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THE REGION TWENTY-ONE 821 MHZ PLAN

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The Region Twenty-One B21 MHz Plan

SCOPE

Introduction

When the Federal Communications Commission announced the 821 MHz allocation of radio frequencies to The Public Safety and Special Emergency Radio Services SERS in July 1986, they mandated that a National Plan outlining the use of public safety radio frequencies be in place before any agency would receive channels from this new allocation. As part of this mandate, Regional Plans conforming to the National plan had to be developed. A Regional Plan for radio spectrum usage by public safety agencies in the Region 21 area was written by members of the Region Planning Committee. The committee represented a cross-section of public safety and SERS radio users within the region. Region Planning Committee membership list is contained in Appendix A.

Purpose

The Regional Plan was developed to insure that maximum public benefit be derived from all radio communication systems used by eligibles that come under FCC rules for Public Safety Radio Services and SERS. Recognizing that the southeastern area of the region is currently experiencing a shortage in the number of radio channels needed by public safety agencies, the Plan was established with the objective of insuring that unassigned frequencies would be distributed in an equitable fashion, with priority given to those public safety agencies and SERS that are primarily responsible for the protection of life and property and that assigned frequencies were being utilized in the most efficient manner.

This plan has been developed in a manner so that all of the spectrum needs of all of the Public Safety and Special Emergency applicants in the region at the time of the filing of the plan will be satisfied, provided the spectrum can be made available for use through U.S. Government negotiations with Canada.

AUTHORITY

Regional Planning Committee

Authority for the Regional Planning Committee to carry out its assigned tasks is derived from the Federal Communications Commission (FCC) Report and Order, Docket 87-112. Each committee member who is a representative of an eligible licensee under the Public Safety Radio Services and the Special Emergency Radio Services is entitled to one vote in all Committee matters. Except as may be provided elsewhere in this plan, the majority of those present at a scheduled meeting will prevail.

National Interrelationships

The Regional Plan is in conformity with the National plan. If there is a conflict between the two plans, the National Plan will prevail. It is expected that Regional Plans for other areas in the country may differ from this plan due to dissimilar situations. By officially sanctioning this plan the FCC agrees to its conformity to the National Plan. Nothing in the plan is to interfere with the proper functions and duties of the organizations appointed by the FCC for frequency coordination in the Private Land Mobile Service, but rather it provides procedures that are the consensus of the Public Safety Radio Service and SERS user agencies in the Region. If there is a perceived conflict then the judgment of the FCC will prevail.

Interoperability

Interoperability between Federal, State and Local Governments during both daily and disaster operations will primarily take place on the five common channels identified in the National Plan. Additionally, through the use of S-160 or equivalent agreements, a licensee may permit Federal use of a non-Federal communications system. Such use, on other than the five identified common channels, is to be in full compliance with FCC requirements governing the use of non-government frequencies (Title 47 CFR, sec 2.103). It is permissible for a non-Federal Government licensee to

increase channel requirements to account for up to a 2% increase in mobile units, provided that written documentation from Federal agencies supports at least that number of increased units.

Regional Plan Update Committee

The Michigan Public Safety Frequency Advisery Committee (MPSFAC) shall be the Regional Plan Update Committee. This committee will remain in place to recommend changes in the Regional Plan to the FCC and provide a mechanism for interregional resolution of problems which arise.

The following rules and procedures shall be established:

- elect a Chairman
- develop a mechanism to fill committee vacancies
- Modify committee membership as needed
- Set response time to process received frequency applications
- meetings are scheduled for the 3rd Tuesday each month except August
- committee voting standards are one vote per member.
- develop an applicant appeal process
- audit implementation of those systems subject to the plan
- maintain coordination with neighboring regional committees
- promulgate other rules and procedures as required
- The FCC will not fund any expenses incurred by the MPSFAC.

Committee Structure

Agency	Number of Representatives
MSP	2
MDNR	1
MDPH	1
Michigan Municipal League	1
Michigan Chapter of the Sheriffs, Association	1
Michigan Charter IACP	1

There are 4 other members of the committee representing city or county public safety or EMS Agencies.

SPECTRUM UTILIZATION

This portion of the plan provides a basis for proper spectrum utilization. Its purpose is to evaluate the implementation of 821 MHz radio communication systems within the Region.

Region Defined (see Appendix C)

The total area is 52,047 sq miles. The population of this region is to be greater than 8,300,000 people by the year 2005 according to statistics from the Michigan Dept. of Management & Budget, Office of Revenue and Tax Analysis, constituting approximately 9% increase since 1980. Within this region are jurisdictions ranging from state governments, county, city/municipal, townships and villages involving Public Safety and Special Emergency Radio Service (SERS) agencies. Their involvement extends from the protection of life and property by police, fire and ambulance service to replenishment and repair of roadways, lights, power, and other essential service.

A "primary zone" is to be considered a geographic area which is severely impacted as a result of an excess demand for scarce spectrum. The requirements for system implementation in a primary zone will be more restrictive than in a secondary zone. Those agencies in a secondary zone will be under the general requirements of the Regional Plan but will not be required to adhere to the more stringent requirements of the primary zone.

The primary zone consists of the following: Wayne, Macomb, Monroe, Oakland, Washtenaw, Ingham, Genesee, and Saginaw counties. The establishment of the primary zone is based upon consideration of population, future expansion and frequency congestion.

Usage Guidelines

Systems operating in the Region having five or more channels will be required to be trunked unless a more spectrum efficient technology can be demonstrated. Systems having four or less channels may be conventional.

As stated by the FCC in its report and order, "Exceptions will be permitted only when a substantial showing is made that alternative technology would be at least as efficient as trunking or that trunking would not meet operational requirements. Exceptions will not be granted routinely; strong evidence showing why trunking is unacceptable must be presented in support of any request for exception."

Compliance with primary and secondary zones will be maintained.

Systems of four or less channels operating in the conventional mode who do not meet FCC loading standards will be required to share the frequency on a non-exclusive basis.

Public safety communications at the state level as it impacts the Region will be reviewed by the MPSFAC. Statewide public safety agencies will submit their communications plans for 10 impact approval if they utilize communications systems within the Region and those portions of such systems must be compatible with the Regional plan.

The next level of communication coverage will be a county/ multiple municipality area. Those systems that are designed to provide area communication coverage must demonstrate their need to require such wide area coverage. Communication coverage beyond the bounds of a jurisdictional area of concern cannot be tolerated unless it is critical to the protection of life and property. If the 821 MHz trunked radio technology is utilized,, the system design must include as many county/multiple municipality government public safety radio users as can be managed technically.

The county/multiple municipality agency or agencies, depending upon system loading and the need for multiple systems within an area, must provide inter-communications between (with the) areawide system(s). In a multi-agency environment, a lead agency using 821 MHz spectrum must implement the common channels in this band as mandated by the National Plan. Such implementation must be reviewed and approved by the MPSFAC.

The next level of communications is the term "Township" to define the level below countywide. Township communications for public safety purposes must provide only the communications needed within its boundaries. However, if the total number of radios in service does not reach minimum loading criteria for a trunked system, then the township must consider utilizing the next higher System level, if 821 MHz trunked radio is available in the area. As those higher level Systems reach capacity, the smaller system communicators in the public safety service must then consider uniting their communications efforts to formulate one large system or forfeit use of the limited 821 MHz spectrum.

Where smaller conventional 821 MHz needs are requested, those frequencies to be utilized must not interfere with the region's trunked systems. The 821 MHz trunked radio system is to be considered the higher technology at this time and in greater compliance with FCC guidelines. The amount of

interference that can be tolerated depends on the service affected. Personal life and property protection shall receive the highest priority. Disruptive interference with communications involved in these services is not going to be permitted. Any co-channel interference within an authorized area of coverage will be examined on a case by case basis.

A requesting applicant for radio communications in the 821 MHz public safety services in the Region will be required to provide loading criteria information for its proposed system. The provisions of this regional plan must be used as a guide for establishing any new systems. Strict adherence for limiting area of coverage to the boundaries of the applicant's jurisdiction must be observed. Overlap or extended coverage must be minimized even where systems utilizing 821 MHz trunked radio are proposing to intermix systems 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 restricted to only the "high ground", transmitter outputs and special antenna patterns must be employed to produce the necessary coverage with the proper amount of ERP, as defined in the frequency assignment methodology section. All necessary precautions will be taken to gain maximum reuse of the limited 821 MHz spectrum.

The distance between transmitters for co-channel reuse will not be held to seventy (70) mile separation. Separation of cochannel transmitters will be determined by the coverage needs of the applicant, natural barriers for separation, antenna patterning and limited ERP where possible. System tests and/or propagation studies should also be provided to establish minimum distances for separation.

Reassignment of Frequencies

It is anticipated that, in all but the most unusual cases, frequencies presently utilized by a licensee will be turned back for reassignment. The FCC-authorized frequency coordinators will be responsible for assignment of the channels to the various agencies awaiting channels in the lower frequency bands. Normal coordination procedures will be followed with these take back channels. The applicant evaluation criteria established in the National plan and further defined in this Regional plan is to be complied with.

In such cases where specific channels are required by numerous applicants, the applicant evaluation matrix will be utilized. In all cases, area of coverage criteria and channel loading criteria will be applied, except upon unique circumstances after receiving approval from the planning MPSFAC.

It is not consistent with the goals and objectives of this Region to permit the direct reassignment of radio frequencies between agencies. All VHF and UHF Frequencies are to be returned to their respective radio service for assignment. Similarly, agencies shall not "farm down" frequencies to other radio services within their political structure simply to take advantage of surplus equipment. The need for communications by such an agency may be outweighed by the needs of another pollical subdivision.

This Regional plan will consider for *planning Purposes* the *communication needs* of all currently eligible under the FCC's Public Safety Radio Services and Special Emergency Radio Services. Additionally, this Regional Plan will consider the communication needs of those public safety service associated operations as the Regional Planning Committee may deem necessary and desirable for local area needs.

Supplement to the Application Form

With each application form (APCO Form FDR3) submitted directly to the MPSFAC, the applicant shall also supply the following supplemental information:

- Details of engineering surveys showing radio coverage will not exceed applicants minimum requirements.
- Explain how the system will be used to communicate with other services in other bands.
- Explain any budget commitment that has been made for the proposed system.
- Explain how the system will interface with long distance radio communications such as amateur radio, satellite communications, and/or long-range emergency preparedness communications systems.
- Statement of need for installing a new 821 MHz system.

- Explain and certify that applicant's agency will comply with the common channel implementation requirements.

COMMUNICATIONS REQUIREMENTS

Common Channel Implementation

The implementation of the common channels required under the National plan will utilize a two tier network.

1. The calling channel will be implemented as a full mobile relay. Wide area coverage transmitters will be installed to maximize regional coverage. Large system users (5 channels or more) of 821 MHz may be required to provide satellite receiver feeds into this wide area transmitter's area of coverage. A watch will be maintained on this channel using control stations. Any or all agencies in the Regional Planning area may be required to operate a control station for the purpose of monitoring and rendering assistance on the calling channel. Each licensee of more than five 821 MHz channels must be willing to provide sufficient satellite receivers for in street mobile coverage within their system area, consistent with their system coverage requirements.

2. Tactical Channels will be geographically assigned throughout the region. Each major user (5 channels) of 821 MHz will be required to sponsor, individually or jointly, one or possibly two localized mobile relays (FB2) to cover specific geographic areas. This will give a fixed number of working channels in an area. Depending upon the needs in an area, multiple channels could be implemented. The placement and coverage of these systems will be controlled to permit reuse of the Frequency several times within the Region. Talkaround on all tactical channels will provide additional on scene communications to supplement the localized mobile relay. In addition, talk-around will also provide on-scene communication in areas where there exists no localized mobile relay.

Areas of Operation

The total area of operation shall encompass the Region, as defined elsewhere in the plan, and shall extend outward to include the total system area of any system of which any portion thereof falls within the Region.

Operation on the Common Channels

Normally, the five interoperable channels are to be used only for activities requiring inter-communication between agencies not sharing any other compatible communications system. Interoperable channels are not to be used by any level agency for daily operations or for interagency communications not requiring interoperability. In major emergency situations, one or more tactical channels may be assigned by the primary public safety dispatch center.

Participants in the interoperable channels include Federal, State and Local Disaster management agencies. Police, Fire, and providers of EMS will be the primary using agencies. If radio channels are available, other services provided in the Public Safety Radio Services and the Special Emergency Radio Services may also participate to the extent required to insure the safety of the public.

Operating Procedures

On all Common Channels plain ENGLISH will be used at all times, and the use of unfamiliar terms, phrases or codes will not be allowed. Users will be coming from varied backgrounds and disciplines each having his/her own language. Any attempt to introduce a new code would only cause confusion and possibly even rejection of the interoperability concept.

Calling Channel (CALL}

The calling channel shall be used to contact other users in the Region that can render assistance at an incident. This channel shall not be utilized as an ongoing working channel. Once contact is made between agencies, an agreed upon tactical or mutual aid channel shall be used for continued communications.

Tactical Channels (TAC 1-TAC 4)

These frequencies are reserved for use by those agencies involved in interagency communications. Incidents requiring multi-agency participation will utilize these frequencies as directed by the control agency assuming responsibility for an incident or area of concern. These frequencies may be subdivided into use by various services of public safety as needed. Appendix H contains a list of the 5 common channels and tone frequencies.

Use of Long-Range Communications

During incidents of major proportions where public safety requirements might include the need for long-range communications in and out of a disaster area, alternate radio communications plans are to be addressed by lead agencies within this region. These agencies shall integrate the appropriate interface to the five national channels as a minimum. Such long distance radio communications could be amateur radio operations, satellite communications and/or long-range emergency preparedness communications Systems. They then could provide the means to communicate outside the area for themselves and the smaller agencies who might need assistance. Instances as addressed in the National Public Safety Planning Advisory Committee's Plan such as earthquakes, hurricanes, floods, widespread forest fires or nuclear reactor problems could be a cause for such long range communications needs.

Expansion of Existing Systems

Existing systems that are to be expanded to include the frequency bands of 821-824/866-869 MHz will have their mobile radios “grandfathered” provided that they are modified in conformance with the Memorandum Opinion and Order, FCC Docket 87-112. Existing base stations in the frequency bands 806-821/851-866 MHz may not be used in the frequency bands 821-824/866-869 MHz.

IMPLEMENTATION AND PROCEDURES

Notification

All interested parties were invited to participate in the development of the Regional Plan. Notification was accomplished by Public Notice sent to all plan area Courthouses and directly notifying organizations representing eligibles. Also notified were state and local government agencies concerned with emergency management as well as federal agencies responsible for National Security and Emergency Preparedness.

Frequency Allocation Process

In performing the allocation process the Committee used the algorithm made available by APCO, Inc. for use as an aid to maximize spectrum utilization. The Committee also considered the results of a recent demographic study to determine the future needs of applicants (see Appendix D). Any system or Frequency that may impact a neighboring planning region has been coordinated by the respective Committee Chairmen of the affected regions.

The plan incorporates a filing of application on a window concept on a by-yearly basis for the evaluation of all applications for the available spectrum during each application cycle. The flow chart, entitled "Evaluation Matrix", sequence of events that will be followed in the allocation of the six megahertz of 821 MHz spectrum.

The allocation is placed in the frequency pool (Block#1) If frequencies are available in the pool, a second iteration of the evaluation matrix could occur if all frequencies are not allocated on the first iteration.

Application yearly windows;

Open Window *(Block #3)*	Window Closed (Blocks #2 and #4)
March 1-14	March 15-September 30
October 1-14	October 15-April 30

Late applications will be rejected *(Block #5)* and returned to the applicant. Applications are received, and reviewed during the window period by the local frequency advisor and the MPSFAC (Block #6). Applications received during the open window period shall be acted upon by the MPSFAC within *30* days after the window is closed.

The MPSFAC will determine if the application is in compliance with the plan (Block #7). An application that is not in compliance with this Regional plan will be rejected at this point (Block #G) and returned to the applicant with an explanation of the reason(s) for rejection.

Having passed the tests of plan compliance the needs assessment evaluation matrix will next be considered. (Block #9).

The evaluation matrix will be used when competition for for spectrum arises. The implementation of the evaluation matrix will result in the award of a score for each application. That score is the total of the points awarded in eight categories, with a maximum possible score of *1235* points. The applicant with the highest total score in a given area will have their application coordinated, others will be rejected if no spectrum is available. Prior to the allocation of points for the eight categories, a needs assessment review is conducted (Block #10). The applicant submits a statement of need for the requested frequencies. This statement of need serves as an overview of the proposed system. The eight categories are as follows:

1. Service and use (Block #11) - maximum score 360 points. Each of the eligible services has a predetermined point value, also point values are assigned based upon the type of use.

Service	Points
Local Gov.	40
Police	40
Special Emerg.	40
Fire	40
Forestry Consv.	40
Highway Maint.	40
Use	
Rescue	40
Safety of Life and Property	40
Environmental Protection	40

Maximum Total 360

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

2. Intersystem Communications (Block #12) - maximum score 100 points. The application is scored on the degree of interoperability that is demonstrated, with a range of points from 0 to 100. This category does not rate the application on the inclusion of the mandated five common channels for interoperability. 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 communication among the Local Government, Police, Special Emergency, Fire, Forestry Conservation and Highway Maintenance Radio Services. All applicants start with 100 points and points are deducted based upon their intersystem communications.

   Deducts

   Deduct 10 points for each radio service in which the applicant lacks communication, via console patch, when direct mobile to mobile communication does not exist. Radio services are stated above.

   Deduct 5 points for each radio service that the applicant lacks direct mobile to mobile communications with. Radio services are stated above.

3. Loading (Block #13) - maximum score 150 points. Those applicants who have demonstrated that they are part of a cooperative, multi-organization, trunked system, will be scored on a range of 0 to 150 points depending upon the extent of the cooperative system.

   Point System:

Multi agency trunked system fully loaded	150
Trunked system fully loaded	100
Conventional system fully loaded	75

Expansion of existing system will be evaluated as to the aforementioned category they are in. Any system less than fully loaded will have its score multiplied by the proportion:

Total number of Mobile units
Number of communications channels X100

A fully loaded channel is a channel with 100 mobile unit utilizing it. System control channels shall not be considered communications channels. Plans submitted to the MPSFAC shall stipulate the number of communication and control channel(s)

4. Spectrum Efficient Technology (Block #14) maximum score 75 points.

This category scores the applicant on the degree of spectrum efficient technology that the system demonstrates. A point value range of 0 to 50 points can be awarded for this category. A trunked system would be considered a spectrum efficient technology as well as any technological systems feature which is designed to enhance the efficiency of the system and provide for the efficient use of spectrum.

Spectrum Efficiency Point.

Description	Points
Trunked System or equal highly efficient Technology	50
Conventional System using MDT	50
Technologies that result in increased system throughput shall receive additional points	25

5. This section 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 have any radio frequencies, 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 #15) – 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

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.

7. System Density (Block #16) - maximum point value of 100 points.

Each applicant will be scored on the level of geographic efficiency, scoring will be based upon the ratio of mobiles to the square mile area covered. The ratio of mobiles to area covered is scored on a ratio multiplied by 100 points with the maximum not to exceed 100 points.

System Density Points

Total number of mobile/portable units in the system / Area in square miles x 100 = score

A high end limit of500 has been established for the maximum square mile area.

8. Givebacks or relinquished Frequency(ies) (Block #17) - maximum score 200 points. The applicant is scored on the number of channels given back. The greater the number of channels given back the higher the score. Point consideration is also given to applicants that have recently established public safety service because of the urban sprawl.

   It is inconsistent with the goals and objectives of this Region to permit the direct reassignment of radio frequencies between agencies. All VHF and UHF frequencies are to be returned to their respective Radio Service and shall not be "farmed down" to other radio services within their political structure. "Farming down" is utilized simply to take advantage of surplus equipment. The need for communications by such an agency may be outweighed by the needs of another political subdivision.

   Scoring

   Number of frequencies to be Relinquished x10 = score

   Applicants requesting initial radio frequency(ies) for the purpose of communication of vital voice messages 50

   Points are totaled for each application (Block #18)

The applications are prioritized by the MPFAC (Block #19). The frequency pool is allocated (Block #20), the appendix to the Regional Plan is updated, the plan is then sent to the FCC for review and approval as outlined in the Report and Order, Docket 87-112 (Block #21). The applications are simultaneously coordinated by APCO. After this point the FCC would grant the license(s) to the applicant (Block #23).

This plan has been prepared with an evaluation matrix to enable consistent evaluation of applications and plans. Variation within the parameters of this plan and submitted application and/or plans may require extensive evaluation. Therefore, it shall be necessary for the MPSFAC to evaluate each plan or situation on its own merit.

Each applicant for a trunked system shall certify that a minimum of 100 mobile for each channel 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 pool and the licensee shall modify their license accordingly. Conventional channels shall be loaded to 100 mobile stations per channel. Where a licensee does not load a channel to 70 mobile, the channel will be available for assignment to other licensees. Mobile, portable and control stations will be considered mobile units. Should system implementation not begin (award of contract) within a two year period or if projected plan channel loading is not attained within four years after the granting of license, the channels will be returned for reallocaton to others. A one year extension maybe granted by the MPSFAC depending upon the circumcstances that are beyond the control of the applicant. Any applicant must be doing all in their power to implement the project within their authority. Systems implementation is monitored by the System Implementation Committee (SIC) who determines if progress is made on the implementation of the system (Block #24). Monitoring of systems implementation by the SIC will take place at a minimum of six month intervals. If progress is made the system is ultimately implemented (Block #26). If progress is not made, the licensee is warned of the consequences of his lack of progress and the SIC informs the local designated frequency advisor of the situation. (Block #27). The Local Designated Frequency Advisor continues to monitor progress on the implementation of the system (Block #28). If the continued monitoring indicates that progress is still not being made the licensee is notified of pending action to withdraw the license (Block #29). The notified licensee can appeal this action (Block #30) or can allow the license to be withdrawn. if the allocated frequencies are withdrawn they are added back to the frequency pool (Block #32) and the process starts a second iteration at Block #1.

Appeal Process

Throughout the frequency allocation process applicants are given opportunities to appeal decisions which have caused rejection of their application. The appeal process has two levels; APCO and the FCC. An applicant who decides to appeal a rejection should initiate that appeal immediately upon

notification of rejection. In the event that an appeal reaches the second level, the FCC, their decision will be final and binding upon all parties.

FREQUENCY ASSIGNMENT METHODOLOGY

Introduction

The frequency assignment methodology used is a two stage process. The first stage is to assign channels, to the degree possible, to all eligibles who have applied for them in accordance with the committee's plan. The second stage is to create frequency pools to be used by future applicants for channels which satisfy the coverage and interference parameters to be defined later in this section.

Desired Coverage

The desired coverage of a system is considered to be, as a maximum, three (3) miles outside of the boundary of the applicant's jurisdiction. The maximum "designed mean signal strength" at this contour shall not exceed +40dBu (+40dB above one microvolt per meter), using 5 Feet above the ground with a 1/4 wave whip antenna. In order to allow for practical system design, the 3 mile pad may be altered on a case by case basis, and the minimum coverage radius in all cases shall not exceed five (5) miles. See Appendix I regarding the Field Strength Measurement.

Interference - Co-channel

Co-channel assignments will be made when it is determined that the two or more systems will create a signal of +5dbu or 33 less anywhere within their co-channel partner's boundary.

Interference - Adjacent Channel

Adjacent channel assignments will be made when it is determined that the two or more systems will create a signal strength of +25dBu or less anywhere within their adjacent channel partner's boundary.

Miscellaneous Considerations

For practical engineering reasons in the area of transmitter combining, frequency assignments for the same site, for the same applicant, will be spaced .25 MHz apart, to the degree possible.

Computer Model

The computer propagation model used to calculate the "designed mean signal strength" is Okumura/Hata. This model has been shown to provide the most accurate results in this frequency band.

Computer Aided Assignment

A computer program is used to do the many calculations and iterations required to solve an otherwise impossible task of efficient channel usage.

Inputs to the program include the applicant's identification, location, coverage requirements and number of channels.

The computer will take all of the inputs and find, if possible, a solution of specific channel assignments which meet the coverage and interference parameters stated above using the minimum number of channels.

Following this stage, future assignments are considered by creating compatible pools of channels based on growth projections of population.