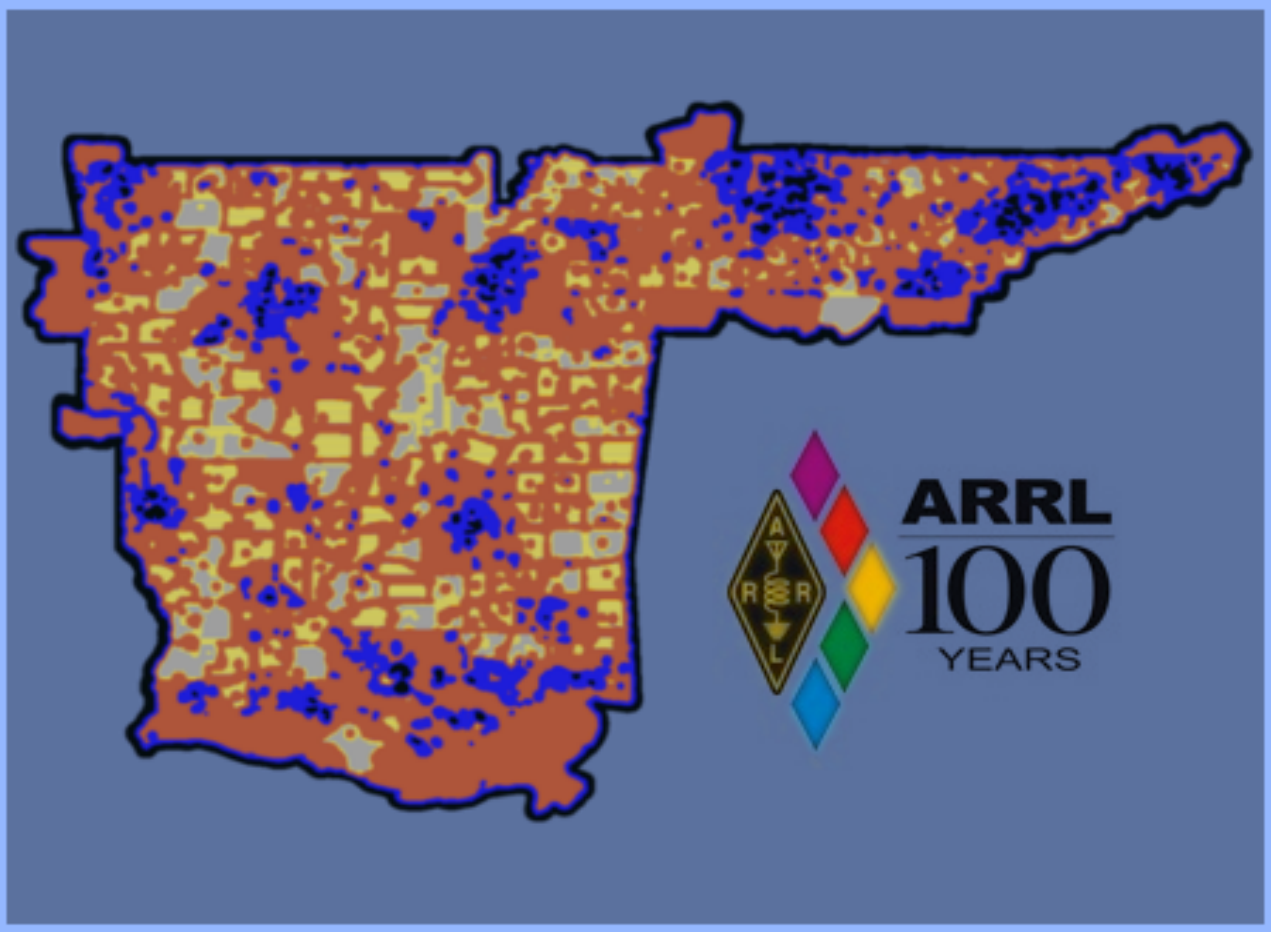
Survey of Members 2013

American Radio Relay League

DELTA DIVISION



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Survey of Members 2013
Delta Division, ARRL

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Executive Summary

Members of the Delta Division of the American Radio Relay League, comprising the State Sections of Arkansas, Louisiana, Mississippi, and Tennessee, were surveyed during the month of July 2013. Frank M. Howell, Ph.D., Assistant Director of the Division conducted the survey in cooperating with ARRL Headquarters in Connecticut using the commercial web-based survey technology licensed from SurveyMonkey.com. The planning for the content of the survey was by Division Director David Norris, K5UZ, Frank Howell K4FMH, and various other ARRL officials. The focus of the 2013 Division Survey was: the demographics of League members; their operating preferences and activity level; local ham club participation; knowledge and use of certain amateur radio technologies, and specific aspects of the ARRL DX Awards Program such as a potential youth category, whether Kosovo should be a new DX entity, and how the time-to-award notifications by the League are functioning. A total of 1,234 valid surveys were completed by bona fide Division members. The age, operating class, geographic location, and Section profiles compared very closely overall to the records kept by the League itself, suggesting that the realized survey could be useful to reflect reliable results. Survey respondents were matched to their addresses released through the FCC ULS which are public records. These addresses were geocoded using the SmartyStreets(tm) service who contributed this work to assist the League in planning.

Key findings include:

● The median age of Delta Division members is 63 years.

● If we consider those who are at least 50 years of age but having only held their licenses a decade or less as "late-in-life" hams, this group totals over one-fifth (22.1%) of all licensed amateurs belonging to the ARRL in the Delta Division.

● Using FCC ULS data extractions in conjunction with the survey results, rates of growth in the Delta Division over the decade of 2003-2013 are 1.09% per year, a steady growth rate driven both by large increases in Technician licenses. However, growth in the "late-in-life" ham category was an annual 2.5 percent.

● DXing and public service are the two most favored operating activities in the Division. This is closely followed by rag-chewing QSOs.

● Most hams spend between 1-5 hours per week pursuing these activities but it varies considerably for smaller segments of the Division's members.

● Clubs and the experiences that League members have in them constitute important elements shaping both amateur's behavior and assessments of membership. Almost two-thirds (65%) say they are a member of at least one local club. The median distance to their nearest club is 9 miles, irregardless of their membership status. By comparison, the average commute to work in the US is almost one hour. Comparing ARRL Affiliated Club locations with those of the survey respondents using GIS methods, the objective distance to a club does not appear to have an important relationship to membership even though it was the second highest reason given for non-membership.

● What *does* affect membership appears to be the availability of time to participate and the quality of club leadership. Life cycle demands involving work and family obligations are tied to age and marital/parental status. These periods reduce the potential for many to seek membership in clubs.

Leadership which allows or even fosters a hostile political environment and which does not plan and conduct interesting educational activities sponsored by the club are the most reported signs of poorly-evaluated leadership in the Delta Division.

● Club leadership is rated very positively by many Division club members. There appears to be a segment of clubs, however, who have lost members due to poor leadership and perhaps a lack of leadership training for succession in club leadership roles.

● On ARRL DX Contest issues, the results did not generally favor adding Kosovo as a new DX entity as only 40 percent supported it. This fell to 30 percent should there be negative consequences later. Adding a youth category received strong support although almost-three fourths reported that the current categories were "about right". Some 76 percent of those who felt the extant categories were about right, however, supported the addition. DXers were less in favor than other hams of a formal review of contest scoring rules, although support was less than 40 percent in each category of favorite operating activity. Sections differed little in this sentiment with Arkansas respondents having lower support. Almost three-fourths reported that the current time-to-award schedule is fine but DXers tend to think it's too long.

● Seven technologies were used to ask survey respondents if they had them or were not familiar with them. The adoption rates are in rank order: APRS (28%), WinLink (23%), SDR Transceiver (20%), JT65 digital mode (19%), D-STAR (12%), 1.2 GHz transmission (6%) and HSMM-MESH (2%). Club membership, especially more than one type, has a significant influence on both adoption and familiarity of each technology. Unlike new technologies in general, age had little relationship to adoption of these technologies.

This report was prepared by Frank M. Howell, Ph.D. K4FMH, Senior Partner at MoniTrends LLC, a business intelligence company in Ridgeland MS and Brooklyn NY, as a courtesy to the ARRL's Delta Division where he serves as an Assistant Director.

Survey of Members 2013
Delta Division, ARRL

Introduction

The Delta Division of the American Radio Relay League, comprising the state sections of Arkansas, Louisiana, Mississippi, and Tennessee, along with the support of ARRL Headquarters, conducted a survey of League members during the month of July, 2013. All members were contacted through their registered electronic mail addresses and invited to participate by Delta Division Director, David Norris, K5UZ. There were two reminder e-mail messages sent over the thirty day window that the survey was available on the commercial website, SurveyMonkey.com with a specific URL to the survey itself. Date, time, and IP address of the respondent was recorded and included in the data file. Along with call sign, this allowed us to screen for multiple surveys from the same prospective respondent.

Of the 7,167 members in this Division, a total of 1,417 successfully completed the web-based survey. However, due to repeated attempts at the survey or a refusal to disclose FCC Call Signs by some, this number was reduced to 1,234 valid surveys as the first time and date stamp was used to determine which survey responses were counted in the cases of multiple attempts. In a few cases, otherwise valid respondents disclosing call signs refused to report their age. Where possible, these respondents' age or birth date were obtained from external sources, using QRZ.com or their respective individual websites as publicly disclosed information.

For parts of this report, we used FCC license Data obtained from the FCC ULS database query available via fcc.gov. Affiliated ARRL Clubs were obtained through an individual request to the League. These two datasets, including our survey respondents, were gecoded through the courtesy of the SmartyStreets(tm) commercial service who provided this service free to support the League's efforts in emergency planning. We express our gratitude for this in-kind contribution by SmartyStreets(tm).

This report presents the basic survey results. We focus on respondent's demographics, license tenure and experience of members, their operating preferences and activity, local ham club participation, knowledge and use of certain amateur radio technologies, and specific aspects of the ARRL DXCC Awards Program. Linking survey respondents and ARRL members' addresses to geographic coordinates allows us to visualize where the League's “customers” are located relative to one another and to Affiliated Clubs. This protocol is part of modern business intelligence methods (see Howell and Porter 2010).

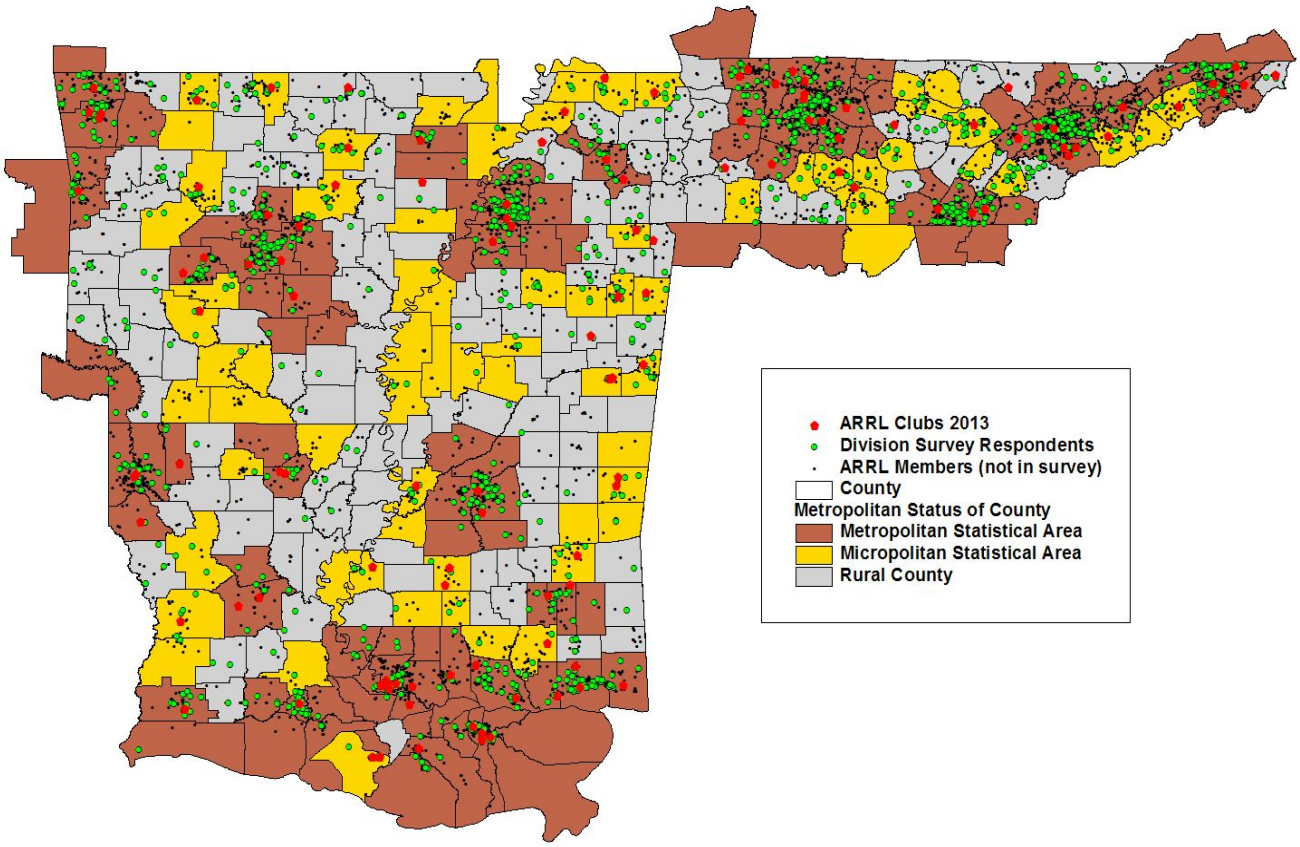
Profile of Survey Respondents

Since this survey is not purely a simple random sample, the external validity must be checked against any known population parameters (e.g., all bona fide ARRL members in the Delta Division). We do this using the factors of geographic distribution, age, state, and license. These are important external validators of the realized sample (see Marsden and Wright 2010). Fortunately, the realized sample that we have appears to be reasonably representative of most of the comparative parameters that we have available for validation.

Using the geocoded addresses, we produced the map in Figure 1 containing ARRL Clubs 2013, Delta Division survey respondents, and ARRL members not in the survey. As a base map, we used the Bureau of Census Metropolitan, Micropolitan, and Rural county designations to feature the spatial dispersion of all three data elements.

Survey respondents are shown in green dots, members not in the survey in smaller ***black*** dots, with Affiliated Clubs in large red dots. Counties in the largest Metropolitan counties are in ***brown***, with ***tan*** polygons representing medium-sized Micropolitan areas, and the remaining and smaller rural counties in ***gray***. We will return to the locations of Affiliated Clubs in a later section of this report so we only focus on the members and survey respondents now.

Figure 1. Spatial Distribution of Delta Division Clubs, Members, and Survey Respondents, 2013



As we would expect with a representative survey, survey respondents as well as League members tend to follow the overall population concentrations in the Delta Division. In each of the Metropolitan areas, there are larger clusters of members and survey respondents. For the tan Micropolitan areas, there are fewer but noticeable clusters of both. In the least populated gray Rural counties, there are the fewest members with correspondingly fewer respondents. It is important to emphasize that this is what we would expect with a fully random sample design. Using maps with survey respondents plotted on them is a growing method to explore geographical and demographic

Table 1. Age Distribution for Delta Division Members of ARRL and Survey Respondents, 2013

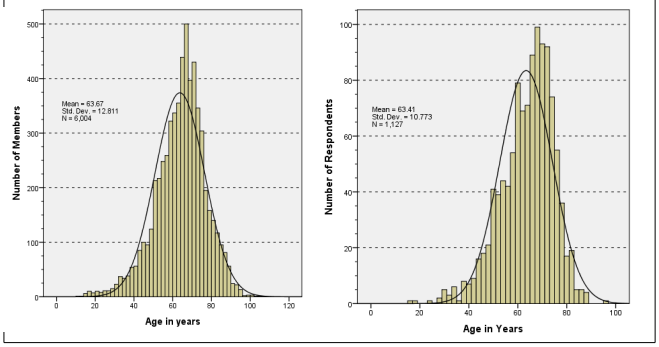
	Delta Division			Survey Respondents		
	Frequency	*Percent*	*Valid Percent*	*Frequency*	*Percent*	*Valid Percent*
< 30 yrs.	72	1.0	1.2	8	.6	.7
30-39 yrs.	186	2.6	3.1	23	1.9	2.0
40-49 yrs.	460	6.4	7.7	85	6.9	7.5
50-59 yrs.	1,259	17.6	21.0	246	19.9	21.8
60-69 yrs.	2,028	28.3	33.9	408	33.1	36.2
70+ yrs.	1,981	27.6	33.1	357	28.9	31.7
Total	5,986	83.5	100.0	1,127	91.3	100.0
Missing	1,181	16.5		107	8.7	
Total	7,167	100.0		1,234	100.0	

Source: ARRL Delta Division Survey 2013

representativeness of surveys (Howell and Porter 2010).

We turn to the age distributions of the survey respondents versus those in the Division's membership. Especially since targeting recruitment by many clubs emphasizes youth, coupled with the feeling that licensed amateurs are graying in the population, it is vital for us to have a very comparable age composition in the survey. In Table 1, a comparison of the percentages of each age category for all Division members versus those in the Survey are shown. After accounting for those who did not report birth date, the "valid percent" column shows that *all age groups are within a single percentage point of one another*. In Figure 2, we show a histogram of the ages of these two comparison groups. These graphics ignore any categories and use individual age in years. The solid bell-shaped curve is what the familiar normal distribution of ages would be. Two observations in comparing these data are relevant. One, both shapes are very similar. Two, the median reported ages for both groups is 63 years of age. (The median is less sensitive to very low or high values than is the average or mean.) The dispersion of the full membership is slightly higher than in the sample as the standard deviations for the members (*sd*=12.8) is two years higher than that observed in the sample (*sd*=10.7). Thus, *the age structure of the sample is nearly identical to that of the Delta Division members as a whole.*

Figure 2. Histograms for Members and Respondents

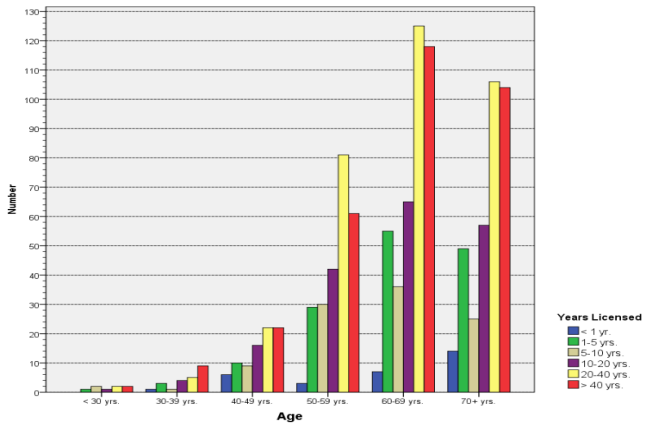


Another comparison that we can make between our survey sample and the population of Delta ARRL hams is operator classification. In Table 3, we compare the percent of known ARRL members to the percent in each license class measured in the survey. While the age distribution of our survey matches the League's membership almost precisely, there are some differences in our survey by license class. We are a bit "over" on Extras and a bit "under" on Technicians. General ticket holders are also a bit "under" the population. While these deviations are to be expected in a sample survey (see Marsden and Wright 2010) but we note them as potential limitations on the results.

Table 3. Operator License Class of Delta Division Members and Survey Respondents, 2013

	Delta Division Members		Survey Respondents	
Operator Class:	*Frequency*	*Percent*	*Frequency*	*Percent*
Advanced	609	8.9	77	6.2
Extra	3,163	46.5	795	64.4
General	1,945	28.6	289	23.4
Novice	17	.2	1	.1
Technician	1,072	15.8	72	5.8
Total	6,806	100.0	1,234	100.0
(Missing)	(361)	(5.0)	(0)	(0.0)

Figure 3. Tenure of Amateur Radio License and Age



One demographic group that we first identified in the 2011 Delta Division Survey were *late-in-life* amateurs: those who are at least 50 years of age but only licensed 10 years or less. We examine the age of the respondent by length of tenure as a licensed amateur. In Figure 3, this

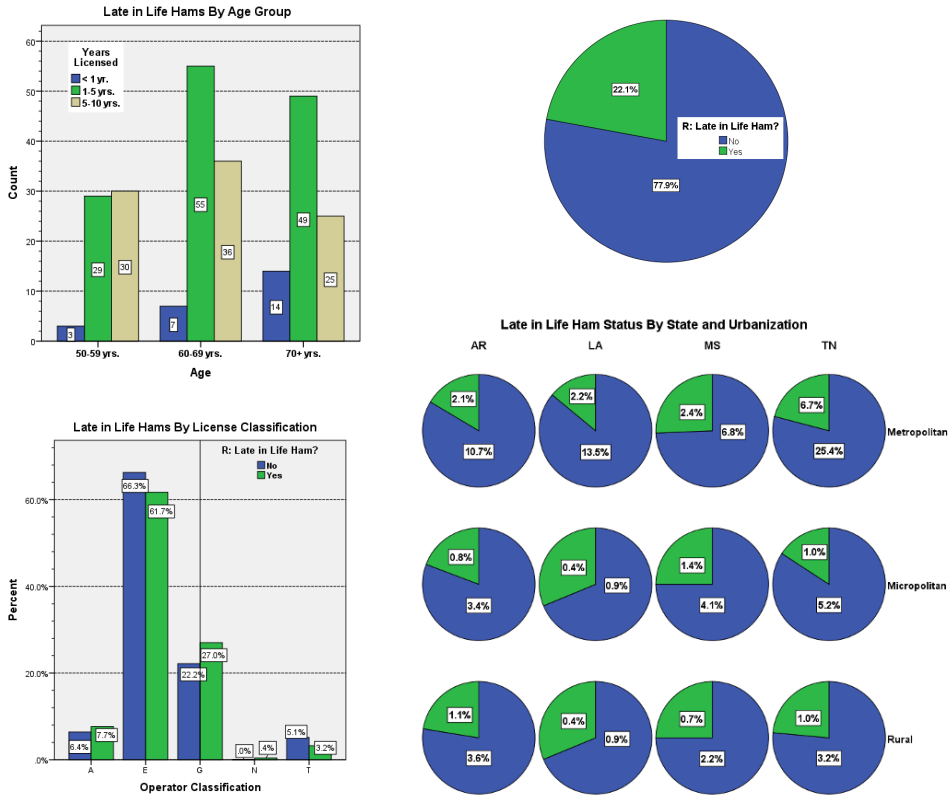
bar chart illustrates the general age distribution centered around 60 years but it is the variation among the bars within each age interval that we focus on now. If the commonly held perception that ham radio is graying were completely true, then there would only be "long-tenure" bars (purple, yellow, red). These three bars reflect longer-tenure hams. However, as the ages of our respondents reaches 50 years and above, there is a noticeable in the "recent tenure" bars (blue, green, tan). In fact, there is a surprising number of "new" (less than one year) hams who are over 70 years of age! Overall, if we consider those respondents who are at least 50 but having only held their licenses a decade or less as "late-in-life" hams, this group totals over one-fifth (22.1%) of all licensed amateurs belonging to the ARRL in the Delta Division.

In Figure 4, the attached pie chart illustrates this pattern. This share is larger than all of the "young" members even with the broad definition of less than 30 years of age. The variation in this demographic segment of Delta ARRL hams is shown in the lattice of pie charts replicated for each Section (state) and by Census Bureau urbanization status. Note that metropolitan follows the U.S. Office of Management & Budget definition for "largest city composites" while micropolitan are the smaller cities in the U.S. Rural counties are those not meeting either of these set of criteria.

There is a small tendency for these hams to not be in the largest population centers in the Division (metropolitan areas). (*Note:* the percentages shown in the pie slice labels in Figure 4's lower panel are for the entire sample, not the individual pie itself.) The share of late-in-life hams in Mississippi are almost constant at one-quarter regardless of size-of-place where their registered residence is located. Arkansas, in contrast, has a slightly smaller share in all three locales. Louisiana has a higher share in rural parishes but fewer proportionately in metro or micro areas. Tennessee has slightly fewer such hams in micropolitan counties. In short, *there is at least one-fifth to one-quarter of the surveyed hams who fit this late-in-life demographic classification.*

Figure 4. Percentage of "Late-in-Life" Amateurs in ARRL Delta Division by Section

Late-in-Life Amateur: age 50+ who have been licensed < 10 years



In the left-hand panel of Figure 4, the age-specific breakdown within the 50+ age group shows that the newest licensees are oldest! There are small numbers in play here but the pattern is not inconsistent with the other license tenure categories. As these

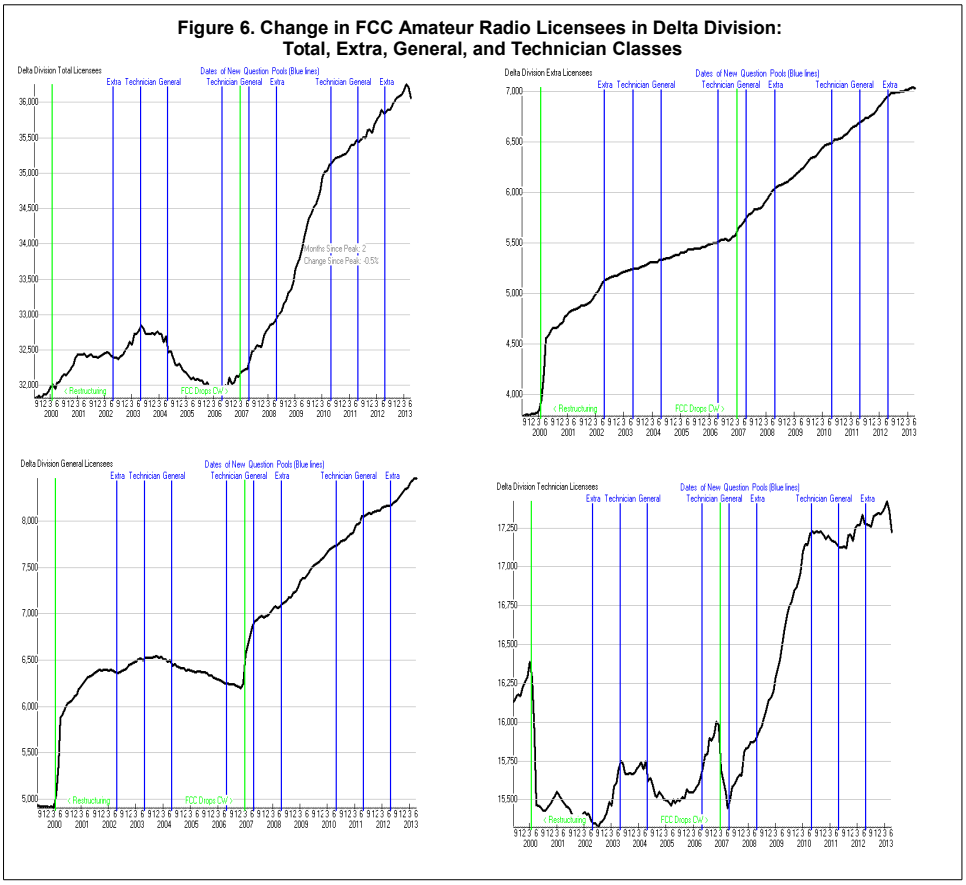
survey respondents reach typical retirement ages (~65 years), they are more likely to have been licensed. Our interpretation of this is along the lines of what sociologists call "life course transitions." We believe that many of these "new" hams become so due to prior impediments in life that kept them from getting licensed. This may have been the Morse Code requirement which was dropped a few years ago. However, there is a progression in these late-in-life hams efforts toward Extra Class. In the lower-left panel of Figure 4, this bar chart shows that there is virtually no difference between those fitting this demographic profile and those who do in their having Extra Class ticket. Although there are small differences, they are more likely to Generals and less likely to hold Technician class licenses. Thus, late-in-life hams do not appear to be driven toward Technician Class only repeater QSOs as some might suggest. In fact, they appear to be similar to other hams in the ARRL in terms of license class.

Some Demographic Growth Estimates for the Delta Division

The science of demography is about births, deaths, and movement (Preston et al. 2000). If the FCC released some key demographic data elements in the ULS record for amateur radio, especially date of birth, we would have greater ability to track and project change in the amateur radio licensee population. But they do not. This is why we've included birthrate in the 2011 and 2012 Delta Division Surveys (and date of first license in the 2013) so that we have this important datum.

The findings involving *late-in-life* amateurs begs the question of sources of future growth in the Delta Division (as well as remainder of ARRL Divisions). Most discussions on how will amateur radio grow, fighting it's perception of a "dying" hobby (e.g., Shaer 2011), emphasizes getting youth involved. For instance, there are numerous youth categories for awards (young ham of the year) and some sentiment for separate categories in contesting (see below) with marketing efforts by the League and other groups. If we review the results just presented, however, we would see that the grow rates for recently licensed "young" amateurs are very small (see the small absolute numbers in Figure 3 above). This suggests that efforts have not been as effective as desired for getting young licensees into the ARRL or that young hams are indeed few in recent years. In contrast, *late-in-life* licensees represent a

Figure 6. Change in FCC Amateur Radio Licensees in Delta Division: Total, Extra, General, and Technician Classes



heretofore unrecognized market for both the League and the U.S. amateur radio enterprise.

We produce some synthetic demographic estimates of growth and rates of growth for the Delta Division in the remainder of this section.

Using the website built by Joe Speroni AH0A (ah0a.org), Figure 5 is a set of line charts for amateur radio licenses in the Delta Division. We include total licenses for all classes but only the extant Technician, General, and Extra licenses. The scope of the data are from 8/1999 to 6/2013 and show the grow spurts after restructuring of licensing in the early 2000s and when CW tests were dropped from the licensing portfolio for total licenses. But these trends are suggestive of the *progression patterns* from Technician to General to Extra Class licenses. Extra Class licenses are little affected by anything except the move away from CW examinations. In contrast, Technician licenses are shaped by the changing question pools, license class restructuring, and the dropping of CW in license testing. The General Class licenses were affected by restructuring and no-code licensing.

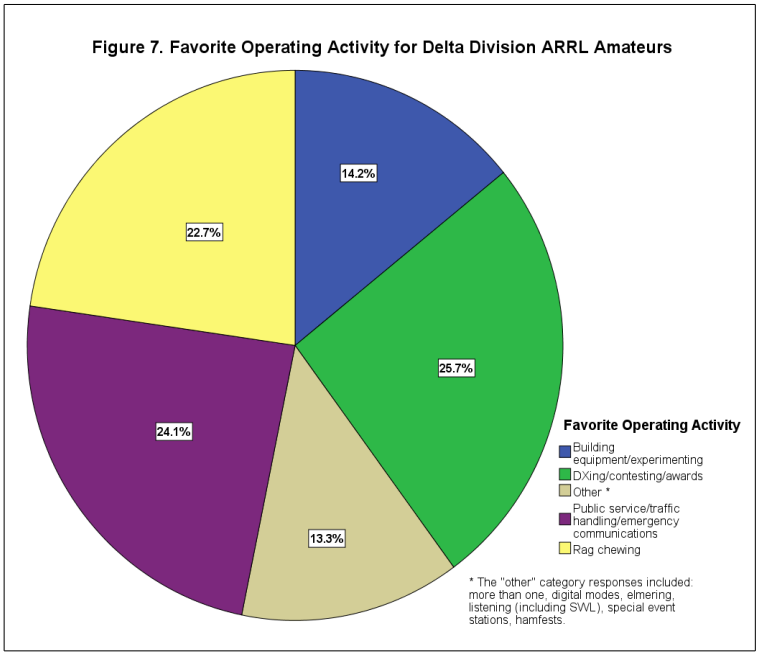
Rates of growth in the Delta Division over the decade of 2003-2013 are 1.09% per year, a steady growth rate driven both by large increases in Technician licenses but also the progression of many into General and Extra classes. This annualized rate is probably more stable than each year-to-year change (which is 1.84% for 2010; 0.87% for 2011; 1.46% for 2012; and -0.09 for the first six months of 2013). We have no existing data with which to estimate the transition-rates from one class to another at the present time. However, it's fairly clear that the Technician entry-level licensees are driving this steady growth rate in the Delta Division.

Now with this baseline for growth among all license segments, let's return to growth among *late-in-life* hams. To compute the demographic growth rates for late-in-life hams, our estimates from the 2013 Survey are as follows. There are 248 survey respondents meeting this criterion of being 50 or older but licensed a decade or less. There are 875 other hams in this age classification who have been licensed over a decade for a total of 1,123 respondents with complete data on both age and date of first licensing. The late-in-life hams are 22 percent of the total survey respondents. But what *rates of growth* do they constitute in the overall growth of amateur radio licensees?

Of all the survey respondents who said they were licensed in the past decade (2003-2013), this represents the synthetic “growth” in the Division (n=281 or 2.5% per year). Of this growth, there is important variation among those age 50 and over. For those licensed less than a full year, their growth rate is 2.8 percent. For those licensed from 1-5 years, their growth rate is 2.6 percent. Finally, those licensed from 5-10 years have a rate of growth of 1.8 percent. *The take-home message from these estimates is that late-in-life hams are a viable, perhaps rapidly-growing segment of Delta Division hams.*

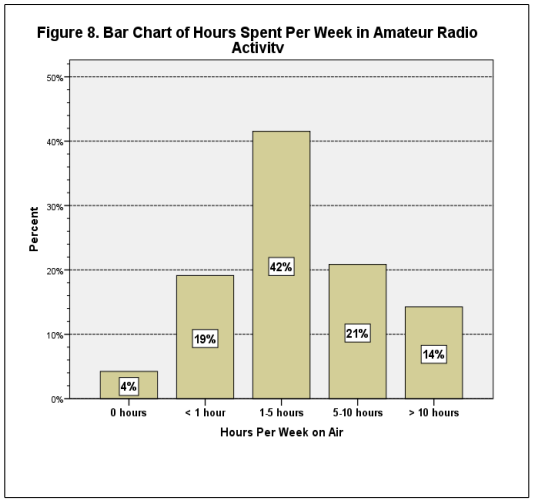
Radio Activity by Delta Amateurs

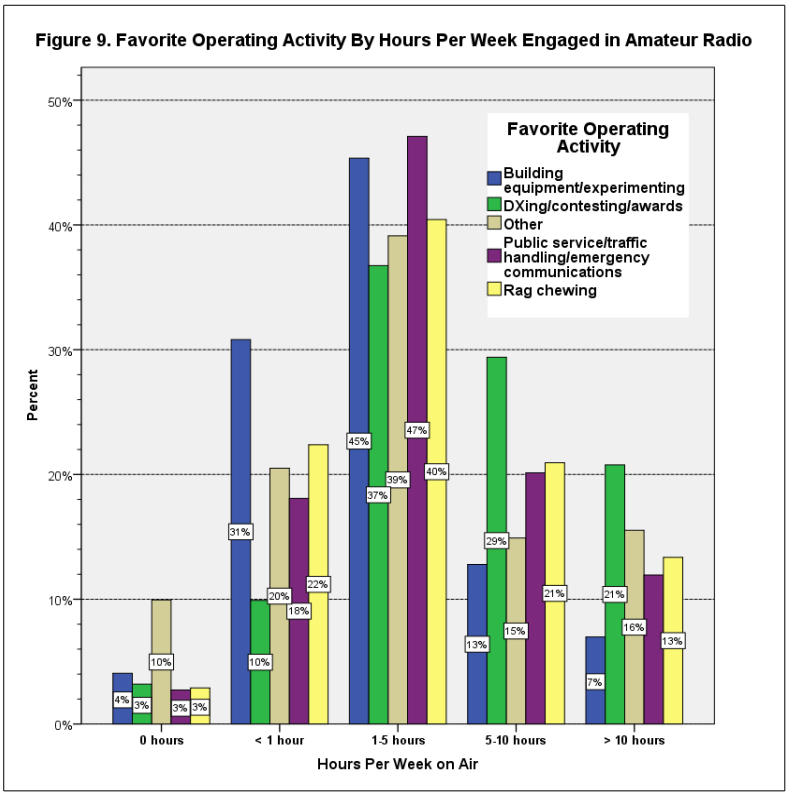
In this section, we ascertain patterns of radio activity for Delta Division hams. This includes their favorite activity and how much time they devote to it during a typical week. In Figure 7, this pie chart shows why there might be conflict over RF real estate on some frequency bands! There are three solid favorite things that Delta hams report: DXing (26%), public service (24%), and rag-chewing (23%). Experimenters who like to build equipment constitute 14 percent of the respondents. About 13 percent favor working digital mode, elmering others in amateur radio, shortwave listening, serving on special event stations or just attending hamfests.



Turning to the amount of time spent doing these favorite activities, there is a lot of variation. About four percent say that they are basically inactive. Almost one-half (42%) spend from one to five hours per week, averaging slightly less than an hour per day. One fifth (21%) spends from 5-10 hours a week while a smaller group (14%) spends over 10 hours a week, an average of almost two hours a day. Thus, there are small groups of ARRL members on each end of an activity continuum: about one-fifth (23%) spending little to no time in active pursuit of the hobby to 14 percent dedicating a significant share of the week on ham radio activities.

Of course, the logical question is whether different activities are met with different time investments. We cross-tabulated the favorite activity results by the amount of time spent per week to product the bar-chart in Figure 9. There are several patterns revealed in this graph. One, experimenters and builders tend to spend less time than others. Two, DXers tend to spend more time, on the order of 5 hours or more per week, some at the extreme. Three, in the group spending more than ten hours per week in amateur radio activity, the second highest bar (tan) is for those in the potpourri "other" activity. This may be mostly for service activities but this is speculation. Nonetheless, there is a group of "other active" hams spending a great deal of time doing it. Four, there is a wide variety of times reported for those whose affinity is public service and EmComm as this group tends to spend 1-5 hours per week but they are prominent in the higher and lower time sectors as well.





We investigated differences in favorite activities and time expenditures by several additional factors, including Section (state), age, late-in-life ham status, operator classification, urbanization, and found very few differences. The exceptions are Section (state) and late-in-life status. Arkansas has a stronger DX affinity while Mississippi has a stronger experimenter participation. *Late-in-life* hams are more public service-oriented as well as have a stronger affinity toward rag-chewing as favorite activities.

Club Participation and Experience

Amateur radio organizations such as "clubs" are volunteer associations formed for various reasons. One has been to create local repeaters on VHF or UHF frequencies. Another has been to foster local pursuit of specialization in the hobby (chasing DX, emergency communications and public service support, experimental work, etc.). A third is a more general group in which all aspects of amateur radio are promoted. From a sociological perspective, these clubs operate as a critical layer between national radio associations such as the ARRL, TAPR, and so forth, and local amateurs. The ARRL has, of course, "sections" which are locally-oriented but tend to reflect a state or large number of licensed hams within a state. Thus, local clubs are very strategic groups in the national organization of amateur radio.

We have included questions involving club members, the type of club, and evaluations of club experiences and leadership. Since we had respondent call signs, we were able to geocode reported residences of respondents (which we used in Figure 1 above) using methods described in Howell and Porter (2010). The ARRL supplied us with a list of all of their affiliated clubs in the U.S., of which we extracted those in the Delta Division for use in this report. These data elements allowed us to compute the distance to each survey respondent's distance to three nearest affiliated clubs in the Division.

Membership. About two-thirds of the Delta Division League members responding said they were currently members of a local club (65.6%), leaving about one-third (34.0%) not presently a club member.

One reason that hams may not be club members is the lack of one "near by". This is a subjective criterion, of course, as in today's society many people commute upwards of an hour to work each day (McKenzie 2013). So we directly examine the distribution of distances in miles from each survey respondent to the nearest ARRL-affiliated club.

Figure 10. Distribution of Distance in Miles to Nearest Club

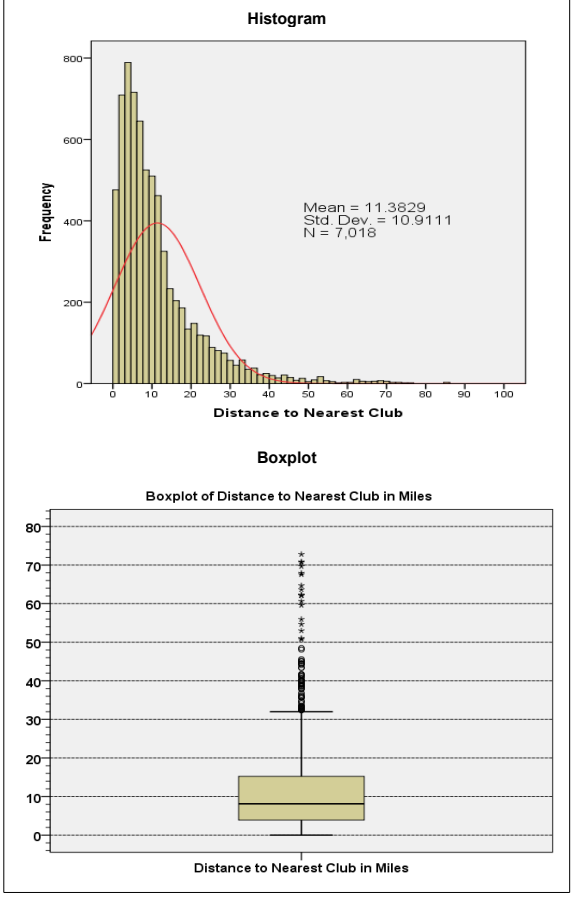
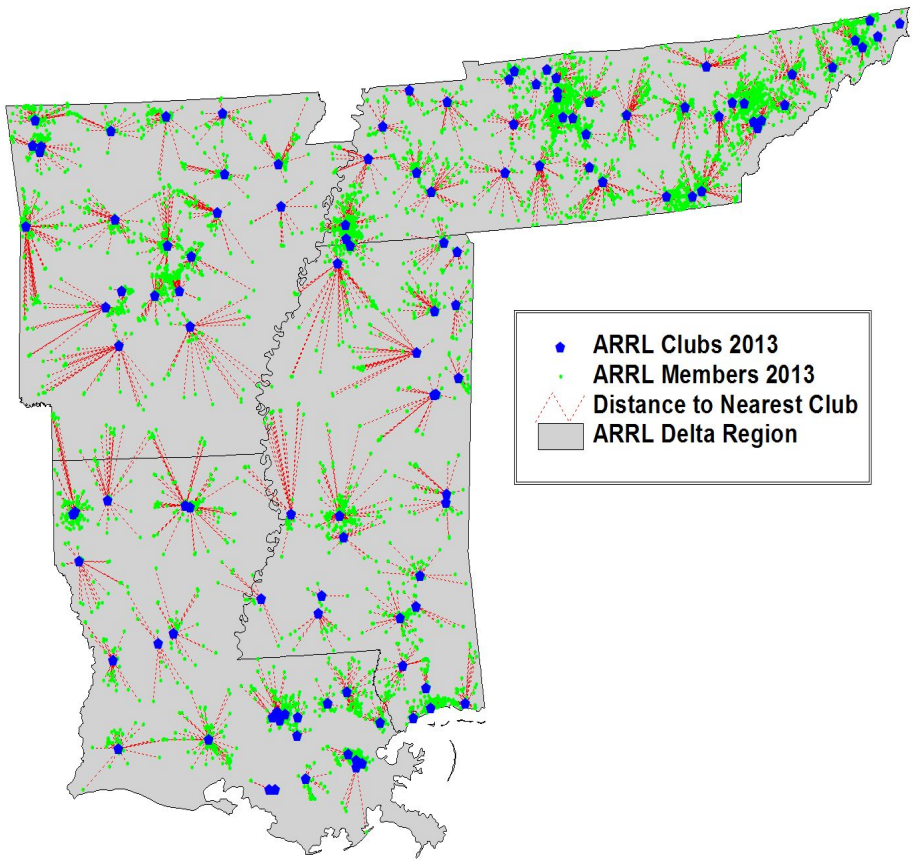


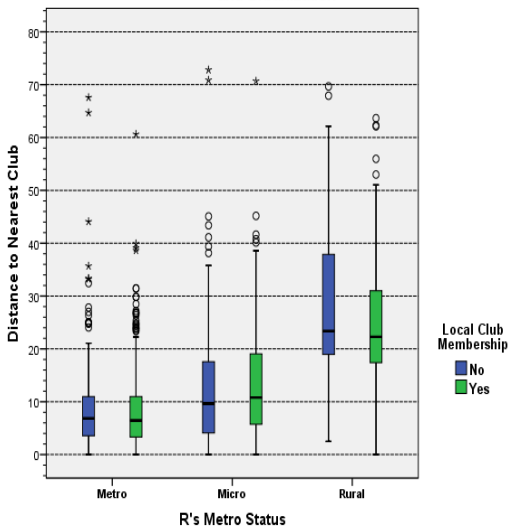
Figure 11. Distance to Nearest Club for Survey Respondents



In Figures 10 and 11, we use three different graphics to understand the variation in distances to clubs. In the upper panel of Figure 10, the histogram orders amateurs from the closest in miles to the furtherest to the nearest club based upon their reported QTH. (The small number of P.O. Boxes produce some nominal distortion in these displays but they depend upon what the licensee reports to the FCC ULS database.) The average distance is just over 11 miles with a standard deviation of almost 11 miles, indicative of a distribution that has a "bunching" around the low end and extreme values toward the high end. In the lower panel, a box-plot of these same data illustrate that the median---where one-half of the distances are above and the other half below this value---is about 8 miles. Thus, the 10 mile distance appears to be where just over one-half of the hams in our survey are located in terms of the nearest ARRL-affiliated club. While this deserves more investigation, we will use a less than 10 miles criterion to measure close proximity to a club.

In Figure 11, we present the spatial display of each survey respondent and club with a red dashed line (---) connecting the respondent to the nearest club. There are a couple of findings emerging from the combination of these three displays. One, there are clubs serving clusters of hams, which is a bit of chicken-and-egg dynamic in that that's perhaps why the club was formed. Two, there are sub-regions where many hams are not close to an ARRL-affiliated club. One can see, for instance, in southern and eastern Arkansas, west central Mississippi, north central Louisiana, and southwest Tennessee, there are groups of hams in our survey that are not very close to an ARRL club. Perhaps the Club Liaison in each Section could make this a priority to either facilitate the launch of a new club in those areas or lend direct

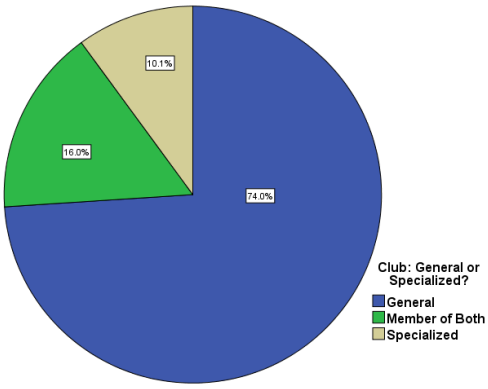
Figure 12. Boxplots of Distance to Nearest ARRL Club By Membership Status and Urbanization



assistance toward extant clubs there to become affiliated with the League and the services it gives to such clubs.

We examined how reported club membership differed by distance proximity, Section, metropolitan status, age, late-in-life status, and operator class. There were very few differences in club membership rates among these group with the exception of urbanization. In Figure 12, a set of box-plots of distance in miles to nearest club by membership status for each type of county shows two key results. One, in urbanized areas whether metro or micropolitan, regardless of distance to a nearest club, some hams are members of *a* club (perhaps not that one) while

Figure 13. Type of ARRL Club Membership Among Delta Division Amateurs



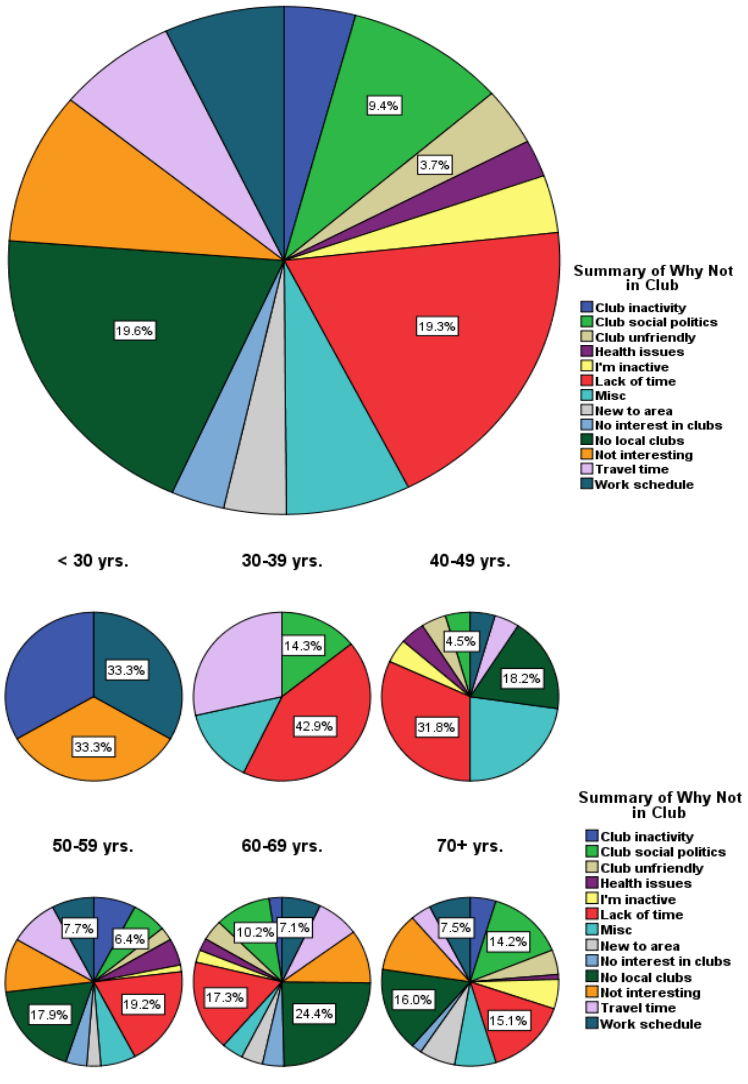
others are not. Two, in rural counties, absolute distance does make a small difference in club membership.

Type of Club. Turning to the type of clubs being participated in, it is clear that general focus clubs are the favorite. Three-fourths (74%) of our survey respondents who said they were members of a club further indicated that it had a general ham radio focus (see Figure 13). Ten percent are members of a specialized club. Another 16 percent are members of both.

We also investigated how club type preferences varied by key interests in amateur radio. A breakout of the pie chart in Figure 13 by favorite activity demonstrates that it is largely DXing and Contesters who are members of specialty clubs, either singularly or in combination with a general club. Rag-chewers are least likely to be a member of a specialty club. Public service (EmComm) as a favorite focus of activity are more likely to be members of both general and special clubs (ARES). Respondents who favor building/experimenting or "other" activities, tend to be members of general clubs if they are members at all.

Reasons Not in Club. Because in a structured social survey it is challenging

Figure 14. Summary of Reasons Given for Delta Hams Not Being in a Club and By Age Group



to probe respondents in great detail about a particular response (see Marsden and Wright 2010), we simply asked those who were not members of a local area club why they were not a member. These were open-ended responses. We viewed each one, making a list of generalized "types" of responses as per conventional social survey protocols. Our coding tended toward delineating different nuances of sentiment while keeping similar comments mapped into the same class even if some classes were not too different (i.e., the pie chart in Figure 14 contains this summary.) This chart shows that the reasons for not joining or leaving a ham radio club are many and somewhat varied. Two of them, however, are at the top, each taking one-fifth of the reasons stated. One of these is simply the lack of time to participate by the ham (20%). Another is the lack of clubs in the local area (19%). These two dominate followed by club social politics and clubs not being interesting.

When we break this chart out by age group, these reasons vary significantly along stages in the life course. While these life course transitions vary by several factors, the typical phases of adult life (especially for men) in the U.S. revolve around early career and family-formation, child-rearing and their activity demands, and subsequently becoming grandparents and entry into retirement. As the lower panel in Figure 14 illustrates, the lack of time is a greater impediment to club membership during the early stages (30-49 years). It consistently declines after age 50. By contrast, the perceived lack of "local" clubs remains fairly constant after age 40 as migration moves settle down (see McKenzie 2013).

The secondary factors of club social politics and the lack of interesting club activities vary also. To some extent, the sentiment of "club unfriendly" seems to ride along with club politics as a deterrent, perhaps a function of our conservative classification but of interest in understanding clubs' ability to attract and retain membership. Club politics and unfriendliness pales a bit in the 40s and 50s but are very significant during the 30s (as many hams are beginning to work in various volunteer groups) and later around the retirement periods of the 60s and beyond. Perhaps more experienced hams just don't feel like being treated in an unprofessional and unfriendly fashion. A quote from an experienced amateur in the Delta Division who fits in this age category says it more fluently:

> "*….Those in the [*omitted*] area are nothing but cliques. If you are a member of more than one you you're are treated as a criminal…*"

While this is an important statement, we further illustrate some of the additional specific statements our survey respondents made about why they were not current members of a local club. Table 2 contains a sampling of these comments. They identify a lack of responsiveness to prospective or current members. An extreme autocratic leadership style of leadership with little "tolerance"

Table 2. Examples of Open-Ended Comments by Survey Respondents Regarding Why They Are Not Members of a Local Club

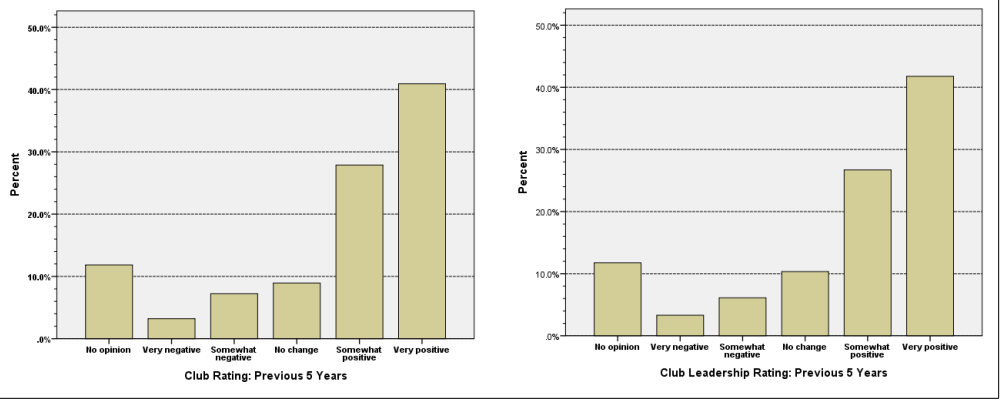
Refused or didn't answer several emails sent to club officers.
The closest club is hostile to those who do not agree with their leadership 100%. There are no other clubs within 30 miles.
Negative attitude of those in charge of the club as well as a club that is lacking of any activity.
They do not seem to want us old farts.
I was looking for a club with members with older elmers and younger hams with the I WANT TO LEARN MORE attitude and I found neither.
I've been a member of clubs in the past and know if I got involved again I would be one of the few to do all the work.
Politics within club environment; boring agenda.

Note: these are only a sampling of the unedited comments made by respondents.

of alternative perspectives or opinions is another theme in these comments, especially where there is only a single club in the local area. A club culture that is disaffected with the hobby in general seems to ward off continued membership. It is also clear that both a club agenda of *activity and learning* along with *social tolerance* (age, etc.) is a factor shaping the loss of membership in Delta Division clubs.

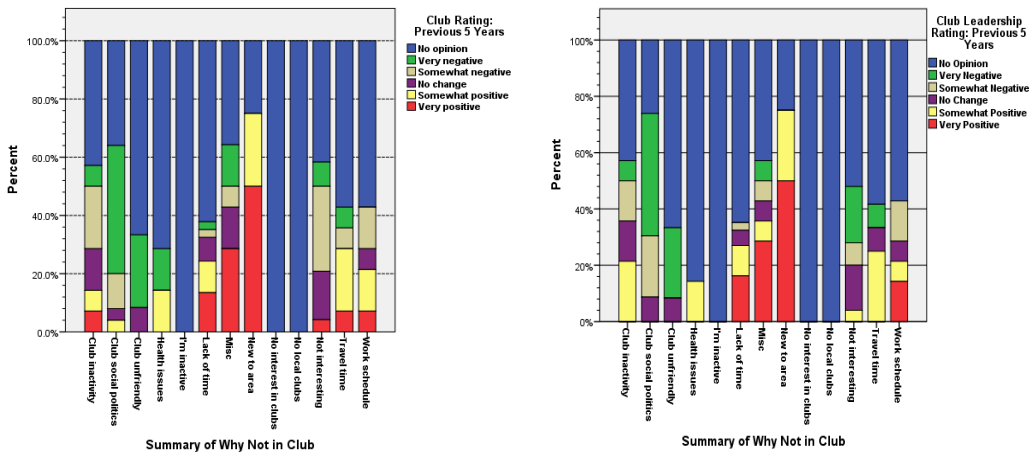
Evaluations of Clubs and Leadership. We will return to why this factor may be at work in hams leaving clubs below in the following analysis of evaluations of club experiences and the leadership of those clubs over the past five years. To establish a baseline for club experiences, we asked survey respondents to tell us about their feelings of their *club experience* over the past five years. This would include those both currently holding membership in one or more local clubs as well as those not currently belonging to such a club. In order to isolate a key dimension of club experiences, we also asked the same question pertaining to *club leadership* over the past five years. We allowed respondents to express a "no opinion" as well as a ranking from "very negative" to "no change" to "very positive".

Figure 15. Ratings of Club Experience and Club Leadership Over Past Five Years



The results for Delta Division respondents is summarized in Figure 15. What is very optimistic in this chart is that slightly over 40 percent feel "very positive" about both their overall club experiences and the leadership of that club. If we combine the "somewhat positive" to this figure, it totals to almost two-thirds of our respondents (69%) say they are positive about their amateur radio clubs. About ten percent have negative feelings about club leadership and previous experiences. About that share have no real opinion while another ten percent indicated no change (whether it is positive or negative). We will investigate how the leadership effectiveness rating over the past five years plays into club membership status: does "poor" leadership lead to club defections in members?

Figure 16. Reasons For No Club Membership By Ratings of Club and Leadership Experience in Previous Five Years

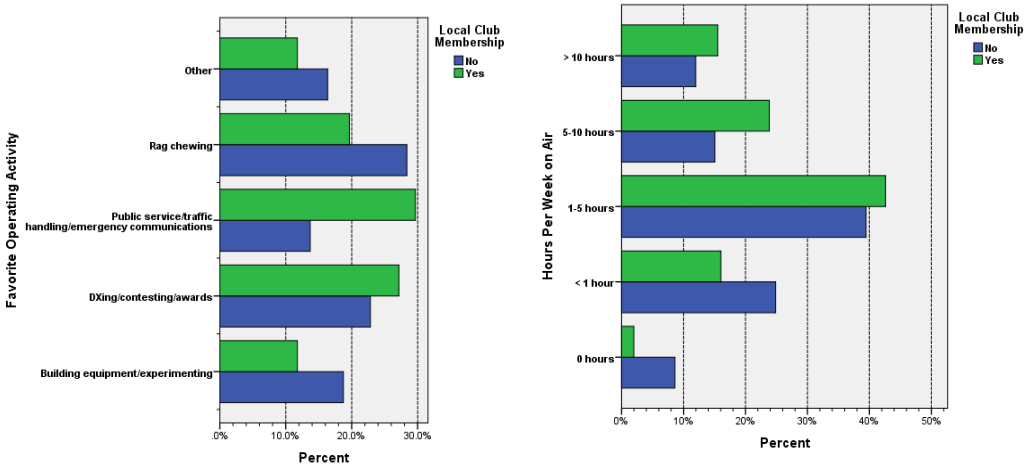


By linking our survey respondent's reasons for not being in a club to both their experiences with clubs as a whole and leadership in specific, we can

better understand how much negative attributes of ARRL Affiliated Clubs in the Division drive membership away. In Figure 16, a stacked bar-chart of the reasons for not being in an ARRL Club are broken down by separate ratings of the respondent's recent experiences with clubs and their leadership. Note that all vertical bars stack to 100 percent so the segment with a given color reflects the percent that the rating category is within the summary reason for a lack of club membership. For instance, in both the left (club) and right (leadership) charts, the "no opinion" (shown in blue) occupies some 40 percent or more of the "club inactivity" rating category and all of the "I'm inactive" category. The key results in this chart are two-fold. One is that the areas in which leadership must play a central role, "club social politics," "club unfriendly," and "not interesting," have much higher segments of very or somewhat negative experiences over the recent past. Two, the almost parallel ratings of clubs and their leadership in each reason as to why one is not a member at the time of the survey demonstrates how important leadership is to the overall club experience. *We believe that this is a critical finding from this survey*.

Is There a "Club Effect"? To close out our analysis of ARRL Affiliated Club participation, we address the composite question of whether there is a measurable club "effect" on League members in the Delta Division. Of course, our research design cannot detect true cause-and-effect from a cross-sectional survey (see Marsden and Wright 2010). However, there are demonstrable distinctions between current members and non-members that are consistent with being in a volunteer group with ongoing interaction about ham radio.

Figure 17. Favorite Operating Activity By Hours On Air By Club Membership



We cross-tabulated favorite operating activity and involvement (hours per week) by club membership. In each case, there are significant differences between club members and those not belonging to such a group. Figure 17 shows these results. Rag-chewers, experimenters, and others are less likely to be in a club. DXers and public service-oriented hams are more likely to have one or more memberships.

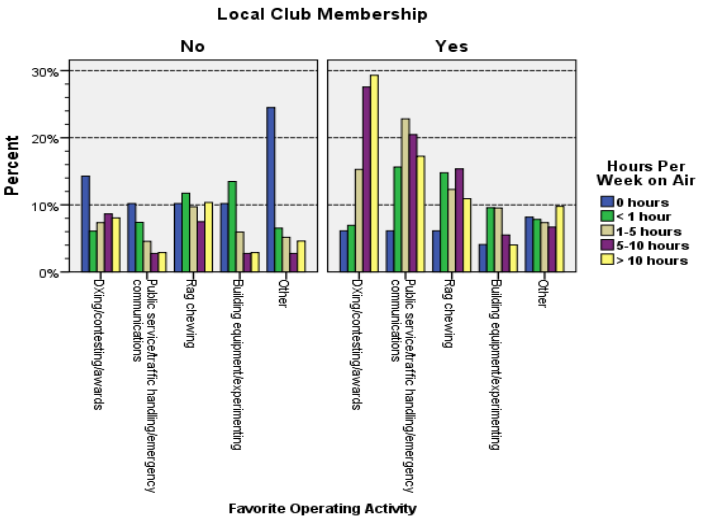
To verify that both activity and time-investment are linked to club membership, we classified them simultaneously by club membership. This is shown in Figure 18. Indeed, club member DXers spend the greatest amount of time on the air (almost 30%) and their DX-hunting peers not in clubs tend to spend no time (about 15%)! This is the second largest category of hams in this breakdown. Thus, *club affiliation has a clear effect on DX activity*.

For emergency communications aficionados, club membership also has a a clear relationship to time-investment. The right panel's bars for EmComm-focused hams are consistently higher than the corresponding ones in the left panel.

Experimenters and builders do not seem to benefit from club membership in terms of how much time they spend per week. (This survey is conducted perhaps too early to detect an impact that the so-called "Maker" community may have on this group.)

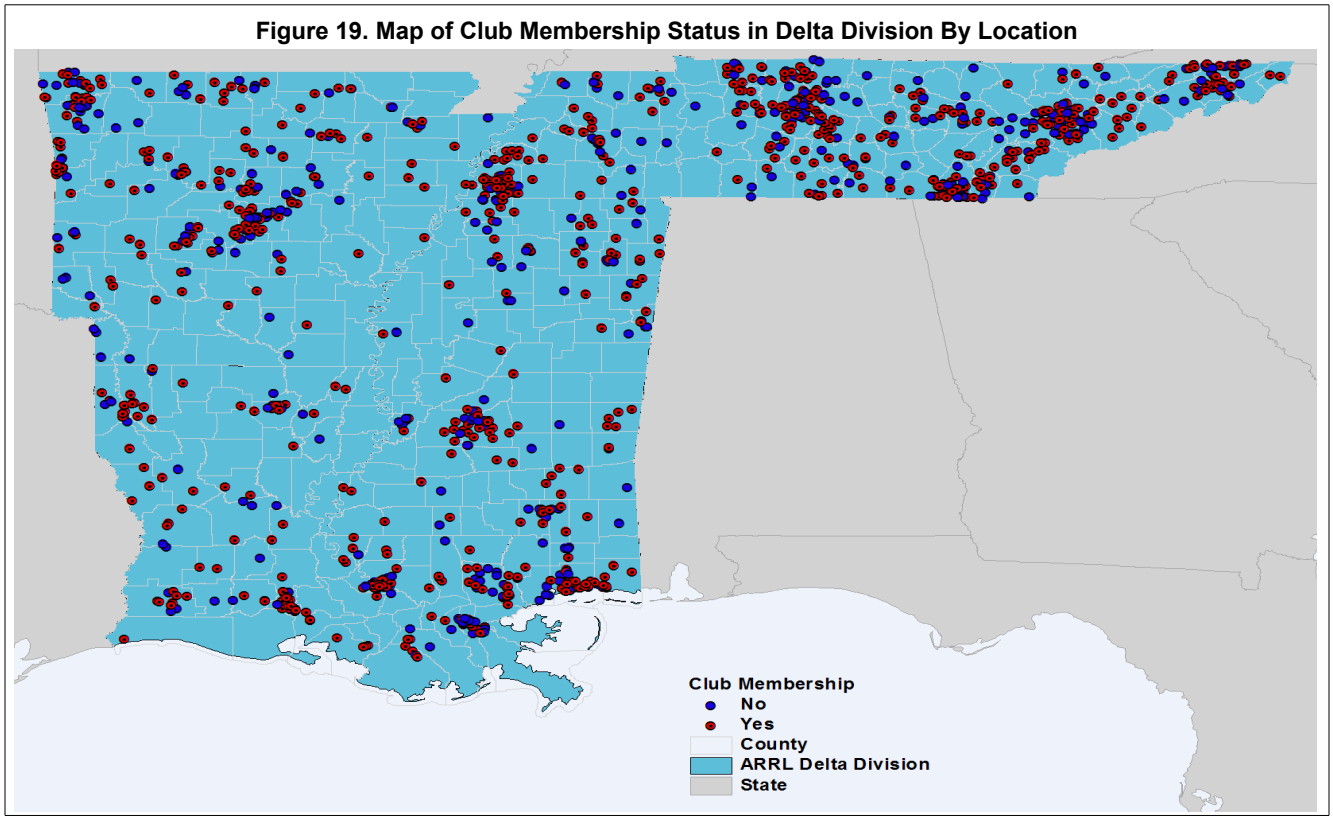
In conclusion, non-members tend to participate less in the hobby based upon time spent in activities. In Figure 19, we show that it is not distance to area clubs that distinguishes them. As can be seen in this map of club members (red dots) and non-members (blue dots), there are few non-members without neighbors who are members of one or more clubs. What this display shows is that club leadership development would yield greater membership and club participation for Delta Division hams. Using a variety of publicly available leadership development venues, the *Division along with Sections and affiliated clubs could sponsor these training activities as part of the annual section convention.*

Figure 18. Favorite Activity By Hours on Air by Club Membership



Currently, the League has a Club Liaison reporting to the Section Director. Enhancement of this activity, perhaps with trained volunteers from the Section's membership, would likely both raise club

Figure 19. Map of Club Membership Status in Delta Division By Location



effectiveness as well as membership participation in local clubs. Launching club president councils in each Division Section with annual meetings at the convention would enhance the League's ability to both reach-out to clubs on other matters as well as increase club effectiveness as that organizational layer between Sections and the membership.

ARRL Contest Participation

The League sponsors several competitive contest events throughout the year. In this survey, we asked about participation in any of these contest events. In addition, we follow-up with policy issues that the League faces regarding them. One is the issue of whether Kosovo should be considered a separate DX Entity and whether this would produce any negative effects on the contest design should it be so included as such. The efficiency of the existing operator categories, whether a youth category should be included, and the effectiveness of the current time-to-award system used by the League are included as well.

Kosovo as a DX Entity. In Figure 20, the results are mixed regarding Kosovo as a DX Entity as over half (60%) are against this change by the ARRL. Although not shown, those respondents who have not participated in League contests in the recent past are slightly more in favor than those who participated. The difference was not very large (as neither was favorite activity) so we should conclude that ardent DX-hounds are no more or less in favor than the full survey population. Comparing these opinions across age, operator class, Section, and so forth produced no significant differences.

Figure 20. Pie Charts of Opinions on Kosovo as DX Entity

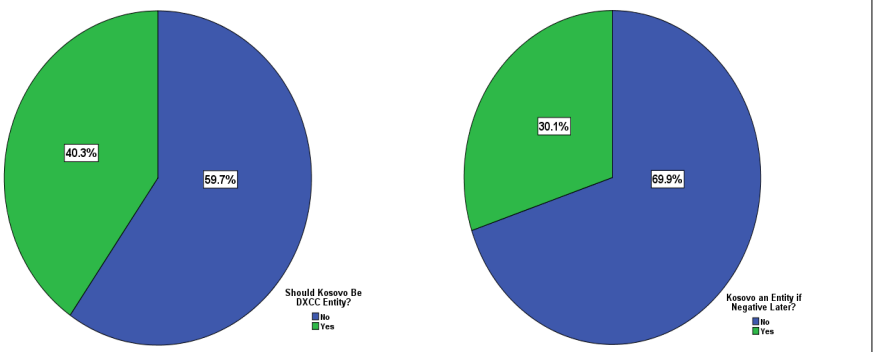
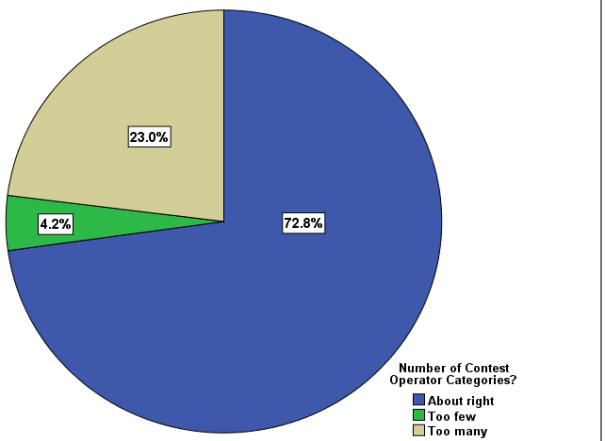


Figure 21. Pie Chart of Opinion About Current Number of Contest Operator Categories



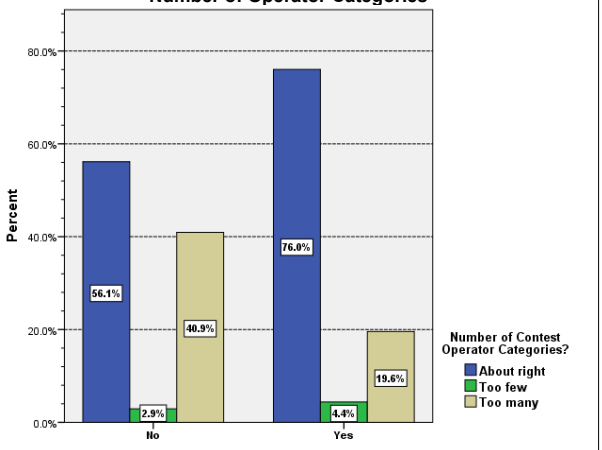
Contest Operator Categorization. Survey respondents were asked about whether the current set of ARRL Contest Operator Categories were appropriate and whether a separate "youth" category should added. In Figure 21, the results are fairly clear: almost three-fourths (73%) think the current ones are "about right". One quarter feel that there are too many (23%) while only a few (4%) think they should be expanded.

However, these opinions change when the issue of a special set-aside for youth operators was the focus. Fully 85 percent are in favor of a youth category. When these opinions are broken down by the first question about existing operator categories, most in favor of a youth category said that the existing categories are "about right" (see Figure 22). About 20 percent of those who said there were already "too

many" would be in favor of adding a youth category. Among those not in favor of adding a special youth category for competition in ARRL Contests, most felt that extant ones were "about right" while 41 percent felt that there are too many already.

So we might conclude that there is broad support for a special set-aside competition category for youth operators while a small group that thinks there are already too many do not agree. In analyses not shown, there seemed to be little significant variation from these basic findings on operator competition categories in ARRL Contesting.

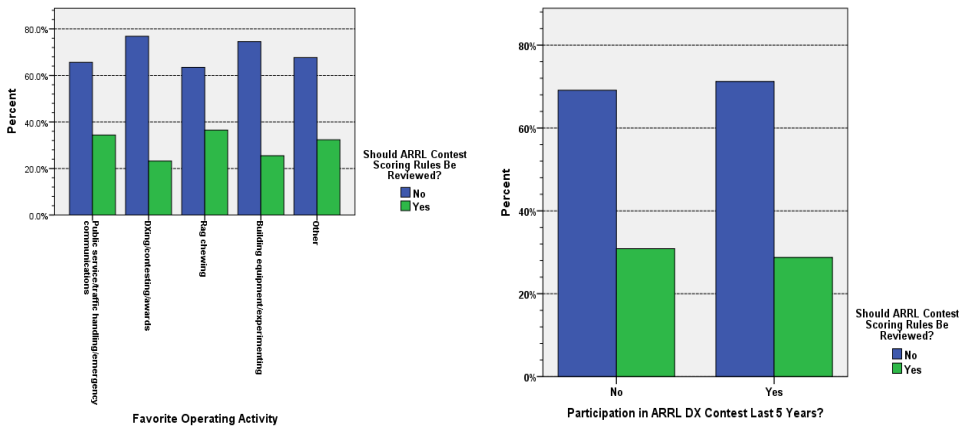
Figure 22. Bar Chart of Favoring a Youth Category By Current Number of Operator Categories



ARRL Contest Scoring Rules. Issues surrounding how the League currently scores contest operators were explored by asking about whether these rules should be reviewed. Only 30 percent felt that they should be reviewed by the ARRL. Upon examining how this relatively low sentiment varied amongst Division members, we find that DXers are slightly less in favor of this review than others. As seen in the left panel of Figure 23, contest DXers are slightly less in favor (22%) of a formal review than those who focus on rag-chewing (38%), public service (36%), or experimenters (25%).

After examining various other possible differences in these preferences, such as Section, age, operator class, club membership and club focus, we found that there are few distinctions other than Section. Arkansas hams were a few percent (24%) less in favor of a formal review than Tennessee (33%), Louisiana (33%), and Mississippi (29%). To address the question of whether experienced DXers hold different views, the right panel of Figure 23 shows that participants in recent years are almost identical to non-participants.

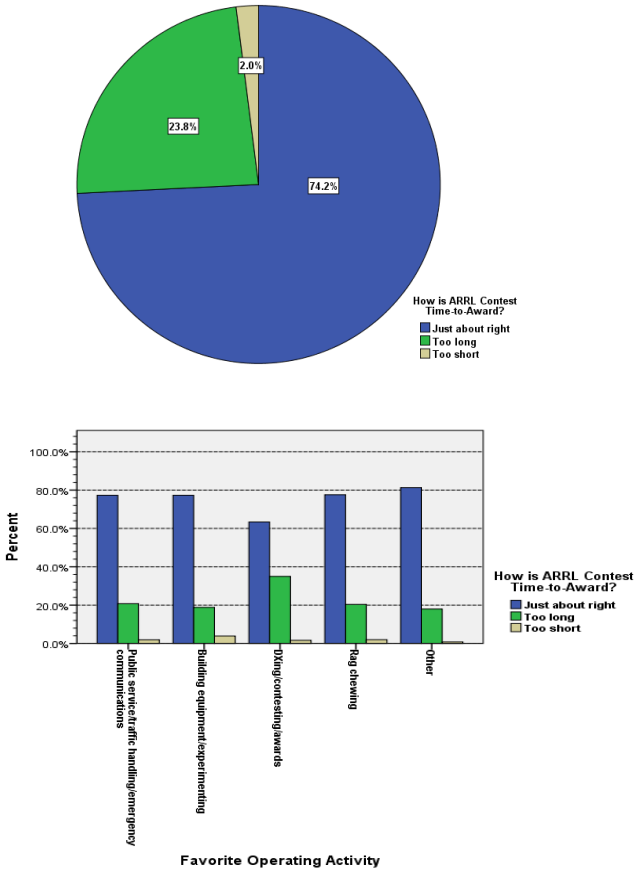
Figure 23. Bar Chart of Preferences of Contest Scoring Review by Favorite Operating Activity and Contest Participation



Time-to-Award Schedule. For contest DXers, waiting until the League's contest officials announce the results might seem like an eternity. Some complain while others wait patiently. The ARRL has recently worked on making the time-to-award process as efficient but as accurate as possible. We asked Delta Division respondents about their feelings on this period. Figure 24, upper panel, shows that most think it is "just about right" (74%). About one-quarter (24%) do say it takes too long to hear back. Some small group, totaling 2 percent, think that it should be longer.

DXers themselves do *tend* to think that this period is too long. When we examined these opinions by DXing participation or as a favorite activity, DXers expressed the opinion that the time is too long more than non-DXers. The lower panel of Figure 24 illustrates these differences. DXers, to the tune of 37%, think it's too long. No other group feels that strongly in favor of shortening it. However, almost two-thirds of the DXers tolerate the current award notification period well: some 64 percent think that it's "just about right".

Figure 24. Pie Chart of Feelings About ARRL Contest Time-to-Award

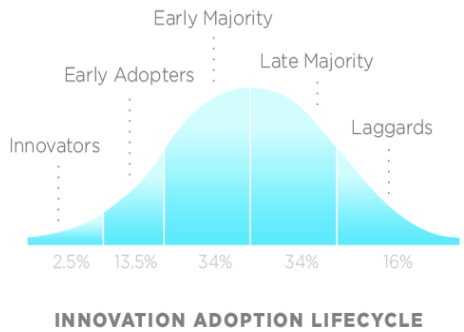


In summary, the period representing the time-to-award for ARRL DX Contests has a significant but minority share of Delta Division hams who want it shortened. Most DXers and non-DXers are relatively satisfied with the current award announcement period.

Modes of Operating Technology

Recent trends in new and innovative technology have influenced experimenters in amateur radio. Many have opened doors to new commercial product lines as well as open-source ones. We do not know much about the adoption of these innovations in amateur radio due to the lack of representative data. Sociologists like Everett Rogers (Rogers and Shoemaker 1971) have offered that the adoption and diffusion of technological innovations tend to follow a somewhat predictable form. Figure 25 illustrates. Those early in the curve---called *Innovators*---comprise less than 2.5 percent of the full cycle of eventual adopters. The *Early Adopters* are influenced by these Innovators in choosing the use of a particular technology. They tend to be 13.5 percent of the total adoptees. The *Early Majority* constitute some 34 percent and together, these three groups comprise the first half of all those who ever adopt the technological innovation. The successive *Late Majority* (34%) and *Laggards* (16%) contribute to full population saturation by the technology. In sum, Rogers and his collaborators contributed a perspective that has proven most realistic in empirically describing the life cycle of how specific technological advances become adopted in society or specific groups.

Figure 25. Adoption-Diffusion Curve



Source:http://en.wikipedia.org/wiki/Technology_adoption_lifecycle

What's this got to do with amateur radio? The innovations that we ask about in this survey are fairly recent advances in technology although they may have had their original ideas rooted well in the past. Our descriptive data, along

with Rogers' *Innovaton Adoption Lifecycle*, reveal a lot about where these innovations are in getting adopted by Delta Division hams. Some may be skeptical at this scenario. But recall the new innovation of "single sideband" transmission. On 75 meters, the long-time AM-ers called them "mush mouths" since they did not have had a BFO knob on their receiver to adjust to the lower sideband! It was far from conventional wisdom that SSB would become the standard for phone operation in amateur radio. For studies of the technical culture of amateur radio based upon in-depth interviews, see Haring (1987) as well as Douglas (1986).

With that preface, we present the basic results for these seven technologies in Figure 25.

This set of pie charts illustrate the actual adoption percentages as well as the lack-of-awareness levels for each technology. They are ordered sequentially in terms of the highest percentage having the technology but not necessarily the (lack of) awareness levels. We have also tagged each pie chart with the classification in Rogers' Adoption-Diffusion Curve shown above.

Clearly, APRS (www.aprs.org) has made a significant penetration since it's introduction with 28 percent saying they have it. The Winlink (www.winlink.org) email system has also reached the *Early Majority* category with 23 percent adoption. Note too that only 5 to 8 percent are unaware of these two technologies. One modest surprise is the penetration that software defined radio (SDR) transceivers have made in the Delta Division. One-fifth (20%) say they have this technology with only just over 4

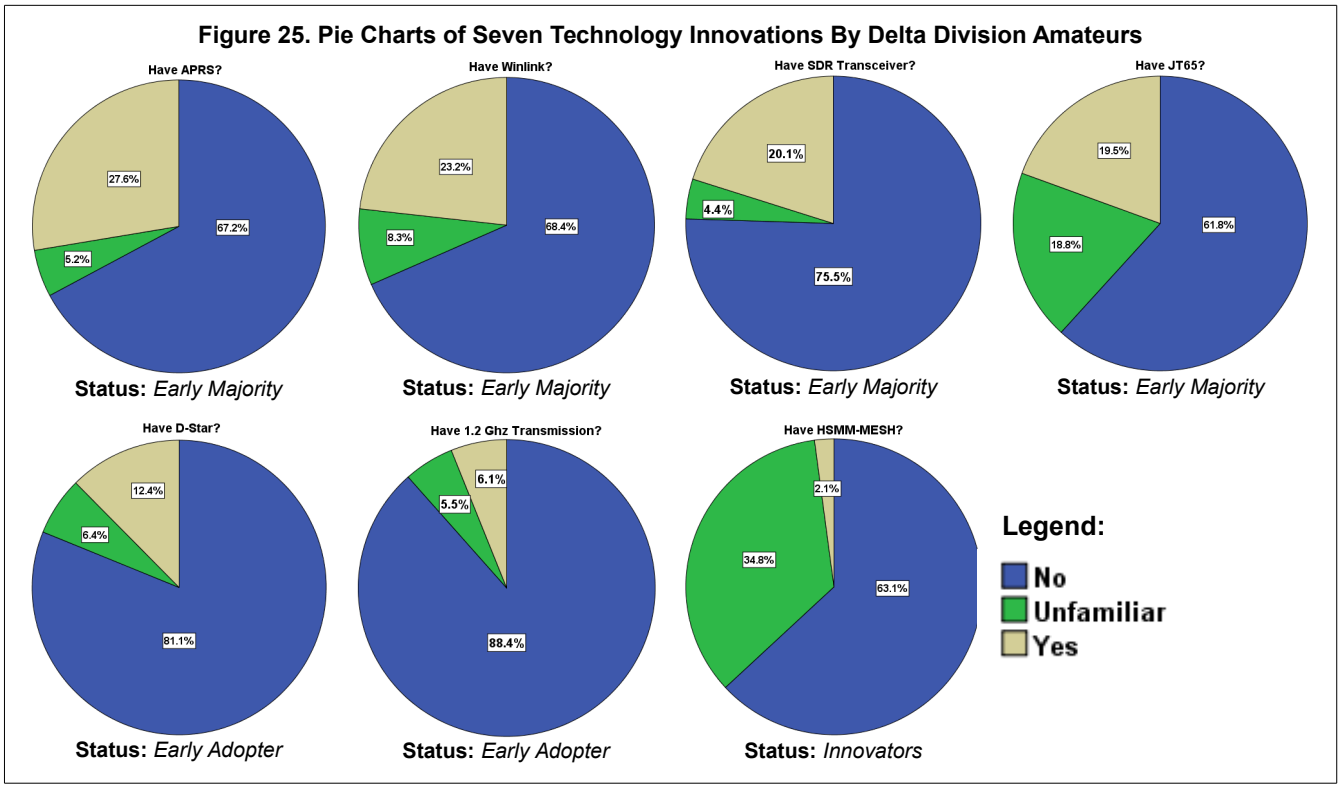


Figure 25. Pie Charts of Seven Technology Innovations By Delta Division Amateurs

percent (4.4%) being unaware of it. SDR transceivers have now reached the *Early Majority* status. Rounding out the Early Majority classification, Professor Joe Taylor's JT65 slow-speed digital protocol (http://hflink.com/jt65/) has reached this status but there is a significant level of unawareness involving JT65 (some 19 percent). Perhaps this is due to whether survey respondents use digital modes at all, producing a certain level of adoption among digital users with a corresponding lack of awareness among those not using digital modes of any kind.

Turning to the *Early Adopter* classification, D-STAR digital voice and data technology (http://www.dstarinfo.com) has had a lively short history. Just over 12 percent (12.4%) have D-STAR technology (broadly defined) in the four states comprising the Delta Division. Only about 6 percent (6.4%) are unaware of D-STAR. Fewer are unaware of 1.2 GHz transmission technology at 5 percent (5.5%) but a smaller share have this capability (6.1%).

Finally, the *Innovators* are currently comprised by those have high-speed multimedia MESH (HSMM-MESH) technology, now re-branded as Broadband-HamNet(tm) (see www.hsmm-mesh.org), where only 2 percent (2.1%) have adopted this technology. Almost one-third (34.8%) in our survey estimate say they are unaware of "MESH" technology.

We would expect these adoption patterns to vary somewhat by a number of factors. For instance, like other technologies, do younger hams in the Division tend to be the innovation leaders with older ones being "stuck" in what they've used for a while? Is is that favorite operating activity---DXing versus public service versus home-brewers, for instance---shapes these seven technological adoption patterns? Do Sections vary, perhaps due to the varying cultures in Annual Conventions or hamfest forums? Or, perhaps, is it the social contagion of networks of hams embedded in clubs (see, for instance, Burt 1987 on social contagion theory) that lead to earlier or later adoption? In our analyses of these questions, the results turn out to be fairly simple and straight-forward so we present only a small portion of those results due to space limits.

Unlike other popular trends in technology, older hams are no less likely to adopt any of these seven technologies than younger hams. There is a small tendency for those in their thirties to have higher adoptions rates but these differences are not large, although they are consistent.

We also examined whether metropolitan location tended to shape adoption. Surprisingly, hams in rural counties tend to have slightly higher adoption rates relative to micropolitan-located hams. Rural hams' adoption rates compare well with those in metropolitan centers around the Division.

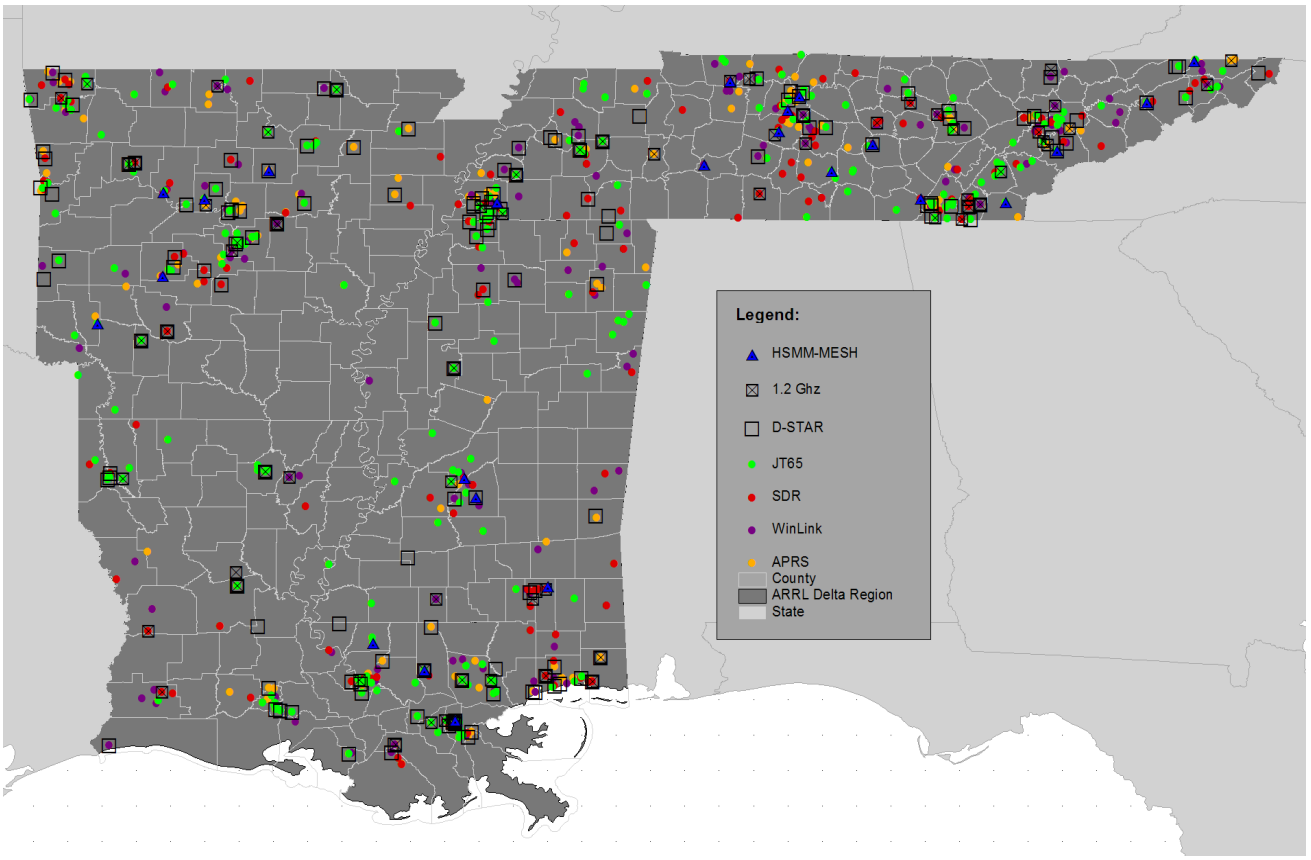
There is a significant pattern of difference in the adoption of specific technologies that aligns with favorite operating activity. D-STAR, APRS, and WinLink are used more by those involved in public service operations than others. Although the numbers are small (only 2.1% of the total sample), there is a nominal pattern for HSMM-MESH and 1.2 GHz transmission to follow the same pattern although builders and experimenters also have higher adoption rates for digital MESH technology too. We note that this may reflect an innovation flow where experimenters develop technological platforms that other specialists adopt but this is beyond the scope of this survey design to examine empirically. The digital mode JT65 and SDR transceivers tend to be the domain of DXers as they lead in the adoption of these two technologies.

What we find fairly clear evidence of is the degree of behavioral participation in amateur radio that is the most consistent factor in adoption of these seven technologies. That is, *club membership, especially being a member of both general and specialized clubs, and recent DX contest participation tend to shape higher adoption rates*. Simply being a member of any club is linked to a higher average adoption percentage as well as lower unfamiliarity with every technology except software-defined radio (SDR) in which they are equal. For the comparisons of types of clubs, those who are members of both general and specialized clubs have higher adoption rates and lower unfamiliarity except for the digital model JT65. The same pattern occurs for those participating in at least one DX contest over the past five years as participants have higher adoption rates and lower familiarity in every technology except D-STAR digital voice and data. Even for the exceptions of SDR, JT65, and D-STAR, greater participation leads to greater familiarity with the technologies. Thus, we conclude that there is likely some social contagion process at work, especially with the consistency of both behavioral adoption and cognitive familiarity both working in the same fashion.

Because of the need to know where specialized technologies are being adopted, we present the best available data in Figure 27. We emphasize that this is based upon a *sample*, not the *population* of all ARRL members in the four states or Sections comprising the Delta Division. For higher adoption rates, a sample such as this is more reliable for higher adoption rates (e.g., APRS) and potentially far less reliable for very low adoption rates (e.g., HSMM-MESH). We encourage the results to be taken with appropriate caution in making extrapolations.

This graphic shows that most technologies are adopted to some degree throughout the Division but in greater numbers where population centers are located. (*Note:* the percentage computed from a small base in all rural counties can still be higher than all metropolitan counties but the latter has higher occurrences of the adopted technology.) In short, Delta Division amateurs who are members of the League have noteworthy patterns of adopting cutting-edge technologies. We have no comparable data with which to compare this Division with others but based upon Rogers' Adoption-Diffusion paradigm, these rates are likely to grow considerably over the next few years.

Figure 27. Spatial Display of Seven Technologies' Adoption in Delta Division



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