

Region 49
700 MHz Regional Planning Committee
Minutes of the January 24, 2008, conference call

Meeting called to discuss the FCC allotment survey mailed to the RPC's on January 7, 2008, with a response due by January 31, 2008. Notice was sent by email to all who had attended a 700 MHz planning meeting in the past 3 years.

Chairman Ron Mayworm called the meeting to order at 10:04 a.m. The following members and guests were present via telephone conference bridge:

Ron Mayworm, Chair, City of Bryan	
Chuck Brotherton, Travis County	
Bill Blowers, Bell County	
James Benton, Texas DPS	
Larry Blare, City of Waco	
Elizabeth Lindemann, City of Austin	
Arletha Guerrero, City of Austin	

Item 1: Introductions, review agenda.

Item 2: Review and discussion of the FCC allotment survey: Due to the tight deadline for responding to the survey (fewer than 30 days between receipt and required response), there was no time to call a formal meeting of the committee, therefore this phone conference was the best available means for getting the committee together.

Chairman Mayworm reviewed the survey. Syracuse Research Corporation, under contract to repack the CAPRAD database frequency allotments nationwide, has asked each region to decide how its allotment of 700 MHz frequencies should be repacked. Options are to go with the "default" sort, which would allot 700 MHz channels in 4-channel, 25 KHz blocks with 250 KHz combiner separation, or to repack the allotment in 12.5 KHz ("narrowband") blocks at the same or tighter spacing. Regions also have the option of varying their allotments by each "county-like entity" within the region depending upon need.

Chairman Mayworm stated that narrower channel packing would deliver more usable frequencies and provide for greater spectrum efficiency. He also noted that Cellwave is now delivering combiners capable of 150 KHz separation.

It was noted that the default, 25 KHz packing would tend to create more unusable "orphan" channels in regions with P25 systems optimized for narrowband frequencies. For example, at 25 KHz, Austin-Travis County would receive 22 channels it would then have to break out into narrowband frequencies for its P25 system. Some would not be usable. A

12.5 KHz sort, on the other hand, would provide 44 distinct channels that could be coordinated for maximum efficiency.

It was also noted that, under the new Statewide Communications Interoperability Plan, all grant funds allocated for interoperable communications are to be spent on P25 infrastructure and subscriber units. Therefore, to maximize spectrum efficiency and provide the greatest number of usable channels, it might make sense for most regions to opt for the 12.5 KHz packing.

Bill Blowers noted that Bell County is considering a M/ACom "Open Sky" system, which requires 25 KHz channels, so he would prefer the default channel plan.

It was then determined that, by chance, each of the four Councils of Governments in Region 49 were represented on the conference call. Chuck Brotherton stated that he felt comfortable speaking for the CAPCOG region in requesting a 12.5 KHz allotment at 150 KHz separation; Larry Blare requested the same for HOTCOG; Ron Mayworm did likewise for BVCOG. Bill Blowers elected to go with 25 KHz / 250 KHz for CTCOG.

Chairman Mayworm stated that he would complete the survey to reflect these choices and return it before the January 31st deadline.

Item 4: Other Business: There was brief discussion of 800 MHz rebanding and recent efforts by the Transition Administrator to schedule a regional planning meeting prior to the date established for Wave 2 submissions of waiver requests, which is March 17, 2008.

Larry Blare recommended that everyone review the latest changes (1/22/08 revision) to the Statewide Interoperability Channel Plan, available at the TSIEC web site at <http://tsiec.region49.org/MOU+TSICP01-22-08.pdf>.

Chairman Mayworm stated that the CAPRAD resort will be available in February or March, and that a revised Region 49 700 MHz plan will be available for review shortly thereafter. A formal meeting of the Region 49 700 MHz Planning Committee will then be called to review and approve the regional plan.

Item 4: Adjourn: Meeting adjourned at 10:35 a.m.

NOTE: This meeting utilized a telephone conference bridge, toll-free dial-in number (877) 807-5706, ID number 173380.

Attachments: "Conf_Call_Announcement_email_1-18-08.pdf"
"RCC_Analysis_CAPRAD_Resort_1-11-2008.pdf"
"RPC49_AllotmentSurveyRESPONSE_01-28-08.pdf"

From: Charles Brotherton
To: Charles Brotherton; Region 49 700 MHz RPC
Date: 1/24/2008
Time: 10:00 AM - 11:00 AM
Subject: URGENT: Region 49 700 MHZ RPC Phone Conference
Place: Phone Bridge: (877) 807-5706, Conference ID 173380
Attachments: RPC49_AllotmentSurvey.doc; CAPRAD Resort 1-11-2008.doc

The FCC has requested an immediate response from each planning region to the survey attached here, "RPC49 Allotment Survey." The response deadline is January 31st. A meeting of the Region 49 700 MHZ planning committee therefore is set for this coming Thursday, January 24th, from 10 a.m. to 11 a.m. CST (1 hour).

This meeting will be by telephone conference only. To join the conference, dial (877) 807-5706 and enter conference ID number 173380.

Prior to this telephone conference, please review the attached documents. During the meeting, we will discuss regional needs related to the 700 MHZ CAPRAD re-sort. Our goal for this meeting is to reach consensus for the region's response to the FCC survey. We have to consider whether to go with the "default" new CAPRAD sort, which will allot 700 MHZ frequencies in 4-channel, 25 KHz blocks with 250 KHz combiner separation, or to recommend 12.5 KHz allotments at the same, or tighter, spacing.

Two documents are attached: "RPC49_AllotmentSurvey.doc" and "CAPRAD Resort 1-11-08.doc." Please review these documents and contact me or Region 49 Chairman Ron Mayworm (rmayworm@bryantx.gov) with any questions you have prior to the telephone conference.

Thank you.
Chuck

Chuck Brotherton
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Travis County Emergency Services

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In July of 2007, the FCC ordered a new 700 MHz band plan for public safety that established revised channel frequencies. Before this change, the 700 MHz public safety frequencies had been separated into 3 MHz blocks. The new FCC-ordered 700 MHz band plan combined frequencies into contiguous channel blocks.

When the FCC established the original 700 MHz band plan for public safety, a database tool, the Computer Assisted Pre-Coordination Resource and Database System, also known as CAPRAD, performed an initial nationwide assignment of channels. The role of the Regional Planning Committees was very limited in the initial CAPRAD channel assignments.

A new CAPRAD sortation of 700 MHz “General”¹ channels is about to be performed. Each Regional Planning Committee (RPC) Chairperson has been sent a listing of geographical areas within their RPC. Based upon the individual geographical areas within each RPC, the Chairs may assign certain channel sortation criterion as depicted in an example below in Figure 1.

County Name	Channel Block Size	Combiner Separation	Capacity Option
District of Columbia, DC	25 kHz	250 kHz ±	Minimum allotment
Allegany County, MD	12.5 kHz	0 kHz	Population model
Anne Arundel County, MD	25 kHz	25 kHz	Population model
Baltimore County, MD	12.5 kHz	50 kHz	Population model
Baltimore City, MD	25 kHz	75 kHz	Population model
Calvert County, MD	12.5 kHz	100 kHz	Population model
Caroline County, MD	25 kHz	125 kHz	Population model
Carroll County, MD	25 kHz	150 kHz	Population model
Cecil County, MD	25 kHz	175 kHz	Population model
Charles County, MD	25 kHz	200 kHz	Population model
Dorchester County, MD	25 kHz	225 kHz	Population model
Frederick County, MD	25 kHz	250 kHz	Population model

FIGURE 1 – EXAMPLE OF SORTATION CRITERION

It is very important to note that there is a short turn-around period for this sortation data.

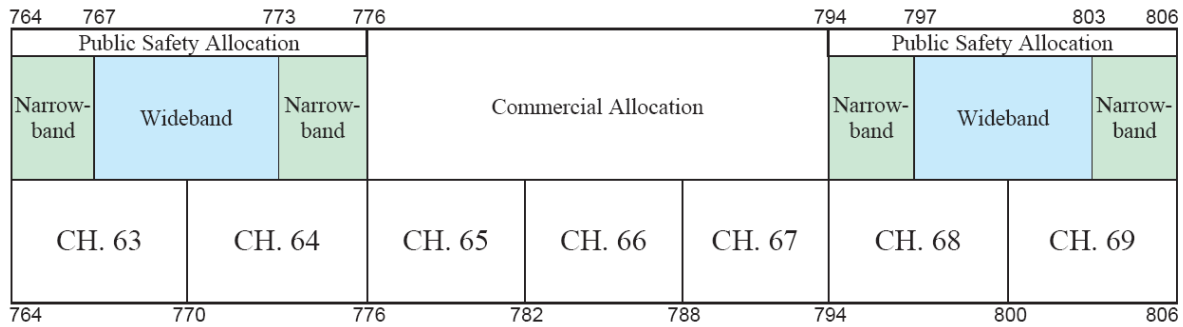
RPC Chairpersons must specify the sortation criterion for each geographical area and return the data to the CAPRAD managers by January 31, 2008. If the sortation criterion is not modified by the deadline, the new 700 MHz channel sortation for the geographical areas will be based upon the original default values used for the first sort; channel block sizes of 25 KHz with contiguous assignments separated by at least 250 KHz. The population model will also be used.

If you wish that the 700 MHz sortation criterion be changed from the default values, please return this email as quickly as possible and before January 29, 2008 to the RPC Chairperson specifying the desired “Channel Block Size”, “Combiner Separation”, and “Capacity Option” for your geographical area. If you require additional information to assist in the understanding of the CAPRAD sortation criterion, please see the following pages.

¹ See 47 CFR §90.531(b)(6)

Background

As indicated on the preceding page, the FCC ordered a new 700 MHz band plan for public safety as part of the Second Report and Order². The old and new band plans are depicted below in Figures 2 and 3.



Narrowband Channels
 Wideband Channels – General Use, Reserve, Interoperability

FIGURE 2 - ORIGINAL 700 MHZ BAND PLAN

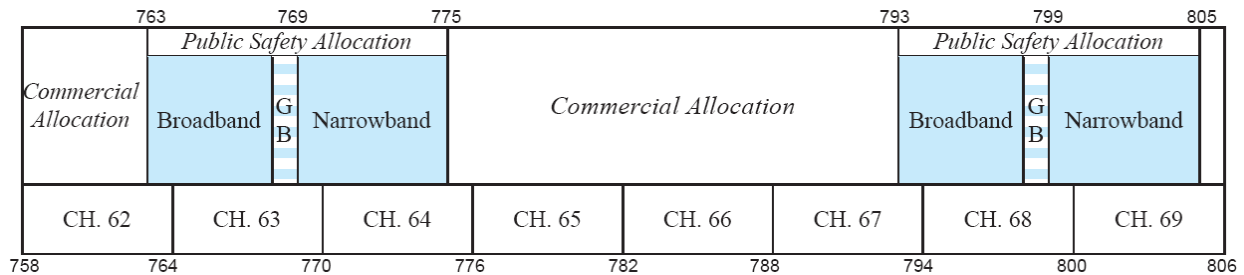


FIGURE 3 - REVISED 700 MHZ BAND PLAN

CAPRAD originally used a number of factors to assign the maximum number of General³ channels to geographical areas while simultaneously providing co-channel and adjacent channel interference protection. The criterion used in the original CAPRAD sort of 700 MHz was based upon assignments in four (4) consecutive blocks of 6.25 KHz channels with the blocks separated by at least 250 KHz. Based upon these engineering factors as well as the population of the geographical area, generally defined as a county, CAPRAD attempted to assign the maximum number of channels available. This criterion was adopted as a strategy to be “technology neutral”.

From a background perspective, the FCC established the 700 MHz frequency band with an acute sense of spectrum management. As such, the Commission’s vision seems to favor digital multi-user trunked radio systems that promote interoperability and efficient spectrum management. From the perspective of the U.S. Department of Homeland Security (DHS), adoption of the P-25

² See FCC 07-132 Released July 31, 2007 and published August 10, 2007

³ CAPRAD’s General Pool channel assignments do not relate to State channels as defined in 47 CFR §90.531(b)(5)

standard is encouraged to promote the rudimentary interoperability of public safety products produced by different equipment manufacturers.

Deciding Sortation Criterion

In deciding the CAPRAD 700 MHz sortation criterion for the geographical area, the initial factor to be considered relates to fundamental questions.

Is this a planning exercise for a future system?

Does the jurisdiction have a technology defined as part of a Plan or specified by a RFP or actual vendor contract?

If the latter and the user has a contract with an equipment vendor, the user's consultant and/or vendor should be consulted to assist in the identification of the geographic sortation criterion. Conversely, if the channels may be used in the future for an undefined technology, the factors discussed below may be of value to the user.

Regardless of application or channel block size, it is critical that the geographical area understand the 700 MHz spectrum efficiency requirements of the FCC found in 47 CFR § 90.535. Those requirements are provided on the following pages.

Channel Block Size – 12.5 KHz (two 6.25 KHz channel pairs)

The DHS encourages the use of the P-25 standard. P-25 systems require 12.5 KHz frequencies. In P-25 Phase I, the 12.5 KHz frequency utilizes Frequency Division Multiple Access (FDMA) to achieve one (1) talkpath. In Phase II, the 12.5 KHz frequency will use Time Division Multiple Access (TDMA) and support two (2) talk paths.

Today, all of the major manufacturers of land mobile radio equipment support the P-25 standard. Motorola's current P-25 system is called ASTRO25® while M/A-COM offers its P-25 product under the name of P25^{IP}®. Other equipment manufacturers sell mobile and portable radios that support the P-25 standard.

From the perspective of a RPC, 12.5 KHz frequencies (two channels) potentially result in a greater number of assignments without the need to manage "orphaned" channels.

Channel Block Size – 25 KHz (four 6.25 KHz channel pairs)

If the user has not made a technology decision for the future, some would recommend that 25 KHz channel blocks should be maintained for a geographical region as the default value to provide the greatest level of flexibility in the future. Through the assignment of 25 KHz blocks, P-25 systems can still be supported; however, the RPC has to deal with the issue of the remaining two unused channels also known as "orphaned" channels. The "orphaned" channels can be potentially reused in the RPC provided that adjacent channel interference does not result. Depending upon the location of the reassignment, it may be necessary to formally amend the

RPC Plan for 700 MHz and coordinate the plan's channel assignment revisions with the adjoining RPC's before re-filing the Plan with the FCC.

In addition to P-25, a 25 KHz channel block would permit the use of a wideband land mobile radio system that supports the goal of spectrum efficiency mandated by the FCC. An example of such a system is M/A-COM's OpenSky® technology that uses TDMA and permits four simultaneous talkpaths on a 25 KHz operating frequency.

From the perspective of data, a 25 KHz channel block also permits a rudimentary amount of bandwidth for data. To meet the efficiency requirements of the FCC, the channel must provide a minimum of 19.2 kbps. This may be helpful in situations where broadband capability is nonexistent or cost prohibitive.

25 KHz channel blocks are the default setting for Channel Block Size.

Combiner Separation

Through the selection of combiner separation requirements, a user may impact the number of channels assigned to a geographic area by CAPRAD. Again, if a user has a system under contract with a manufacturer, the user should consult with the vendor representative or project consultant for advice.

In a "simulcast" system, most vendors will request 250 KHz of separation as a strategy to minimize the cost of a combiner. In reality, some combiners can support more densely packed channels; however, the signal losses may be somewhat higher as well as the cost of the product. In a large system, multiple combiners may be used and through careful planning, smaller separation requirements may be possible even with the use of "standard" 250 KHz combiners.

Channel spacing of 250 kHz allows the use of a single combiner when all of the channels in a geographic area are licensed and used at the same site. When the channels are used by different licensees, this wide spacing doesn't provide any advantage. Even if all channels are used at the same site, reducing the spacing to 125 kHz may require two combiners, which is common in large systems anyway to provide antenna redundancy.

In a multicast system, the separation between channels may not be as critical. With tighter combiner spacing, the geographical area should receive a greater number of channel blocks.

250 KHz of combiner separation is the default value.

Capacity Option

Geographical areas may also receive channel blocks based upon the "Capacity Option" selected. The population model provides the greatest number of channel blocks while the "Minimum Allotment" method does not.

The default setting is Population Model.

47 CFR § 90.535 Modulation and spectrum usage efficiency requirements

Transmitters designed to operate in 769–775 MHz and 799–805 MHz frequency bands must meet the following modulation standards:

(a) All transmitters in the 769-775 MHz and 799-805 MHz frequency bands must use digital modulation. Mobile and portable transmitters may have analog modulation capability only as a secondary mode in addition to its primary digital mode. Mobile and portable transmitters that only operate on the low power channels designated in §§ 90.531(b)(3), 90.531(b)(4), are exempt from this digital modulation requirement.

(b) Transmitters designed to operate in the narrowband segment using digital modulation must be capable of maintaining a minimum data (nonvoice) rate of 4.8 kbps per 6.25 kHz of bandwidth.

(c) Transmitters designed to operate in the wideband segment using digital modulation must be capable of maintaining a minimum data (non-voice) rate of 384 kbps per 150 kHz of bandwidth.

(d) The following provisions apply to licensees operating in the channels designated in §§ 90.531(b)(5) or 90.531(b)(6).

(1) With the exception of licensees designated in paragraph (d)(2) of this section, after December 31, 2014, licensees may only operate in voice mode in these channels at a voice efficiency of at least one voice path per 6.25 kHz of spectrum bandwidth.

(2) Licensees authorized to operate systems in the voice mode on these channels from applications filed on or before December 31, 2014, may continue operating in voice mode on these channels (including modification applications of such licenses granted after December 31, 2014, for expansion or maintenance of such systems) at a voice efficiency of at least one voice path per 12.5 kHz of spectrum bandwidth until December 31, 2016.

(3) The licensees designated in paragraph (d)(2) of this section must, no later than January 31, 2017, file a declaration through the Universal Licensing System that they are operating these channels at a voice efficiency of at least one voice path per 6.25 kHz of spectrum bandwidth.

Region 49 Regional Planning Committee
Ronald G. Mayworm
City of Bryan, Texas
P.O. Box 1585, Bryan, TX 77805-1585
January 7, 2007

Mr./Ms. Chairman,

In 2001, National Pool allotments were generated for the 700 MHz public safety general use spectrum allocation provided by the Federal Communications Commission (FCC) as a result of Docket 96-86. The documentation structure, as well as all techniques utilized for estimation of capacity needs, coverage and interference modeling, and other technical factors were presented, vetted, and agreed to by the national public safety community through the National Coordination Committee (NCC) and APCO National Plan Committees. The allotments were placed into the Computer Assisted Pre-Coordination Resource and Database System (CAPRAD) by early 2003, where they have served as the basis for nearly all of the 700 MHz Regional Plans in the United States, both submitted and under development.

In their SECOND REPORT AND ORDER (Adopted: July 31, 2007, Released: August 10, 2007), the FCC reconfigured the 700 MHz band, placing previously block-interleaved narrowband and broadband allocations into contiguous blocks in order to facilitate development and deployment of a National Broadband public safety network topology. The new band configuration mandated by this order adversely impacted the narrowband voice allotments in CAPRAD, causing constraint violations to 643 counties (about 20% of the counties within the US).

At a National Regional Planning Committee meeting in Texas in September 2007, it was decided that the best mitigation approach would be to repack the entire set of pool allotments and reset them within CAPRAD, rather than attempt to fix violations at the local level. Repacking the allotments would allow the RPCs to deal immediately with the newly configured band, as they did when the initial allotment pool was loaded into CAPRAD in 2003. In addition, the RPCs decided that a much more effective set of pool allotments could be developed by utilizing additional information not available at the time of the initial allotment generation. Syracuse Research Corporation has been contracted by the Sheriff's Association of Texas to accomplish the repacking effort.

The attached form is provided for collection of individual RPC and county information pertaining to local requirements and intended spectrum utilization. Each row identifies a county-like entity to receive pool allotments and provides channel-width and minimum antenna system combiner-separation options, with default values of 25-kHz and 250-kHz respectively. Each cell in the form is a drop-down list when this document is opened in Microsoft Word. Options may be selected by choosing from the drop-down lists and then

saving changes to the document. If system technology and spectrum use requirements are known and stable, specifying channel-width and minimum combiner-separation lower than the default values would contribute to spectral efficiency (avoiding wasted or unusable “orphan” channels) and allow tighter frequency packing within your Region, which may provide the opportunity for higher capacity pool allotments. If technology and spectrum use requirements are unknown or likely to change, the default values are recommended.

In addition, each county-like entity may specify that pool allotments reflect either the population-modeled capacity or the minimum capacity. The minimum capacity option generates a pool no larger than the nation-wide county minimum, and is given to accommodate counties or regions that either plan to independently pack their own pool allotments, or do not currently intend to implement 700 MHz narrowband technology.

All Regions are invited to participate in a WebEx Conference Call to be held on Monday, January 14 at 3:00 PM EST. During this call, moderators representing Syracuse Research Corporation, the National Regional Planning Executive Committee, and Texas Sheriffs’ Association will be on hand to present information regarding the CAPRAD re-packing process and RPC input form, and to answer questions from the RPC’s. It is anticipated that weekly conference calls will be held following this initial meeting to assist the RPC’s with further questions. Dial-in information for the January 14 call will be forthcoming.

Please determine channel-width, combiner separation, and allotment capacity requirements for each county-like entity in your RPC, and return the attached form form and letter (with your choices selected and saved as described above) to Ms. Karla Jurrens at karla@txsheriffs.org by 5:00 PM EST on January 31, 2008.

In the case that the attached form is not received by 5:00 PM EST on January 31, 2008, all county-like entity requirements for your RPC will assume default values of 25-kHz channel-width, 250-kHz combiner-separation, and population-modeled capacity, as used in the original pool allotments.

Sincerely,
Margaret Daly, Systems Engineer and Program Manager
Syracuse Research Corporation
mdaly@syres.com
c/o National Regional Planning Committee

County Name	Channel Block Size	Combiner Separation	Capacity Option
Bastrop County, TX	12.5 kHz	150 kHz	Population model
Bell County, TX	25 kHz	250 kHz	Population model
Blanco County, TX	12.5 kHz	150 kHz	Population model
Bosque County, TX	12.5 kHz	150 kHz	Population model
Brazos County, TX	12.5 kHz	150 kHz	Population model
Burleson County, TX	12.5 kHz	150 kHz	Population model
Burnet County, TX	12.5 kHz	150 kHz	Population model
Caldwell County, TX	12.5 kHz	150 kHz	Population model
Coryell County, TX	25 kHz	250 kHz	Population model
Falls County, TX	12.5 kHz	150 kHz	Population model
Fayette County, TX	12.5 kHz	150 kHz	Population model
Freestone County, TX	12.5 kHz	150 kHz	Population model
Grimes County, TX	12.5 kHz	150 kHz	Population model
Hamilton County, TX	25 kHz	250 kHz	Population model
Hays County, TX	12.5 kHz	150 kHz	Population model
Hill County, TX	12.5 kHz	150 kHz	Population model
Lampasas County, TX	25 kHz	250 kHz	Population model
Lee County, TX	12.5 kHz	150 kHz	Population model
Leon County, TX	12.5 kHz	150 kHz	Population model
Limestone County, TX	12.5 kHz	150 kHz	Population model
Llano County, TX	12.5 kHz	150 kHz	Population model
Madison County, TX	12.5 kHz	150 kHz	Population model
McLennan County, TX	12.5 kHz	150 kHz	Population model
Milam County, TX	25 kHz	250 kHz	Population model
Mills County, TX	25 kHz	250 kHz	Population model
Robertson County, TX	12.5 kHz	150 kHz	Population model
San Saba County, TX	25 kHz	250 kHz	Population model
Travis County, TX	12.5 kHz	150 kHz	Population model
Washington County, TX	12.5 kHz	150 kHz	Population model
Williamson County, TX	12.5 kHz	150 kHz	Population model