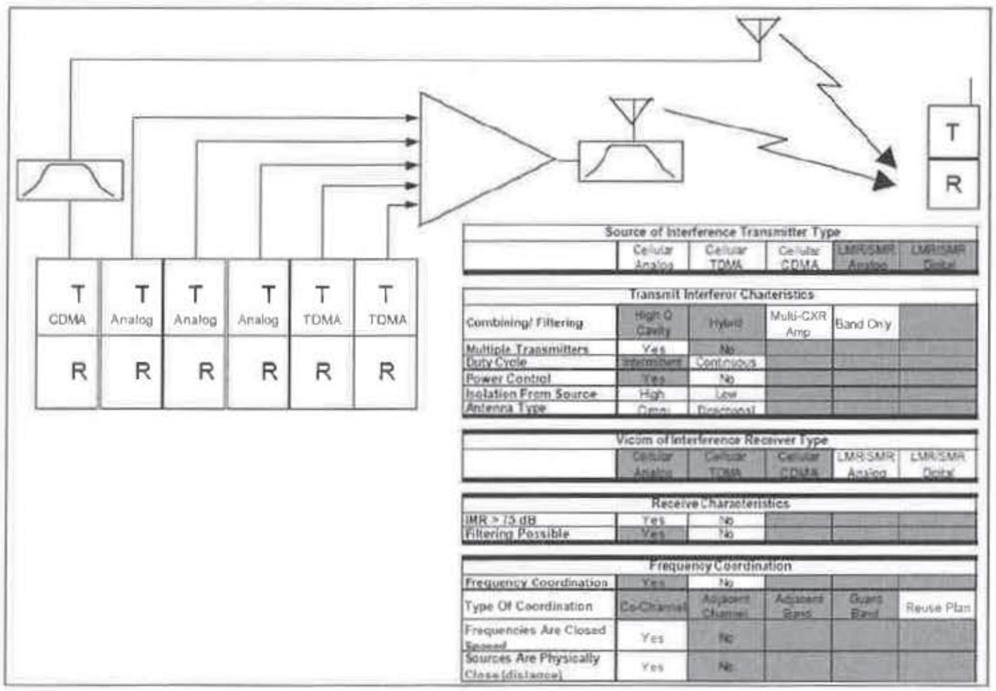
Figure 23 Case 1B, SMR iDEN to LMR Subscriber

The coordination and reassignment of frequencies deployed at a particular site can eliminate the IMR, allowing the situation to be resolved.

10.3 CASE 1C, CELLULAR CARRIER TO PUBLIC SAFETY SUBSCRIBER

Case 1C is similar to the other Case 1 scenarios except that the interference emanates from transmitters in an adjacent band (Figure 24). The symptoms are similar to the other Case 1 scenarios as this produces coverage holes around the offending site. Due to pressures for minimizing antenna sites, many of the cellular carriers are co-locating. This greatly increases the potential for IMR due to the extremely high number of frequencies involved. The interference potential is increasing as cellular abandons analog for the digital transmitters with higher OOBE and eliminates Hi-Q cavities, deploying multi-carrier transmitters with only band filtering.

This scenario is especially destructive with older portables with 65 dB IMR specifications and preselectors that are designed for Inter national in addition to Domestic distribution. That is because the International band for LMR extends 1 MHz into the Domestic cellular band. This situation is further aggravated if the portables utilize vehicular adapter consoles as this eliminates the portable antenna in efficiency and may even have mobile gain antennas. Under these circumstances, 5th order IM becomes commonplace. It is not unreasonable for a 20 channel trunked system that has units that operate within ¼ mile of a combined carrier site to have over 1000 IM products distributed randomly over the various frequencies in the 866 - 869 MHz band. For this case, the highest receiver IM performance is mandatory!



24 Case 1C, Cellular Carrier Base to Public Safety Subscriber

The Case 1 scenarios all have a similar pattern of interference, wherein the interference potential is maximized where the desired signal is weakest while the interferers are the strongest. This is the classic Near/Far problem (discussed earlier in this document). A typical system wide scenario might look something like Figure 25 with the LMR base in the center. In this case, both Base to Mobile and subscriber-to-subscriber interference is portrayed. Only consider the size of the red zones around interfering sites at this time. The green distribution will be discussed later.

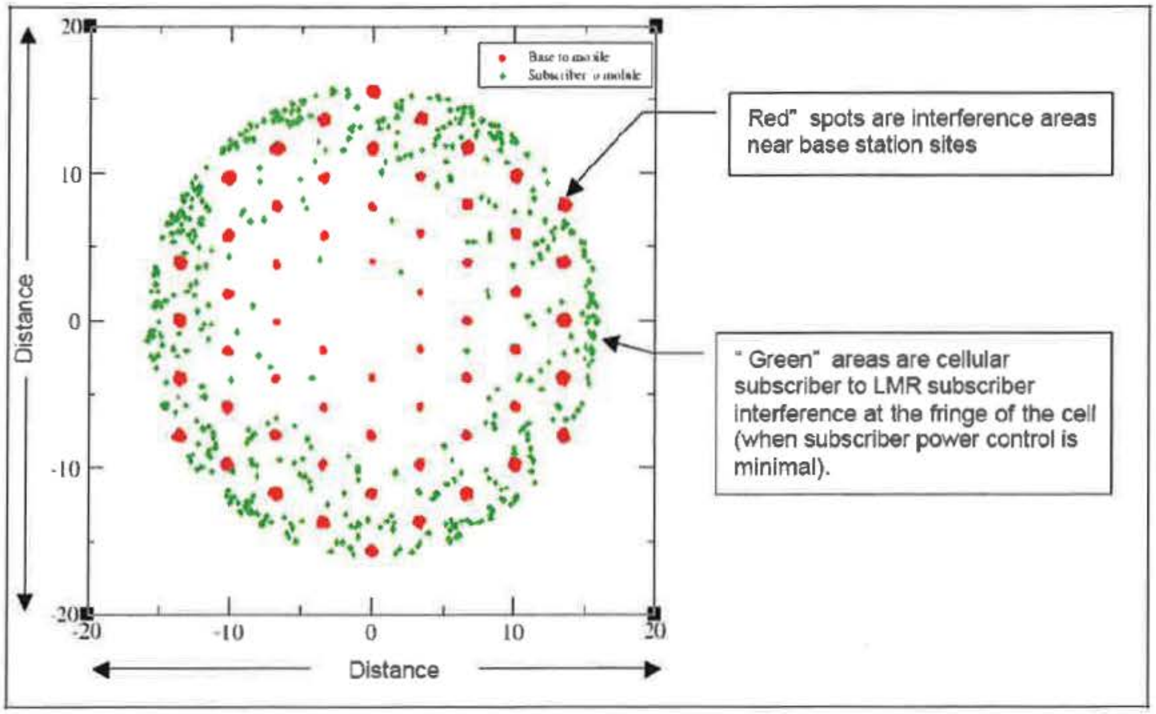
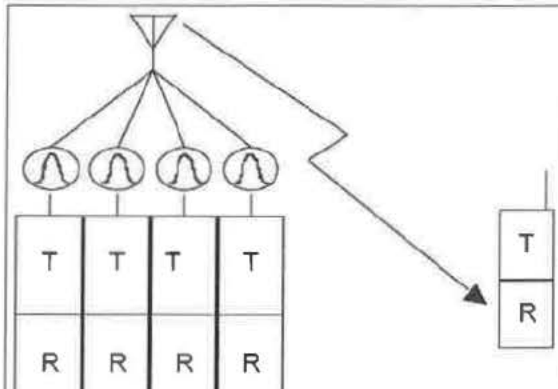


Figure 25 Base to Mobile and Mobile-to-Mobile Interference Pattern

10.4 CASE 2, LMR BASE TO CELLULAR PHONE

Case 2 essentially is the opposite direction from Case 1, where the LMR base station creates coverage holes around its sites for cellular subscribers (Figure 26). Although this case could cause limited interference, it is unlikely due to the fact that the stations are well filtered and the cellular subscribers have alternate sites to be handed over to in case of IMR type interference. Only Public Safety stations operate in the 866 -869 MHz band so their deployment density is quite low compared to the cellular deployment. Also, the LMR transmitters have an internal filter that provides protection above 869 MHz and the HI-Q cavities also limit any OOB emissions.



Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital
Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
Duty Cycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			
Victim of Interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital
Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Possible	Yes	No			
Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Sources Are Physically Close (distance)	Yes	No			

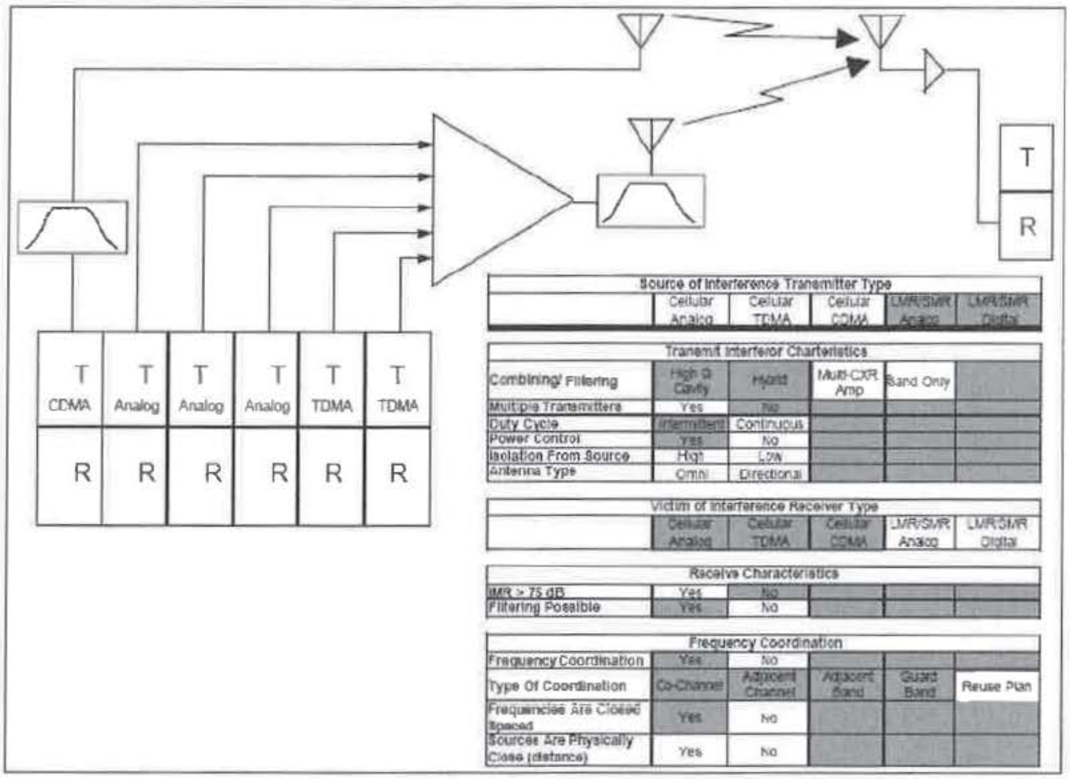
Figure 26 Case 2, LMR Base Station to Cellular Phone

10.5 CASE 3, CELLULAR BASE TO 900 MHZ BASE

Case 3 is the only 90 MHz scenario that will be evaluated (Figure 27). There are several documented cases of this type of interference, primarily caused by the Cellular B carrier. The high OOBE of the various modulations and combinations of modulations along with only band filtering can produce a fairly high noise floor. In this case the noise is amplified by the gain of the transmit antenna and also the receive antenna. Because it is base-to-base interference, the paths often have only free space losses associated with them. At 900 MHz the free space los between dipoles at 1 mile is 91 dB, but this is reduced by as much as 23 dBd of antenna gains. Thus the isolation is les than 70 dB at one mile. However, sites can be closer than one mile and have even stronger interference potential. When CDMA and mixtures of analog or narrow band analog are present, the potential of IM increases. There is potential IM in the cellular antenna structure that would prevent any filtering at the 900 MHz LMR site from being effective. If CDMA is deployed, then there is also the potential of multiple sources of interference being received. When coupled with high performance TTA's (Tower Top Amplifiers)to compensate for low power 900MHz products, the probability of interference is increased.

The configuration shown in Figure 27 is very important. Note that the CDMA is on a separate antenna from the narrow band modulations. If they were combined, the resulting IM of the CDMA with the narrow band carriers can create a very strong and wide noise source. Therefore the combining of wide band and narrow band signals in a linear amplifier is not recommended and should be avoided!

Interference from nearby paging transmitters operating without cavity filtering is also a frequent source of reduced coverage for 900 MHz base receivers. Excess reserve gain in the TTAs on sites with high ambient noise levels will also reduce coverage.



Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
Duty Cycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			

Victim of Interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

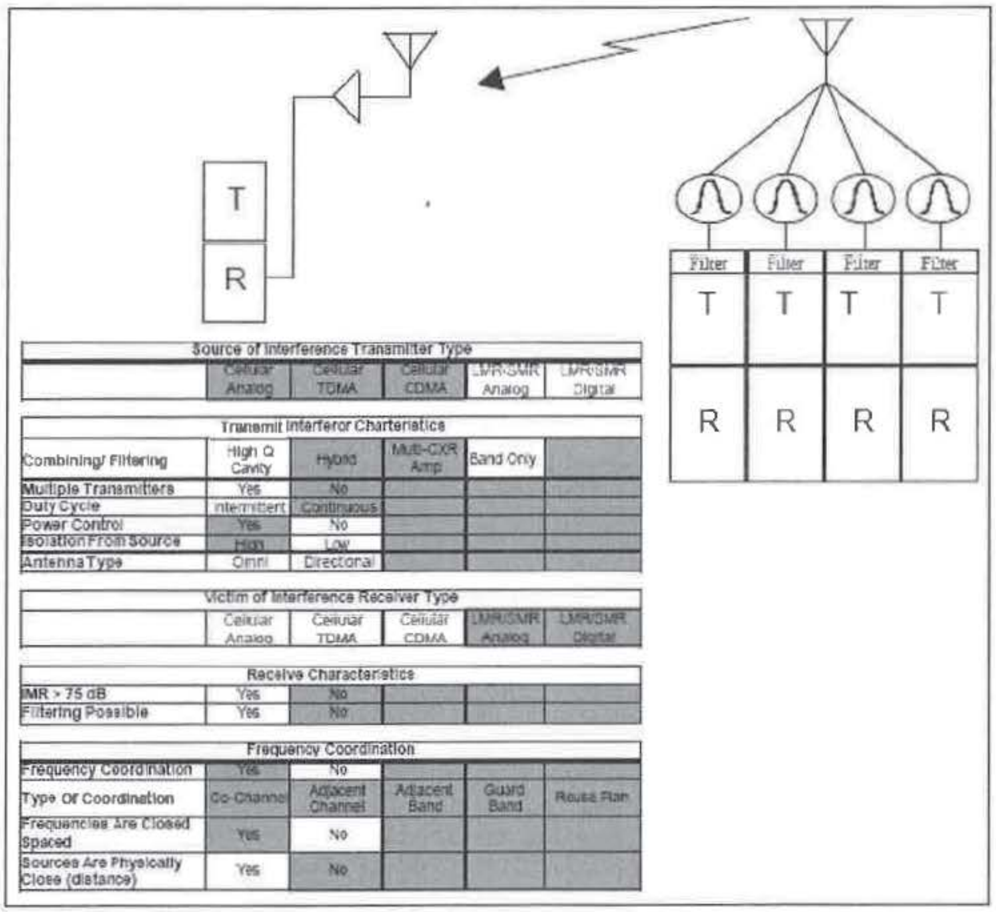
Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Posaible	Yes	No			

Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Sources Are Physically Close (distance)	Yes	No			

Figure 27 Case 3, Cellular Transmitters to 900 MHz Base Receivers

10.6 CASE 4, LMR BASE TO CELLULAR BASE

Case 4 has LMR base stations causing potential interference to Cellular Base station receivers (Figure28). There is little likelihood of this because there is a 2 MHz guard band between the LMR band and the cellular band. Motorola LMR base stations are heavily filtered and provide over 50 dB of suppression at the high end of the base receive band as shown in Figure 29. This coupled with Hi-Q cavity filters should suppress OOB emissions adequately to prevent cellular base stations from being interfered with. Even if they were interfered with, the density of LMR base stations is quite low compared to cellular base stations. The cellular system' s ability to hand over subscribers to other resources make this type of interference even less likely.



Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
Duty Cycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			

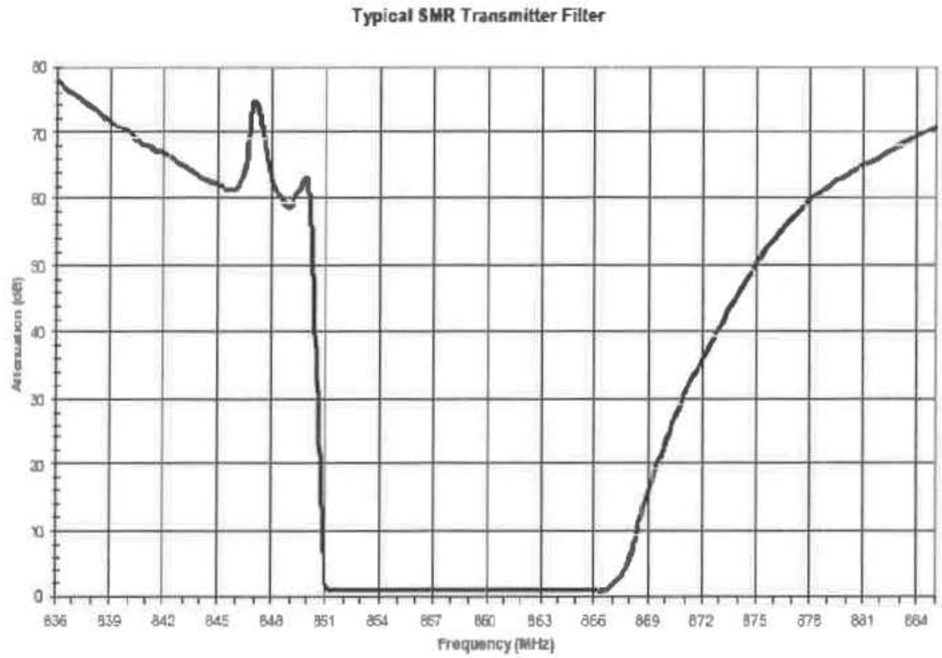
Victim of Interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Possible	Yes	No			

Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Sources Are Physically Close (distance)	Yes	No			

Figure 28 Case 4, LMR Base to Cellular Base

Figure 29 Typical Motorola iDEN Base Station Internal Bandpass Filter



10.7 CASE 5, CELLULAR SUBSCRIBER TO LMR SUBSCRIBER

Case 5 is where Cellular Subscriber units can interfere with LMR subscriber units (Figure 30). There are several mechanisms that need to be discus ed. First there is the direct subscriber-to-subscriber interference. Here the high allowable OOBE of cellular subscriber units can cause localized interference around those units when the cellular units are far from their sites (power control doesn't limit the power output) and the LMR unit is far from its desired signal. Figure 21 shows this as the light green blotches associated with the fringe of the cell sites.

The use of CDMA subscriber units is more worrisome as multiple units can be transmitting simultaneously on the same wideband frequency. Often a large population of cellular users coincident with a major public safety event can occur. Now the large population of subscribers in close proximity both in frequency and distance can increase the potential for interference. In addition, if the public safety event is close to a cellular site and a large population of cellular subscribers occurs, then there is also the opportunity for receiver IM to occur. In a well-documented case in Canada, intermittent interference occurred to the direct mode of fire fighter portables.

Interference Scenario					
Source of Interference					
Interference Source Transmitter Type	Cellular			LMR / SMR	
	Analog	TDMA	CDMA	Analog	Digital
Combining / Filtering	H Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	YES*	NO			
Duty Cycle	Intermittent	Continuous			
Power Control	YES	NO			
Isolation from Source	High	Low			
Antenna Type	Omni	Directional			
Victim					
IMR > 75 dB	YES	NO			
Filtering Possibe	YES	NO			
Frequency Coordination					
Frequency Coordination	YES	NO			
Type of Coordination	Co-Chan	Adj-Chan	Adj-Band	Guard Band	Reuse Plan
Frequencies are close spaced	YES	NO			
Sources are physically close (distance)	YES	NO			

Figure 30 Case 5, Cellular Subscriber to LMR Subscriber

10.8 CASE6, SUBSCRIBER TO LMR BASE

Case 6 involves interference from subscriber units to LMR base receivers (Figures 31 &32). Again this is a classic Near/Far scenario. Receiver voting in the LMR system is the best defense for this type of interference, recognizing that for analog systems strong interference can be misinterpreted as a desired signal. Proper use of sub-audible codes can mitigate the undesired voting potential with the voting offering the decreased likelihood that multiple interfering scenarios occur simultaneously.

Case 6A involves the in-band LMR case. In many systems, TTA' s are used to increase sensitivity for fringe talk-in. However, this also increases the susceptibility to interference. A special case is where the LMR subscriber is a control station. This can produce the example of system cross talk and temporary lockup previously described. The area of maximum impact is a reduction in the base talk-in coverage.

Case 6B is the cellular case. Here subscriber units have power control so they would have minimal impact if the cellular site and LMR sites are co-located.

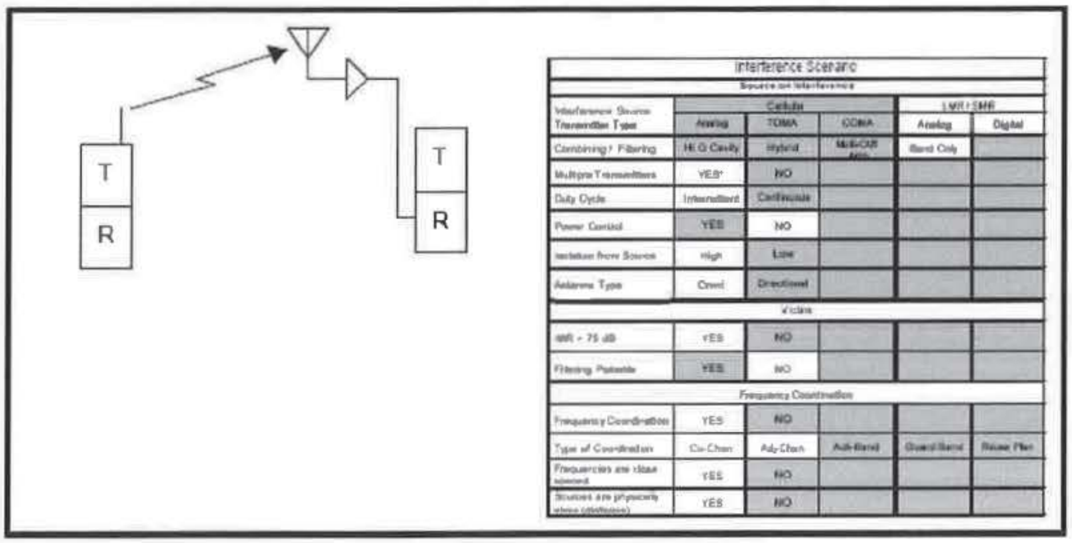
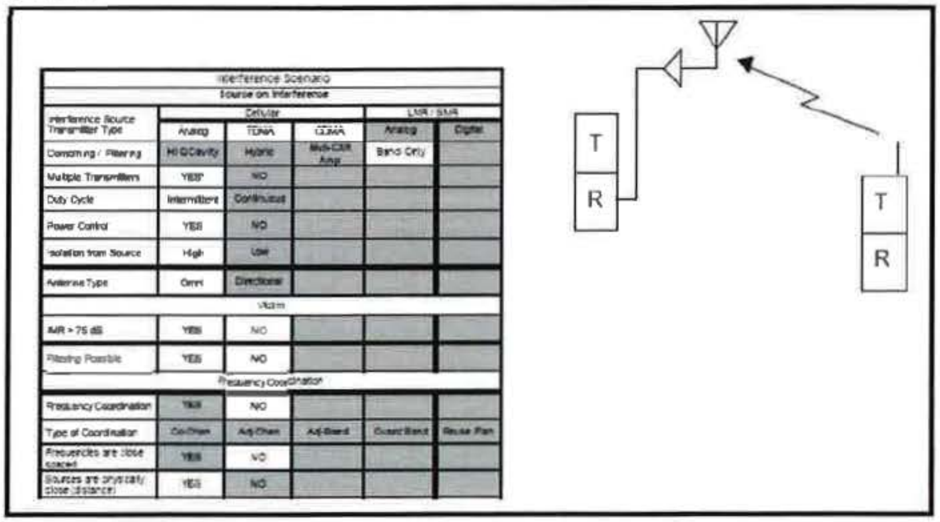


Figure 31 Case 6A, LMR Subscriber to LMR Base

The use of macro diversity (voting) is the best tool for the prevention of this type of interference.

Figure 33 depicts a special case where the cellular system and LMR system are co-located. This essentially minimizes the size of the reduced coverage. If a LMR site were at the junction of three cells, then the potential for multiple interferers transmitting at maximum output power would produce a much worse case. Fixed cellular units, similar to LMR control stations are also a potential problem. In this case the small red diamonds represent the cellular type deployment of sites.



Interference Scenario					
Source on Interference					
Interference Source Transmitter Type	Cellular			LMR / SMR	
	Analog	TDMA	CDMA	Analog	Digital
Combining / Filtering	Hi Q Cavity	Hybrid	Multi-CSR Amp	Band Only	
Multiple Transmitters	YES	NO			
Duty Cycle	Intermittent	Continuous			
Power Control	YES	NO			
Isolation from Source	High	Low			
Antenna Type	Omni	Directional			
Victim					
IMR > 75 dB	YES	NO			
Filtering Possible	YES	NO			
Frequency Coordination					
Frequency Coordination	YES	NO			
Type of Coordination	Co-Chan	Adj-Chan	Adj-Band	Guard Band	Reuse Plan
Frequencies are close spaced	YES	NO			
Sources are physically close (distance)	YES	NO			

Figure 32 Case 6B, Cellular Subscriber to LMR Base

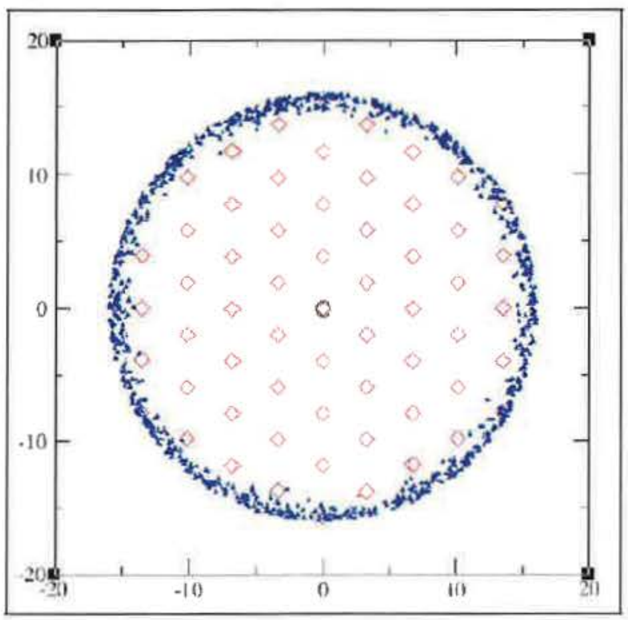


Figure 33 Case Co-Located Cellular System and LMR System

11 SITE ISOLATION

As described earlier, there are two ways of predicting the losses between a base station and a subscriber unit at close distances. The antenna patterns aren't completely formed and in many cases there are little to no obstructions to increase the losses.

Numerous investigations have been made. Dr. Garry Hess reported on this in his books, and numerous measurements have been made while investigating interference cases.

Figures 35, 36 and 37 show the results of measurements made in the Motorola Schaumburg parking lot many years ago. Note that except for the very low antenna case, all the port-to-port isolation measurements produced ≥65 dB of path loss [isolation] for omni directional antennas. The near/far field transition occurs at ~36 feet. This particular pattern is very important as lower antenna heights are being deployed and this lowers the anticipated site isolation by eliminating the additional isolation produced by the transmit antenna pattern.

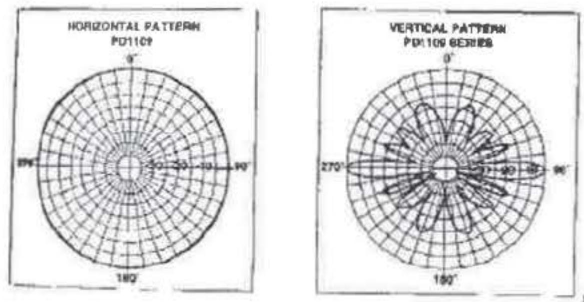


Figure 34 PD 1109 Antenna Pattern.

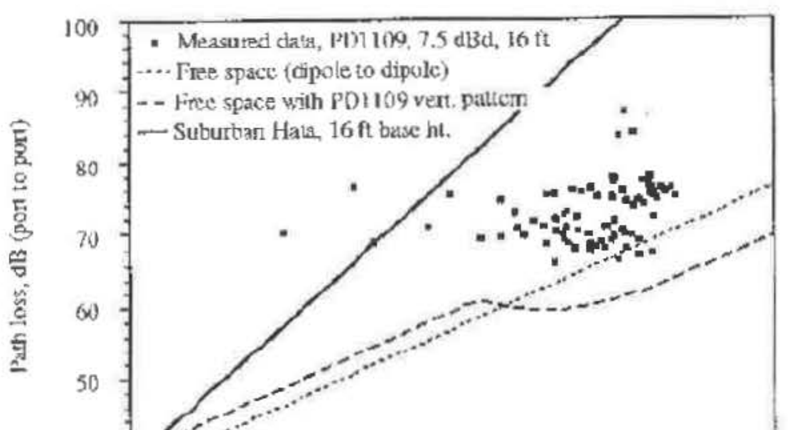


Figure 35 PD 1109 @ 16 Ft above Receive Antenna

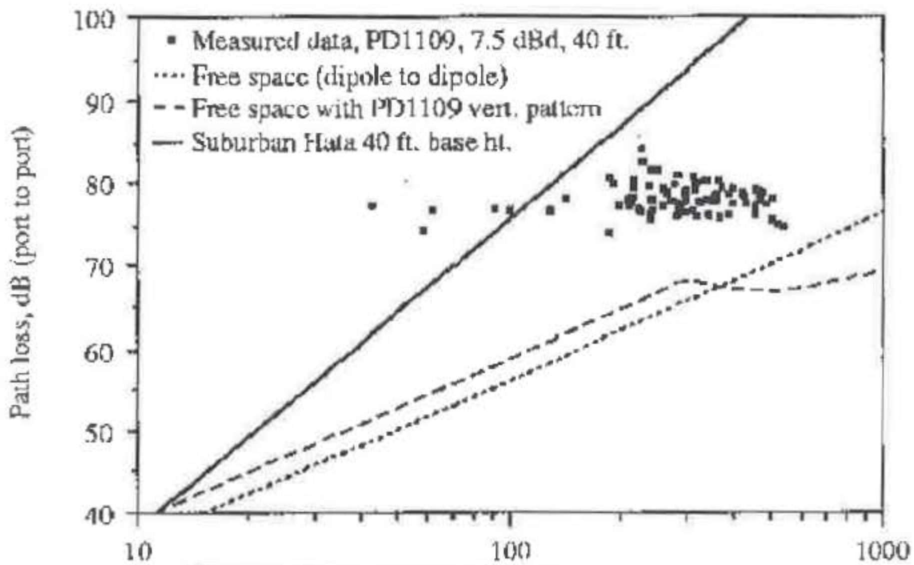


Figure 36 PD 1109 @ 40 Ft Above Receive Antenna

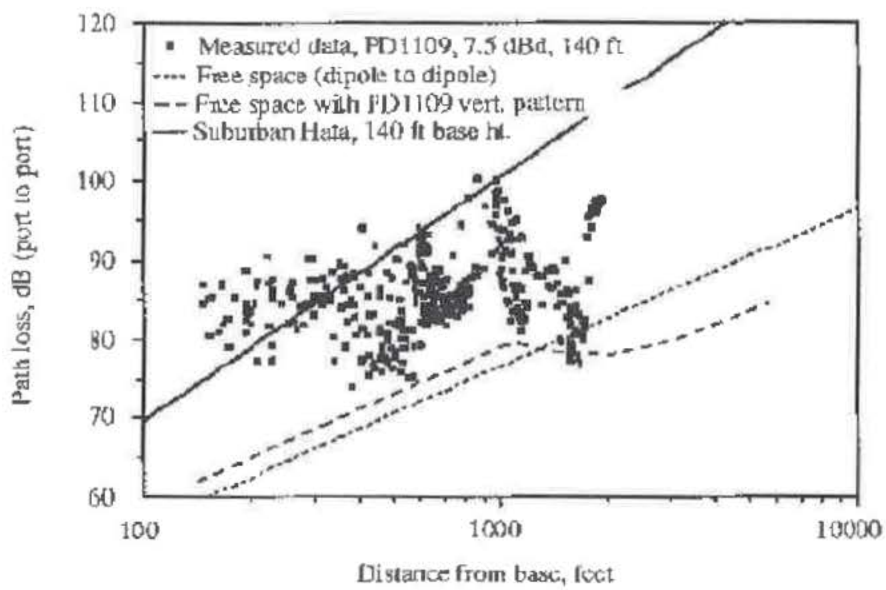


Figure 37 PD 1109 @ 140 Ft Above Receive Antenna

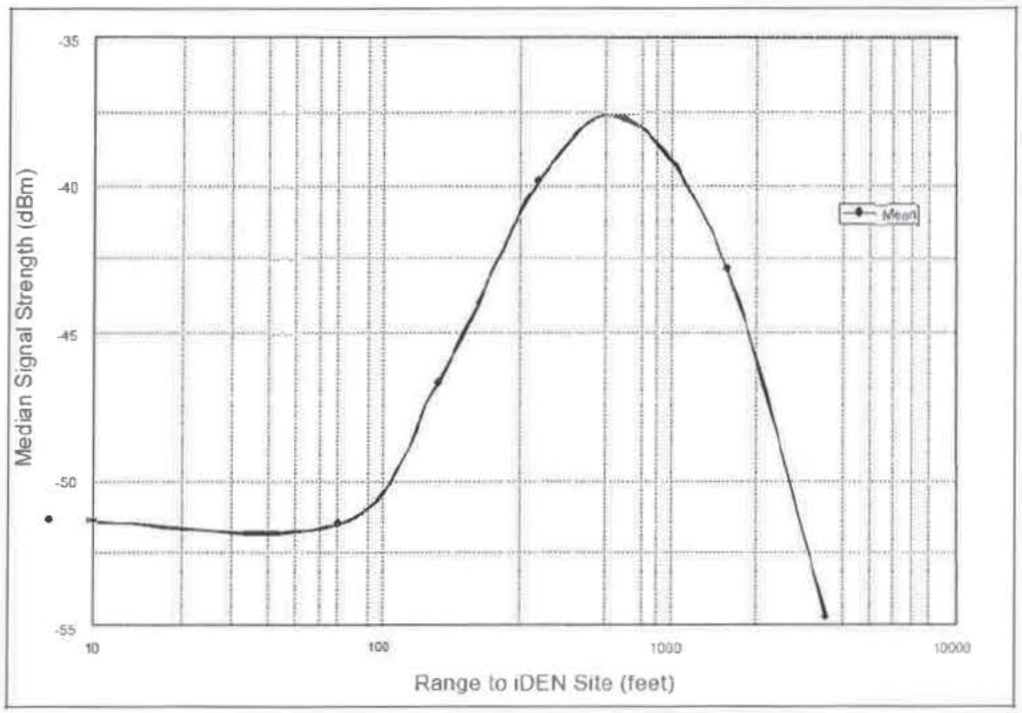


Figure 38 Median Signal Strength Model for Measured iDEN Sites

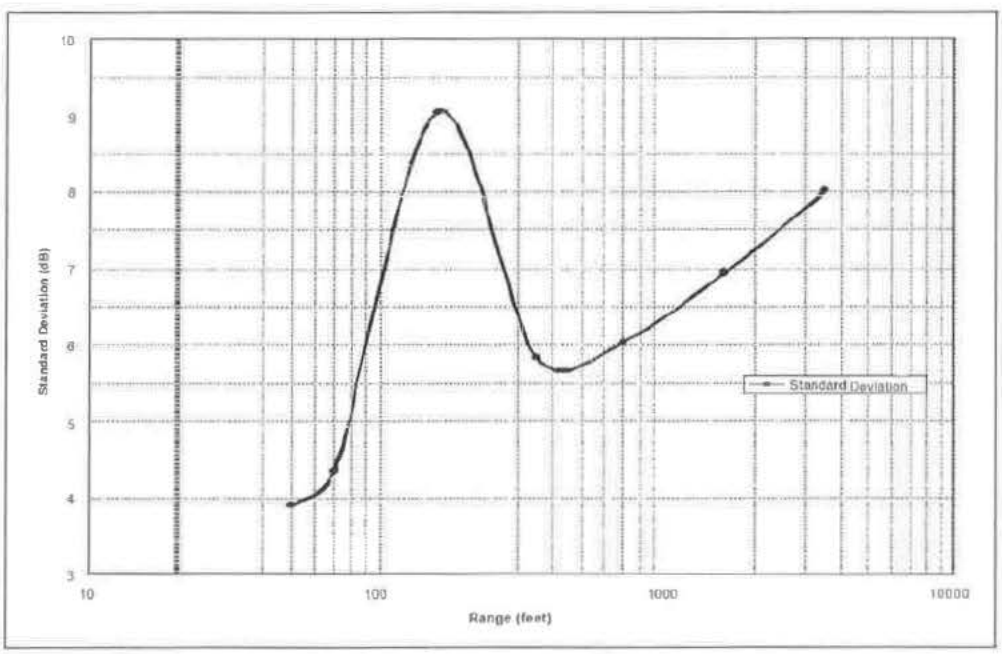


Figure 39 Standard Deviation of Received Power from iDEN Sites vs. Range (measured)

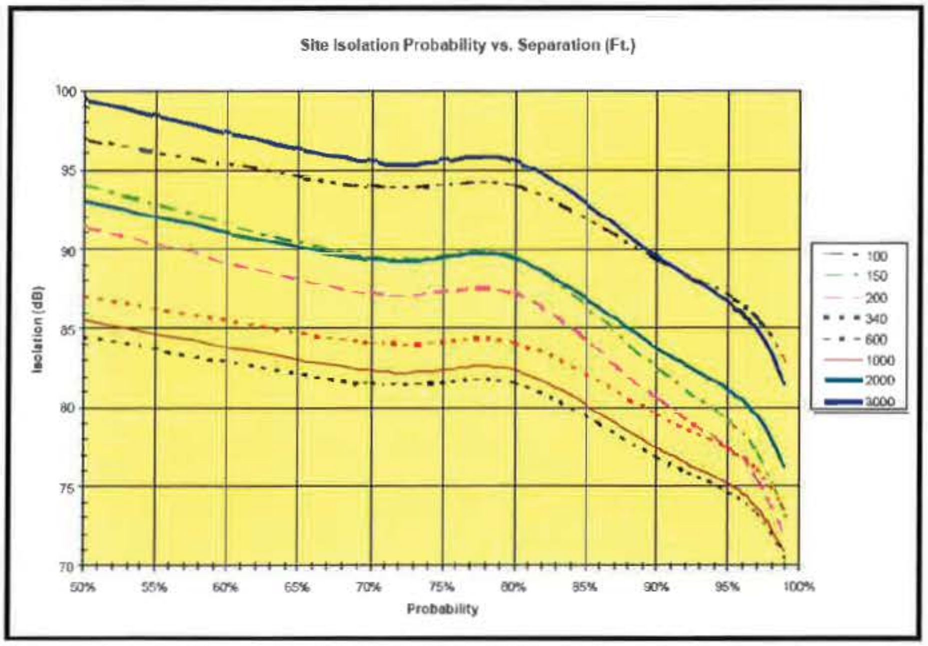


Figure 40 Calculated Probability of Site Isolation

Compare this to a simple spreadsheet model. This allows a coarse look at the port-to-port isolation (Figure 41). The scenario consists of a tower 100 feet tall, a 105 ° sectored antenna with 11.8 dBd gain, and an arbitrary 10 dB of clutter loss. The primary point to note is that the isolation is greater than 75 dB and that the general shape of the graph is quite similar to the standard deviation of field measurements (Figure 39). The standard deviation is highest in the region closest to the base of the tower, as this is where nulling of the antenna side lobes occurs. Since there were many different types of antennas involved in the data, the largest variations occur in this region.

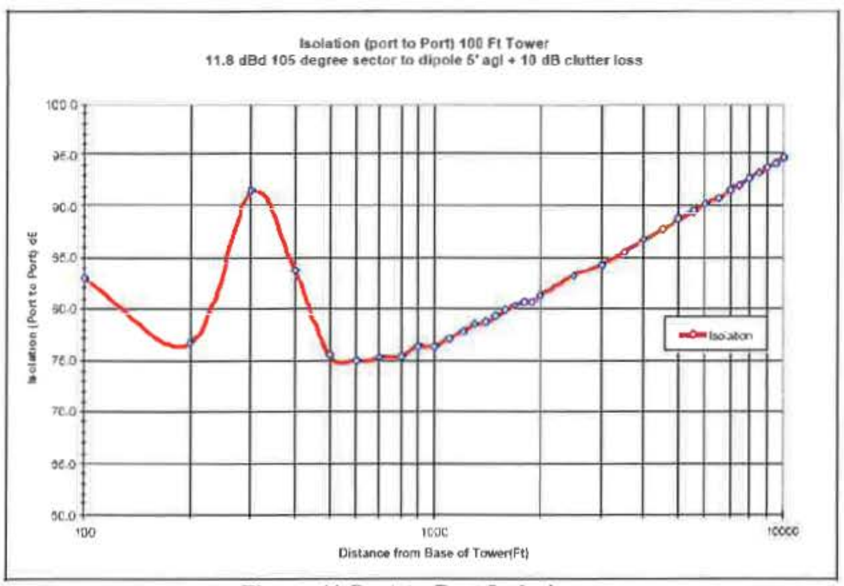


Figure 41 Port-to-Port Isolation

12 RESOLVING INTERFERENCE

The following sections describe actions that can be taken to minimize Radio Frequency Interference (RFI) between systems operating at 800 MHz within the same geographical location. These guidelines are general in nature and these same techniques and philosophies can be applied to most any systems experiencing RFI. Thorough testing will determine actual causes (in some cases, multiple causes) and sources of interference that the system is experiencing. Therefore, thorough testing should precede and follow the application of any solutions proposed below to determine the appropriate actions required and the effectiveness of the deployed solution.

12.1RECOMMENDED RESOLUTION PROCESS:

1. Identify performance issue as RF Interference.
2. Identify potential source(s) of the interference.
3. Contact other system operators to cooperatively identify the interference issue. The correct and accurate assessment of the interference mechanism is critical to developing an action plan that will rectify the situation.
4. FC rules stipulate that the two system licensees must work cooperatively to resolve any reports of interference.
5. Implement required changes.
6. Monitor performance.
7. Maintain communications with other operators as the site/system evolves.

12.2 METHODS TO REDUCE INTERFERENCE OF SPECIFIC TYPES

12.2.1 POSSIBLE ACTIONS TO REDUCE THE EFFECTS OF TRANSMITTER SIDEBAND NOISE:

- Change frequencies to increase frequency spacing between the channels.
- Lower transmitter power as much as possible. This can reduce coverage and move traffic to surrounding sites if there is sufficient coverage overlap. The resulting reduction in carried load may allow a reduction in the number of transmitters that will also reduce the noise floor rise due to transmitter sideband noise.
- Increasing the center of radiation on the undesired transmit antennas > 80' AGL will increase the local path loss to the affected units and reduce the noise floor rise due to antenna discrimination.
- Increase desired signal level. This may be accomplished by increasing desired ERP (more power or higher gain antennas) or adding desired sites.
- Co-locating sites will maximize the desired signal strength where the undesired energy is strongest.
- Change antennas in an attempt to reduce the undesired signal level in the immediate area of a site. This may be a change of pattern, the removal of down -tilt, less energy in lower lobes or higher gain (narrower vertical beam width).
- Use cavity combiners instead of hybrid combiners. Use only when the recommended tests have demonstrated that cavities will help. Note that some auto-tune cavity combiners may not work properly with iDEN's Quad-QAM modulation.
- Escalate the construction of new sites in surrounding areas to allow further reduction in ERP.
- Swap frequencies or segregate spectrum. These alternatives would require FCC approval.

12.2.2 POSSIBLE ACTIONS TO REDUCE THE EFFECTS OF PORTABLE RECEIVER IM

- Increase desired signal strength by adding sites or changing antennas.
- Avoid using portables with an IM specification < 75 dB. Portables with higher IM specifications are much more immune to IM interference.
- Design systems for in-building coverage. This will present higher desired signal levels " on-the-street" , overriding IM interference where it is more likely to occur - on the street near low sites. (The undesired signal strengths are typically attenuated inside buildings and the strength of the IM mix is typically insufficient to interfere with the desired signal.) This may allow portables with lower IM specifications (i.e. IM δ 70 dB) to be utilized.
- Determine the frequencies being used by each operator. Attempt to coordinate to prevent creating third and fifth order Intermodulation (IM) products. Change the receive and transmit frequency plan so that IM products do not fall on receive channels.
- Reduce the ERP of the undesired transmit channels as much as possible. A 1 dB reduction in ERP will reduce 3rd order products by 3 dB and 5th order products by 5dB. This reduction in ERP is likely to reduce the number of transmitters that can contribute to mixes as the traffic is offloaded to surrounding sites.
- Change portable antennas. Reduce portable antenna gain if there is sufficient desired signal. Each 1 dB reduction in gain will reduce 3rd order products in the receiver front-end by 3 dB and 5th order products by 5 dB.
- Use voting receivers to minimize the impact of portable interference to base receivers .
- Sweep the transmit antenna system or check the tuning on the combiners to reduce transmitter generated IM.
- Swap frequencies or segregate spectrum. These alternatives would require FC approval. Consolidated spectrum would tend to create tightly clumped IM products. Existing interlaced frequency allocations spread out the IM products across much of the band.

12.2.3 POSSIBLE ACTIONS TO REDUCE THE POSSIBILITY OF INTERFERENCE IN THE FUTURE

- Maintain constant communication between license holders to coordinate frequency deployments and system expansion plans and actions.
- Co-locate sites whenever possible.
- Swap frequencies to remove interlaced frequency assignments - requires FCC approval.
- Segregate frequencies into sub-bands and either minimize use of frequencies at sub-band edge or establish guard bands between sub-bands.

12.3 INTERFERENCE REDUCTION METHODS

The following section describes various methods for minimizing or eliminating interference. Most often, the interference is not totally eliminated, it is just reduced to levels that where acceptable communications can be maintained.

Multiple methods must often be employed. One method may reduce a certain kind of interference and then a different type of interference may then be revealed. Only thorough testing will completely characterize the interference types that are occurring in any given situation. The " best" solution for any given case will depend on many factors including the individual circumstances of the location. What worked in one case may not work as well in another case. For example, a change of frequencies in one case may not be possible in another case.

These solutions are offered as a menu of possible choices. The optimal applications of the various solutions will be determined by the details of each and every situation.

12.3.1CHANGE FREQUENCY PAIRS

Changing frequencies is a relatively easy way to avoid both Side Band Noise (SBN)and Intermodulation (IM) interference if this flexibility exists in any given case. Changing frequencies in a frequency reuse system has multiple effects that ripple across many sites if not the entire service area.

Increase the frequency spacing between channels to address sideband noise issues. Moving one or more close spaced frequencies can reduce the amount of sideband noise that can fall on nearby channels. Frequency spacings of 150 KHz or greater permits the use of filtering on the transmitter. Greater frequency spacings generally offer increased protection.

Changing transmit frequencies involved in an IM product can be used to move the mix to a channel that is not used in the area or to a frequency that is more immune to the IM product. Receiver frequencies can be moved from channels where IM mixes occur.

In some cases an exchange of frequencies is another possibility where and when this is permitted. Ideally, a segregation of frequency utilization into sub-bands offers much more protection as compared to situations where frequencies assignments are interlaced. IM may be generated, but it is more likely to be within ones own sub-band where the system design can mitigate it. IM products generated at the source and outside the sub-band can be filtered.

12.3.2 REDUCE ERP OR SIGNAL STRENGTH OF THE UNDESIRED SIGNAL

One way to reduce interference is to reduce the signal strength of undesired signals. This may be difficult at times as the amount of reduction required may be sufficient as to negatively impact communications on those channels. But when possible, this can be effective solution.

In some cases the reduction may be aimed solely at the sideband energy on a given channel or set of channels. In other cases, a reduction in the radiated power of the main carrier is required.

Adding filters (typically RF cavity filters) between a transmitter and the antenna may by used to reduce the energy radiated in channels separated from the transmit frequency. Cavity filters typically offer little reduction within 150 kHz on either side of the car ier frequency. Cavity filter will typically offer more protection at greater frequency separations. Ceramic auto tune cavity filers and combiners provide higher Q filters while offering more flexibility to change frequencies when needed. Note that some auto tune cavities may not function with iDEN modulation.

Lowering transmitter ERP can help control both sideband noise levels as well as the power in an IM mix. Due to the nature of IM interference, a 1 dB reduction in ERP on frequencies involved in a 3rd order mix can reduce the IM product level inside a portable receiver front-end by 3 dB. For 5th order mixes, a 1 dB reduction can reduce the IM level by 5 dB. A 1-2 dB reduction in transmitter ERP may be enough to reduce the IM levels to acceptable levels. A reduction in transmit ERP may reduce the size of a cell and the traffic carrying capacity of that cell. A drop in offered load may also allow one or two transmitters to be turned off, thereby decreasing the interference potential of the cell.

ERP can be simply reduced by reducing the transmitter power. This change affects the entire cell. A more selective way to change the ERP to specific location is to change the antenna gain pattern. The area where a reduction is desired may be a specific spot or it may be the area within a certain distance of the site. Reducing antenna gain , reducing down-tilt, or using an antenna with greater lobe reduction or using a different gain antenna can all be used to reduce the signal strength near a site where there is an abundance of signal strength.

There are several more creative ways to reduce IM interference by reducing the levels of the signals involved in the process. A portable with increased immunity against the IM products is one of the best methods of protecting oneself from IM interference no matter what the sources are. Such a portable generally has better all around performance and the added expense is well worth the investment, especially given the growth in wireless and the increased chances of operating near other wireless devices. A portable with an IM spec of 75 dB or greater is sufficient protection against almost al IM in studied and expected scenarios. Receiver specification improvements typically require an increase in battery drain to provide enhanced IM performance. That is why mobile installations tend to have better IM performance than portables.

Oddly enough, using a lower gain antenna on a portable that is experiencing IM interference is one way to lower the amount of undesired signal reaching a portable receiver' s front-end. This lowers the desired signal a few dB but reduces the IM products by the order of the product. This can be an effective solution when there is sufficient desired signal strength and the interference is due to front-end overload. Note that a lower gain antenna may reduce the portables' effective range in other situations.

Another method of decreasing the impact of an undesired signal to increase the distance between the source and target. Path loss increases logarithmically with distance. Distance also changes the amount of gain in the antenna pattern. The potential for interference is noticeably reduced when sites are above 80' above ground level (AGL). Raising the center of radiation of transmit antennas can eliminate interference. Zoning rules and atheistic are forcing antennas to lower levels and there may be "stealth" sites behind store-front facades and many more sites below 80' AGL. A more conventional tower or building installation provides increased protection from RFI. Note that increasing demands for wireless services is a factor in more sites that are heavily loaded and frequency reuse is enhanced when theses sites are deployed below tree top or building top levels.

Lowering the ERP's and reducing the number of transmitters on any one site may shrink the coverage area of a given cell and off load traffic to surround cells. Adding additional cells (otherwise known as cell splitting) adjacent to the cell is one way to accommodate these reductions while maintaining offered service levels.

Sweeping sites to find transmitted IM (IM) is required regularly to insure legal operation. Reducing transmitted IM levels and maintaining low radiated IM levels is an effective method to reduce the possibility of interference of this type.

12.3.3 INCREASE ERP OR SIGNAL STRENGTH OF DESIRED SIGNAL

A number of methods exist for reducing or eliminating interference by increasing the desired signal level. This method can override many forms of interference including both Sideband noise and receiver IM .

It is fairly common now for users of wireless communications systems to desire or demand coverage inside buildings. Many two-way radio users conduct business indoors and therefore need inside coverage. The mobility of portables requires in-building coverage. Public Safety users often have to enter buildings to perform their critical life-preserving activities. Providing in-building coverage will require more sites or equipment but it will also provide protection against many forms of interference. Many of the interference problem areas can be found near other sites while on the street. The little extra building loss usually reduces the interference down below troublesome levels. This is especially true for the case where IM is occurring in the portable's receiver. Every dB of attenuation to the undesired produces a 3 times or 5 times reduction in the level of any IM product.

Increasing the transmitter power on desired frequencies can improve the downlink performance by overriding the interference. The ERP can also be raised into a particular area by changing the antenna pattern or by increasing antenna gain. Increasing the antenna height above ground level on the desired transmitters can also increase the level of the desired signal.

Adding additional sites on the desired channels is another available option. This has the added benefit of increasing coverage inside buildings.

Deploying Bi-Directional Amplifiers (BDA) or channelized repeaters are also possible ways to improve coverage into specific areas that would benefit from enhanced coverage. However, BDA's can be a source of interference so their deployment needs to be well engineered.

The co-location of transmitter sites ensures that the desired signal is stronger on-channel than any interfering signal. This may not always be possible when mixing systems of different types such as high density cellular on many low sites and a lower density two-way radio system on a few high sites. This option reduces talk-out interference but it can increase talk-in interference, requiring "voting" receivers to minimize this effect.

Mentioned above, the use of a portable with higher performance specifications is another way to reduce the probability of interference. The specifications of interest are the selectivity and IM performance of the radio. Radios with specifications in this areas > 70 dB are needed to offer reasonable protection for use in typical environments where there high levels of desired RF. Increased protection is offered by improved specifications.

Increasing the signal strength of the desired signal is a highly effective method for minimizing interference and these choices should be considered as alternatives in most cases.

12.3.4 LONGTERM AVOIDANCE

Longer term strategies for minimizing or eliminating inference may involve an exchange of frequencies or a segregation of frequencies to move the operations of any given system to its own spectrum allocation. This will usually require some approval by the FCC and possibly some coordination with one or more designated coordinating bodies.

Swapping one or more frequency pairs may provide an opportunity to address an individual case or set of cases throughout a small area.

Segregating frequencies would separate distinct service types into different sub-bands and offer higher each service a higher level of protection against interference. There may be some interference if the sub-bands are located next to each other but the interference in such cases would easier to predict, identify and create an engineered solution when it does occur.

REGION 23 700 MHz PLAN
APPENDIX T - DTV TRANSITIONS

This Appendix Contains

1. The Plan's reference for technical information on spectrum realignment as related to the transition from analog television broadcasting to digitalized television broadcasts.

NOTE: The Region 23 700 MHz Plan's Appendix "T" may also be identified as "National Coordination Committee — Implementation Subcommittee Appendix P - DTV Transition (IM00040-A 20010510"

APPENDIX P
DTV TRANSITION

The date is now beyond the required date for transition to DTV and the following remains in the document for informational purposes only.

APPENDIX P

DTV TRANSITION

Frequency Availability through the DTV Transition

On August 14, 1996, the FCC released a *Sixth Further Notice of Proposed Rule Making* in the digital television (DTV) proceeding. A portion of the spectrum recovered from TV channels 60-69 when DTV is fully deployed "could be used to meet public safety needs."[1] By Congressional direction in the Balanced Budget Act of 1997, the FCC reallocated 24 MHz of spectrum to Public Safety services in the 764-776 MHz and 794-806 MHz bands. The statute required the FCC to establish service rules, by September 30, 1998, in order to start the process of assigning licenses. The rules that the FCC established by September 30, 1998, "provided the minimum technical framework necessary to standardize operations in this spectrum band, including, but not limited to: (a) establishing interference limits at the boundaries of the spectrum block and service areas; (b) establishing technical restrictions necessary to protect full-service analog and digital television service during the transition to digital television services; (c) permitting public safety licensees the flexibility to aggregate multiple licenses to create larger spectrum blocks and service areas, and to disaggregate or partition licenses to create smaller spectrum blocks or service areas; and (d) ensuring that the new spectrum will not be subject to harmful interference from television broadcast licensees"[2].

In April 1997, the FCC assigned a second 6 MHz block of spectrum to each license (or permit to construct) holders of full power, analog, television broadcast station (NTSC) in order to construct a digital television station (DTV). Secondary low power television stations (LPTV), secondary translators and boosters (TX), mutually exclusive applications for new stations, and application filed after a cut-off date did not receive a second 6 MHz allotment for DTV. The FC established about a 10 year timeline for those stations with a DTV assignment to construct a DTV station, cease NTSC transmissions, and return one of the two 6 MHz blocks of spectrum to the FCC. Target date for the end of analog television (NTSC) transmission was set for December31, 2006.

Congress provided several market penetration loopholes (>85% households served, all 4 major networks converted, etc) allowing NTSC operations to continue past the December 31, 2006 date. While there are over 100 NTSC full power stations in this band, there are also about 12 DTV assignments. The DTV assignments might continue operations past the December 31, 2006 date for two reasons. 1) They must find a suitable channel below channel 60 to move to,

[1]Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service, M Docket No. 87-268,*Sixth Further Notice of Proposed Rule Making*, 11 FCC Rcd 10,968, 10,980 (1996) (*DTV Sixth Notice*).
[2]FCC 98-191, 1st R&O and 3rd NPRM on WT Docket No. 96-86 Operational & Technical Requirements or the 700 MHz Public Safety Band, para.4.

which may be their own NTSC assignment. They may not be able to find another allocation until other NTSC stations have ceased operations and returned a channel below 60 to the FCC. Or, 2) their license does not expire until after 2006 (most are licensed into 2007 or 2008).

Protection of Public Safety from future TV/DTV Stations

Public safety base and mobile operations must have a safe distance between the co-channel or adjacent TV and DTV systems. This typically means that a co-channel and adjacent channel base and mobile system cannot operate in areas where TV stations already exist. The public safety systems that will operate in the 70 MHz band for some locations in the U.S. and its possessions must wait until the transition period is over and the TV/DTV stations have moved to other channels before beginning operations. In other areas, channels will be available for public safety operations. During the transition period, public safety stations must be acutely aware of the TV allocations for both TV and DTV stations. The FC wants the number of situations where the public safety license has to coordinate its station with the existing TV stations kept to a minimum. The Commission's decisions in the reallocation of spectrum to DTV implemented two requirements which will help public safety systems to protect TV/DTV stations and reduce the number of coordinations. The first requirement is that full power UHF-TV stations can no longer apply for channels 60-69 or modifications in channels 60-69 which would increase the stations' service areas, which creates a known environment for public safety licensees.[3]Thesecond requirement is that since only existing TV station licensees can apply for DTV channels, the applicants and their proposed locations are already known.[4]

[3]*See Reallocation Report and Order*, 12 FCC Rcd 22,969-22,970. Stations with existing channel 60-69 TV construction permits must complete their stations and file for a license by January 2, 2001.
[4]*See DTV Sixth Report and Order*, 12 FCC Rcd 14,739-14,754; *See also* In the Matter of Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service, *Memorandum Opinion and Order on Reconsideration of the Sixth Report and Order* in MM Docket No. 87-268, 13 FCC Rcd 7418 (1998). The 11

STATE	CITY	NTSC TV Ch.	DTV Ch.	ERP (kW)	HAAT (m)
California	Stockton	64	62	63.5	874
California	Los Angeles	11	65	688.7	896
California	Riverside	62	68	180.1	723
California	Concord	42	63	61.0	856
Pennsylvania	Allentown	39	62	50.0	302
Pennsylvania	Philadelphia	6	64	1000.0	332
Pennsylvania	Philadelphia	10	67	791.8	354
Puerto Rico	Aguada	50	62	50.0	343
Puerto Rico	Mayaguez	16	63	50.0	347
Puerto Rico	Naranjito	64	65	50.0	142
Puerto Rico	Aguadilla	12	69	691.8	665

Also, the low power TV stations and translators already on channels 60-69 are secondary and must cease operations if they cause harmful interference when a primary service, like land mobile, comes into operation. The secondary Low Power TV stations already on channels 60-69 cannot apply for the new Class A protection status.

Spectrum Overview

700 MHz Public Safety Band - 24 megahertz of spectrum

TV 61	TV 62	**TV 63**	**TV 64**	TV 65	TV 66	TV 67	**TV 68**	**TV 69**	806-824
									LMR
		Public	Public				Public	Public	Band
		Safety	Safety				Safety	Safety	
		6 MHz	6 MHz				6 MHz	6 MHz	

TV Channel 63 TV Channel 64 TV Channel 68 TV Channel 69

764 MHz 770 776

NB	**WB**	**NB**
3 MHz	**6 MHz**	**3 MHz**

794 MHz 800 806

NB	**WB**	**NB**
3 MHz	**6 MHz**	**3 MHz**

NB = narrowband channels **WB** = wideband channels

The FCC designated 764-776 MHz (TV Channels 63 and 64) for base-to-mobile transmissions and 794-806 MHz (TV Channels 68 and 69) for mobile-to-base communications. In addition, base transmit channels in TV Channel 63 are paired with mobile channels in TV Channel 68 and likewise that base channels in TV Channel 64 are paired with mobile channels in TV Channel 69. This provides 30 MHz separation between base and mobile transmit channel center frequencies. This band plan was suggested because of the close proximity of TV Channels 68 and 69 to the 806-824 MHz band, which already contains the transmit channels for mobile and portable radios (base receive).

Mobile transmissions are allowed on any part of the 700 MHz band, not just the upper 12 MHz. This will facilitate direct mobile-to-mobile communications (*i.e.*, not through a repeater) that are often employed at the site of an incident, where wide area communications facilities are not available or desired. Allowing mobile transmissions on both halves of a paired channel is generally consistent with FC rules governing use of other public safety bands.

Non-uniform TV Channel Pairing

There are currently geographical areas where, either licensed or otherwise protected full-service analog or new digital, television stations are currently authorized to operate on TV Channels 62, 63, 64, 65, 67, 68, and 69.[5] During the DTV transition period, an incumbent TV station occupying one or more of the four Public Safety channels (63, 64, 68, 69) or the three adjacent channels (62, 65, 67) may preclude pairing of the channels in accordance with the band plan defined above. Therefore, to provide for cases where standard pairing is not practicable during the DTV transition period, the FC will allow the RPCs to consider pairing base-to-mobile channels in TV Channel 63 with mobile-to-base channels in TV Channel 69 and/or base-to-mobile channels in TV Channel 64 with mobile-to-base channels in TV Channel 68. Because such non-standard channel pairing may cause problems when the band becomes more fully occupied, the FC expects the RPCs to permit such non-standard channel pairing only when absolutely necessary, and the FC may require stations to return to standard channel pairing after the DTV transition period is over. However, the FC will not permit non-standard channel pairing on the nationwide interoperability channels in the 70 MHz band because of the need for nationwide uniformity of these channels.

At least three issues must be considered before deciding upon non-uniform channel pairing:

1. Preliminary analysis, looking at current incumbent TV stations, shows few geographic areas where non-uniform pairing allows early implementation of 700 MHz systems. As DTV Transition progresses, and TV stations vacate the band, this situation might change.

2. If interoperability channels must be uniform, operation on I/O channels will be blocked until all incumbent TV stations are cleared, even though General Use channels may be implemented earlier.

3. If I/O channels must follow uniform pairing, and general use & reserve channels can be implemented using non-uniform pairing, narrowband voice subscriber equipment must operate on 3 different channel pairings - 39 MHz (764-767 paired with 803-806 MHz), 30 MHz, and 21 MHz (773-776 paired with 794-797 MHz). Likewise, there will be 3 different channel pairing for wideband channels. No vendors have volunteered to build equipment & systems for non-uniform pairing, yet.

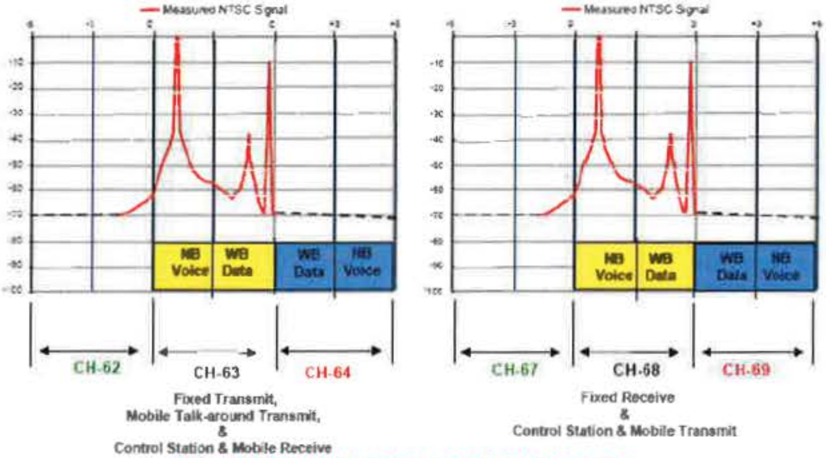
TV/DTV Protection

During the DTV Transition period, public safety must consider all co-channel and adjacent channel TV and DTV stations within about a 160 mile radius.

For public safety channel pair 63/68, public safety must consider six TV/DTV channels - co-channels 63 and 68, as well as, adjacent channels 62, 64, 67, and 69.

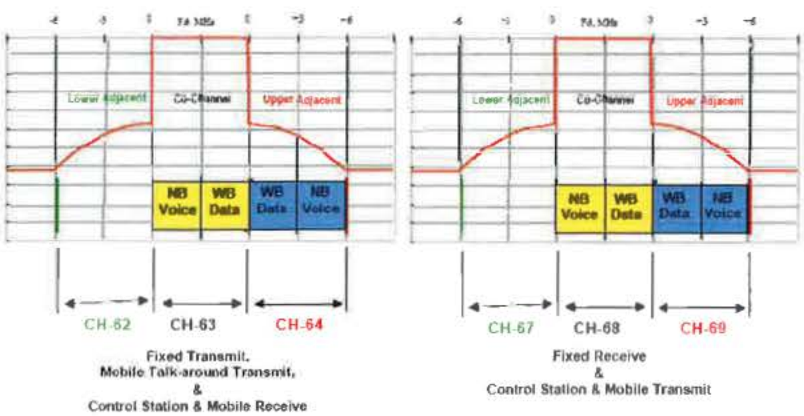
[5] *See Reallocation, Notice of Proposed Rule Making,* 12 FCC Rcd at 14,141, 14,177-78 and 14,182-83.

Measured (off-the-air) Analog TV Signal
vs
700 MHz Public Safety Assignments



HAVE 2 CO-CHANNEL AND 4 ADJACENT CHANNELS
TO CONSIDER FOR EACH 700 MHz PAIRED BLOCKS OF SPECTRUM

DTV Emission Mask
vs
700 MHz Public Safety Assignments



HAVE 2 CO-CHANNEL AND 4 ADJACENT CHANNELS
TO CONSIDER FOR EACH 700 MHz PAIRED BLOCKS OF SPECTRUM

For public safety channel pair 64/69, public safety must consider five TV/DTV channels; co-channels 64 and 69, as wel as, adjacent channels 63, 65, and 68.

It may only takes one TV/DTV station to block operations on one, the other, or both public safety channel pairs. For a public safety system at 500 watts ERP and 500 ft HAAT, co-channel TV stations can block a 120 mile radius and adjacent channel TV/DTV stations can block a 90 mile radius.

Since base stations transmitters are located only on channels 63 and 64, LMR mobile only TV/DTV protection spacing on channels 68 and 69 may be shorter than LMR base TV/DTV protection on channels 63 & 64.

TV/DTV Protection Criteria

Public safety applicants can select one of three ways to meet the TV/DTV protection requirements: (1) utilize the geographic separation specified in the 40 dB Tables of 90.309; (2) submit an engineering study to justify other separations which the Commission approves; or (3) obtain concurrence from the applicable TV/DTV station(s).

90.309 40 dB D/U Tables

The FCC adopted a 40 dB desired (TV/DTV) to undesired (LMR) signal ratio for co-channel operations and a 0 dB desired/undesired(D/U)signal ratio for adjacent channel operations. The D/U ratio is used to determine the geographic separation needed between public safety base stations and the Grade B service contours of co-channel and adjacent channel TV/DTV stations.[6] The D/U signal ratio is used to determine the level of land mobile signals that can be permitted at protected fringe area TV receiver locations without degrading the TV picture to les than a defined picture quality. In other words, the D/U signal ratio indicates what relative levels of TV and land mobile signals can be tolerated without causing excessive interference to TV reception at the fringe of the TV service area.

Desired and undesired contours are not quite the same thing. Desired analog TV contours are defined as F(50,50), meaning coverage is 50% of the places and 50% of the time. Undesired land mobile or interference contours are defined as F(50,10). For Digital TV, the desired contours are defined as F(50,90), while the undesired land mobile contour are still F(50,10).

Land mobile and analog TV services have successfully shared the 470-512 MHz band (TV Channels 14-20) within a 50 mile radius of eleven major cities since the early 1970's based upon providing a signal ratio of at least 50 dB[7] between the desired TV signal and undesired co- channel land mobile signal (D/U signal ratio) at a hypothetical 88.5 km (55 mi) Grade B service contour and an adjacent channel D/U signal ratio of 0 dB at the same hypothetical Grade B service contour. These separation distances also protected the land mobile systems from interference from the TV stations. In 1985, recognizing that 50 dB D/U was to conservative, the FC proposed to expand land mobile/TV sharing to other TV channels and proposed that the geographic separation requirements for co-channel operations be based on a D/U signal ratio of

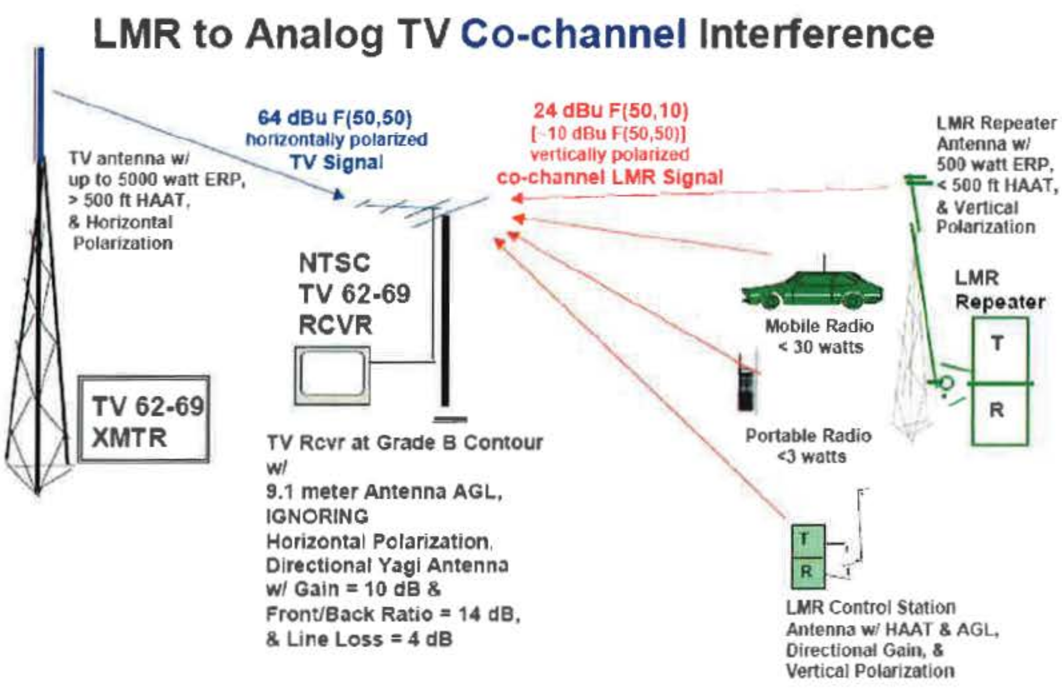
[6] *See Second Notice*, 12 FCC Rcd 17,803.

[7] For TV Channel 15 in New York City, a 40 dB D/U signal ratio is used. *See* 47 C.F.R. §§ 90.307(b) and 90.309 (Table B). A 50 dB protection ratio means that the amplitude of the desired TV signal is more than 300 times greater than the amplitude of the undesired signal at the Grade B service contour. A 40 dB protection ratio means the desired TV signal is 100 times greater.

40 dB rather than 50 dB.[8] That proceeding was put on hold pending completion of the DTV proceeding, which has now been completed. In the 470-512 MHz band, the FCC also relied on minimum separation distances based on the various heights and powers of the land mobile stations (HAAT/ERP separation tables) to prevent harmful interference.

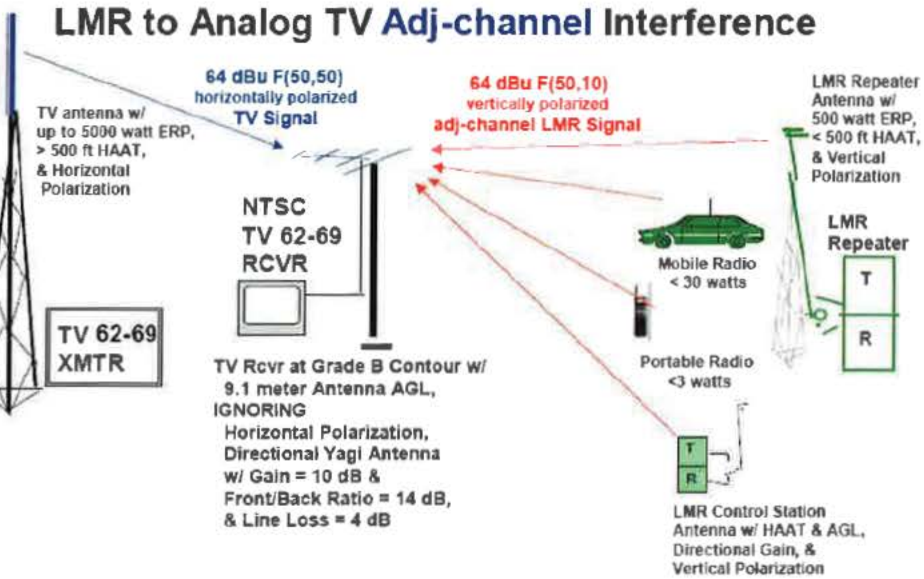
Since this simple, yet conservative, method was successful, the FC decided to use this same method, the 90.309 HAT/ERP Separation Tables, to administer LMR to TV/DTV receiver protection criteria for the services in the700 MHz band.

Co-channel land mobile base station transmitters are limited to a maximum signal strength at the hypothetical TV Grade B contour 40 dB D/U below desired 64 dBu F(50,50) analog TV signal level, or 24 dBu F(50,10).[9] The FC adopted a 0 dB D/U signal ratio for adjacent channel operations. Adjacent channel land mobile transmitters will be limited to a maximum signal of 64 dBu F(50,10) which is 0 dB D/U below the TV Grade B signal of 64 dBu F(50,50) at the TV station Grade B contour of 88.5 km (55 miles). A typical TV receiver's adjacent channel rejection is at least 10-20 dB greater than this level which will further safeguards TV receivers from land mobile interference.



[8] *See* Amendment of the Rules Concerning Further Sharing of the UHF Television Band by Private Land Mobile Radio Services, GEN Docket No. 85-172, *Notice of Proposed Rulemaking*, 101 FCC 2d 852, 861 (1985) (*UHF-TV Sharing NPRM*).

[9] In terms of miles, if everything else is the same, a 40 dB D/U ratio rather than a 50 dB D/U ratio allows base stations to be located approximately 48.3 km (30 mi) closer to a co-channel TV station. *See* 47 C.F.R. § 90.309, Tables A & B.



The equivalent ratios for a DTV station's 41 dB F(50,90) desired field strength contour are land mobile 17 dB F(50,10) contour for co-channel and land mobile - 23 dB F(50,10) contour for adjacent channel.

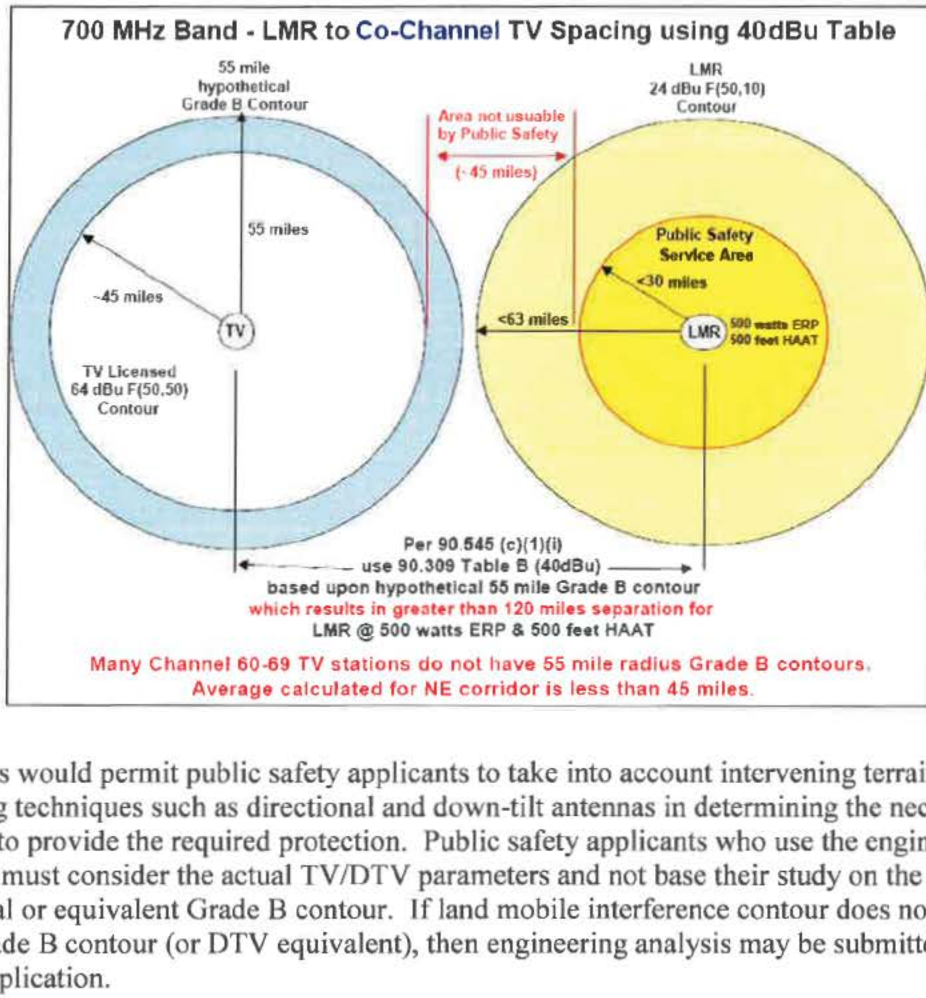
The Tables to protect TV/DTV stations are found in Section 90.309 of the Commission's rules. These existing Tables cover co-channel protection based on a 40 dB D/U ratio using the separation methods described in Section 73.61 of the Commission's rules for base, control, and mobile stations, and for adjacent channel stations for base stations based on a 0 dB D/U ratio. However, the original considerations in 470-512 MHz band under Section 90.309 were different in that mobiles were limited in their roaming distance from the base station (less than 30 miles) and mobiles were on the same TV channel as the base station.

Control and mobile stations (including portables) are limited in height (200 ft for control stations, 20 ft for mobiles/portables) and power (200 watts ERP for control stations, 30 watts for mobiles, 3 watts for portables). Mobiles and control stations shall afford protection to co-channel and adjacent channel TV/DTV stations in accordance with the values specified in Table D (co-channel frequencies based on 40 dB protection for TV and 17 dB for DTV) in § 90.309. Control stations and mobiles/portables shall keep a minimum distance of 8 kilometers (5 miles) from all adjacent channel TV/DTV station hypothetical or equivalent Grade B contours (adjacent channel frequencies based on 0 dB protection for TV and -23 dB for DTV). This means that control and mobile stations shall keep a minimum distance of 96.5 kilometers (60 miles) from all adjacent channel TV/DTV stations.

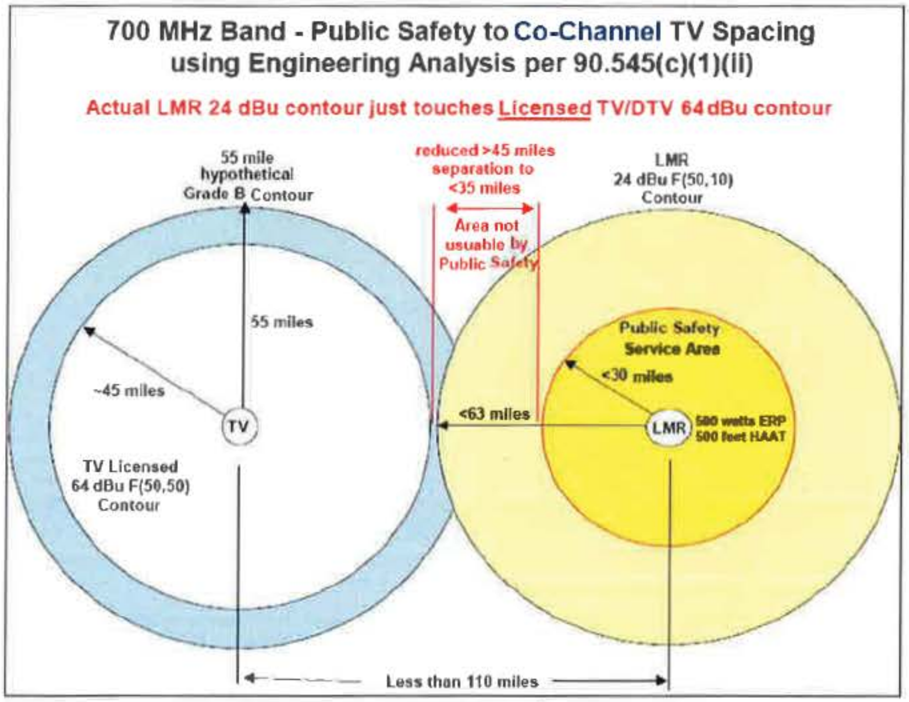
Since operators of mobiles and portables are able to move and communicate with each other, licensees or coordinators must determine the areas where the mobiles can and cannot roam in order to protect the TV/DTV stations, and advise the mobile operators of these areas and their restrictions.

Engineering Analysis

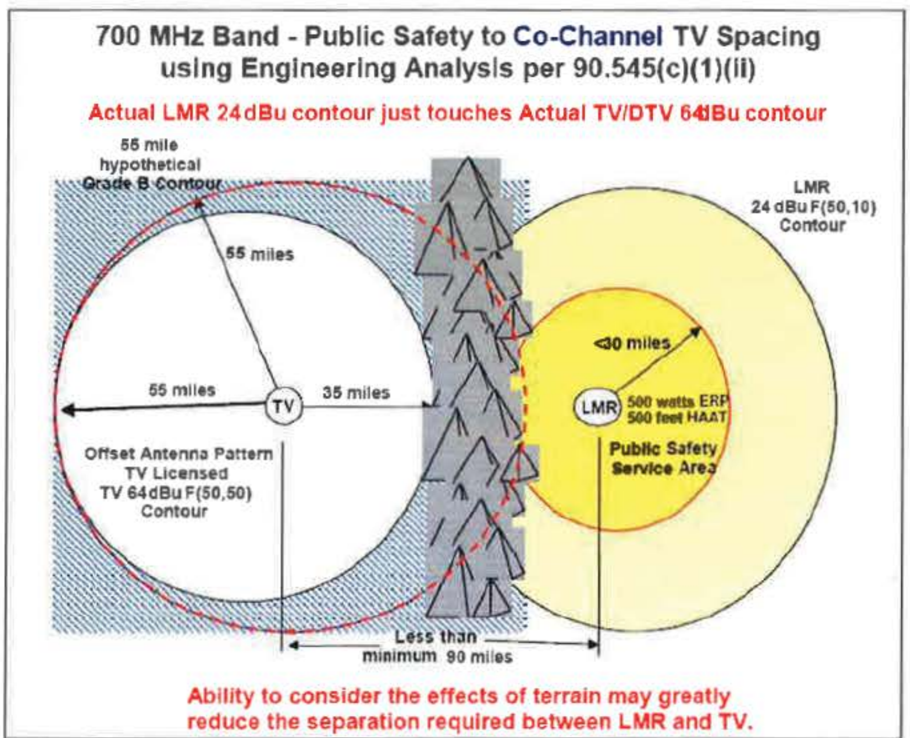
Limiting TV/land mobile separation to distances specified in the 40 dB HAAT/ERP Separation Tables found in 90.309may prevent public safety entities from fully utilizing this spectrum in a number of major metropolitan areas until after the DTV transition period ends. Public safety applicants will be allowed to submit engineering studies showing how they propose to meet the appropriate D/U signal ratio at the existing TV station's authorized or applied for Grade B service contour or equivalent contour for DTV stations instead of the hypothetical contour at 88.5 km.



This would permit public safety applicants to take into account intervening terrain and engineering techniques such as directional and down-tilt antennas in determining the necessary separation to provide the required protection. Public safety applicants who use the engineering techniques must consider the actual TV/DTV parameters and not base their study on the 88.5 km hypothetical or equivalent Grade B contour. If land mobile interference contour does not overlap the TV Grade B contour (or DTV equivalent), then engineering analysis may be submitted to the FC with the application.



This method is most useful with lower power TV stations whose Grade B contours are much smaller than the hypothetical55mile (88.5km) Grade B contour or have directional patterns.



Note that a 200 ft AGL limitation on 700 MHz control stations is much higher than the 100 ft AGL limitation used at UHF. Limiting control station antenna height and/or ERP may greatly reduce land mobile to TV contour spacing.

Also, note that analysis for TV/DTV receivers uses 30 ft (10 m) antenna height whereas, analysis for land mobile subscribers uses about a 6 ft (2m) antenna height.

TV/DTV Short-spacing

Public safety applicants will also be allowed to "short-space" even closer if they get the (written) approval of the TV stations they are required to protect. Public safety applicants need to determine the station's intended market area vs. its hypothetical Grade B contour area. Alternately, the TV/DTV station may be short-spaced against another TV/DTV station, limiting their area of operation, but does not affect LMR operations. Instead of each agency negotiating with a TV/DTV station individually, they may want to combine into a single group or committee and negotiate together.

TV/DTV Height Adjustment Factor

In order to protect certain TV/DTV stations which have extremely large contours due to unusual height situations, such as a television station mounted on top of Mount Wilson near Los Angeles, California, the FC incorporated an additional height adjustment factor which must be used by all public safety base, control and mobile stations to protect these few TV/DTV stations and afford the land mobile stations the necessary protection from the TV/DTV stations. The equation necessary to calculate the additional distance from the hypothetical or equivalent Grade B contour is found in the rules section 90.545(c)(2)(iii).

CANADIAN AND MEXICAN BORDER REGIONS

The FC typically takes one of two approaches. They either postpone licensing of land mobile stations within a certain geographic distance (*e.g.*, 120 km (75 miles)) of Canada and Mexico, or permit interim authorizations conditioned on the outcome of future agreements. Because international negotiations can take many months or even years to finalize, the FC took the later approach and adopted certain interim requirements for public safety licenses along the Canada and Mexico borders, providing that the licenses are subject to whatever future agreements the United States develops with the two countries.

Nevertheless, existing mutual agreements with Canada and Mexico for the use of these bands for UHF television must be recognized until further negotiations are completed. The US negotiated an agreement with Mexico of DTV operations near the US/Mexican border in July 1998. The US just negotiated an agreement with Mexico of DTV operations, and limited non- broadcast operations on 746-806MHz, near the US/Canadian border in September 2000. Existing agreements recognize existing TV and/or DTV allotments and planning factors within a specified distance of the border. The Canadian Letter of Understanding also acknowledges that US plans to use 746-806 MHz for non-broadcast purposes and provides planning criteria (40 dB D/U) to protect Canadian TV/DTV receivers.

Additionally, public safety facilities within the United States must accept interference from authorized channel 60-69 TV transmitters in Canada and Mexico in accordance with the existing agreements. Since the locations of the Canadian and Mexican analog TV assignments and DTV allotments are known, the public safety applicants can consider the levels of harmful interference to expect from Canadian and Mexican TV/DTV stations when applying for a license. Both Canada and Mexico have been informally notified that the Commission has changed its allocated use of TV channels 60-69, and the Commission will discuss the possibility of mutually compatible spectrum use with Canada and Mexico.

REGION 23 700 MHZ PLAN
APPENDIX U - MRPFAC COMMITTEE STRUCTURE

This Appendix Contains

1. The Plan's illustration of the committee structure of the Mississippi Public Safety Frequency Advisory Committee (MRPFAC).

NOTE: The Region 23 700 MHz Plan will be administered by MRPFAC upon formal approval of the Plan by the Federal Communication Commission.

APPENDIX U MRPFAC Committee Structure

Agency	No. of Representatives	
	Member	Alternate
Mississippi Band of Choctaw Indians	1	1
Mississippi Association of Supervisors	1	1
Mississippi Association of Police Chiefs	1	1
Mississippi Sheriff's Association	1	1
Mississippi Association of Fire Chiefs	1	1
Mississippi Municipal League	1	1
Mississippi Prehospital Professions Association	1	1
Mississippi Emergency Management Agency	1	1
Mississippi Department of Public Safety	1	1
Mississippi Wireless Communication Commission	1	1
Mississippi APCO Chapter	1	1
Mississippi NENA Chapter	1	1

There are also 4 APCO appointed members of the committee representing city or county public safety agencies that have a background in either or both of the following:

1. Radio frequency systems
2. Public safety answering point

MRPFAC MEETINGS

The MRPFAC meetings function in accordance with Roberts Rules of Order.

MRPFAC ROUTINE DUTIES

- A chairman is elected during the first meeting each year.
- MRPFAC shall meet at least twice a year and may meet at the discretion of the majority members or by call of the Chairperson. Time and location of meetings shall be at the call of the Chairperson or majority vote at a meeting; when application need committee action. Applications are to be sent to committee members by the applicant two weeks prior to the meeting. The applicant can obtain the addresses form the MRPFAC secretary.
- Review application based upon the Region 23 matrix. Review the application(s) for interoperability technical requirements. Further the MRPFAC will review the application(s) for interoperability operational requirements if there is no SIEC
- Deal with appeals/application clarification, consider applicant presentations.
- Interact with applications to determine if the implementation of their systems is in accordance with their applications.
- Maintain coordination with neighboring regional committees and other FCC certified frequency coordinators and their advisors.
- Promulgate other rules and procedures as need to operate efficiently and effectively. Further the MRPFAC adjusts its membership as needed to insure that it is representative of the agencies it serves.

REGION 23 700 MHz PLAN
APPENDIX V - EXISTING INTEROPERABILITY AGREEMENTS AND RULES

This Appendix Contains

1. General statewide interoperability rules promulgated by a series of agreements between the state of Mississippi and various agencies, entities and units of government.

2. General statewide interoperability rules promulgated through a series of mutual agreements.

Existing Interoperability Agreements

The Region 23 Planning Committee feels that it would be impractical to gather all of the interoperability agreements that may exist statewide. As soon as agencies begin requesting 700 MHZ frequencies, these documents will have become outdated.

Therefore, we have included only existing plans that cover the whole of the State of Mississippi. However, as per the Region 23 Plan, applicants are required to provide existing interoperability information and to plan for interoperability for both pre and post 700 MHz system implementation.

APPENDIX V – EXISTING INTEROPERABILITY AGREEMENTS AND RULES

1. Interoperability Channels

1.1 Introduction

The ability for agencies to effectively respond to mutual aid requests directly depends on their ability to communicate with each other. Mississippi is subject to many natural disasters and contains regions and facilities which may be susceptible to a man-made disaster or weapons of mass destruction attack.

Mutual aid should be encouraged among agencies. This Plan seeks to facilitate the communications necessary for effective mutual aid. The administration of the 700 MHz interoperability channels is the responsibility of the State of Mississippi Statewide Interoperable Executive Committee (SIEC). If at any time both the State and the Region 23 Planning Committee agree to do so, then the Region 23 Planning Committee may assume this role and notify the FCC in writing of the change in administrative duties.

To provide interoperability with public safety units from throughout the State and Nation, all such 700 MHz. subscriber radios shall be equipped to operate on all of the NPSPAC 800 MHz conventional mutual aid channels in analog mode as follows:

NATIONWIDE 800 MHz. BAND PUBLIC SAFETY INTEROPERABILITY CHANNELS

FCC 800 MHz NPSPAC Band (Post-Re-banding)				
FREQ / FCC CHANNEL (SUBSCRIBER LOAD)		BASE,MOBILE, OR FIXED (CONTROL)	ELIGIBILITY / PRIMARY USE	COMMON NAME
RECEIVE	TRANSMIT			
851.0125	806.0125	Fixed-Mobile		8CALL90
	SIMPLEX	Base-Mobile	Any Public Safety Eligible	8CALL90D
851.5125	806.5125	Fixed-Mobile	Any Public Safety Eligible	8CALL91
	SIMPLEX	Base-Mobile		8CALL91D
852.0125	807.0125	Fixed-Mobile	Any Public Safety Eligible	8CALL92
	SIMPLEX	Base-Mobile		8CALL92D
852.5125	807.5125	Fixed-Mobile	Any Public Safety Eligible	8CALL93
	SIMPLEX	Base-Mobile		8CALL93D
853.0125	808.0125	Fixed-Mobile	Any Public Safety Eligible	8CALL94
	SIMPLEX	Base-Mobile		8CALL94D

Prior to re-banding above frequencies are 5 MHz higher. Common name would be ICALL, ITAC1, ITAC2, ITAC3, ITAC4 respectively.

1.2 700 MHz Interoperability Channels

All mobile and portable unites operating under this Plan must use the Channel Naming as outlined in the NPSTC Channel Naming Report. All mobile and portable units operating under this Plan and utilizing 700 MHz channels must be programmed for the Mandatory interoperability channels as specified in the State of Mississippi Tactical Interoperability Communications Plan as follows:

700 MHz INTEROPERABILITY CHANNELS				
* REGION 23 MANDATORY INTEROPERABILITY CHANNELS				
CHANNEL RECEIVE	CHANNEL TRANSMIT	BASE,MOBILE, OR FIXED (CONTROL)	ELIGIBILITY / PRIMARY USE	COMMON NAME
39-40	999-1000	Fixed-Mobile	Calling Channel *	7CALL50
	SIMPLEX	Base-Mobile		7CALL50D
119-120	1079-1080	Fixed-Mobile	General Public Safety Service *	7TAC55
	SIMPLEX	Base-Mobile		7TAC55D
319-320	1279-1280	Fixed-Mobile	Other Public Service *	7GTAC57
	SIMPLEX	Base-Mobile		7GTAC57D
303-304	1263-1264	Fixed-Mobile	Mobile Repeater (M03 Use Primary) *	7MOB59
	SIMPLEX	Base-Mobile		7MOB59D
681-682	1641-1642	Fixed-Mobile	Calling Channel *	7CALL70
	SIMPLEX	Base-Mobile		7CALL70D
761-762	1721-1722	Fixed-Mobile	General Public Safety Service *	7TAC75
	SIMPLEX	Base-Mobile		7TAC75D
937-938	1897-1898	Fixed-Mobile	Other Public Services*	7GTAC77
	SIMPLEX	Base-Mobile		7GTAC77D
881-882	1841-1842	Fixed-Mobile	Mobile Repeater (M03 Use Primary) *	7MOB79
	SIMPLEX	Base-Mobile		7MOB79D
	SIMPLEX	Base-Mobile		7FIRE84D

All such 700 MHz. subscriber radios shall also be equipped with the listed channels for operation in both the conventional repeater mode and the direct (talkaround) mode using P25 digital modulation with a NAC of $293. These channels operate outside of the trunked system so they can be used in the direct mode for short range radio to radio anywhere or if the trunked system is down.

1.2.1 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.

1.2.2 Network Access Code

In the Project 25 Common Air Interface definition, the Network Access Code (NAC) is analogous to 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.BACC 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.

1.2.3 Talkgroup ID

In the Project 25 Common Air Interface definition, the Talkgroup ID on conventional channels is analogous to the use of Talkgroups in Trunked radio. In order to ensure that all users can communicate, all units should use a common Talkgroup ID

Recommendation: Use P25 default value for Talkgroup ID =$0001

1.2.4 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.

1.2.5 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 $000000000000000000000.

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 unencrypted messages of $80 and default key Id for unencrypted messages of $0000. These same defaults may be used for 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. Due to the number of natural disaster type events that take place simultaneously in Mississippi that for interoperability use all radios should have the minimum number of National Interoperability Channels called for in the NCC guidelines. All of these National Interoperability Channels should have met NCC guidelines using common alphanumeric nomenclature.

1.3 Interoperability Channel Use

The state will equip three State owned Sites On Wheels (SOW) with radio equipment to support interoperability at remote locations. They will also support mutual aid task force events statewide. Almost all interoperability communication in this state use National Interoperability VHF, UHF channels, NPSPAC channels, or state wide mutual aid channels.

1.4 Calling Channels

The only means of monitoring calling channels throughout Mississippi is with the deployment of the three COWs referred to above or Agencies that have deployed interoperability channels. Any Agency deploying 700 MHz spectrum must install the National Interoperability Channels at their dispatch point and continuously monitor them for emergency calls.

1.5 Interoperability Talkgroups/Channels

1.5.1 700 MHz and 800 MHz Talkgroups/Channels

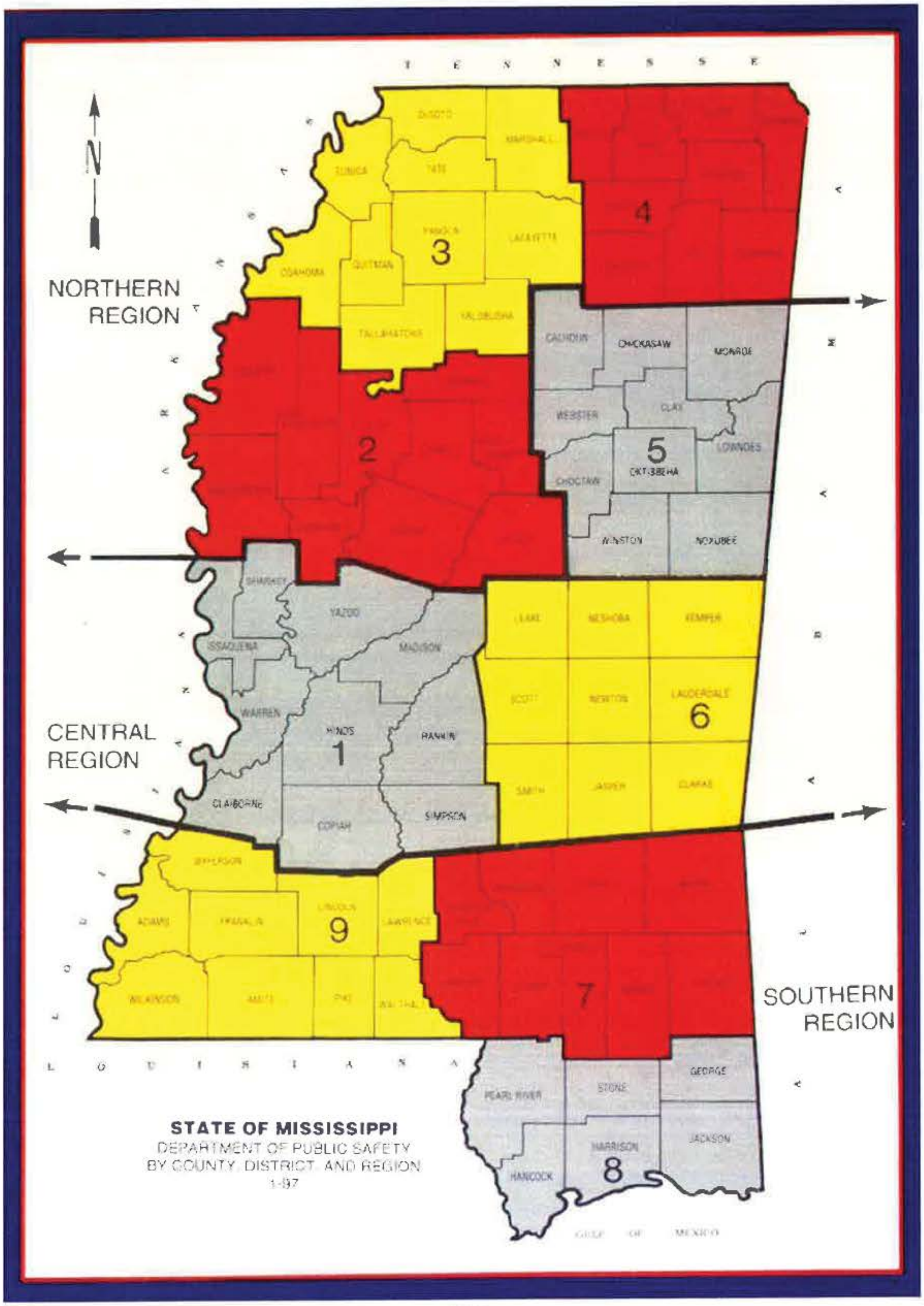
All 700 MHz radio subscriber units operating under the Mississippi State license or licensed under the Region 23 Plan are required to have the following 700 MHz. and 800 MHz. talkgroups/channels programmed by region:

See map for Region boundaries following this table.

ENTITY	AGENCY	TALKGROUP NAME	TALKGROUP ALIAS
INTEROPERABILITY	STATEWIDE	State Special Event Common	ST SE CMN
INTEROPERABILITY	STATEWIDE	State Special Event 1	ST SE 1
INTEROPERABILITY	STATEWIDE	State Special Event 2	ST SE 2
INTEROPERABILITY	STATEWIDE	State Special Event 3	ST SE 3
INTEROPERABILITY	REGION 1	Region 1 Special Event Common	R1 SE CMN
INTEROPERABILITY	REGION 1	Region 1 Special Event 1	R1 SE 1
INTEROPERABILITY	REGION 1	Region 1 Special Event 2	R1 SE 2
INTEROPERABILITY	REGION 1	Region 1 Special Event 3	R1 SE 3
INTEROPERABILITY	REGION 2	Region 2 Special Event Common	R2 SE CMN
INTEROPERABILITY	REGION 2	Region 2 Special Event 1	R2 SE 1

APPENDIX V – EXISTING INTEROPERABILITY AGREEMENTS AND RULES

ENTITY	AGENCY	TALKGROUP NAME	TALKGROUP ALIAS
INTEROPERABILITY	REGION 2	Region 2 Special Event 2	R2 SE 2
INTEROPERABILITY	REGION 2	Region 2 Special Event 3	R2 SE 3
INTEROPERABILITY	REGION 3	Region 3 Special Event Common	R3 SE CMN
INTEROPERABILITY	REGION 3	Region 3 Special Event 1	R3 SE CMN
INTEROPERABILITY	REGION 3	Region 3 Special Event 2	R3 SE CMN
INTEROPERABILITY	REGION 3	Region 3 Special Event 3	R3 SE CMN
INTEROPERABILITY	REGION 4	Region 4 Special Event Common	R4 SE CMN
INTEROPERABILITY	REGION 4	Region 4 Special Event 1	R4 SE CMN
INTEROPERABILITY	REGION 4	Region 4 Special Event 2	R4 SE CMN
INTEROPERABILITY	REGION 4	Region 4 Special Event 3	R4 SE CMN
INTEROPERABILITY	REGION 5	Region 5 Special Event Common	R5 SE CMN
INTEROPERABILITY	REGION 5	Region 5 Special Event 1	R5 SE CMN
INTEROPERABILITY	REGION 5	Region 5 Special Event 2	R5 SE CMN
INTEROPERABILITY	REGION 5	Region 5 Special Event 3	R5 SE CMN
INTEROPERABILITY	REGION 6	Region 6 Special Event Common	R6 SE CMN
INTEROPERABILITY	REGION 6	Region 6 Special Event 1	R6 SE CMN
INTEROPERABILITY	REGION 6	Region 6 Special Event 2	R6 SE CMN
INTEROPERABILITY	REGION 6	Region 6 Special Event 3	R6 SE CMN
INTEROPERABILITY	REGION 7	Region 7 Special Event Common	R7 SE CMN
INTEROPERABILITY	REGION 7	Region 7 Special Event 1	R7 SE 1
INTEROPERABILITY	REGION 7	Region 7 Special Event 2	R7 SE 2
INTEROPERABILITY	REGION 7	Region 7 Special Event 3	R7 SE 3
INTEROPERABILITY	REGION 8	Region 8 Special Event Common	R8 SE CMN
INTEROPERABILITY	REGION 8	Region 8 Special Event 1	R8 SE 1
INTEROPERABILITY	REGION 8	Region 8 Special Event 2	R8 SE 2
INTEROPERABILITY	REGION 8	Region 8 Special Event 3	R8 SE 3
INTEROPERABILITY	REGION 9	Region 9 Special Event Common	R9 SE CMN
INTEROPERABILITY	REGION 9	Region 9 Special Event 1	R9 SE 1
INTEROPERABILITY	REGION 9	Region 9 Special Event 2	R9 SE 2
INTEROPERABILITY	REGION 9	Region 9 Special Event 3	R9 SE 3


T E N N E S S E E
NORTHERN REGION
CENTRAL REGION
SOUTHERN REGION
DESOTO
MARSHALL
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PANOLA
LAFAYETTE
COAHOMA
QUITMAN
TALLAHATCHIE
YALOBUSHA
CALHOUN
CHICKASAW
MONROE
WEBSTER
CLAY
LOWNDES
CHOCTAW
OKTIBBEHA
WINSTON
NOXUBEE
SHARKEY
YAZOO
ISSAQUENA
MADISON
LEAKE
NESHOBA
KEMPER
WARREN
HINDS
RANKIN
SCOTT
NEWTON
LAUDERDALE
SMITH
JASPER
CLARKE
CLAIBORNE
COPIAH
SIMPSON
JEFFERSON
ADAMS
FRANKLIN
LINCOLN
LAWRENCE
WILKINSON
AMITE
PIKE
WALTHALL
L O U I S I A N A
PEARL RIVER
STONE
GEORGE
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HARRISON
JACKSON
GULF OF MEXICO
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STATE OF MISSISSIPPI
DEPARTMENT OF PUBLIC SAFETY
BY COUNTY, DISTRICT, AND REGION
1-87

1.5.2 Statewide P25 700 MHz System Talkgroups

All such 700 MHz. subscriber radios shall be equipped with the following talkgroups for operation in the statewide P25 700 MHz system:

Special Event Talkgroups

- **State Special Event Common (ST SE-CMN):** digital P25 700 MHz calling channel for use by emergency personnel statewide for a special event.
  State Special Event 1 (ST SE-1): assigned by event coordinator
  State Special Event 2 (ST SE-2): assigned by event coordinator
  State Special Event 3 (ST SE-3): assigned by event coordinator

- **Region 1 Special Event Common (R1 SE-CMN):** digital P25 700 MHz common channel for use by emergency personnel in region 1 for a special event.
  Region 1 Special Event 1 (R1 SE-1): assigned by event coordinator
  Region 1 Special Event 2 (R1 SE-2): assigned by event coordinator
  Region 1 Special Event 3 (R1 SE-3): assigned by event coordinator

- **Region 2 Special Event Common (R2 SE-CMN):** digital P25 700 MHz common channel for use by emergency personnel in region 2 for a special event.
  Region 2 Special Event 1 (R2 SE-1): assigned by event coordinator
  Region 2 Special Event 2 (R2 SE-2): assigned by event coordinator
  Region 2 Special Event 3 (R2 SE-3): assigned by event coordinator

- **Region 3 Special Event Common (R3 SE-CMN):** digital P25 700 MHz common channel for use by emergency personnel in region 3 for a special event.
  Region 3 Special Event 1 (R3 SE-1): assigned by event coordinator
  Region 3 Special Event 2 (R3 SE-2): assigned by event coordinator
  Region 3 Special Event 3 (R3 SE-3): assigned by event coordinator

- **Region 4 Special Event Common (R4 SE-CMN):** digital P25 700 MHz common channel for use by emergency personnel in region 4 for a special event.
  Region 4 Special Event 1 (R4 SE-1): assigned by event coordinator
  Region 4 Special Event 2 (R4 SE-2): assigned by event coordinator
  Region 4 Special Event 3 (R4 SE-3): assigned by event coordinator

- **Region 5 Special Event Common (R5 SE-CMN):** digital P25 700 MHz common channel for use by emergency personnel in region 5 for a special event.
  Region 5 Special Event 1 (R5 SE-1): assigned by event coordinator
  Region 5 Special Event 2 (R5 SE-2): assigned by event coordinator
  Region 5 Special Event 3 (R5 SE-3): assigned by event coordinator

- **Region 6 Special Event Common (R6 SE-CMN):** digital P25 700 MHz common channel for use by emergency personnel in region 6 for a special event.
  Region 6 Special Event 1 (R6 SE-1): assigned by event coordinator
  Region 6 Special Event 2 (R6 SE-2): assigned by event coordinator
  Region 6 Special Event 3 (R6 SE-3): assigned by event coordinator

- **Region 7 Special Event Common (R7 SE-CMN):** digital P25 700 MHz common channel for use by emergency personnel in region 7 for a special event.
  Region 7 Special Event 1 (R7 SE-1): assigned by event coordinator
  Region 7 Special Event 2 (R7 SE-2): assigned by event coordinator
  Region 7 Special Event 3 (R7 SE-3): assigned by event coordinator

- **Region 8 Special Event Common (R8 SE-CMN):** digital P25 700 MHz common channel for use by emergency personnel in region 8 for a special event.
  Region 8 Special Event 1 (R8 SE-1): assigned by event coordinator
  Region 8 Special Event 2 (R8 SE-2): assigned by event coordinator
  Region 8 Special Event 3 (R8 SE-3): assigned by event coordinator

- **Region 9 Special Event Common (R9 SE-CMN):** digital P25 700 MHz common channel for use by emergency personnel in region 9 for a special event.
  Region 9 Special Event 1 (R9 SE-1): assigned by event coordinator
  Region 9 Special Event 2 (R9 SE-2): assigned by event coordinator
  Region 9 Special Event 3 (R9 SE-3): assigned by event coordinator

1.5.3 Non 700/800 MHz interoperability frequencies.

For most of rural MS law enforcement use either 45.22 MHz or 155.490 MHz as a statewide common channel which is a simplex system.

The fire departments use 154.160MHz as their statewide common channel.

REGION 23 700 MHz PLAN
APPENDIX W – CERTIFICATION OF OPEN MEETINGS

This Appendix Contains

1. Open meetings certification by the 700 MHz RPC Chairman.

Mississippi Public Safety
FREQUENCY ADVISORY COMMITTEE

(MSPSFAC) REGION 23 700 MHz Planning Committee

DIRECT ALL CORRESPONDENCE TO:
Donald W. Loper, Chairman Region 23 700 MHz Public Safety RPC
3893 Highway 468 West
Pearl, MS 39208
(601) 933-2603
State of Mississippi

CERTIFICATION OF PUBLIC MEETINGS

ON BEHALF of the members of the Region 23 700 MHz Planning Committee, I hereby certify that all meetings of the Planning Committee were open to the public; that solicitations were made at said meetings to secure comments from members of the public; and that any comments received were duly noted and properly considered during the development of the Region 23 700 MHz Plan to which this certification is affixed.

I ATTEST that proper notification was given to the public. Public notices included, but were not limited to: postings on web sites maintained by the FCC, by the Mississippi Chapter of APCO and by the Mississippi Public Safety Frequency Advisory Committee; notices sent via the MCHS system, and notices distributed via representatives of the various government units, not for profit agencies, for profit entities and private parties who attended 700 MHz RPC meetings and those persons who attended meetings of the Mississippi Public Safety Frequency Advisory Committee. An initial solicitation of individual and parties of interest was distributed on November 8, 2001 (See Exhibit E of the 700 MHz Region 23 700 MHz Plan). The planning process was terminated on March 31,2006 upon an electronic filing of the plan with the Federal Communications Commission.

I FURTHER ATTEST that the 700 MHz RPC will terminate upon final approval of the 700 MHz Region 23 Plan, but that the 700 MHz RPC members have voted to remain active and make available opportunities for further public comment should there be a need to revise or modify the Plan submitted to the FCC on March 31, 2006. Following approval of the Plan by the FCC, public comment will be accepted for 700 MHz frequency allocations pursuant to guidelines of the Plan as finally approved.

On this 10th day of April 2006, the above comments are certified as true and accurate to the best of my belief and knowledge.

Donald W. Loper, Chairman
Region 23 700 MHz RPC

REGION 23 700 MHz PLAN
APPENDIX X – SIGNED CONCURRANCE DOCUMENTS AND SIGNED DISPUTE RESULUTION AGREEMENTS

This Appendix Contains

1. Documentation of approval of the inter-region coordination agreements between Region 23 and Regions: 1, 4, 18 and 39.
2. Signed Dispute Resolution Agreements between Region 23 and Regions: 1, 4, 18 and 39.

INTER REGION COORDINATION AGREEMENT APPROVAL DOCUMENTATION

REGION 39 – TENNESSEE

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 23 (Mississippi) and Region 39 (Tennessee).

II. INTER-REGIONAL COORDINATION AGREEMENT

2. The following is the specific procedure for inter-regional coordination which has been agreed upon by Region 23 and Region 39, 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.

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.

---

[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 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.

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 chairperson's 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 Plan Oversight Committee (NPOC)[2], of the National Public Safety Telecommunications Council. 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 NPOC will, within thirty (30) calendar days, report its recommendation(s) to the Regional chairpersons via the CAPRAD database. The NPOC'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*

[2] The Regional Plan Oversight Committee (RPOC) is a committee within the National Public Safety Telecommunications Council (NPSTC) established to arbitrate disputes between 700 MHz Regions that cannot be resolved by the impacted Regions.

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, Region 23 and Region 39 do hereunto set their signatures the day and year first above written.

Respectfully,

____
Donald W. Loper
Chair, Region 23

____
John W. Johnson
Chair, Region 39

Date: ______________

REGION 1 – ALABAMA

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 23 (Mississippi) and Region 1 (Alabama).

II. INTER-REGIONAL COORDINATION AGREEMENT

2. The following is the specific procedure for inter-regional coordination which has been agreed upon by Region 23 and Region 1, 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 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.

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 chairperson's 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 Plan Oversight Committee (NPOC)[2], of the National Public Safety Telecommunications Council. 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 NPOC will, within thirty (30) calendar days, report its recommendation(s) to the Regional chairpersons via the CAPRAD database. The NPOC'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

[2] The Regional Plan Oversight Committee (RPOC) is a committee within the National Public Safety Telecommunications Council (NPSTC) established to arbitrate disputes between 700 MHz Regions that cannot be resolved by the Impacted Regions.

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, Region 23 and Region 1 do hereunto set their signatures the day and year first above written.

Respectfully,

____
Donald W. Loper
Chair, Region 23

____
Eric Linsley
Chair, Region 1

Date: ______________

REGION 4 – ARKANSAS

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 23 (Mississippi) and Region 4 (Arkansas).

II. INTER-REGIONAL COORDINATION AGREEMENT

2. The following is the specific procedure for inter-regional coordination which has been agreed upon by Region 23 and Region 4, 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 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.

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 chairperson's 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 Plan Oversight Committee (NPOC)[2], of the National Public Safety Telecommunications Council. 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 NPOC will, within thirty (30) calendar days, report its recommendation(s) to the Regional chairpersons via the CAPRAD database. The NPOC'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

[2] The Regional Plan Oversight Committee (RPOC) is a committee within the National Public Safety Telecommunications Council (NPSTC) established to arbitrate disputes between 700 MHz Regions that cannot be resolved by the impacted Regions.

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, Region 23 and Region 4 do hereunto set their signatures the day and year first above written.

Respectfully,

____

Donald W. Loper

Chair, Region 23

____

Carl W. Jacobs

Chair, Region 4

Date: ______________

REGION 18 – LOUISIANA

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 23 (Mississippi) and Region 18 (Louisiana).

II. INTER-REGIONAL COORDINATION AGREEMENT

2. The following is the specific procedure for inter-regional coordination which has been agreed upon by Region 23 and Region 18, 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 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.

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 chairperson's 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 Plan Oversight Committee (NPOC)[2], of the National Public Safety Telecommunications Council. 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 NPOC will, within thirty (30) calendar days, report its recommendation(s) to the Regional chairpersons via the CAPRAD database. The NPOC'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

[2] The Regional Plan Oversight Committee (RPOC) is a committee within the National Public Safety Telecommunications Council (NPSTC) established to arbitrato disputes between 700 MHz Regions that cannot be resolved by the impacted Regions.

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, Region 23 and Region 18 do hereunto set their signatures the day and year first above written.

Respectfully,

____
Donald W. Loper
Chair, Region 23

____
Kenneth C. Hughes
Chair, Region 18

Date: ____________

SAMPLE CONCURRENCE LETTER

Date

Mr. ______________________

Regional Chairperson Region ____

Contact Info

Dear Mr. Loper,

Region ____ is in receipt of your proposed 700 MHz Regional Plan, submitted to this Committee on mm/dd/yy. Region ____ met on mm/dd/yy, reviewed and formally approved Region 23's Plan.

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

Sincerely,

Mr. ________________________

Chairperson Region _____

Contact Info

SIGNED LETTERS OF CONCURRANCE FROM ADJACENT REGIONS

1. Region 23 700 MHz Regional Plan
2. Region 23 700 MHz Regional Plan Revision per FCC Order 14-172 – October 2015

700 MHz Regional Planning Committee

Region 39, Tennessee

Region 39, 700 MHz Regional Planning Committee
John Johnson, Chairman
3041 Sidco Drive
Nashville, TN 37204

April 28, 2010

Mr. Donald Loper
Chairman Region 23
Mississippi Dept of Public Safety
3895 Hwy. 468 West
Pearl, MS 39208

Dear Don,

Region 39 has received and reviewed the Region 23 700 MHz Plan. On behalf of Region 39, by this letter, Region 39 concurs with the Region 23 Plan.

We request that Region 23 allow Region 39 to review any FCC applications that affects our Region, prior to the application being submitted to the FCC and will respond in a timely manner as set forth in our Dispute Resolution.

Sincerely,

John W. Johnson
Chairman Region 39
700 MHz Regional Planning Committee

Theodore H. Lawson
Richard H. Crost, P.L.S.
Robert J. Gordon

George E. Oaks
Ted Montgomery
Eric M. Linsley

MOBILE COUNTY PUBLIC WORKS

Director of Public Works / County Engineer
Joe W. Ruffer, P.E.

February 8, 2010

Donald Loper, Chairman
Region 23, 700 MHz Regional Planning Committee
Mississippi Department of Public Safety
3893 Hwy. 468 W.
Pearl, MS 39208

Re: Region 23, Mississippi 700 MHz Regional Plan

I have received your email dated February 1, 2008 and a copy of the above-mentioned plan. As Chairman of the Region 1, Alabama Regional Planning Committee, I concur with Region 23's 700 MHz Regional Plan. I also concur with the Inter-Regional Coordination Procedures and Procedures for Resolution of Disputes and I have enclosed a signed copy.

Yours Truly

Eric M. Linsley
Director of Public Safety Communications
Chairman Region 1, 700 MHz Regional Planning Committee

cc Joe Ruffer, P.E.
County Engineer

Region 4 (Arkansas) 700 MHz Regional Planning Committee
J.M. Rowe Chairman
125 Carnation Place
Hot Springs AR 71913

May 1, 2010

Mr. Donald Loper
Chairman Region 23
Mississippi Dept of Public Safety
1893 Hwy. 468 West
Pearl, MS 39208

Dear Don,

Region 4 has received and reviewed the Region 23 700 MHz Plan. On behalf of Region 4, by this letter, Region 4 concurs with the Region 23 Plan.

We request that Region 23 allow Region 4 to review any FCC applications that affects our Region, prior to the application being submitted to the FCC and will respond in a timely manner, as set forth in our Dispute Resolution.

Sincerely,

JM Rowe

J.M. Rowe
Chairman Region 4
700 MHz Regional Planning Committee

APPENDIX Z

ADJACENT REGION CONCURRENCE LETTER

March 29, 2010

Mr. Donald W. Loper
Director of Communications
MDPS / MHSP
Region 23

Dear Mr. Loper

Region 18 is in receipt of your proposed 700 MHz Regional Plan, submitted to this Committee on 2/5/2010. Region 18 met on 3/9/2010, reviewed and formally approved Region 23's Plan.

This letter serves as the official, written concurrence of Region 18 to your proposed 700 MHz Regional Plan.

Sincerely,

Mr. Ken Hughes
Chairperson Region 18
1300 Perdido St.
Suite 9W03
New Orleans, LA 70112

Region 1, Alabama

Region 1, 700 & 800 MHz Regional Planning Committee
Eric Linsley, Chairman
1150 Schillinger Road North
Mobile, AL 36608

October 28, 2015

Lana Nicks
Region 23, 700 Regional Planning
Committee State of Mississippi
Sent via email: lnicks@wcc.ms.gov

Re: Region 23, Mississippi 700 MHz Regional Plan

Dear Lana:

I have received your email dated October 20, 2015 and a copy of the above-mentioned modified plan. As Chairman of the Region 1, Alabama Regional Planning Committee, I concur with Region 23's amended 700 MHz Regional Plan. If you have any questions, please contact me at (251) 574-7931.

Respectfully,

Eric Linsley
Chairman Region 1 RPC

Region 4 (Arkansas) 700 MHz RPC

27OCT2015

Dear Ms. Nicks,

Region 4 finds no objection to granting concurrence to the Region 23 700 MHz plan update dated October 2015.

The usual caveats should apply.

Sincerely,

JM Rowe

J.M. Rowe, Chair
Region 4 700 MHz
Planning Committee

Louisiana Public Safety 700MHz Planning Committee

Region 18
Michael Musselman, Chair
Anthony Summers, Vice Chair

October 27, 2015

Tom Lariviere, Chairman Region 23
Wireless Communication Commission
412 East Woodrow Wilson Ave.
Mail Stop 6601
Jackson, MS 39216

Re: Mississippi Region 23 700 MHz Plan Modification

Dear Mr. Lariviere:

As requested, I have reviewed the proposed modifications (changes) to the Region 23 Plan.

Louisiana, Region 18 has no objections to the proposed modifications.

Please contact me if you have any questions.

Sincerely,

Michael Musselman

Michael Musselman, Chairperson
Region 18 (Louisiana)
700 MHz Planning Committee

NPSPAC
700 MHz Region 39, Tennessee

NPSPAC Region 39 700 MHz Regional Review Committee

Jesse Griggs, Chairman
TN Dept. of Correction
Rachel Jackson State Office Bldg.
320 6th Ave. N
Nashville, TN 37243

Patrick Rollins, Vice Chair
City of Chattanooga
3420 Amnicola Hwy
Chattanooga, TN 37406

October 26, 2015

Tom Lariviere, Chairperson
Region 23 700 MHz Regional Planning Committee
State of Mississippi

Dear Mr. Larivere,

Region 39 (Tennessee) has reviewed the proposed changes to Region 23's 700 MHz Regional Plan and also reviewed the proposed allotments of the former reserve channels, now allocated for general use.

This letter serves as the official, written concurrence of Region 39 to your proposed 700 MHz Regional Plan amendment.

Sincerely,

Jesse D. Griggs
Chairperson
Tennessee Dept. of Correction
6406 Centennial Blvd. Nashville, TN 37209

SIGNED DISPUTE RESOLUTION AGREEMENTS FROM ADJACENT REGIONS

III. CONCLUSION

3. IN AGREEMENT HERETO, Region 23 and Region 39 do hereunto set their signatures the day and year first above written.

Respectfully,

Donald W. Loper P

Donald W. Loper

Chair, Region 23

John W. Johnson

John W. Johnson

Chair, Region 39

Date April 16, 2010

III. CONCLUSION

3. IN AGREEMENT HERETO, Region 23 and Region 1 do hereunto set their signatures the day and year first above written.

Respectfully,

Donald W. Loper

Donald W. Loper
Chair, Region 23

Eric Linsley
Chair, Region 1

Date: 2-8-10

Appendix G Inter-Regional Dispute Resolution

The procedure will consist of the following steps should a dispute occur:

If the adjacent Region(s) cannot approve the request, the adjacent Region shall document the reasons for partial or non-concurrence, and respond within ten (10) calendar days via mail, email or fax. 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 via email, mail or fax. Findings may include, but not be limited to unconditional concurrence; conditional concurrence contingent upon modification of applicant's technical parameters; or 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.

If the Inter-Regional Working Group cannot resolve the dispute, then the matter shall be forwarded for evaluation to the National Plan Oversight Committee (NPOC), of 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 NPOC will, within thirty (30) calendar days, report its recommendation(s) to the Regional chairpersons via the CAPRAD database. The NPOC's decision may support either of the disputing Regions or it may develop a proposal that it deems mutually advantageous to each disputing Region.

CONCLUSION

In agreement hereto, Regions 4 and Region 23 do by the signing of the document pledge to abide by this Agreement.

Respectfully, [all signatories to agreement]

JM Rowe Chair, Region 4 700 MHz RPC

Donald W. Loper P - Region 23 700 MHz RPC
Date: 3/16/10

III. CONCLUSION

3. IN AGREEMENT HERETO, Region 23 and Region 18 do hereunto set their signatures the day and year first above written.

Respectfully,

Donald W. Loper

Donald W. Loper
Chair, Region 23

Kenneth C. Hughes
Chair, Region 18

Date: 3/29/2010

REGION 23 700 MHz PLAN
APPENDIX Y – ACRONYMS USED IN THS DOCUMENT

This Appendix Contains

1. Acronyms used in this Plan

Acronyms Used in the Region 23 Plan

APCO – Association of Public-Safety Communications Officials
CAPRAD - Computer Assisted Pre-Coordination Resource and Database
DTV - Digital Television
ERP - Effective Radiated Power
ICS - Incident Command System
MEMA – Mississippi Emergency Management Agency
MDT - Mobile Data Terminal
MOU - Memorandum of Understanding
MRPFAC – Mississippi 700 MHz Regional Planning and Frequency Advisory Committee
NENA – National Emergency Number Association
NCC - National Coordinating Committee
NIJ - National Institute of Justice
NIMS - National Incident Management System
NLECTC - National Law Enforcement and Corrections Technology Center
NPSPAC - National Public Safety Planning Advisory Committee
NPSTC - National Public Safety Telecommunication Council
PSWAC - Public Safety Wireless Advisory Committee
PW - FCC designator for Public Safety "Pool" Frequencies
SIEC - State Interoperability Executive Committee
WCC – Mississippi Wireless Communication Commission

REGION 23 700 MHz PLAN
APPENDIX Z – REGIONAL PLAN UPDATES

This Appendix Contains

1. General Use Channels and Air to Ground Channels pursuant to FCC Order 14-172 dated October 24, 2014.

GENERAL USE CHANNELS PURSUANT TO FCC ORDER 14-172

General Use Channels and Air to Ground Channels pursuant to FCC Order 14-172 dated October 24, 2014

In its Report and Order (FCC 14-172) dated October 24, 2014, the FCC reallocated the 700 MHz Reserve Channels to General Use Channels. The MRPFAC has modified the Region 23 700 MHz Regional Plan to utilize all former Reserve channels as "floating allotments" to supplement the existing General Use allotments in Region 23:

Class	Band Width	Channel	Base Frequency	Mobile Frequency
General Use	Voice 12.5KHz	37-38	769.23125	799.23125
General Use	Voice 12.5KHz	61-62	769.38125	799.38125
General Use	Voice 12.5KHz	77-78	769.48125	799.48125
General Use	Voice 12.5KHz	117-118	769.73125	799.73125
General Use	Voice 12.5KHz	141-142	769.88125	799.88125
General Use	Voice 12.5KHz	157-158	769.98125	799.98125
General Use	Voice 12.5KHz	197-198	770.23125	800.23125
General Use	Voice 12.5KHz	221-222	770.38125	800.38125
General Use	Voice 12.5KHz	237-238	770.48125	800.48125
General Use	Voice 12.5KHz	277-278	770.73125	800.73125
General Use	Voice 12.5KHz	301-302	770.88125	800.88125
General Use	Voice 12.5KHz	317-318	770.98125	800.98125
General Use	Voice 12.5KHz	643-644	773.01875	803.01875
General Use	Voice 12.5KHz	683-684	773.26875	803.26875
General Use	Voice 12.5KHz	699-700	773.36875	803.36875
General Use	Voice 12.5KHz	723-724	773.51875	803.51875
General Use	Voice 12.5KHz	763-764	773.76875	803.76875
General Use	Voice 12.5KHz	779-780	773.86875	803.86875
General Use	Voice 12.5KHz	803-804	774.01875	804.01875
General Use	Voice 12.5KHz	843-844	774.26875	804.26875
General Use	Voice 12.5KHz	859-860	774.36875	804.36875
General Use	Voice 12.5KHz	883-884	774.51875	804.51875
General Use	Voice 12.5KHz	923-924	774.76875	804.76875
General Use	Voice 12.5KHz	939-940	774.86875	804.86875

AIR TO GROUND CHANNELS PURSUANT TO FCC ORDER 14-172

In its Report and Order (FCC 14-172) dated October 24, 2014, the FCC redesignated the 700 MHz Secondary Trunked channels and reserved them for specific Air to Ground communications to be used by low-altitude aircraft and ground stations. The MRPFAC has modified the Region 23 700 MHz Regional Plan to utilize the following channels as Air to Ground Channels:

Class	Band Width	Channel	Base Frequency	Mobile Frequency
Air Ground	Voice 12.5KHz	21-22	769.13125	799.13125
Air Ground	Voice 12.5KHz	101-102	769.63125	799.63125
Air Ground	Voice 12.5KHz	181-182	770.13125	800.13125
Air Ground	Voice 12.5KHz	261-262	770.63125	800.63125
Air Ground	Voice 12.5KHz	659-660	773.11875	803.11875
Air Ground	Voice 12.5KHz	739-740	773.61875	803.61875
Air Ground	Voice 12.5KHz	819-820	774.11875	804.11875
Air Ground	Voice 12.5KHz	899-900	774.61875	804.61875