Original

REGION 52

PUBLIC SAFETY RADIO COMMUNICATIONS PLAN

PANHANDLE, HIGH PLAINS AND NORTHWEST TEXAS AREA

Original

ACKNOWLEDGEMENT

This plan is the Region 52, State of Texas, submission to the Federal Communications Commission. It is the sincere wish by all those involved in Public Safety and Public Services communications in this region that this plan is the beginning of the end of our poor quality communications.

Many hours and dollars have gone into the preparation of this plan. The financial burden has been borne, for the most part, by donations from the three area council of governments in this region.

It is with great satisfaction that I present this plan and hope that it will be put to use in the future.

Walt Kelley

Walt Kelley, Chairman
Region 52 821 Planning Committee

Phone (806) 378-3022
Fax (806) 372-2417

P. O. Box 1971
Amarillo, Texas 79186

4.1.8 Traffic Loading Study 28
4.1.9 Slow Growth 28
4.2 Use of Long Range Communications 29
4.3 Expansion of Existing Systems 29
4.4 Use of Cellular Telephone 29
4.5 Aircraft Operations 29

5.0 **IMPLEMENTATION AND PROCEDURES**

5.1 Notification 30
5.2 Frequency Allocation Process 30
5.3 Assignment Statistics 30
5.4 Expansion of Initial Allocation 30
5.5 Prioritization of Applicants 30
5.6 Application Process 32
5.7 Appeal Process 32

Appendix A: Channel Allocation by Channel A1
Appendix B: Channel Allocation by County/Region B1
Appendix C: Planning Committee Roster C1
Appendix D: Region Map D1
Appendix E: Public Notices E1

1.0 SCOPE

1.1 INTRODUCTION

In December of 1983, the United States Congress directed the Federal Communications Commission (FCC) to establish a plan to ensure that the communications needs of state and local public safety authorities would be met. By their regular means of initiation, the FCC began the process of developing such a plan. Through their efforts, and the efforts of the

National Public Safety Planning Advisory Committee (NPSPAC) the plan was begun. The National Public Safety Planning Advisory Committee provided an opportunity for the public safety community and other interested members of the public to participate in an overall spectrum management approach by recommending policy guidelines, technical standards, and procedures to satisfy public safety needs for the foreseeable future. After consideration of NPSPAC's Final Report and comments filed in Docket No. 87–112, a Report and Order was released by the FCC in December 1987, which established a structure for the National Plan that consists of guidelines for the development of regional plans.

The National Plan provides guidelines for the development of regional plans. The particulars of this plan are found in FCC 87–359, which contains the required steps and contents for regional plan development. It is on this document that this plan is developed.

1.2 PURPOSE

Public safety communications has, for many years, been inadequate throughout the United States. This is as true for Region 52 as it is for any other region. Many, if not all, public safety radio users are constantly bombarded with outside interference, noise, and over crowding. It is with these problems in mind that this plan was developed.

This regional plan was developed with the objective of assuring all levels of public safety/public service agencies that radio communications in the near and distant future will not suffer from the problems of the past. The allocation of frequencies was done in as equitable a way as was possible. The goal was to supply a pool of frequencies for each county, special medical services and a pool for state agency use with adequate reserve allocations for future needs in all areas, and a method to appeal initial allocations based on need.

The National Plan as developed by NPSPAC, was followed very closely in all considerations for frequency allocation, re–use, turn back, regional interoperability, spectrum requirements and adjacent region operations. This plan should provide the flexibility to accommodate the growth and changes which are bound to occur in public safety and public service communications operations long into the future.

2.0 AUTHORITY

2.1 REGIONAL PLANNING COMMITTEE

The development of the Public Safety Radio Communications Plan for Region 52, one of several regions in the State of Texas, has followed the requirements of the FCC's Report and Order as issued in the matter of General Docket 87–112.

In accordance with the FCC's Report and Order 87–112, the Associated Public Safety Communications Officers Inc. (APCO) recommended to the Commission the appointment of a "Convener" for Texas Region 52. The Convener served as the coordinator for the assembly and formation of the planning committee.

Participants in the formation of the Regional Planning Committee represent interested parties from both the Public Safety and Special Emergency Radio Services as well as individual from the private sector. A total of 69 individuals have participated in the development process. The list herein contains the names, organizational affiliations, and mailing addresses of all participants in the Regional Planning Committee.

The committee was selected by attendance at the planning meetings. The Committee consisted of both voting and non–voting members (non–voting members were not representing users or were alternates from the same community), each voting member represented an eligible licensee under the Public Safety Radio Services and the Special Emergency Radio Services. Except as may be provided elsewhere in the Plan, the majority of those present at a scheduled meeting constituted a majority for all business. Only the final approval of the plan prior to submission to the FCC required a vote from more than would be in attendance at a regular meeting. In this case the vote was conducted by mail ballot sent to all those who had participated in the planing process. In this way, the finished plan was reviewed and accepted by the widest, within reason, group of public safety/public service users.

2.2 PLANNING COMMITTEE FORMATION

The process of forming the Planning Committee was conducted in the following steps:

> Presentations concerning the requirements and goals for a regional planning committee were presented and discussed at various group or agency meetings throughout the region. At each presentation there was an opportunity for persons

to place themselves and/or their agency on the mailing list for future communications.

Letters of announcement were mailed with in the region to all agency radio users, those placed on the mailing list, as well as to state organizations composed of local government level public safety/public service users.

A public notice was placed in the newspapers in Amarillo, Lubbock and Wichita Falls (Appendix E). Each of these papers has a wide distribution within the region. This first meeting was held at the Lubbock Texas Convention Center, a public facility. The chairman was elected at the first organizational meeting. A roster of the planning committee established at this meeting is in Appendix C.

A planning sub–committee was formed and met periodically to development a working copy to the plan. It was the intention of this sub–committee to develop a plan which is ideally suited for the geographic and demographic characteristics which make this region of Texas unique. At the same time, however, the planning committee attempted to stay within the principles 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.

Frequency needs of the region were studied by each sub–region Council of Government. This was done in conjunction with 9–1–1 studies. All Public Safety agencies were verbally questioned as to needs. The three 9–1–1 Coordinators served on and reported findings to the planning committee.

A final draft approval meeting of the planning sub–committee was held, changes made and approved. A draft copy of the plan was mailed to all committee members along with a ballot. Upon approval of the committee the draft will be forwarded to the FCC for approval.

Committee membership was left open, to allow the participation of any person or agency which may not have been notified or who may have decided later to join the committee.

Vendor participation was encouraged in the committee work, but vendors were not allowed a vote.

2.3 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 govern. It is expected that Regional Plans for other areas of the country may differ from this plan due to the broad differences in circumstance, geography, and population density. By officially sanctioning this plan the Federal Communications Commission 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 Special

Emergency Radio Service user agencies in this Region. If there is a perceived conflict then the judgment of the FCC will prevail.

2.4 FEDERAL INTEROPERABILITY

Interoperability between the 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 for government 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 percent increase in mobile units, provided that written documentation from Federal agencies supports at least that number of increased units.

2.5 REGIONAL REVIEW COMMITTEE

Upon approval of this Plan by the Federal Communications Commission, a Region Review Committee will be established for the review of applications or for the settlement of disputes concerning this plan and/or its application. This Committee shall elect its own chairperson from within its membership. This committee shall consist of the Chairman of the Planning Committee (chair of the review committee until the committee can hold an election), the APCO frequency coordinator of the State of Texas (ex–officio), a state agency representative, a city government, county government, and a medical services provider representative from each planning sub–region (Panhandle Regional Planning Committee, South Plains Area Governments, North Texas Regional Planning Commission). This committee and its composition will be assured by the Texas APCO chapter and other Public Safety Organizations. Membership on this committee will be solicited on an annual basis. Since this committee will probably not have regular business, it will be up to the APCO Frequency Coordinator to notify the committee of problems or conflicts. To facilitate this function, the APCO Chapter shall furnish the names, agency affiliation, address and phone number of each committee member. Each member of the committee shall be furnished a

copy of this plan upon their appointment or election to the committee.

Plan updates shall be accomplished by this committee. All changes or updates to the plan shall be first agreed upon by this committee and then submitted to the FCC for their review and considerations. When approved all changes shall be added to the plan with the appropriate documentation of approval.

This committee shall meet at least once annually to review the implementation of the plan. This review shall consist of examination of any and all license activity or present applications of the 821–824/866–869 MHZ (referred to as 821 MHZ from here on) Public Safety/Public Service radio spectrum. They shall negotiate with adjacent regions for the resolution of inter–regional problems.

3.0 SPECTRUM UTILIZATION

This portion of the Plan provides a basis for proper spectrum utilization. Its purpose is to guide the APCO Frequency Coordinator and/or the Region Review Committee in their task of evaluating the implementation of this plan within this Region.

3.1 REGION DEFINED

Region 52 is one of 6 (six) regions in the State of Texas. This region is located in the Texas Panhandle, portions of the South Plains region and the North West portion of Texas just to the south east of the Panhandle area. This region is the result of definition by the Federal Communications Commission as a result of recommendations made in the National Public Safety Planning Advisory Committee (NPSPAC) plan as submitted and approved and contained in docket 87–112.

3.2 REGION PROFILE (Demographic Information)

The purpose of this section is to provide the basis for the assignment of frequencies, and their re–use. Since the frequency allocation formula used is based on population within a county, it is necessary to provide this information within this plan. Below is the population data by sub–region used in the determination of frequency allocations.

Panhandle Sub–region

County	1980 Population	1990 Population	% Change	2000 Population
Armstrong	1994	2021	1.35	2156
Briscoe	2579	1996	–23.77	2429
Carson	6672	6570	–1.53	7160
Castro	10556	9038	–14.38	12394
Childress	6960	5917	–14.86	6823
Collingsworth	4648	3559	–23.43	4250
Dallam	6531	5446	–16.61	7472
Deaf Smith	21165	19089	– 9.81	25923
Donley	4075	3685	– 9.57	4398
Gray	26386	23824	–9.71	28424
Hall	5594	3892	–30.43	4997
Hansford	6209	5839	–5.96	7253
Hartley	3987	3632	– 8.90	4209
Hemphill	5304	3713	–30.00	5647
Hutchinson	26304	25619	–2.60	30083
Lipscomb	3766	3140	–16.62	3605
Moore	16575	17868	7.80	21070
Ochiltree	9588	9100	–5.09	11728
Oldham	2283	2278	–.22	3005
Parmer	11038	9380	–10.94	12556
Potter	98637	97140	–1.52	116145

Panhandle Sub–region (continued)

County	1980 Population	1990 Population	% Change	2000 Population
Randall	75062	8942	419.13	100659
Roberts	1187	1187	–13.65	1169
Sherman	3174	2853	–10.11	3685
Swisher	9723	8112	–16.57	10806
Wheeler	7137	5873	–17.67	7336
Sub–Total	377124	370033	– 1.88	445382

South Plains Sub–region

County	1980 Population	1990 Population	% Change	2000 Population
Bailey	8168	7064	–13.52	8852
Cochran	4825	4377	– 9.28	5437
Crosby	8859	7304	–17.55	9438
Dickens	3539	2571	–27.35	3321
Floyd	9834	8497	–13.60	10603
Garza	5336	5143	– 3.62	6061
Hale	37592	34671	– 7.77	47807
Hockley	23230	24199	4.17	27490
King	425	354	–16.71	324
Lamb	18669	15072	–19.27	20905
Lubbock	211651	222636	5.19	285475
Lynn	8605	6758	–21.46	9315
Motley	1950	1532	–21.43	1793
Terry	14581	13218	–9.35	16047
Yoakum	8299	8786	5.87	10337
Sub–Total	365563	362182	–2.92	463205

North West Texas Sub–region

County	1980 Population	1990 Population	% Change	2000 Population
Archer	7266	7973	9.7	9966
Baylor	4919	4385	–10.9	5011
Clay	9582	10024	4.6	10718
Cottle	2947	2247	–23.8	2787
Foard	2158	1794	–16.9	2056
Hardeman	6368	5283	–17.0	6686
Jack	7408	6981	– 5.8	8164
Montague	17410	17274	– 0.8	19957
Wichita	121082	122378	1.1	127771
Wilbarger	15931	15121	– 5.1	19045
Young	19083	18126	– 5.0	23401
Sub–total	214154	211586	– 1.2	235562
Region Totals	956841	943801	–1.36	1144149

3.3 GEOGRAPHICAL DESCRIPTION

The Panhandle of Texas is a 26,000 square mile area encompassing 10 percent of the state's land mass. Its citizens live in 26 counties and 59 cities. There is only one city over 50,000 in population which is the City of Amarillo. The Panhandle is considered very flat with no mountains and no large bodies of water. The area is predominately rural in character with an agricultural and petrochemical economic base.

The South Plains of Texas is a 13,737 square mile area. Its citizens live in 15 counties and 45 cities. There is only one city over 50,000 in population which is the City of Lubbock. The South Plains are also flat with no mountains and no large bodies of water. The area is predominately rural in character with agriculture, agribusiness, and service industries economic base.

The North Texas area is a 9,461 square mile area. It's citizens live in 11 counties. There is only one city over 50,000 in population which is the City of Wichita Falls. North Texas is flat with no mountains and no large bodies of water. The area is predominately rural in character, with an agricultural and service industries economic base.

3.4 USAGE GUIDELINES

All systems operating within the Region having five or more channels will be required to be trunked. Those systems having four or less channels may be conventional or trunked. The FCC, in its Report and Order states, "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, however, and strong evidence showing why trunking is unacceptable must be presented in support of any request for exception."

Systems of four of 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 Committee. Statewide public safety agencies will submit their communications plans

for 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. This would apply in a situation such as a city requesting coverage of an entire county. 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 and public service radio users as can be managed technically.

The county/multiple municipality agency agencies, depending upon systems loading and the need for multiple systems within an area, must provide inter–communications between area–wide systems. In a multi–agency environment, a lead agency using 821 MHz spectrum, which may be any organization having primary response obligations, must implement the Common Channels in this band as mandated by the National Plan. Such implementation must be reviewed and approved by the Review Committee, the Texas State APCO Frequency Coordinator, and APCO.

Municipal terminology often differs. In order to provide a title for the next level of communications the term "City" is used to define the level below countywide. City communications for public safety and public services 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, that 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 public safety and public 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 and disruptive interference with communications involved in these services in an area shall not be tolerated. Any co–channel interference within an authorized area of coverage will be examined on a case by case basis.

3.5 TECHNICAL DESIGN REQUIREMENTS FOR LICENSING

3.5.1 DEFINITION OF COVERAGE AREA

The coverage area shall be that area for which a system is intended to cover with a received signal strength of greater than 41 dBU. This area shall normally represent the boundaries of the County or the incorporated municipality which is applying for license. In the case of regional or area–wide, multi–jurisdictional systems, the coverage shall be that area of all jurisdictions participating in the system combined.

3.5.2 SYSTEM COVERAGE LIMITATIONS

System coverage shall be limited to the coverage area defined as listed above plus no more than five (5) additional miles in all directions extending from said boundaries of definition. This limitation shall assure maximum frequency reuse. The only exception to this rule shall be those applicants wishing to offer service or system use to areas outside of their jurisdictional boundaries. In these situations the applicant shall provide a proposal of said service to the Regional Review Committee for consideration. This proposal will include official letters of agreement signed by all concerned.

Systems not located within the geographical center of the jurisdiction(s) for which they cover shall utilize either directional antennas or antenna/tower relationship techniques to achieve the coverage required by this plan.

3.5.3 DETERMINATION OF COVERAGE

There are three variables used in determining the area of coverage of a proposed system. These variables are (1) the strength of the received signal, (2) antenna

height above average terrain (HAAT), and (3) the effective radiated power (ERP) of the system.

Received Signal Strength: For purposes of this plan, received signal strength shall be the determining factor which defines the actual boundary of a system. The minimum signal level which marks the outer boundary of a system shall be 41 dBU.

Antenna Height: Shall be the height of the Antenna above the average terrain surrounding the tower site.

Effective Radiated Power (ERP): This shall be the transmitter output power minus all line and equipment losses multiplied by the gain to the transmitting antenna.

Data provided in the Carey Propagation Curves, which follows, shall be used to obtain the distances to the 41 dBU boundary, based on HAAT and ERP. This distance is the calculated distance from the transmitting site. The procedure for determining this distance is contained in a later section.

A minimum system shall be permitted without special consideration when it is limited to an HAAT of 100 feet and the transmitter is centrally located within the jurisdiction or jurisdictions participating in a system. In all jurisdictions, regardless of size, a maximum boundary radius of 8 miles shall be allowed provided adequate measures have been taken to assure that interference of existing co–channel and adjacent channel systems will not occur.

Preparation of these requirements shall be the responsibility of the applicant. The Federal Communications Commission provides, in part 90.309(a)(4) of the Rules and Regulations, some additional guidance for these calculations.

3.5.4 ANNEXATIONS AND OTHER EXPANSIONS

It is well known that as cities grow, annexations occur. When an expansion of the present city limits of any city currently using an 821 megahertz system within the spectrum as herein specified occurs, it is understood that the existing system may have to be expanded and its range increased. This is a modification and may be permitted. The increased range of the system will have to be determined at the time of modification to assure non–interference with any other existing system.

Where interference is likely, the use of alternate methods of expansion, such as satellite systems or "smart" repeaters may be necessary.

Should the annexation or expansion of a city effectively take in all or most of a county, the allocation for that county may be given to the city if required by said city and not in use of planned to be used by the county. Where more spectrum is not available from the initial allocation, the rules for expansion of initial allocation, as contained in this plan, shall apply.

3.5.5 COVERAGE AREA DESCRIPTION

All applicants shall provide with their applications a map showing the jurisdictional boundaries to be covered by the system, and the calculated system coverage. This map shall display the location of the system transmitter(s), including control stations. It is recommended that a U.S. Geological Survey (USGS) Quad, topographical, map be used for this purpose. If not available, a high quality locally produced map or a highway map may be substituted. Regardless of the type map used, the name of the applicant and the scale of the map shall be displayed on the map.

3.5.6 CONTROL STATIONS

Control stations within a system shall be limited in both transmit power, antenna height and antenna orientation. The control station design shall be such that the received signal strength at the mobile relay is approximately 6 Db above the signal of a mobile unit transmitting from the same location of the control station.

As with other stationary elements of a system, the location of all control stations shall be given, by street address, latitude and longitude. Ground elevation, antenna height, transmitter power and antenna type and orientation shall be given.

3.5.7 CONTROL STATIONS USED AS SYSTEM BACKUP

It is understood that some jurisdictions and/or system users will desire some method of system backup that is both effective and inexpensive. Although provisions have not been made for this in either the Federal Communications

Rules and Regulations or in the NPSPAC plan, an attempt shall be made in the provisions of this Regional plan to allow such operation.

The use of a control station as a system backup makes good application and economical sense. Some minor changes may be necessary in some applications to avoid interference with adjacent systems or co–channel systems. These changes are listed below:

The antenna used for control purposes must be of the directional (yagi) design so that received signal strength at the mobile relay is as mentioned above. The antenna used for backup will usually be of the omni–directional type, but may be directional if required. As in the mobile relay, the antenna height above average terrain and the gain of the antenna, coupled with the transmitter power must be given as listed above. The calculated coverage of the backup station shall be mapped as is the mobile relay. A method to switch between antennas must be used. The method chosen shall be included with the application for license, as well as the written plan for the use of the control/backup station.

INTERFERENCE: Any control/backup station found to be causing interference to an adjacent system or co–channel interference shall be required to modify said system to eliminate all interference. This may require power reduction, changes in antenna orientation, changing antenna height or any combination.

3.5.8 PROCEDURES FOR DETERMINING SERVICE AREA CONTOUR

Two methods may be used to determine the service area of a system. These methods are the Okumura/Hata and the Carey Propagation methods. Due to the complexity of the Okumura/Hata method only the Carey Curve is presented here, as a guide to assist in system planning.

At 821 MHz Okumura/Hata provides an accurate prediction of median field strengths. There are different types of structure densities and numerous other detailed correction factors for terrain undulations, over water portions of the terrain and upward or downward terrain variations that can be applied to this model.

Carey's data was developed for TV coverage predictions and is included in the FCC code, paragraph 73.699. Since it was developed for TV, a height correction of 9 dB is necessary. Carey also has good correlation with Okumura at distances greater than 10 miles.

3.5.9 OKUMURA/HATA METHOD

The Okumura method uses four different classifications to describe the average terrain around a transmitter site of area. The classifications are:

1 – Urban, which is a built–up city crowded with large buildings or closely interspersed with houses and thickly–grown trees. This would include the downtown area of a major city.

2 – Suburban, which is a city of highway scattered with trees, houses and building. This would include the downtown area of a large city.

3 – Open is an area where there are no obstacles such as tall trees or building in the propagation path or a plot of land which is cleared of anything for 300 to 400 meters ahead. This would include farm land, open fields, etc.

4 – Quasi–open is an area between suburban and open areas. This includes ares outside of city limits that have few building and houses.

The Okumura method is most appropriate when working with high density population areas. It is also the method used by most computer packing programs, such as the one used in the development of this plan, and yields a better plan than does the Carey Curve for systems covering a 10 mile radius or less.

3.5.10 CAREY CURVE METHOD

Convert effective radiated power from watts to dBK using the formula:

$$P(dBK) = \{10 \times \log P(Watts)\} - 30 \quad (B-1)$$

SUBTRACT this NEGATIVE number (in other words, convert it to positive and add) from 41 dBu.

In the look–up tables, determine the two height columns that correspond most closely with your H.A.A.T. (for example, if your HAAT is 300 feet, use the 200 and 500 columns).

Interpolate between the listings under the two columns to determine where the figure arrived at in Step 2 falls.

Read the milage at the extreme left–hand column of the row.

E X A M P L E

To determine the service area of a UHF base station with ERP of 125 watts and an antenna height above average terrain of 400 feet:

$$P\{dBK\} = 10 \times \log (125) - 30$$
$$P\{dBK\} = 21 - 30$$
$$P\{dBK\} = -9$$

Subtracting:

$$F\{dBu\} = 41 - (-9)$$
$$F\{dBu\} = 50$$

From the look–up table, 50 falls between 45.6 and 52.9 as 400 is interpolated between 200 and 500. Corresponding mileage is 12.

(Table Follows On Next Page)

CAREY PROPAGATION CURVE LOOK-UP TABLE

UHF F(50.50) dBu/kw erp

MILES	100	200	500	1000	MILES	100	200	500	1000
5	60.8	66.0	72.9	79.0	44	9.5	12.5	18.5	24.5
6	56.9	61.7	68.7	74.6	45	8.9	11.9	17.8	23.8
7	53.4	58.2	65.1	71.0	46	8.4	11.3	17.0	23.1
8	50.2	55.1	62.0	68.0	47	7.9	10.7	16.3	22.3
9	47.4	52.4	59.4	65.4	48	7.3	10.1	15.6	21.6
10	44.8	49.9	57.0	63.1	49	6.8	9.5	15.0	20.9
11	42.4	47.7	54.9	60.9	50	6.3	8.9	14.3	20.2
12	40.2	45.6	52.9	59.0	51	5.8	8.4	13.6	19.5
13	38.2	43.7	51.1	57.2	52	5.3	7.8	13.0	18.8
14	36.3	41.9	49.5	55.4	53	4.9	7.3	12.4	18.1
15	34.6	40.1	47.9	53.8	54	4.4	6.8	11.8	17.5
16	33.0	38.5	46.3	52.2	55	4.0	6.2	11.2	16.8
17	31.5	37.0	44.9	50.7	56	3.6	5.7	10.6	16.1
18	30.0	35.6	43.5	49.2	57	3.2	5.2	10.0	15.5
19	28.7	34.3	42.1	47.9	58	2.8	4.8	9.5	14.9
20	27.5	33.0	40.8	46.5	59	2.4	4.3	9.0	14.3
21	26.4	31.7	39.5	45.3	60	2.0	3.9	8.4	13.7
22	25.3	30.6	38.3	44.1	61	1.7	3.5	7.9	13.1
23	24.3	29.5	37.1	42.9	62	1.3	3.1	7.4	12.5
24	23.3	28.4	35.9	41.9	63	1.0	2.7	6.9	12.0
25	22.4	27.4	34.8	40.7	64	.7	2.3	6.4	11.4
26	21.5	26.4	33.8	39.7	65	.3	1.9	6.0	10.9
27	20.7	25.4	32.7	38.7	66	0.0	1.6	5.5	10.3
28	19.9	24.5	31.7	37.7	67	-.3	1.2	5.0	9.8
29	19.1	23.6	30.7	36.81	68	-.7	.9	4.5	9.3
30	18.4	22.7	29.8	35.9	69	-1.0	.5	4.1	8.8
31	17.6	21.8	28.9	35.0	70	-1.4	.2	3.7	8.3
32	16.9	21.0	28.0	34.1	71	-1.7	-.2	3.2	7.8
33	16.2	20.1	27.1	33.2	72	-2.0	-.5	2.8	7.3
34	15.6	19.3	26.3	32.4	73	-2.4	-.9	2.4	6.9
35	14.9	18.6	25.5	31.5	74	-2.7	-1.2	2.0	6.4
36	14.3	17.8	24.6	30.7	75	-3.0	-1.5	1.7	6.0
37	13.7	17.1	23.8	29.9	76	-3.3	-1.9	1.3	5.6
38	13.0	16.4	23.0	29.1	77	-3.5	-2.1	.9	5.3
39	12.4	15.7	22.3	28.3	78	-3.8	-2.4	.5	4.8
40	11.8	15.0	21.5	27.6	79	-4.0	-2.7	.1	4.4
41	11.2	14.3	20.7	26.8	80	-4.8	-3.1	-.3	3.9
42	10.6	13.7	20.0	26.0					
43	10.1	13.1	19.2	25.3					

3.5.11 CO-CHANNEL INTERFERENCE PROCEDURE

Determine the distance from the proposed station to the existing station.

If not previously known, determine service area boundary of existing station. (method is detailed on page 21)

Find distance from proposed station to closest point of service area boundary of the existing station. (subtract #2 from #1)

Based on mileage from 3 (above), E.R.P. and H.A.A.T. of the proposed station, consult look-up tables from dBu level at the service area boundary of the existing station.

Subtract this dBu level from #1. If the result is 35 dB or greater, the proposed system will conform with the interference parameters. If the result is less than 35 dBu, the proposed system must be redesigned by lowering power, antenna height, or both until the 35 db protection ratio is met.

Note: If the terrain between the two systems would provide additional protection that would no be evident from using the normalized H.A.A.T.'s, it will be permissible to calculate the H.A.A.T. of both existing and proposed systems along the radial line directly connecting the two stations. The resulting service area boundary of the existing station and the dBu level of the proposed station at that point would then be used to calculate the protection ratio.

E X A M P L E

	Station A (proposed)	Station X (existing)
ERP:	100W (-10dBk)	200W (-7dBk)
H.A.A.T.:	500 feet, AMSL	200 feet, AMSL

Distance from A to X: 46 miles

Service Area Boundary:	13 miles	11 miles

46 miles - ll miles = 35 miles, distance from proposed to service area boundary of existing station.
From look-up tables, dBu level at 35 miles from a station with an ERP of 100 watts and HAAT of 500 feet is:

25.5 - 10 = 15.5 dBu

Subtracting this amount from the defined #1 dBu level at the service area boundary of the existing station gives 25.5 dB of protection, 9.5 dB less than the minimum required.

3.5.12 REASSIGNMENT OF FREQUENCIES

All agencies participating in the use of the new 821 megahertz spectrum shall prepare and submit a plan for the abandonment of their currently licensed frequencies in the lower bands. These released frequencies shall be available for reassignment to those agencies not migrating to 821 MHz at this time.

These released frequencies shall be returned to the radio service from which it was assigned. These frequencies shall then be available for reassignment by the assignment /coordination criteria in effect for that particular service by the regular FCC authorized coordinator for that service.

Frequencies which are to be abandoned by an agency shall not be handed down to another agency within the respective jurisdiction. Though this may seem a convenient method to re–use existing radio equipment, the reassignment must be handled through the normal process. It is recommended that any jurisdiction wishing to "hand down" frequencies to another agency submit the proper coordination and application forms with the document of release. This will put the applicant in a better posture for reassignment of the frequency in question. It should be noted that even thought this procedure is followed there is no guarantee that a particular frequency will be assigned to the returning jurisdiction.

The time frame allowed for phasing into 821 MHz and out of the lower currently licensed bands will be considered on a case by case basis by the review committee. Generally one year will be considered acceptable in most cases, with two years as a general maximum. Any agency requiring more than one year shall provide documents stating the reasons for the delay, and give the estimated time of turn–back.

3.5.13 UNUSED SPECTRUM

Due to the fact that all of the frequency spectrum is not needed at this time the excess channel pairs will be returned to a reserve pool. These channels may be used for conflict with adjacent Region till needed. This does not imply that these frequencies are unavailable, only that before they can be utilized within the Region they must be coordinated via the regular APCO coordination process and within the guidelines set forth in this plan. Where possible, the channels designated for a jurisdiction in this plan shall be used. Channel selection for coordination will be done in ascending order from the last used channel pair. The following channels have been marked as reserved for future region use:

683	684	686	687	688	689	693	694	695	698	699	700	704
705	706	707	708	709	710	720	721	722	726	727	728	729
730	731	732	733	734	735	736	738	739	740	741	744	746
747	748	758	760	766	769	770	772	777	830			

3.5.14 ADJACENT REGION CONSIDERATIONS

Coordination with adjacent regions shall be an on–going process until all region plans have been finalized. At present all adjacent regions have been coordinated with and no conflicts have been identified. The adjacent regions with which coordination has been conducted are: Region 7 (Colorado), Region 16 (Kansas), Region 29 (New Mexico), Region 34 (Oklahoma), Region 40 (Texas), Region 50 (Texas).

As the use of the five National/Channels is not considered a day–to–day function the "hard" coordination for the use of these channels is not considered to be necessary or advisable. The use of these channels will always be on a non–interference basis, with on–the–air coordination at the time of use when required. Any user found to be operating in any manner other than this shall be considered to be operating improperly and subject to the existing Federal Communications Commission rules for willful interference with the communications of other users.

4.0 COMMUNICATIONS REQUIREMENTS

4.1 COMMON CHANNEL IMPLEMENTATION

The implementation of the National common channels must follow the guidelines as set forth by the Federal Communications Commission by the approval of the National Plan. These five common channels are accessible by all levels of government and shall be used in accordance with the provisions of the National Plan.

The International Calling Channel (821/866.0125 MHz) shall be implemented as a full mobile relay. Wide area coverage transmitters will be installed where applicable within a system. Large system users (5 channels or more) of 821 MHz shall be required to monitor this channel at all times. The area of coverage for this channel shall be equal to the area covered by the licensed system. This may or may not require the use of satellite receivers within the area to meet this requirement.

The four International Tactical Channels will be assigned region–wide, for use as needed by all eligible licensees. These channels are to be used in accordance with the National Plan and in compliance with the regulations as set forth by the Federal Communications Commission. These channels require no special licensing, only that the users be eligible for licensing on the other Public Safety channels as specified in FCC Rules and Regulations.

4.1.1 AREAS OF OPERATION

The common channels shall be available for use throughout the Region. No specific assignments were deemed necessary within the Region.

4.1.2 OPERATION ON THE COMMON CHANNELS

Normally, the five interoperable channels are to be used only for activities requiring inter–communications between agencies not sharing any other compatible communications system. Interoperable channels are not to be used by any level agency for routine, 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 Agency within that area of operation. The primary Public Safety agency in each county shall be the County Sheriff's Department or Public Safety Department or the lead agency, which may

be any agency licensed to operate in this spectrum, or "on–scene" commander. The primary agencies through assigned Incident Commanders will assign one or more of the Internatioal tactical channels for use according to need during each special situation requiring the use of these channels.

Participants in the interoperable channels include Federal, State, and Local Disaster Management agencies. Police, Fire, and providers of Basic and Advanced Life support services 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. These agencies include the Highway Department, Motor Vehicle Comptroller, Forestry, Wildlife and other special service agencies not normally involved in day to day public safety operations.

4.1.3 OPERATION 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.

4.1.3.1 International Calling Channel (ICALL) – The International Calling channel shall be used to establish contact with other users in a particular Region that can render assistance at an incident. This channel shall not be utilized as an ongoing working channel. Once contact has been established between agencies, an agreed upon Tactical or mutual aid channel shall be used for continued communications.

4.1.3.2 International Tactical Channels (ITAC 1 – ITAC 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 according to function in an incident or by geographical location in response to an incident.

It is recommended that the following assignments for ITAC–1 through ITAC–4 be used when possible.

ITAC–1 ..... Law Enforcement

ITAC–2 ..... Fire Services

ITAC–3 ..... Emergency Medical Services

ITAC–4 ..... Command and Control