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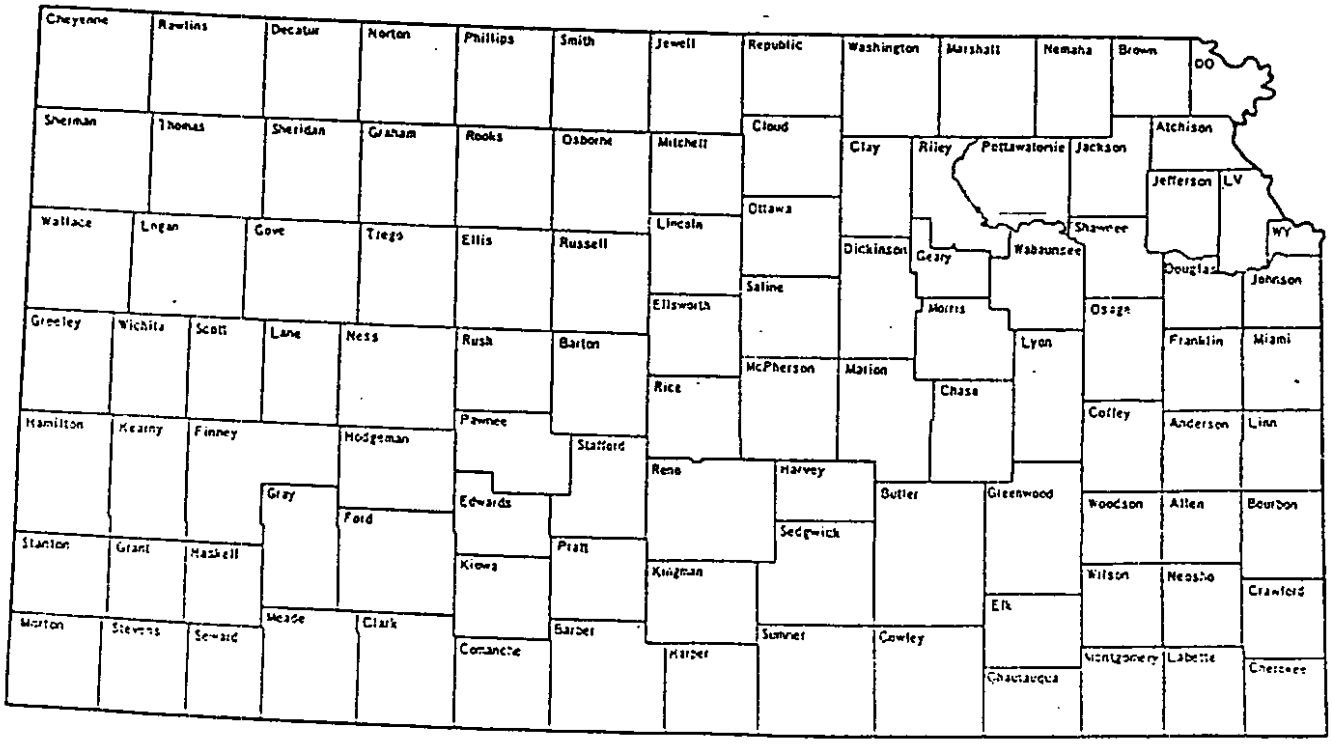
800 Mhz PLAN



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REGION 16 (KANSAS)

800 Mhz PLANNING COMMITTEE

February 26, 1991

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Federal Communications Commission
Gettysburg, PA

Greetings:

The Region 16 (Kansas) Planning Committee hereby submits to the Federal Communications Commission for review and approval our 800 Mhz Public Safety Communications Plan, as required by FCC document 87-112.

After researching the present and future requirements for Public Safety channels in this Region, it was decided to generally make the frequency assignments on a countywide basis. Cities are encouraged to integrate their communications with the county system. This is the current case with a number of our existing communications systems.

The Statewide channels are for use with the State of Kansas highway and police requirements. The Statewide allocation allows Kansas communication personnel to install mobile radio channels in a checkerboard pattern, minimizing co-channel interference. Where appropriate, the State can cooperate with individual counties to install better systems for the benefit of both.

Kansas is an area which is very rural by nature. The entire region, except Kansas City, falls into the "Rural" classification according to FCC part 90. Further, Part 90.631 (d) does not include any sections of this Region as "urbanized" in terms of loading. Part 90.635 mentions Kansas City in terms of antenna height and power output.

Many areas of the State will not be able to attain a loading of 70 units per channel. However, present communications are very unsatisfactory due to co-channel interference from nearby users and from radio "skip" on the low VHF band. There will be adequate channels to accommodate all eligible Public Safety and Special Emergency Radio Service users within the allocations shown. A vast improvement in communications will be possible for these eligibles if the loading requirements are generally more flexible. The printout of channel assignments lists 92 unoccupied channels, some of which are guard channels on either side of the Statewide assignments.

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In order to make logical choices in the assignment plan, those counties with light loading were assigned four channels. As these counties come onto the 800 Mhz system, channels are available on a planned basis without conflicting assignments having already been made. Channel assignments were made by the APCO computer in Florida using a "packing program" available there.

In the rural areas, four repeater channels will be more frequency efficient and cost effective than the forced use of five channels for a trunked system. This will permit the law enforcement, maintenance/engineering, fire and EMS personnel to operate a high quality system with no cross channel conflicts. If necessary and appropriate, additional channels are available from the reserve pool or by reassignment to allow expansion.

We, therefore, join Region 26 in requesting the FCC consider waiving the channel loading standards for conventional and trunked systems wherever possible in region 16. This will improve existing and planned communications systems without frequency allocation conflicts.

The committee felt that the inclusion of five channels for interoperability as recommended in the National Plan is adequate for this Region.

Carl A. Fisher, Chairman,
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Region 16 (Kansas) 800 Mhz Public Safety Communications Plan

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I. Executive Summary

In 1983, the U. S. Congress directed the Federal Communications Commission to develop a policy which would maximize the effectiveness of Public Safety communications in this country. The Commission set into motion a process which has ultimately resulted in the conditional release of 6 MHz of additional 800 MHz spectrum for Region 16 (Kansas), that condition being the acceptance by the FCC of a Regional Communications Plan. Carl Fisher of The Kansas Turnpike Authority and an officer in The Kansas Chapter of APCO, was appointed Convener by The Kansas Chapter of APCO for the Regional Plan. Under his direction a convening meeting was called. That meeting had the responsibility to elect a chairman for a Regional Plan Committee and lay the groundwork for the Plan.

This document is that Regional Plan. The intent is to equitably assign 821-824 and 866-869 MHz channels to all eligible entities in the State of Kansas, and to establish at the outset a spectrum efficient frequency reuse layout.

Upon approval of this Plan by the Commission, a Region 16 Plan Review Committee (RPRC), will be responsible for conducting annual system implementation reviews, making recommendations to the Commission, for the resolution of interregional problems, recommending modifications and amendments to the Plan, and for exercising general overview of the Plan.

Region 16 (Kansas) 800 Mhz Public Safety Communications Plan

The authorization document for this Plan is FCC General Docket #87-112, adopted by the Commission on November 24, 1987. That document, and therefore this Plan, addresses a wide variety of technical, procedural and operational considerations. Furthermore, Docket #87-112 legally establishes the authority of a Review Committee to carry out the tasks so assigned by this document. Upon the acceptance of this Plan by the FCC, channels in the ranges of 821-824 MHz and 866-869 MHz will be available for licensing to Region 16 users. FCC regulations require issuance of a license prior to operation of any radio communications equipment.

The convening meeting for Region 16 was held on September 20, 1989 at the Red Coach Inn Motel in Salina, Kansas. Carl Fisher and Ken Duckworth (of The Wichita/Sedgwick County Emergency Center) were elected Chairman and Vice Chairman, respectively.

Considerable effort was made over the following several months to give adequate information to all interested parties in the State of Kansas. The makeup of the Committee membership reflects that effort. The Committee membership also reflects the fact that most interest in this Committee's work lies along the Kansas City to Topeka corridor and the metropolitan Wichita areas, the relatively high population density areas of the state.

It was the intention of this Committee to develop a Plan which is ideally suited for the geographic and demographic characteristics which make Kansas unique. At the same time, however, the Committee attempted to stay within the prin-

ciples set forth in Docket #87-112 and the Plan submitted by NPSPAC (National Public Safety Planning Advisory Committee). An element of flexibility is designed into the Regional Plan, to allow for future adjustments.

This Plan has been designed to satisfy three conditions. First, the submission of this Plan is required by the FCC before any channels may be assigned from the 6 MHz of reserve frequencies. Second, it is used as a guide by the RPRC. Third, it is a reference for agencies to facilitate their planning of 800 MHz communications systems.

II. Regional Planning Committee

The membership of the Regional Planning Committee (also referred to as the Committee) has been drawn from representatives of Public Safety Agencies and Special Emergency eligibles within Region 16. Authority for the Committee to carry out its assigned tasks is derived from the Federal Communications Commission (FCC Report and Order, Docket #87-112).

This Regional Plan conforms to the National Plan. If there is a conflict between the two Plans, the National Plan will govern. Nothing in the Plan is to interfere with the proper function and duties of the organizations appointed by the FCC for frequency coordination in the Private Land Mobile Service. The Plan provides procedures that are the consensus of the Public Safety Radio Service and Special Emergency Radio Service user agencies in the Region. If there is a conflict, the judgment of the FCC will prevail.

Regional Planning Committee meetings were set by the Chairman giving at least 14 days notice to all Committee members. The agenda was set by the Chairman. Issues of importance could be added to the agenda by any Committee member prior to notification.

All meetings were held in accordance with the Kansas open meetings law. Each member was entitled to one vote, with a maximum of two members from any eligible user group. Only current Committee members voted. The Committee consisted of at least six members. Additional ad-hoc members were appointed by the chairman with the advice of the committee. Committee membership consisted of representatives from eligible Public Safety or Special Emergency Radio Service Agencies. All eligible entities received equal consideration. Votes on all matters required a simple majority of the members present. The meetings were conducted according to "Roberts Rules of Order, Revised".

Upon acceptance of this Plan by the FCC, the Region 16 800 MHz Planning Committee shall be dissolved. (A Region 16 Plan Review Committee (RPRC) shall be established and named by the Kansas Chapter of APCO) This Committee shall elect its own chairperson from within its membership. The Committee shall consist of at least six (6) members, selected with broad representation of eligible entities. The APCO frequency advisor(s) for the State of Kansas shall be a member(s). The RPRC shall conduct an annual implementation review. They may make recommendations to the FCC for modification of this Plan as appropriate. They shall negotiate

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with adjacent regions for the resolution of inter-regional problems. They shall exercise general overview of the Plan. Any revision(s) to the Plan shall comply with all relevant FCC regulations and further enhance the effectiveness of the 800 MHz spectrum for its users. The RPRC shall meet at the call of it's Chairperson or by direction of APCO or the FCC.

III. Application Procedures

All applications for 800 MHz channels to be assigned under the Plan must be submitted to the APCO Frequency Coordination Office. Complete duplicate copies shall be submitted to the APCO Local Frequency Advisors. Applications shall comply fully with FCC Rules and shall be in full compliance of this Plan.

Upon receipt, Advisors will check applications for compliance with the Plan. An evaluation procedure will be initiated. This procedure is discussed in the FREQUENCY DISTRIBUTION POLICIES section of this Plan. Their findings will be transmitted to the APCO Frequency Coordination Office.

If the application can not be approved by the Coordinator, it will be returned to the applicant. After modification and correction, it may be resubmitted. The same distribution will be made with the amended application as with the original.

In addition to the information required by Part 90.607 (b) (1) and (c) (1), the applicant shall indicate which frequencies are to be turned back for reassignment.

The FCC requires surrender of lower frequencies if the following three conditions are met:

1) the new system fully replaces the functions of the old one,

2) the licensee has no other communications requirements that could be met through the use of the lower frequencies, and

3) the new system has operated satisfactorily for sufficient time to allow a smooth transition from former operations and to insure system reliability.

The applicant must satisfactorily justify any significant difference between service area and the predicted coverage area. If the coverage area exceeds the service area, the applicant shall state the steps to be taken to eliminate interference to other jurisdictions.

IV. Region 16 Characteristics

A. Terrain

Region 16 is composed of the entire State of Kansas. Physically, the region known as the Flint Hills is an uplift area marked by large rolling hills running north-northwesterly from near the southeast corner of the state toward Nebraska. The northern one third of the State is generally more hilly than the south, with the exception of the Flint Hills area in the southeast. From Wichita westward the terrain is generally flat with only low hills. There are no mountains in Kansas. The hills are generally low and rolling. The altitude of the area varies from about 800 ft.

AMSL in the southeast to about 4000 ft. AMSL on several areas of the Kansas/Colorado border. The terrain lifts toward the Continental Divide from Southeast to West.

B. Demography

The population of nearly 2.5 million (1) people is distributed unevenly, with a high population area in the corridor between metropolitan Kansas City to Topeka, and in the metropolitan Wichita area. The density decreases markedly in the western areas of the state. Generally low populations are west of US 81 Highway. The Garden City, Dodge City, Hutchinson, Hays, Liberal and Great Bend communities are the population centers for the area. Kansas has 105 counties. More than one-third of the population reside in the seven county area of Wyandotte, Johnson, Douglas, Leavenworth, Shawnee, Miami and Franklin. This is the roughly triangular shaped area known as the Kansas City to Topeka corridor. Even though much of the area outside of Wichita is rural farm and ranch land, the metropolitan area of Wichita, Hutchinson, and Newton (including land in Sedgwick, Butler, Sumner, Harvey, Cowley, and Reno counties), have a population counted at 610,415 in 1990, or nearly 25% of the population of the state. Together, these two areas (13 counties) account for 59% of Kansas' population. Special problems in law enforcement exist for Riley and Geary counties because of Kansas State University and the large military post (Ft. Riley), making population figures change from month to month. Many of the students and military are counted elsewhere in the census.

Another area of concern is the southeast corner of the State in Crawford, Cherokee, Labette, Montgomery, and Neosho counties. These have a combined population of 136,486. Since this area borders both Missouri and Oklahoma, special attention must be paid during the channel allocation. The City of Galena is less than 50 miles from Arkansas, coordination with that state will be required for the southeast corner of Kansas.

Population density and the problems involved in the two state area of metropolitan Kansas City require a sub-region for the Kansas City-Topeka area (counties of Wyandotte, Johnson, Douglas, Miami, Leavenworth, Shawnee and Franklin). The Sub-region Committee and its report shall be a part of the Region 16 Committee and this report.

V. Frequency Distribution Policies

It is the intention of the Committee to define a channel distribution policy which will allot 821-824, 866-869 MHz and Give-Back Channels fairly and efficiently to all eligible users. This policy may be generally divided into four separate policies, defined below.

a) Channel Allocation - the distribution of 821-824 and 866-869 MHz channels.

b) Channel Reuse - the use of the same 800 MHz channel by two (or more) agencies which have sufficient geographical separation, permitting the agencies to operate without interference to each other.

c) Frequency Give-Back - the return of vacated lower band frequencies to the FCC for re-licensing by agencies implementing 800 MHz systems.

d) Channel Recall - a reclamation of 800 MHz channels by the FCC from agencies which have failed to make sufficient progress toward the implementation of their proposed 800 MHz system.

A. Channel Allocation

One criteria used to evaluate a given user's channel allocation will be that user's demonstrated need. The statement of requirements should include, in addition to the information specifically requested, any special or unusual circumstances which the requestor wants the Coordinator to consider. For example, a suburban enclave which has a low population density, but a high crime rate, may need more channels than the population figure alone would allocate.

Should the demand warrant, the allocation of 800 MHz channels will be based on an evaluation matrix. This methodology is designed to evaluate the relative merit of an application as objectively as possible. That evaluation will result in a score which is the total of the points awarded in seven categories, with a maximum possible score of 1000 points.

The seven categories are as follows:

1) Service: maximum score 350 points. Each of the eligible services has a predetermined point value (Appendix B). An applicant with multiple service categories will be scored on the basis of the percentage which each service

represents of the total system. For example, a system which is 50 percent police and 50 percent highway maintenance would be awarded the total of 50 percent of the point value for police plus 50 percent of the point value for highway maintenance.

2) Inter-System Communications: maximum score 100 points. The application is scored on the degree of interoperability which 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. There will be an award of 20 points per channel for this category, e.g., if the applicant specifies 3 channels for interoperability, 60 points will be awarded.

3) Loading: maximum score 150 points. Applications should reflect efficient loading of all requested frequencies. The points in this category will be calculated by dividing the number of mobiles/portables by the number of channels requested. The resulting ratio will be the system's loading factor. The loading factor is then divided by the optimum loading factor to determine that system's efficiency, as a percentage. The percentage is multiplied by 150 to determine the total number of points awarded. (The optimum loading factor is defined elsewhere in this document.)

4) Spectrum Efficient Technology: maximum score 100 points. This category scores the applicant on the degree of spectrum efficient technology which the system demonstrates. A point value range of 0 to 100 points can be awarded for this category. A trunked system will be considered a spectrum efficient technology. Any technological systems feature designed to enhance the efficiency of the system and provide for the efficient use of the spectrum is also considered beneficial.

5) System Implementation Factors: maximum score 50 points. This category scores the applicant on two factors, budgetary commitment and comprehensive planning completeness. The degree of budgetary commitment is scored on a range of 0 to 25 points. An applicant demonstrating a high degree of commitment in funding the proposed system will receive the higher score. Each applicant will be scored on the degree of comprehensive planning completeness with a range of scoring from 0 to 25 points. Applicants will be required to submit a timetable for the implementation of their communications system. Trunked systems are awarded 100 points. Nontrunked, but efficient, technology (data, for example) may be awarded a maximum of 50 points. Conventional systems may be awarded a maximum of 25 points.

6) Geographic Efficiency: maximum score 100 points. Each applicant will be scored on the level of geographic efficiency. Scoring will be based upon two sub-categories: the area covered relative to the area of political responsibility and the channel re-use potential.

7) Give-backs: maximum score 150 points. The applicant is scored in two sub-categories: the number of channels given back and the extent of availability of those channels to others. The greater the level of availability of the give-backs, the higher the score will be.

8) Combined systems: Multiple agency (City, County, State, etc.) systems shall be given 25 points per additional agency. We are encouraging a move toward combined systems in order to gain channel efficiency.

Points are totaled for each application and the applications are ranked by the Frequency Advisor. The channels are allocated from the channel assignment plan (Appendix H) for each application. The application is further reviewed for full compliance with the Regional Plan. Those applications which meet all requirements of the Plan will be submitted to APCO and the FCC for final approval.

B. Channel Reuse

It is the responsibility of the Committee and the Coordinator to seek the maximum usefulness of 800 MHz frequencies. Limits will be placed on such system design elements as antenna design, transmitted power, transmitter location, and actual channels assigned to the applicant.

C. Frequency Give-Back

It is anticipated that in all but the most unusual cases, frequencies presently used by a licensee will be turned back for reassignment. Frequency coordinators for the service affected will be responsible for reassignment of the channels to other agencies awaiting channels in the

lower frequency bands. Normal coordination procedures will be followed with these "give-backs" except that the applicant evaluation criteria established in the National Plan and further defined in this Regional Plan is to be considered. In such cases where specific channels are required by numerous applicants, the applicant evaluation matrix will be used. In all cases, area of coverage criteria and channel loading criteria, as outlined in this Plan, will be applied unless unique circumstances are brought to the attention of the Regional Committee. It is not consistent with the goals and objectives of this Committee to permit the direct reassignment of radio frequencies between agencies. All frequencies are to be returned to their respective pools to be assigned for the most beneficial public use. Similarly, an agency does not have the option to "farm down" frequencies to other 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 political subdivision.

This Regional Plan will consider, for planning purposes, the communication needs of all current eligibles under the FCC's Services. Additionally, this Regional Plan will consider the communication needs of Public Safety Service associated operations as the Committee may deem necessary and desirable for local area needs.

D. Loading Standards

The FCC has established loading standards for these channels (see FCC Rules, Pt. 90.631 and 90.633). Users not meeting loading standards may be subject to loss of channels, or assignment of other entities to the same channel. The FCC will waive loading standards when a compelling case for waiver is made (FCC R&O 87-112). The Planning Committee requests that the loading standards for this Region be lowered in accordance with FCC part 90.631(d) and 90.633(e), since the entire region (except Kansas City) falls under the classification of "Rural" in terms of channel loading.

Channels lost due to failure to meet loading standards may be reallocated to other agencies to help satisfy the demand, if such demand exists.

E. Slow Growth Entities

All systems in the 821-824/866-869 Mhz bands under this plan will be slow growth in accordance with Section 90.629 of the Commission's rules.

F. Appeal Process

Throughout the channel allocation process applicants are given opportunities to appeal decisions which 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 with APCO upon notification of rejection. In the event an appeal reaches the second level, the FCC's decision will be final and binding upon all parties.

VI. System Design Considerations

A. Coverage Area

The coverage area should be geographically limited to the minimum extent practical in order to maintain maximum channel reuse in Region 16. Any agency requesting a transmitter location not centrally located with its service area must include in its request adequate justification for such placement. Design modifications may be required which will minimize interference, such as directional antennas or reduced power.

Agencies with service areas outside their geographic boundaries may request extended coverage areas. Such requests must be accompanied by written justification. Extended coverage areas will not be authorized unless approved by the Frequency Coordinator. Extended coverage area applications will be given favorable consideration when those systems are made available for use by other eligible agencies.

Small jurisdictions with minimal needs may be required to combine their communication systems where possible. Such combined systems will enable Cities and Counties to utilize the spectrum more efficiently. Multiple County systems may provide 24 hour professional dispatch service where such is not practical at this time.

All systems should be designed for a maximum signal level of 40 Dbu at a distance of 3 miles beyond the outer boundary of the area of political responsibility.

B. Trunking Requirements

The following policies relate to whether an applicant's system will be trunked or conventional:

1) All 800 MHz Public Safety & SERS communications systems using five or more channels will be required to use trunking technology. Systems having four or less channels may be conventional. 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.

2) Communications systems not meeting FCC loading requirements may be required to share or relinquish their channels.

3) Where smaller 800 MHz needs are requested, those channels so used must not interfere with local trunked systems. A trunked radio system is considered to be a more efficient technology and will take precedence over conventional systems.

C. System Loading Requirements

1) Conventional systems: An agency requesting a single channel will not be required to meet the loading requirements in order to obtain the new channel if turning back the existing channel for reassignment. However, if the single channel is not loaded with 70 units or more within three years after the license is granted, the channel will be available for assignment to other entities on a shared basis in the event that other channels meeting the criteria for

assignment are exhausted. Shared use is not interference free. Users of single channel systems may be required to provide FCC with "confirmation of loading" for mobiles and portables as a method of validating system loading.

2) Trunked systems: Entities requesting additional channels shall comply with FCC loading standards or provide sufficient documentation to justify the request.

3) Entities requesting additional channels must show loading of 100 percent or greater on their existing system.

4) Mutual aid channels are not considered when determining system loading.

D. Co-Channel Interference

An agency requesting channels which have been previously licensed within this region or an adjacent region must show that their proposed system will produce signal levels which do not exceed 5 Dbu at any point inside the coverage area of the existing system.

E. Adjacent Channel Interference

The proposed communications system must be designed so that signal levels will not exceed 25 Dbu inside the coverage area of adjacent channels.

F. Encrypted Communications

The use of encrypted communications is encouraged for those agencies conducting covert operations which require some assurance of communication security. The Plan recommends encryption techniques which provide high levels of communication security as well as a high level of voice recognition.

It is required that encrypted communication be transmitted in a digital format having a bit rate not to exceed that which will fit within a 25 KHz channel. Agencies which inter-operate with federal agencies in covert operations will be required to use secure communications complying with standards set by the National Security Agency. Standards vary according to classifications and are based upon the sensitivity and the nature of the information to be exchanged. Many of the agencies such as the FBI, US Customs, DEA and the Coast Guard which inter-operate with state and local agencies are required to use encryption which meets FIP-S42 data encryption standards.

To provide for encryption, all Common Channel repeaters should be capable of passing encrypted digital communications. The Calling Channel shall not use any means of encryption. A digitally capable fixed end will allow state, local, and federal agencies to use their subscriber units on any of these systems in the encrypted mode independently, or by sharing a common key to work with each other securely. Further, this digital capability will accommodate those agencies with S-160 agreements and will provide for anticipated future interoperability requirements.

Communications on the 4 Common Channel pairs support the National Mutual Aid System designated for tactical operations, disaster and emergency management, as well as local and regional interoperability. The ability to operate securely on these channels would both protect and enhance these operations. It is evident that the capability of the

four tactical channels to support secure communications is also strongly recommended.

G. Use of Alternate Communications

During incidents of major proportion where public safety requirements might include the need for alternate communications in and out of a disaster area, alternate radio communications plans are to be addressed by lead agencies within this region. These agencies are encouraged to integrate an interface to the Common Channel(s). Those lead agencies could then provide the means to communicate outside the area for themselves and any small agencies which might need assistance. Instances as addressed in the National Public Safety Planning Advisory Committee Plan such as earthquakes, floods, widespread fires or nuclear reactor problems could be cause for such long-range communications needs.

H. Cellular Telephone Use

The use of a car radio telephone via interconnect through an 800 MHz trunked radio system or other two-way radio communication system will normally require a significant amount of air time. Therefore, the use of a defeatable interconnect for radio telephone use could be allowed for systems implemented under this Regional Plan. The use of cellular telephones for automatic interconnect to the Public switched telephone network is recommended. It is probable that large areas of Kansas will never be covered by cellular telephone systems. Where such systems exist, they are a valuable adjunct to the radio network.