

REGION 23

700 MHz PUBLIC SAFETY BAND REGIONAL PLAN

700 MHz COMMITTEE OFFICERS

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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 Region 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	<u>40</u>
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,

$$\text{System Points (from previous category)} \times 2 = \text{Score.}$$

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

$$(\text{Total number of subscriber units}) / (\text{Area in square miles}) \times 100 = \text{score.}$$

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.

$$\text{Scoring: Number frequencies to be Relinquished} \times 10 = \text{Score}$$

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
MS Board of Animal Health (MBAH)	Dr. Brigid Elchos MBAH Primary	Phone: 601-953-3800 Brigid@mdac.state.ms.us	121 North Jefferson Street Jackson, Mississippi
MS Board of Animal Health (MBAH)	Dr. Jim Watson MBAH Secondary	Phone: 601-359-1170 Cellular: 601-594-8402 jimw@mdac.state.ms.us	121 North Jefferson Street Jackson, Mississippi
MS Board of Animal Health (MBAH)	Ronnie White MBAH Secondary	Phone: 601-953-7001 Ronnie@mdac.state.ms.us	121 North Jefferson Street Jackson, Mississippi
Mississippi Department of Health (MDH)	Jim Craig Director, Office of Health Protection	Phone: 601-576-7680 Cellular 601-946-6046 jcraig@msdh.state.ms.us	570 E Woodrow Wilson Jackson, MS 39215
Mississippi Department of Transportation (MDOT)	Willie Huff Law Enforcement Director	General: 601-359-7001 Fax: 601-359-7050 Office: 601-359-1707 Cellular: 601-672-0722 Fax: 601-359-1709 whuff@mdot.state.ms.us	401 Northwest Street Jackson, MS 39201 Mailing: P.O. Box 1850 Jackson, MS 39215-1850
Mississippi Department of Transportation (MDOT)	Todd Jordan	Phone: 601-544-6511 tjordan@mdot.state.ms.us	Hattiesburg MS
Mississippi Department of Transportation (MDOT)	Sharpie Smith	Phone: 601-554-9374 ssmith@mdot.state.ms.us	
Wireless Communication Commission	Bill Buffington	Phone: 601-665-2206 bbuffington@mdps.state.ms.us	412 East Woodrow Wilson Avenue, Mail Stop 6601

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			Jackson, MS 39216
Department of Public Safety Mississippi Highway Patrol (MHP)	Donald W. Loper Director of Communications	Phone: 601-933-2603 Cellular: 601-260-9425 Fax: 601-933-2673 dloper@mdps.state.ms.us	1900 East Woodrow Wilson Jackson, MS 39216 Mailing: P.O. Box 958 Jackson, MS 39205
Mississippi National Guard (MSNG)	CW2 Andy Taleisnik Frequency/Communications Manager	Phone: 601-313-6482 Andy.taleisnik@us.army.mil	1410 Riverside Drive Jackson, MS 39202
Mississippi National Guard (MSNG)	Colonel Lee Smithson	Phone: 601-313-6698 lee.smithson@us.army.mil	1410 Riverside Drive Jackson, MS 39202
Mississippi National Guard (MSNG)	LTC Gary Huffman	Phone: 601-313-6313 gary.huffman1@us.army.mil ngmsj3loc@ng.army.mil	1410 Riverside Drive Jackson, MS 39202
Mississippi National Guard (MSNG)	LTC Gary Ladd	Phone: 601-313-6698 gary.d.ladd@us.army.mil	
MS Dept of Public Safety Office of Homeland Security Search and Rescue	Byron E. Thompson, Jr., State SAR Coordinator	Office: 601-346-1505 Cellular: 601-665-3561 Fax: 601-346-1521 bthompson@mdps.state.ms.us	1230 Raymond Road Jackson, MS 39205
Local			
MS Veterinary Medical Association (MVMA)	Dr. C. Leetyner President	Phone: 662-325-1342 tyner@cvm.msstate.edu	209 S. Lafayette St. Starkville, MS 39759 Mailing: PO Box 6100 Mississippi State, MS 39762
Tribal			
Mississippi Band of Choctaw Indians	Ken York, Director of Planning	Phone: 601-650-1562 Cellular: 601-650-2562 KHYork@choctaw.org	Post Office Box 6010 Choctaw, MS 39350
Federal			
Department of Defense (DoD)	Brian Esker Frequency Spectrum Management for Northcom, DoD	Phone: 719-554-4656 brian.esker@usnorthcom.mil	
Department of Homeland Security (DHS)	Dave Campbell Frequency/Communications Manager	Phone: 202-444-0210 Cellular: (202) 680-3917 David.campbell2@dhs.gov	

Organization	Name, Title	Phone/E-mail	Location / Address
Department of Interior/National Interagency Fire Center (DOI/NIFC)	Chris Lewis Frequency/Communications Manager	Phone: 202-208-6759 Cellular: 202-320-3731 Christopher_lewis@doi.gov	
Federal Communications Commission (FCC)	Richard Lee Frequency/Communications Manager	Phone: 202-418-1104 Email: Richard.lee@fcc.gov	
National Disaster Medical System (NDMS)	Captain Tom Bowman	Phone 770- 220-5217 Cellular 770-274-9560 Thomas.Bowman@dhs.gov	3003 Chamblee-Tucker Road Atlanta, GA 30341
National Disaster Medical System (NDMS)	Dan Fletcher	Cellular 404-682-8476 Dan.Fletcher@dhs.gov	3003 Chamblee-Tucker Road Atlanta, GA 30341
National Telecommunications and Information Administration (NTIA)	John McFall Frequency/Communications Manager	Phone: 202-482-1486 Jmcfall@ntia.doc.gov	
USCG Frequency Management	Leesa Morgan Frequency/Communications Manager	Phone: 504-671-2028 leesa.i.morgan@uscg.mil	500 Poydras Street New Orleans, LA, 70130
US Coast Guard	CWO Joe Ricci Communications Technical Manager	Phone: 504-671-22215 joe.a.ricci@uscg.mil	500 Poydras Street New Orleans, LA, 70130

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.

List of individuals contacted to participate in the Planning Process
LOCAL EMERGENCY MANAGEMENT – REGION 23 CONTACTS

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Alcorn County Rickey Gibens 1828 Proper Street Corinth, MS 38834 rgacfs@avsia.com	Claiborne County Roderick Devoual PO Box 558 Port Gibson, MS 39150 roderickdevoual@ccmsgov.us	Greene County Trent Robertson PO Box 334 Leaksville, MS 39451 greenecoema@tds.net
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Bolivar County Bill Quinton PO Box 538 Cleveland, MS 38732 wtquinton@cableone.net	Copiah County Randle Drane 122 South Lowe Street Hazlehurst, MS 39083 rdrane@copiahcountymiss.gov	Hinds County Jimmie Lewis PO Box 22568 Jackson, MS 39225 jlewis@co.hinds.ms.us
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Thad A. Roberts

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Eugene Doss

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Issaquena County
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issaquenaema@aol.com

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Daniel Cole
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List of individuals contacted to participate in the Planning Process

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Pike County
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Tate County
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Websterfc_1@bellsouth.net

Yalobusha County
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List of individuals contacted to participate in the Planning Process

TRIBAL CONTACTS – REGION 23 CONTACTS

Tunica-Biloxi Indians of LA, Inc
Tribal Administrator
Earl Barbry
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ebarby@tunica.org

MS Band of Choctaw Indians
IT Director for MS Band of Choctaw Indians
Michelle.york@choctaw.org
Info@choctaw.org

Quapaw Tribe of Oklahoma
Tribal Chairperson
P O Box 765
Quapaw, OK 74363
Mailbag@quapawtribe.com

Choctaw Nation of Oklahoma
vonna@choctawnation.com

The Chickasaw Nation
Rebecca Chandler
Historic Preservation Officer
Rebecca.chandler@chickasaw.net
www.chickasaw.net

Jena Band of Choctaw Indians
Chief Christine Norris
P O Box 14
Jena, LA 71342
chief@jenachoctaw.org

List of individuals contacted to participate in the Planning Process

SHERIFF DEPARTMENT – REGION 23 CONTACTS

www.mssheriff.org

List of individuals contacted to participate in the Planning Process

ADJACENT REGIONAL CHAIR – REGION 23 CONTACTS

Region 1 - Alabama
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Mobile County Public Works
1150 Schillinger Road North
Mobile, AL 36608
linsleye@attglobal.net

Region 4 – Arkansas
Mr. Carl Jacobs, *Chairperson*
Pulaski County Emergency
3200 Brown Street
Little Rock, AR 72204
pccd@aristotle.net

Region 18 – Louisiana
Mr. Kenneth C. Hughes,
Chairperson
UASI Communications Planner
1300 Perdido Street
New Orleans, LA 70112
KCHughes@CityofNO.com

Region 39 – Tennessee
John W. Johnson, *Chairperson*
TN Emergency Management
3041 Sidco Drive
Nashville, TN 37204
jjohnson@tnema.org

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	BLUE MOUNTAIN	CLEVELAND
ABERDEEN	BLUE SPRINGS	CLINTON
ACKERMAN	BOLTON	COAHOMA
ALGOMA	BOONEVILLE	COFFEEVILLE
ALLIGATOR	BOYLE	COLDWATER
AMORY	BRANDON	COLLINS
ANGUILLA	BRAXTON	COLUMBIA
ARCOLA	BROOKHAVEN	COLUMBUS
ARTESIA	BROOKSVILLE	COMO
ASHLAND	BRUCE	CORINTH
BALDWYN	BUDE	COURTLAND
BASSFIELD	BURNSVILLE	CRAWFORD
BATESVILLE	BYHALIA	CRENSHAW
BAY SAINT LOUIS	BYRAM	CROSBY
BAY SPRINGS	CALEDONIA	CROWDER
BEAUMONT	CALHOUN CITY	CRUGER
BEAUREGARD	CANTON	CRYSTAL SPRINGS
BELMONT	CARROLLTON	D LO
BELZONI	CARTHAGE	DECATUR
BENOIT	CARY	DEKALB
BENTONIA	CENTREVILLE	DERMA
BEULAH	CHARLESTON	D'LBERVILLE
BIG CREEK	CHUNKY	DODDSVILLE
BILOXI	CLARKSDALE	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
RIGHTON	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
SCOوبا	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

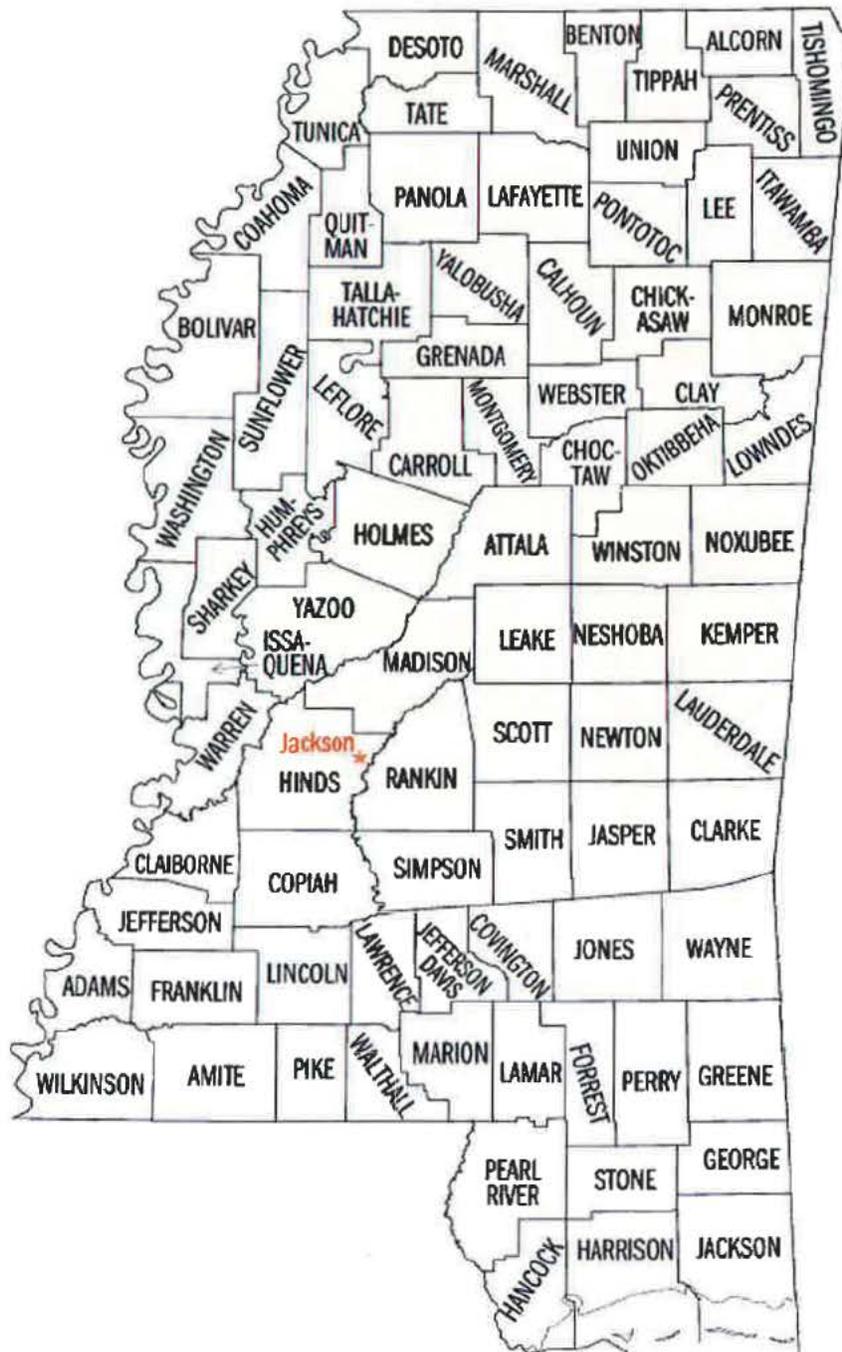
Tunica-Biloxi Indians of Louisiana

The Chicksaw Nation

Region 23 - Appendix C – Mississippi

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 31 of 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

<i>Meeting Date</i>	<i>Location</i>
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 ANNOUNCEMENTS 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

Region 23 – Appendix E - Mississippi

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.

Region 23 – Appendix E - Mississippi

PROOF OF PUBLICATION THE STATE OF MISSISSIPPI HINDS COUNTY

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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 Rules 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
3813 Hwy 468 West
Pearl, MS 39208
PH: 601 833-2903
September 28, 2009

October 2 and 22, 2009 000260111-1

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)



Region 23 – Appendix E - Mississippi



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](ftp://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.

Region 23 – Appendix E - 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

Region 23 – Appendix E - Mississippi



PUBLIC NOTICE

Federal Communications Commission
446 12th St., S.W.
Washington, D.C. 20554

Form: media information 2007 / 418-0280
Internet: <http://www.fcc.gov>
TTY: 1-888-423-6222

DA 12-1161
September 30, 2012

PUBLIC SAFETY AND HOME LAND SECURITY BUREAU ANNOUNCES REGION 21 (MISSISSIPPI) 700 MHz REGIONAL PLANNING COMMITTEE TO HOLD MEETING

WT Docket 02-378

The Region 23 (Mississippi) 700 MHz Regional Planning Committee (RPC) will hold a planning meeting on Wednesday, October 14, 2012 beginning at 1:30 PM CST, the Region 23 RPC will convene at the Woodfolk 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 Lantieri, Chairman
Region 23 (Mississippi) 700 MHz Regional Planning Committee
412 E Woodrow Wilson Avenue, Mail Stop 6601
Jackson, MS 39216
(601) 966-1024
lanr137@gmail.com

- FCC -

¹The 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

Region 23 – Appendix F - Mississippi

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 convener 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

Region 23 – Appendix F - Mississippi

05/21/02 10:14 FAX 6019801368

CHIEF OF POLICE

002

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 BOC. 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 – Appendix F - Mississippi

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 – Appendix F - Mississippi

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 – Appendix F - Mississippi

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.

Region 23 – Appendix F - Mississippi

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 "1-8-02"

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	jc.wilson@netdoor.com
Bill Ford	City of Vicksburg	601-631-2995	billf@vicksburg.org
L.W. Callaway	Warren County EMA	601-636-1544	lwcawaway@co.warren.ms.us
Don McGinnon	Jones County EOC	601-426-3187	DMcGinnon@jonesec.com
Ben Durant	City of Mobile	251-208-6825	ben@cityofmobile.org
David A. Rose Sr.	Mobile Fire-Rescue	251-208-1192	rose@cityofmobile.org
Richard Elizey	Jones County EOC	601-425-0230	richardjz@jonesec.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	601-795-3095	
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	251-686-2682	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	gcricenti@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	rwilson@rankincounty.org
Robert "Gil" Bailey	Harrison County E911	228-831-0760	hamson911@co.harrison.ms.us

Region 23 – Appendix F - Mississippi

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

Name	Agency	Address	Phone	Email
Bill 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@memas.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 39063	601-894-1658	rdrane@copiahcountyma.gov
Jack Duncan	Buford Goff & Associates	1331 Elmwood Avenue, Suite 200 Columbia, SC 29201	803-254-6302	Jack.duncan@bgaanc.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 39063	601-894-1658	dford@copiahcountyma.gov
Clifford Gale	Lincoln County EMA	PO Box 672 Brookhaven, MS 39602	601-754-3210	bccl@cablcne.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@memas.ms.gov
Susan Perkins	MEMA	1 MEMA Dr. Pearl, MS	601-933-6375	sperkins@memas.ms.gov
Bill Quinton	Bolivar County EMA	PO Box 538 Cleveland, MS 38732	662-843-2300	wquinton@cablcne.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 39063	601-894-1658	rstevens@copiahcountyma.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	517-258-6968	qwingham@bgslobal.net
Jim Whitehead	Motorola	10 Canebrake Blvd #350 Flowood, MS 39232	601-622-8836	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 Olch Road Puravis, MS 39475	601-794-5378	vbyrd@lamarcounty.com
Richard Elzey	Jones County EOC/Region 23 Advisor	22 Mason Street Laurel, MS 39440	601-428-3187	richard@jonesoc.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	GSRC/PVGCICC	42334 Deluxe Plaza, Suite 1 Hammond, LA 70403	225-337-8088	mmurphy@gsrcoi.org
Rod McLain	Buford Golf & 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	601-933-8375	sperkins@memas.ms.gov
Bette Rinehart	Motorola	28 Twin Lakes Dr. Gettysburg, PA 17325	717-334-0654	C18923@email.mot.com
Harry Warner	Buford Golf & Associates	807 Eaton Drive Mason, MI 48854	517-256-6968	gwingham@sbccglobal.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@jonesoc.com		
Dent Guynes	MSDH	✓		Dennis.guynes@msdh.state.ms.us		
Jeff Arrington	Clarke Co EMA	✓		cfire@clarkecountymms.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		
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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

Region 23 – Appendix G - Mississippi

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 \square 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.

Region 23 – Appendix G - Mississippi

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 shall 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.

Region 23 – Appendix G - Mississippi

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

Region 23 – Appendix H - Mississippi

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 by 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 the vice-chair is then 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.

Region 23 – Appendix H - Mississippi

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 within 10 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.

Region 23 – Appendix I – Mississippi

Tutorial

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.

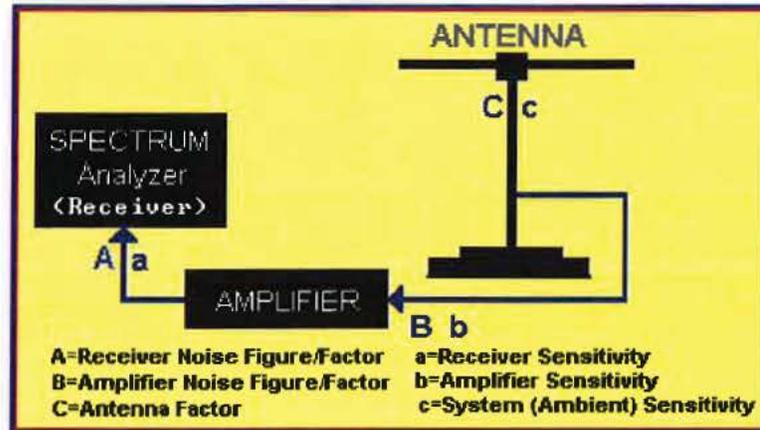


FIGURE 1. RECEIVER SYSTEM BLOCK DIAGRAM

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/meter²

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:

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

Region 23 – Appendix I – Mississippi

Tutorial

Where,

$$P_0 = \text{power density in watts/meter}^2$$

$$P_t = \text{transmitted power in Watts}$$

$$r = \text{distance in meters}$$

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.

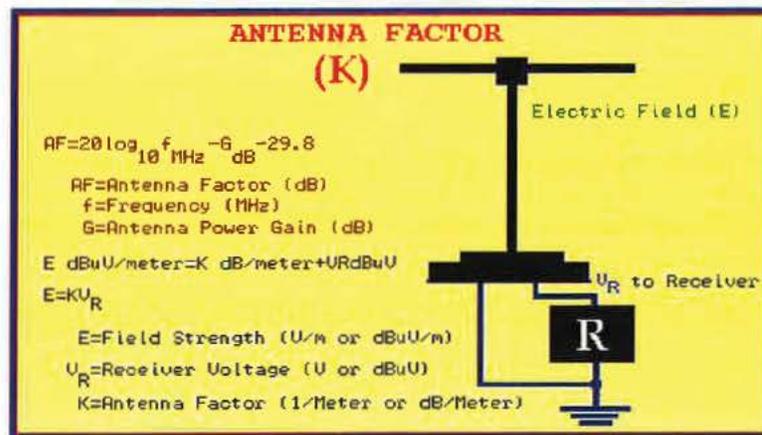


FIGURE 2. ANTENNA FACTOR

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

The power received by the antenna is then defined by:

$$P_r = P A_e = P G \lambda^2 / 4\pi \text{ (Watts)}$$

Where,

$$P = \text{power density in Watts/meter}^2$$

$$G = \text{antenna (power) gain}$$

$$\lambda = \text{wavelength in meters}$$

Combining these equations with the field strength equation yields:

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

Region 23 – Appendix I – Mississippi

Tutorial

Also,

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

Where,

V_r = received voltage

Z_o = receiver input impedance

Then,

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

Knowing that:

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

Since an antenna factor is defined as:

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

We can simplify and rearrange terms to yield:

$$K = E/V_r$$

Then,

$$K = (f \pi \pi / 50 \Omega) \text{ (Square Root (30/Z}_o\text{G))}$$

Or in logarithmic form [for $Z_o = 50 \Omega$ ohm system]:

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

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:

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

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Tutorial

Where,

N_r = measured noise in milliwatts
 G_r = device power gain - linear ratio
 B_r = 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. N_{fig} (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 = $10\log_{10} 290^\circ\text{K}$
(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/m²) = 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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Tutorial

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.*

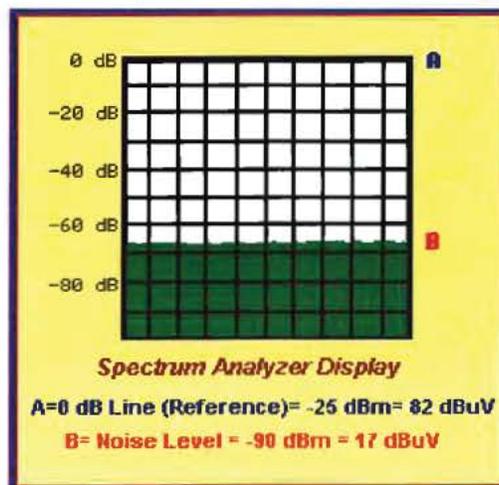


FIGURE 3. SPECTRUM ANALYZER DISPLAY

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.*

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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:

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

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 $\lambda^2 / 4\pi$; λ (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:

$$S_e = N_{F_{10}} - 174 + B_n - A_e \text{ (dBW/m}^2\text{)}$$

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Tutorial

Where,

$$\begin{aligned} N_{fig} &= \text{system noise figure (dB)} \\ B_R &= \text{receiver bandwidth, in Hertz (dB)} \\ A_e &= \text{antenna effective capture area (dB)} \\ * &= 10 \log_{10} \text{ Boltzman's Constant} \times 290 \text{ }^\circ\text{K} + 30 \text{ dB} \end{aligned}$$

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:

$$\begin{aligned} S_R &= 15 + (-228.5) + 24.6 + 39.5 = -149.4 \text{ (dBW)} \\ &= -119.4 \text{ (dBm)} \end{aligned}$$

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

Then,

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

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

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

The receiver bandwidth (B_R) calculation will be:

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

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Tutorial

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

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

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/ cm^2 (square centimeters) = units/ m^2 - 40 dB
2. Volts/meter (V/m) = Square Root ($\text{mW/cm}^2 \times 3763.6$)

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

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

Some additional helpful conversion factors for radiated measurement units are:

$$\begin{aligned} \text{dBW/m}^2 &= \text{dBV/m} - 25.8 \\ \text{dBW/m}^2 &= \text{dB}_{\mu\text{V}}/\text{m} - 145.8 \\ \text{dBm/m}^2 &= \text{dB}_{\mu\text{V}}/\text{m} - 115.8 \\ \text{dBm/cm}^2 &= \text{dB}_{\mu\text{V}}/\text{m} - 155.8 \\ \text{dBm/cm}^2 &= \text{dBV/m} - 35.8 \\ \text{dBW/m}^2 &= \text{dBm/m}^2 - 30.0 \\ \text{dBW/m}^2 &= \text{dBW/cm}^2 + 40.0 \\ \text{dBW/m}^2 &= \text{dBm/cm}^2 + 10.0 \end{aligned}$$

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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Tutorial

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 O becomes this Plan's Appendix J.

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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 dB μ 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 dB μ interfering contour will be allowed to touch but not overlap the 40 dB μ service contour of the system being evaluated. All contours are (50, 50).

For adjacent and alternate channels, the 60 dB μ interfering contour will be allowed to touch but not overlap the 40 dB μ 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 1 μ V/m (customarily denoted as 40 dB μ). 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 dB μ 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 dB μ in the 700 MHz band corresponds to a signal of -92.7 dBm, received by a half-wavelength dipole ($\lambda/2$) 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.

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If CMRS out-of-band emissions (OOBE) noise is allowed to be equal to the original thermal noise floor, there is a 3 dB reduction¹ 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.

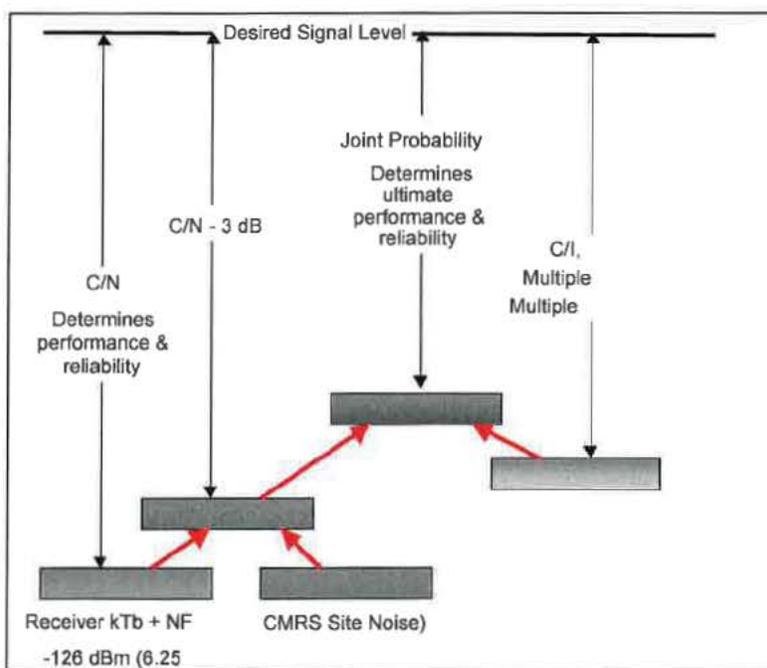


Figure 1 - Interfering Sources Create A “Noise” Level Influencing Reliability

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.

² See Appendix A for an explanation of how the 1% interference value is defined and derived.

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The ultimate performance and reliability has to take into consideration both the noise sources (thermal & CMRS OOB) 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 dB μ 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.

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Portable In-Building Coverage

Most Public Safety communications systems, today, are designed for portable in-building³ coverage and the requirement for >95 % reliable coverage. To analyze the impact of requiring portable in building coverage and designing to a 40 dB μ 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 dB μ 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 dB μ 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 OOB is suppressed to TIA's most recent recommendation and the "site isolation" is maintained at 65 dB minimum.
- The 40 dB μ 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.

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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.

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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 \approx 240 Watts (ERPd)**

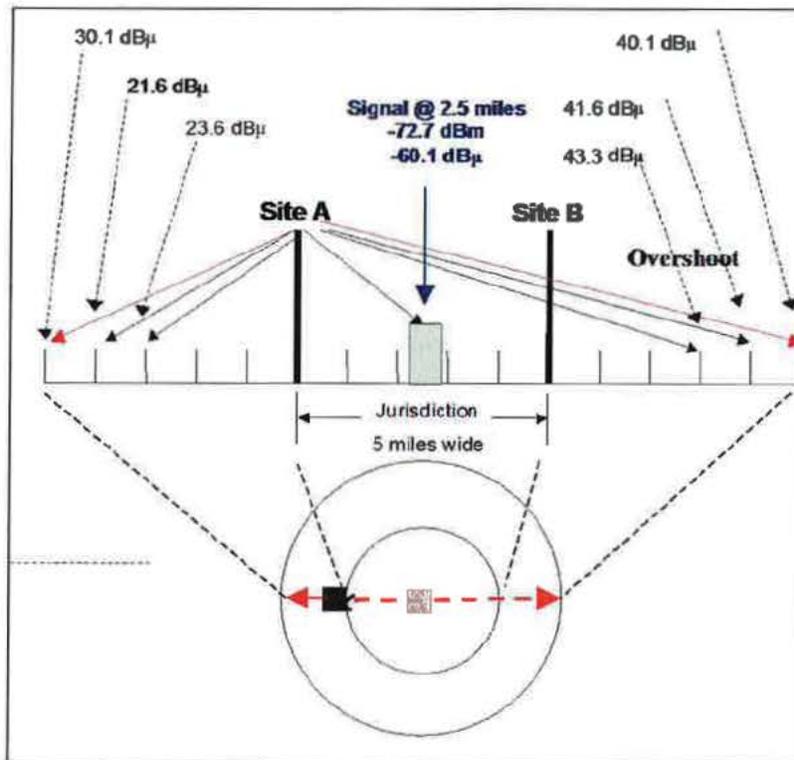


Figure 2 - Field Strength From Left Most Sites.

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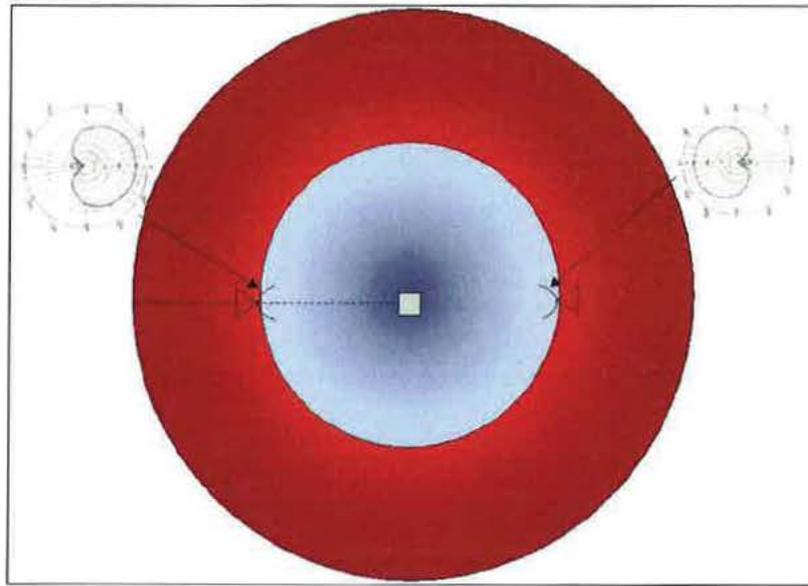


Figure 3 - Antenna Configuration Required To Limit Field Strength Off "Backside"

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 dB μ . 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 optimistic 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 dB μ . 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.

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Downtilting of antennas, instead of directional antennas, to control the 40 dB μ 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 miles⁴. 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 dB μ 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 dB μ 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.

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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.

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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.

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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 dB μ . Signal level for Site A can be up to 40 dB μ , 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 performance for this scenario is shown in Table 2, above, for 20 dB building loss typical of urban areas.

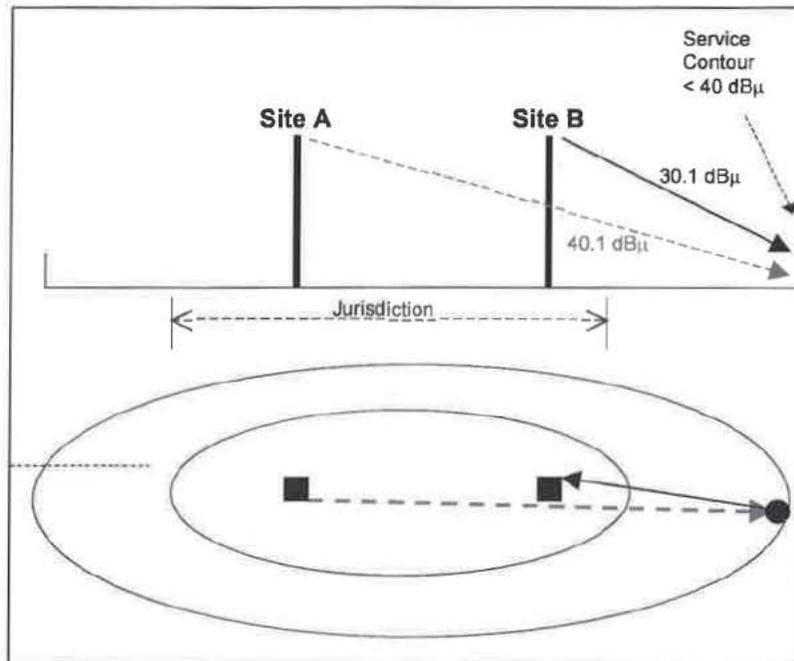


Figure 3a. Scenario 1 on of Use of Table 5

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 dB μ . Signal level for Site A can be up to 38.4 dB μ . (See Appendix B for simple method to sum the powers of signals expressed in decibels.) The composite power level is 39.7 dB μ . Therefore, Site A can be slightly less than 11 miles from the Service Contour, or ~7 miles inside the Service Area boundary. The coverage performance for this example is shown in Table 3, above, for 15 dB building loss typical of suburban areas.

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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 dB μ . Signal level for Site A can be up to 36.4 dB μ . (See Appendix B simple method to sum signals expressed in decibels.) The composite power level is 40.0 dB μ . Therefore, Site A can be ~13 miles from the Service Contour, or ~10 miles inside the Service Area boundary. The coverage performance 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 dB μ 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 dB μ Field Strength

Using this recommendation the 40 dB μ 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 dB μ 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.

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Co-Channel Interfering Contour Recommendation

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

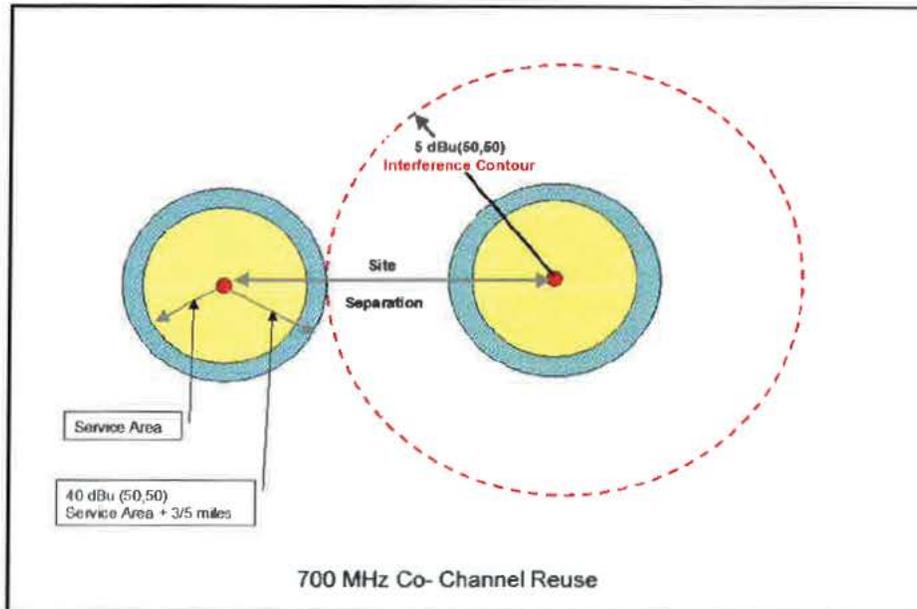


Figure 4 - Co-Channel Reuse Criterion

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 OOB.

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.

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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 dB μ 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 \geq 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

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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.

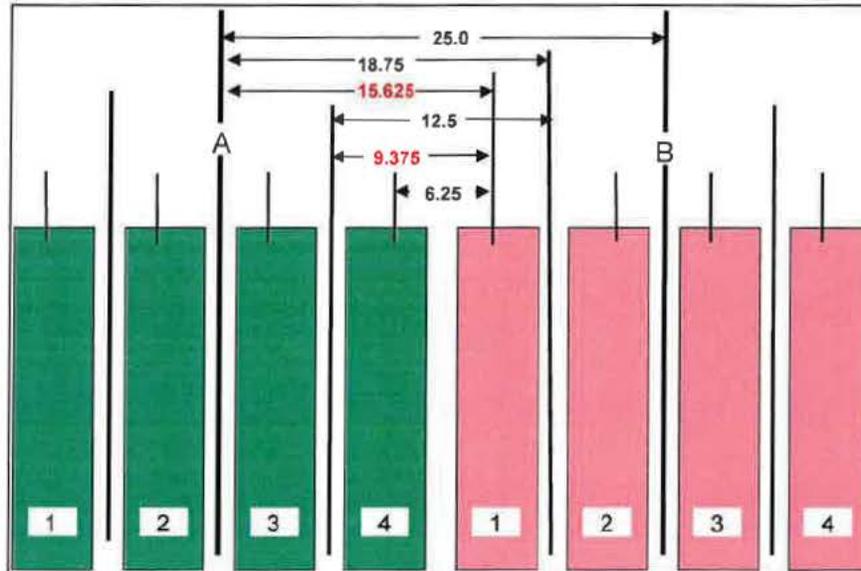


Figure 5, Potential Frequency Separations

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

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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 dB μ service contour, at 60 dB μ .

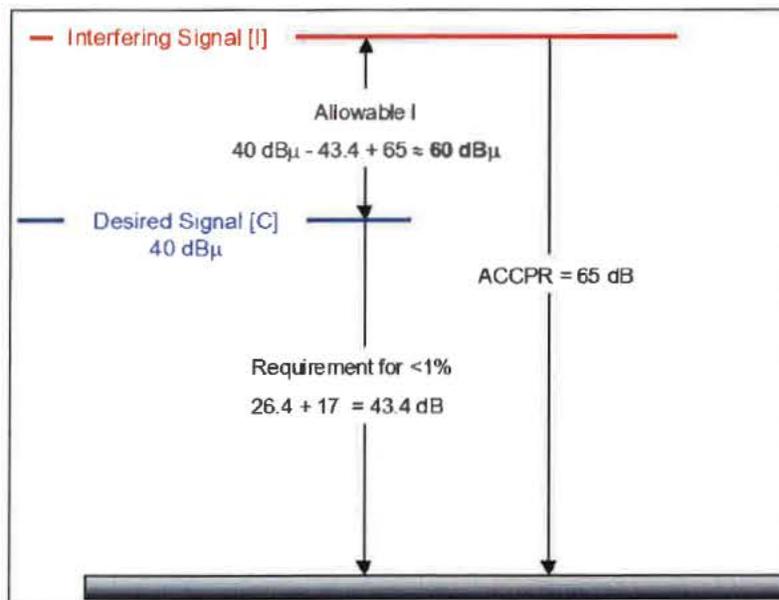


Figure 6 - Adjusted Adjacent 25 kHz Channel Interfering Contour Value

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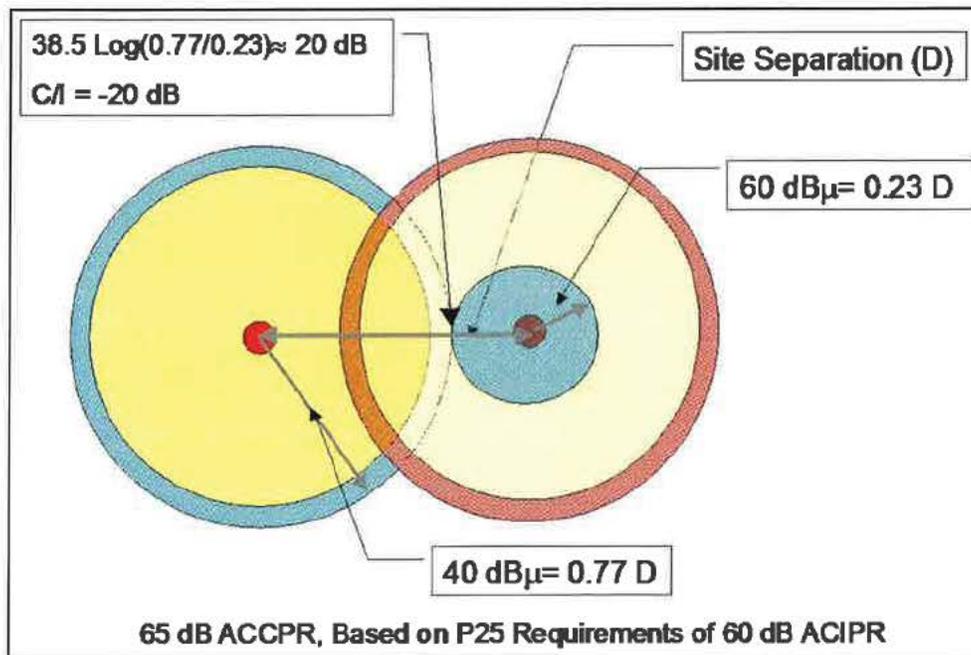


Figure 7 - Example Of Adjacent/Alternate Overlap Criterion

Adjacent Channel Interfering Contour Recommendation

An adjacent (25 kHz) channel shall be allowed to have its 60 $\text{dB}\mu$ (50, 50) interfering contour touch but not overlap the 40 $\text{dB}\mu$ (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

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- 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

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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.

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

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

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

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

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

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

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

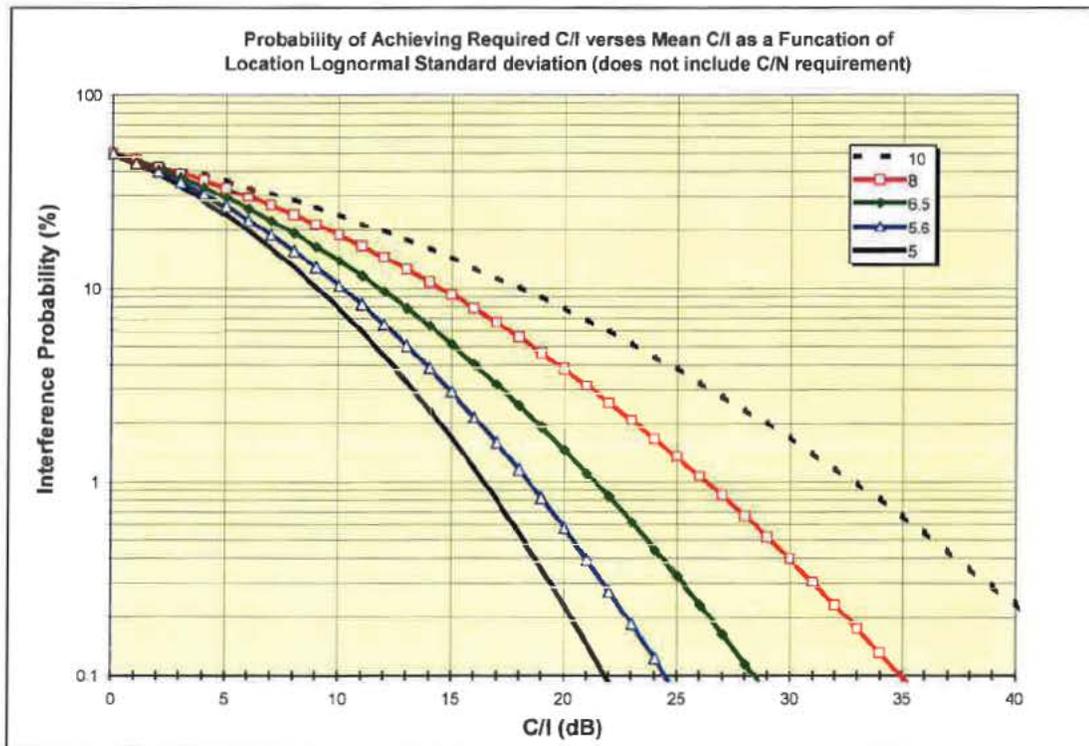


Figure A1, Probability Of Achieving Required C/I As A Function Of Location Standard Deviation

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.

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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%.

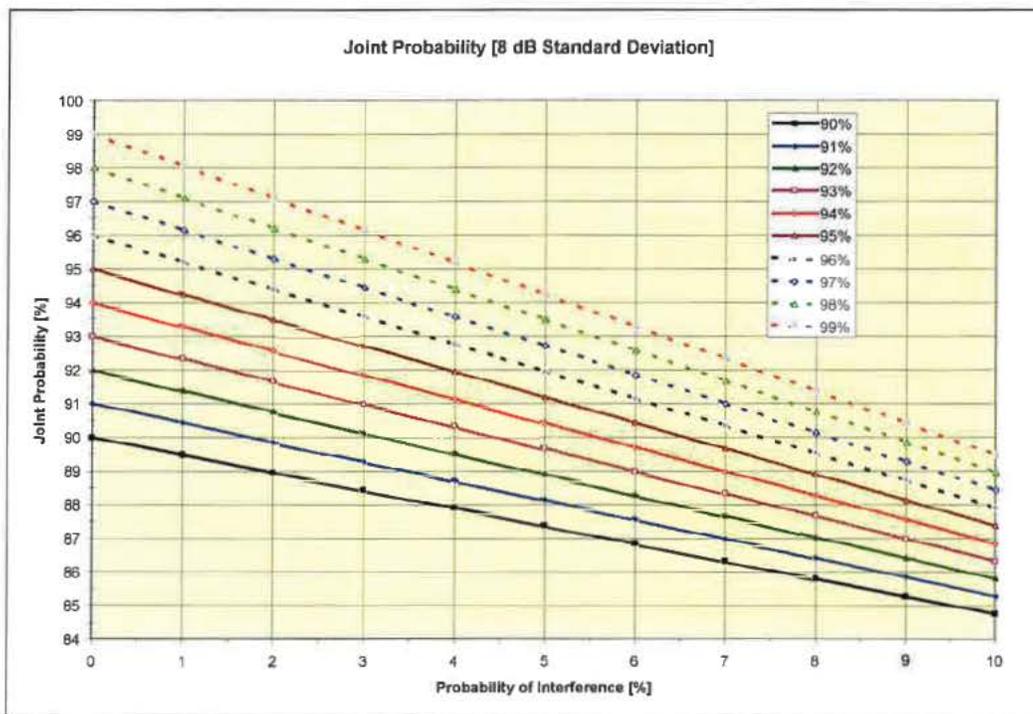


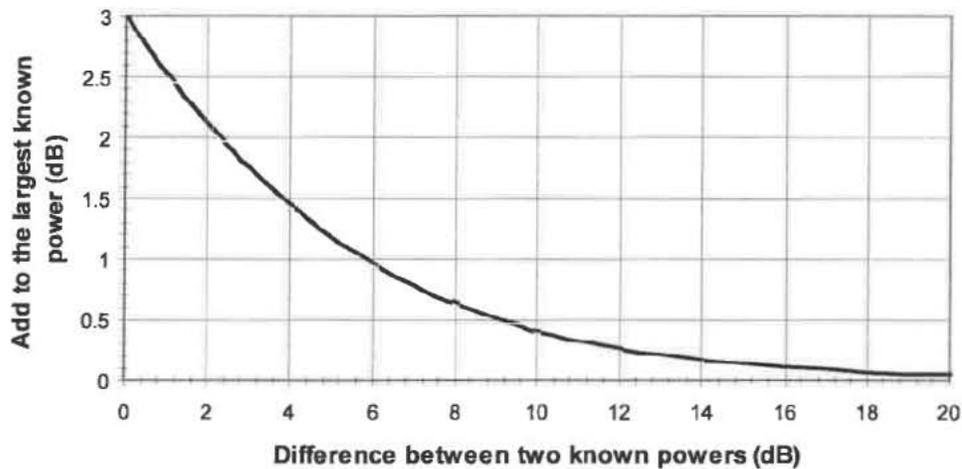
Figure A2 - Effect Of Joint Probability On The Composite Probability

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.

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Appendix B

Adding Two Known Non-Coherent Powers



In order to sum the power of two or more signals expressed in dBm or dB μ , 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 dB μ .

The chart above provides simple method to sum two power levels expressed in dBm or dB μ . 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 dB μ . Signal B is 37.5 dB μ . Difference is 1.1 dB. Power delta is about 2.5 dB. Composite signal level is 37.5 dB μ + 2.5 dB = 40 dB μ .

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

**REGION 23 - APPENDIX K
NIJ APPENDIX L FUNDING REQUEST FORM**

**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.