The Current State of VHF Contesting

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Main Text

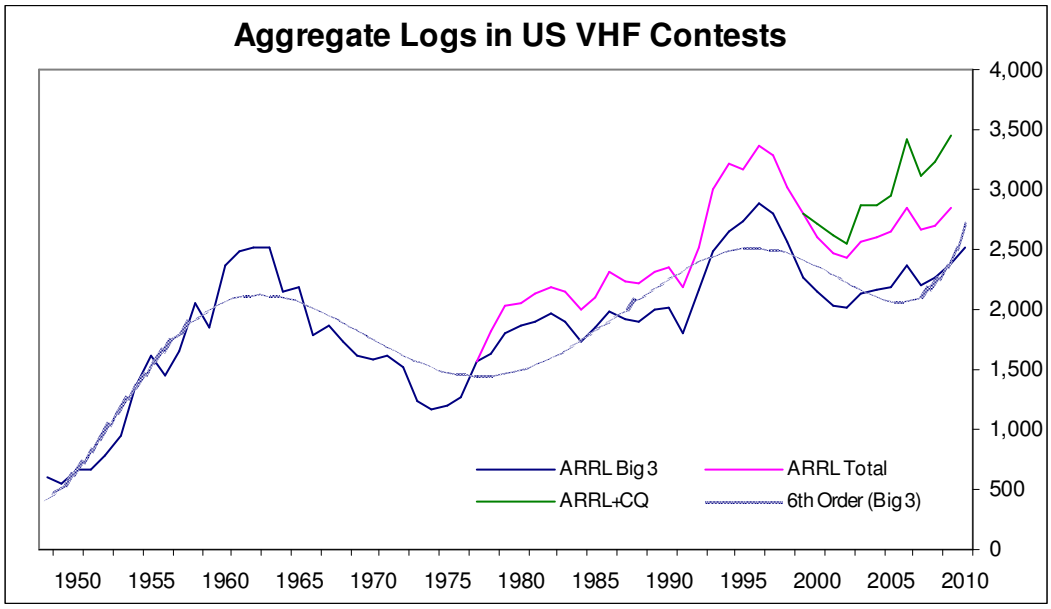
Within the backdrop of VHF contest trends research, this article discusses the current status of individual VHF contests in the United States. Forward projection of aggregate contest log activity is also attempted. With the data and graphs being updated through the 2010 September, the statistical references are more current than other important, but older, articles published on the topic of VHF contest trends.

Review of Contest Trends Research

Over the last 60 years, VHF contesting activity in the United States has experienced pronounced cyclical patterns. Many participants have observed and commented upon the tremendous ups and downs in VHF contest activities. This has been a most perplexing phenomenon, defying ready explanation. It is also unique to the VHF arena, with some domestic HF contests showing fluctuations from only the solar cycle.

The stark cyclical nature of VHF activities can be clearly seen in Figure I. The aggregate log count of the ARRL VHF events definitely shows peaks in the early 1960's and 1990's, but with significant downturns in the 1970's and early 2000 era. The blue line is the summation of log counts in January, June, and September (referred to as the "big three" VHF contests; also sometimes referred to as the VHF "major" contests). The pink line contains all six ARRL VHF contests (the big three plus August UHF, 10G, and EME). The green line is the aggregate of all ARRL contests and the CQ VHF since 2000. To highlight the cycles in the graph, the dashed blue line in Figure I smoothes out the yearly aggregate counts of the three ARRL majors. Two complete cycles, and perhaps the start of a third cycle in current time frames, can be vividly observed.

Figure I – Aggregate VHF Log Counts, 1948 - 2010

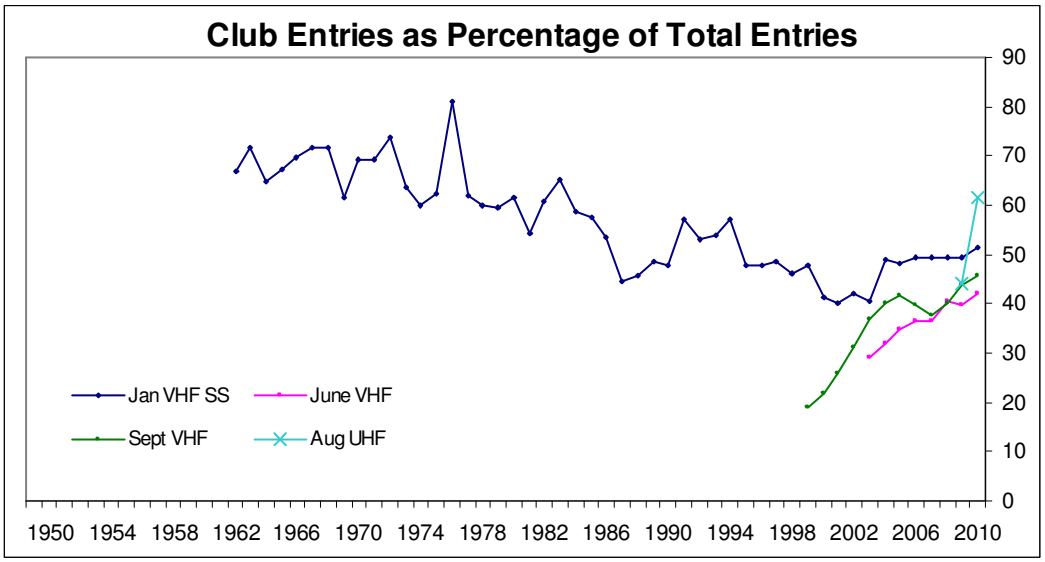


The cyclical nature of VHF events has been heavily analyzed in the literature. Numerous factors have been proposed over the years [Outline, 2010]. Some of the mystery surrounding the peaking and bottoming of contest data has been ferreted out through the use of statistical models. Simple regression analysis was initially conducted in a first round of statistical testing. More sophisticated multiple regression analysis was started in the first round and then became especially detailed in a second round of mathematical effort. Time-series de-trending and autoregressive features were incorporated into the second round [Descriptive Model, 2006; Statistical Model, 2006; Other Impacts, 2005]. Ultimately, several factors were found to be statistically significant at the 95th confidence level. For a good compilation of all contest trends articles, please refer to recent articles and presentations [*QST*, 2009; Central States, 2009]. The following variables have shown significant explanatory power.

Major regulatory changes which affect licensee status, and in particular, participation of new licensees on the VHF bands, have a huge impact on VHF contesting activities. Regulatory issues are very likely the single biggest factor in explaining both the positive and negative trends in all three ARRL VHF major events. Even the three specialty VHF contests (UHF, 10G, EME) display a 2nd peaking of log counts, although it is rather doubtful that log increases in the 10G and EME are related to regulations fostering new licensees onto VHF frequencies.

Club activity has likewise generated huge impacts on VHF contest logs, with a close correlation between the number of contest logs and club logs. The percentage of total contest logs attributable to the clubs is quite significant, as is seen in the following graph [Mt. Airy *Cheese Bits*, 2004].

Figure II – VHF Club Logs, 1948 – 2010



While club activity offers great explanatory power for VHF contest log variation, the clubs themselves are also greatly influenced by the above noted regulatory changes in licensee structuring. Both the number of clubs and the total amount of club logs have moved in sync with the regulatory changes that have expanded or restricted licensee totals and new licensees on VHF frequencies.

A general loss of interest in VHF activities following the contesting peak years in the early 1960's as well as the 1990's has also been tested and found to be statistically significant. While not as large an impact as regulatory or club effects, a loss of interest from contesting and even away from VHF general operating may explain post-peak log counts, especially in light of the absence of adverse regulatory changes occurring in the same time frames.

Major technological changes over the years are also thought to influence operating activity. While difficult to quantify for statistical testing purposes, the loss of AM activity nets in the 1960's and 1970's as a consequence of increasing FM repeater usage, the emergence of the first generation multi-mode rigs and brick amplifiers in the late 1970's, and the more recent development of HF + VHF transceivers by the mid 2000's have all sparked major changes in VHF operating and contesting. Zimmerman [2005] even suggested that the loss of the logs following the first peak could be almost wholly explained by the move of clubs from AM nets to FM repeaters.

Individual rule changes have been tested, but have not been found to be statistically significant. For instance, the change to grid squares beginning in 1983 may have been warmly received by contesters, but no major surge in contest log data was noted in any VHF contest. However, a cumulative effect of rules modernization was found to be significant through the use of dummy variables being "turned on", beginning with 1978 data. But during the same time period, incentive licensee restructuring was also underway, so it is unclear which event (if either) was responsible for the gradual increase in contest log entries. A more robust test of regressing total licensee numerical data

against contest log counts was found to be statistically significant in all three ARRL VHF majors. Thus, regulatory changes once again appear to be a major influence on contest activity rather than rules modifications.

Additionally, rules changes have been observed in the ARRL contests to cause unintended consequences, at least in some situations. During the first era of the *CQ VHF* contests in the 1950's and 1960's, the uneven administration of contests and sudden and dramatic changes in the rules set were often criticized by contesters, and were generally considered as being negative in impact. In other instances however, such as the rules change in the 2000 CQ VHF, innovative and dramatic rules changes produced very positive impacts in log counts, total stations worked, and total grids activated.

Currently, many amateurs desire fairness and consistency in both the administration of contests and in the rules set. However, internal resistance in changing rules, the perception of unfair rules, and the general lack of rule diversity between the various contests have been cited as reasons for operator fatigue from contesting [Zimmermann, 2004, 2005, 2010].

Many other factors may also be at play, although many ideas are incapable of statistical testing, and thus fall into a statistical residual or error term. Some of these factors include an "age wave" of seasoned VHF operators; zoning restrictions on antennas; and high land prices in some areas of the country. A more complete discussion of these other factors can be found in the literature [Other Impacts, 2005].

Current Conditions

Aggregate conditions will be discussed first, and then in rough chronological order, the six ARRL VHF contests, CQ VHF, Spring and Fall Sprints, and the 2G+. The author does not have immediate access to contest data or worthwhile histories on the Microwave Activity Days, SMIRK activities, nor any WSJT contests or activities, so no discussion will be conducted on those VHF events.

In the Aggregate

Most new licensees are now starting their amateur experiences on HF frequencies. This is a dramatic change to the amateur licensing structure, since the entry-way for new Technician licensees throughout much of the last 60 years has been on VHF. Even Novices in the 1950's and 1960's commonly started on VHF. Thus, VHF operating and contesting may be facing a general down-draft going forward in time. With regulatory changes arguably being the biggest factor driving the cyclical pattern in VHF contesting, this single factor may become a large concern for contest administrators over the next several years. This concern towards VHF contesting becomes even more alarming when one realizes that many HF contests are increasing in popularity, even with very little growth in the amateur licensee totals.

Offsetting this potentially severe problem is the development of club activity on the VHF bands. Clubs currently account for between 42% of the total logs (June VHF) and 61% of total logs (August UHF). The percentage of points generated by the clubs is just as high, between 50% and 55% in recent events. A cursory highlight of recent club activity is pertinent. Established clubs, such as Mt. Airy, North East Weak Signal (NEWS), Potomac Valley Radio Club (PVRC), and many others post large point totals and sizable log counts in several VHF events. Several other clubs are emerging as huge centers of activity, as well. Most notably, Northern Lights Radio Society (NLRS) in the August UHF; Society of Midwest Contesters (SMC) in the June VHF; Southern California Contest Club (SCCC) in the medium club competition of several contests, and other clubs with significant log entry totals (Pacific NW VHF, Florida Contest Group, etc) are all developing quite nicely. Others have huge point totals with smaller club log counts (Mt. Frank, etc).

Another bright spot is the growing acceptance and usage of technological changes on VHF. The most noticeable technology-related impact on VHF contests is the vast number of HF transceivers that contain 6 and / or 2 meters (and in some cases 432 and even 1.2G). This is drawing experienced HF operators into the summer VHF contests, many of whom possess excellent CW skills. The increasing ease of obtaining microwave equipment is another encouraging technological development. What was once the exclusive province of engineers and commercial technicians is now becoming home to anyone with a solid interest in deploying transverter equipment.

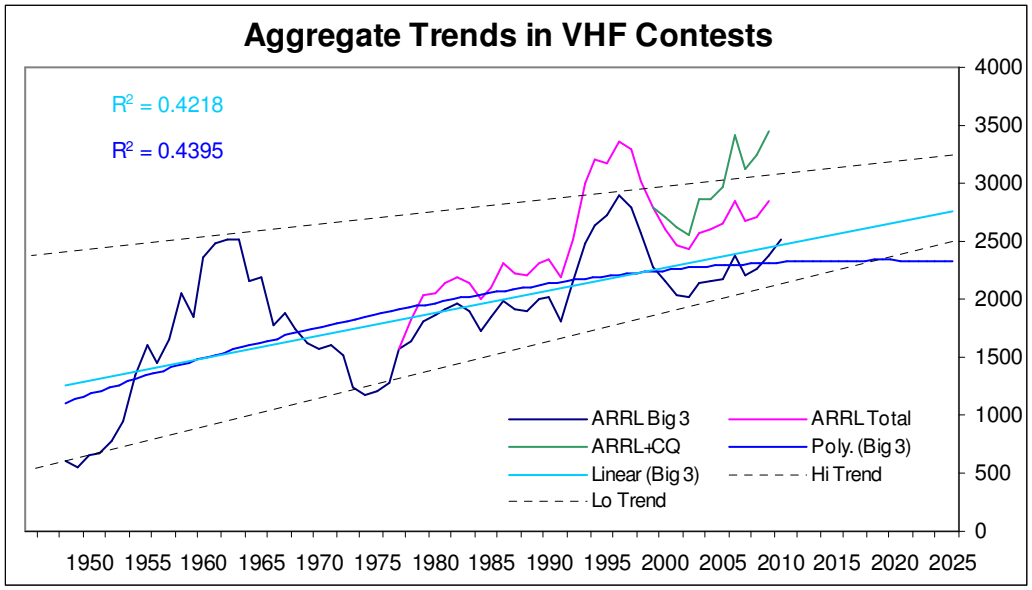
But other economic and demographic related factors may be trending to the negative, especially local regulatory and economic pressure on antenna systems. The aging of the VHF operating population is also a discouraging sign. However, the increasingly small size and sophistication of many VHF radios may alleviate some of these economic and regulatory issues, with more amateurs being able to mount effective mountain-top portable and rover stations. The newer technologies may also be attracting a younger population of amateurs, potentially injecting vitality and new blood into the mix.

Overall, it is problematic whether club activity and technological items can completely make up for loss of the amateur entry-way on VHF. The current and future contesting environment is therefore mixed. Even the current rules regime generates some measure of uncertainty. While both ARRL and CQ are currently providing consistency of rules and of administration in VHF contests, there is an underlying concern that rules sets have become too entrenched and unable to change from a monotonous “sameness” [Zimmermann, 2004, 2005]. What started out in 1948 as distinctly different contest rules for the various contests has now evolved into very similar scoring methodologies for most of the ARRL contests as well as the CQ VHF.

To gain a better understanding of overall trends, Figure III takes the ARRL aggregate log counts of Figure I and extrapolates them forward in time to 2025. The statistical procedure is based on linear as well as 2nd order polynomial regression analysis, generating “best fit” trend lines from past data points. The general technique, and most

importantly, the policy implications for VHF activities, has been discussed in detail in recent articles [*QST*, 2009; CS 2009].

Figure III – Aggregate Trends in VHF Contesting



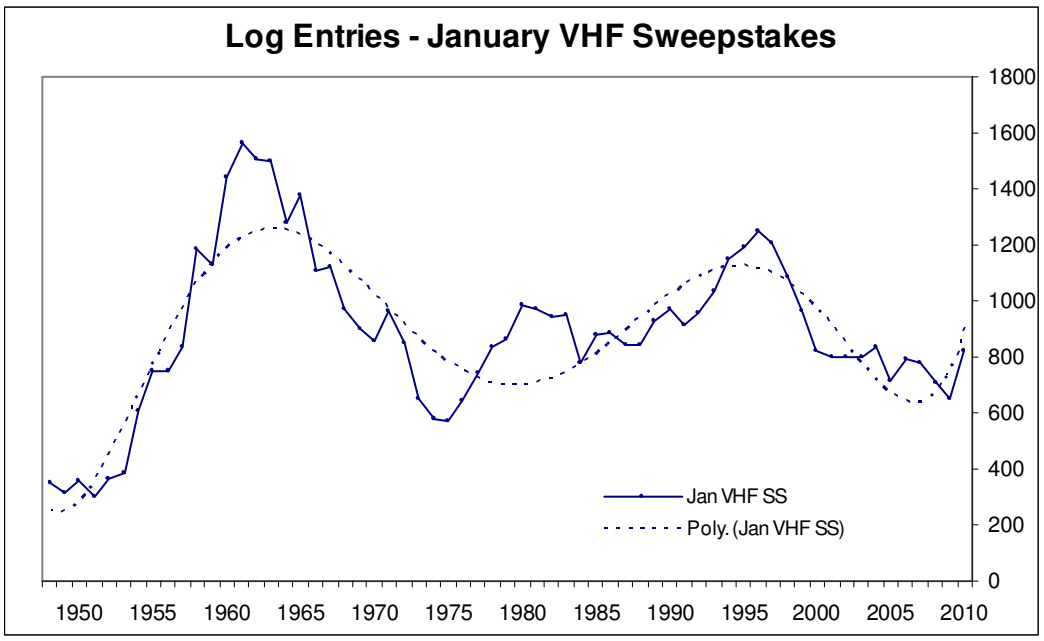
The linear trend of Figure III projects a gradually increasing log count, and is well within the extreme event-type of channels etched out by the historical high and low log counts. The non-linear trend projects a period of stagnation going forward. While this polynomial trend moves outside the projected low points, both trends have close to the same explanatory power, with a statistical goodness of fit of between 0.4218 and 0.4385. For comparison purposes, R2 values of 1.000 would be a complete fit of past historical data, while an R2 of 0.000 would be a complete absence of fit. Other non-linear trend-lines have also been tested, but either have lower R2 values or produce ludicrous results when projected into the future (such as zero logs or an infinite number of logs all within a few years). A 2nd order power formula at least generates a feasible forward projection with similar probabilities as the linear trend.

Thus, statistics only takes us so far in explaining contest activities. It is equally probable that we could be traveling along a slow growth path in log counts OR going down a bumpy road of stagnation and ultimate decline. This dichotomy of results from the exact same data is due to the conflicting factors driving the cyclical pattern – regulatory, economic, and demographic issues may be indicating a downtrend, but club activity and technology are suggesting an uptrend. If all factors are in accord at the same time, we would be heading to either a high or low point. With some factors being positive while others are negative, we end up with alternative and equally probable future pathways.

The January VHF Sweepstakes

This event has experienced the most dramatic cyclical pattern of all US based VHF contests. The early years of this contest were largely fueled by Novice and Technician authorizations onto the VHF bands. As the new licensees found their way into VHF oriented clubs, and with January then being the only club competition event, the VHF Sweepstakes quickly became the preeminent activity of the VHF contesting season. The 1961 peak of 1,561 logs was so monumental that it has never been eclipsed to the present time. The second peak in 1996 of 1,250 contests was also monumental, and was likely due to the huge influx of no-code technicians then hitting the bands.

Figure IV – January Log Totals, 1948 – 2010



Since 2001, January log totals have been hovering around 800 entries. The percentage of logs generated by the clubs has been remarkably consistent since 2003, with a mild increase from 49% to 52% by 2010. This is a critical factor in this contest, as the almost complete lack of propagation makes January largely dependent upon clubs to generate local support. The most successful club in the event remains Mt. Airy, who has methodically rallied its members for the last 50 years to enter and usually win the unlimited club competition.

Currently, January appears to have stable log numbers, although up until 2010, there was a concern that the event might be in decline. Log counts need to be closely scrutinized for the next several years to ascertain whether the 170 log upswing in 2010 was an aberration or represented a return to normalcy following the explosive second peak in the 1990's. It is highly unlikely that January will ever return to its former premier status. It is much more probable that current log entry levels are indicative of what this contest can generate in years of decent club organizational levels.

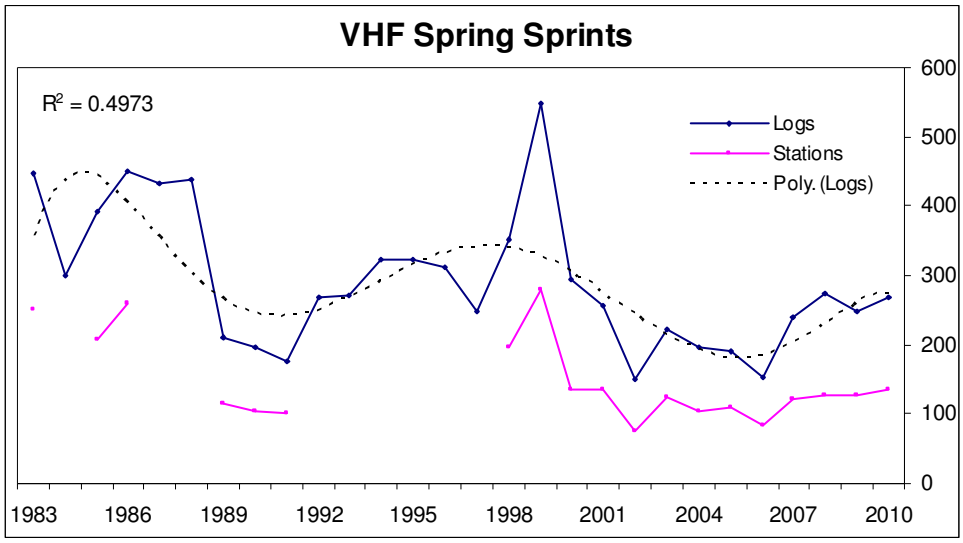
VHF Spring Sprints

Initially developed in 1983 to test out and promote the grid square program that was then being developed by the League, the Sprints proved to be very popular in its early years. Coinciding with weekly activity nights on the various VHF bands, the Sprints had an interesting evening format, with a new band event for each week. After many years, the League ended sponsorship over the Sprints in 1999. Several VHF clubs and societies then stepped in to keep the Sprints alive for that one year, with a different club / person sponsoring each weekly event. The next year in 2000, the East Tennessee DX Assn began sponsorship on all weeks.

The Sprints once again almost became extinct in 2007, when the sponsor lost volunteer organizational support. John Kalenowsky, K9JK, stepped in and volunteered to keep the Sprints going. With the assistance of a few other individuals, John has sponsored the Spring Sprints since then. The Central States VHF Society agreed to co-host the Sprints along with K9JK, effective 2010. An interesting history of the Sprints can be found at Kalenowsky [2009].

Since 2007, K9JK has encouraged the usage of 6 character locators for the exchange, and made a few other changes to the format (such as the addition of a Rookie class). A big change occurred in 2010, when John moved the contest to distance scoring. Just as the Sprints served as an experimental platform for development of grid squares in the 1980's, the Sprints are once again serving as a place for experimentation with the implementation of distance scoring rules.

Figure V – VHF Spring Sprints, 1983 - 2010



With its short, evening format, the Sprints could appeal to many individuals who do not have the interest or desire in participating in a longer, weekend contest. However, participation has likely been hurt over the years by various administrative decisions.

After the League in 1987 stopped publicizing the Sprints as a Contest "Announcement" and moved the Results write-ups to the *NCJ,* participation dropped by over 50% within a few years. Several years later in 1999, the ARRL ended sponsorship altogether on fairly short notice. In announcing its decision to withdraw as sponsor, the League stated that "Participation in the VHF/UHF Spring Sprints has never reached the level of a healthy national event" [ARRL, 1999]. Ironically, log submissions in 1999 rose to an all-time high. This may have been driven by a "rallying around the flag" effect, as the August UHF also had a similar reaction to a League announcement on the future of that contest. But even the next sponsor, the East Tennessee DX Assn, ended its sponsorship with little fanfare or notice.

Currently, there does seem to be some upward movement in recent participation levels (see Figure V, above). While the Sprints are nowhere as popular as they were in the 1980's, the weekly events appear to be in a stable condition at current levels. The move to distance scoring has not initially hurt or helped participation, either, as there has been no significantly positive or negative change in station or log counts in 2010.

In spite of concern over moving to a new scoring method, the contests in 2010 ran fairly smoothly. There was little or no resistance to the usage of 6 digit locators, and most people unfamiliar with 6 characters quickly adapted. There also did not seem to be any dramatic change in operating styles or contestant objectives, as contestants generally tried to work everyone they could hear. There was certainly more awareness of distances traversed. The biggest problem was in the logging programs that did not calculate distances. But even here, the sponsor told everyone to just submit the exchanges, and distances will then be calculated for them. No strenuous objections were noted by contestants to this procedure. Some people even estimated distances on their own.

In preliminary analysis of the Spring Sprint results, there were few differences in rankings of individual contestants between the various scoring systems [Simulation 7, 2010]. Those stations that did well with distance scoring would have also done very well with a grid based system. Perhaps over time, there will be more differentiation of results between the stations emphasizing grid square multipliers versus those who reach for longer distances. But in the first year of distance scoring in the Sprints, no major changes occurred in the typical rankings of stations. This was the case in both the single band events as well as the cumulative standings, with distance scores across all weekly events added together for a composite distance score. This cumulative ranking even contains some rudimentary aspects of a multi-band distance format.

Microwave Activity Days

After a discussion in 2003 on the VHF Contesting reflector by the late Bill Seabreeze, W3IY, and others, the first Saturday of every month was designated as an activity day on microwave frequencies. The general goal has been to develop activity on the various microwave bands. Less of a contest and more of an activity, participants are encouraged to work fellow amateurs on microwaves and then report the activity on VHF reflectors.

Typically, active stations improve their capabilities through the activity, better preparing themselves for contest situations at other times of the year. Aside from reports submitted to the VHF reflectors, no statistics have been kept by any central organization.

San Bernardino Microwave 2G + Contest

Begun in 2003 as a club competition event, this contest focuses on microwaves at 2 GHz and above. From the start, distance scoring has been in use, with 1 km distances being the minimum range for contacts. Portable / roving activity is encouraged, with the same 16 km distance being used for re-contact as in the ARRL 10G. Typically, operating time for the contest extends over an entire weekend, sometimes into a second weekend.

Figure VI – SBMS 2G+ Statistics

Year	Logs	Points	Clubs
2010	28	126,234	5
2009			
2008			
2007	32	238,583	5
2006	48	244,924	4
2005			5
2004	43	124,038	4
2003	32	46,402	4

In the first years of the contest, power multipliers were used, with the basic calculation being distance * power mults. 100 QSO points were also given for each unique call sign worked per band. The power multiplier was dropped in 2007, and a band multiplier was used instead. The 2010 and 2011 rules have x 2 for 2G QSO's; then, x 1 for 3 to 10 G; x 2 for 24G; x 4 for 47G; and x 8 for 76G + . The 100 point bonus for unique calls has been retained.

In 2010, the 2G+ event coincided with the May Microwave Activity Day as well as the Microwave Spring Sprint. This provided an overlap of activity times, potentially increasing participation across all three events. The 2G+ certainly is a unique affair, catering to microwave-oriented clubs. Clubs that have participated in the past include San Bernardino, Northern Lights, Mt. Airy, Midwest VHF / UHF, Ontario CC and groups known as San Diego Microwave, Front Range Microwave of Colorado, Michigan VHF / UHF, and Arizona MUG. The rules specifically allow for smaller groups of large clubs to enter as a separate club, due to isolated locations of local microwave activities. Because of the relative lack of data, no estimation can made regarding the vitality or popularity of the contest.

June VHF QSO Party

This contest has been amazingly successful in the last several years. Since 2006, record high log counts for the June VHF have been set four times – 1,048 logs in 2006; 1,075 logs in 2008; 1,137 entries in 2009, and then 1,202 logs in 2010. The most recent activity in June is now even approaching the 2nd highest log count of all US VHF contests (January, 1996 at 1,250 log submissions).

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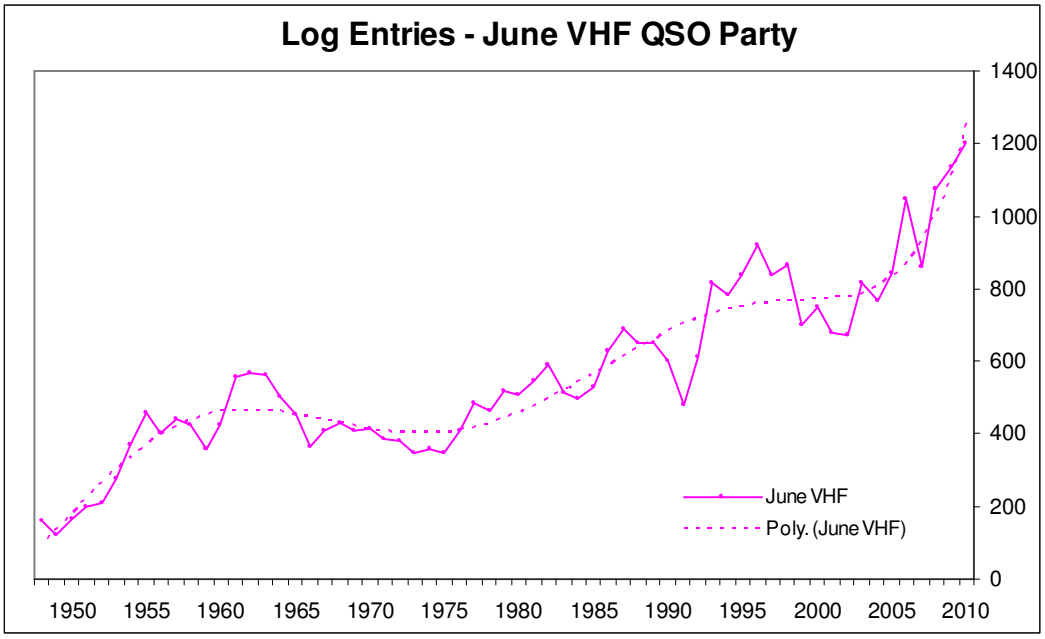
Figure VII – June VHF QSO Party Logs, 1948 – 2010



Current activity is in stark contrast from earlier years, when January vastly out-numbered all other contests, including June. For instance, during the first peak in the early 1960's, January exceeded June by over 1,000 logs entries. In the second peak in 1996, January still generated 327 more logs than June. But a turning point was reached in 2003, when for the first time, more logs were submitted in June than January of the same year. 2010 marks the seventh time in the last eight years that June had produced more logs, more points, and more grid multipliers than any other VHF contest, including January. June has truly become the preeminent VHF affair of the year. An interesting comparison between the January and June contests can be found in the literature [*NCJ*, 2007].

Three reasons have been advanced for the recent surge in activity. First, club competition has brought many new stations into this contest, often with extensive HF experience. For

example, SMC informally had 16 stations active in 2002, the last year without clubs. By 2008, hordes of HF operators from the club had entered June, zooming SMC club logs to 71, an amazing four-fold increase in just a few years. It is no coincidence that June went into overdrive at the exact same time that club competition commenced.

A second large reason, and somewhat connected to the first, is the wide-spread technological development of placing 6 meters and / or 2 meters into the newer HF rigs. This has enabled HF operators to make an easy jump into the summer contests, where 6 meters usually dominates. No longer must a dedicated VHF radio be used for the summer Es season. Now, one can just tune a HF dipole to 6 meters and put out 100 watts of power into wide-open 6 meters band conditions. It is no wonder that HF-oriented clubs such as SMC, Potomac Valley Radio Club (PVRC), and Northern California Contest Club (NCCC) are all posting large log counts and aggregate point totals in June. Technological advances have really worked wonders for this contest. The outlook is bright for the June VHF QSO Party.

A third possible reason for the heightened activity in June may simply be the strong summer E skips that have been experienced recently. Since 2006, all years of record logs have been associated with tremendous Es in many areas of the county. With the July CQ VHF also experiencing large log counts in years of big E skip, there may be some merit to the argument that the surge in summer contests is propagation related. It would be interesting to see if the log counts stay high in marginal conditions.

The only downside to this contest may be that 6 meters is so completely dominating in years of good e-skip that activity on 2 meters and above is curtailed. To a large extent, this has always been the case, given good Es on 6. But in some ways, having 6 meters in all the new HF radios has transformed June into something like a 10 meter contest when skip is present. Upper band activity in this contest really suffers when 6 meters is open.

SMIRK 6 Meter Contest

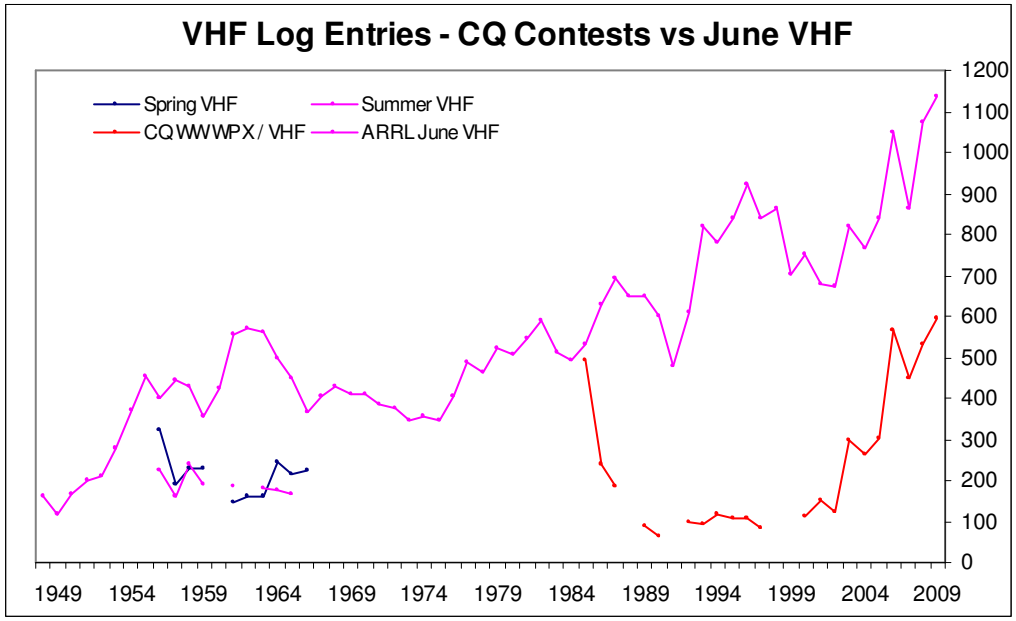
Traditionally held the third weekend of June, this event has been sponsored by the Six Meter Amateur Radio Klub (SMIRK) since at least 1981 [QST, 1981]. It focuses exclusively on 6 meters. 1 QSO point is given for any SSB or CW contact, and 2 QSO points if the station supplies a SMRIK number. Final score is QSO points * grids. Participants do not have to be a current member of SMIRK.

Only data from the 2000 through 2008 time period is currently available, and thus no conclusions can be drawn as to possible trends or current status of this long-standing event. It is a laid-back, breezy affair at the height of the Es season that is appreciated by the VHF community.

CQ VHF

This contest has gone through numerous iterations. The original CQ WW VHF series ran in the 1950's and 1960's and was trailblazing in its originality. The second era commenced in 1985, with prefixes initially being used as multipliers. Prefixes and grids were both combined into the scoring metric thereafter. By 1992, grids became the sole multiplier. Thus, both ARRL and CQ contests have become increasingly similar in their scoring rules.

Figure VIII – CQ VHF Contests; June VHF 1948 – 2009



The double peaking of contest activity that is so pronounced in ARRL data has not been observed in the CQ VHF. This is perhaps due to the relative lack of momentum and support shown by the contest community to the event in past years, but it may also be simply the result of a more limited data set being available for the CQ VHF. A detailed analysis of the CQ VHF was published a few years ago, and can be found in the literature [*CQ VHF*, 2006].

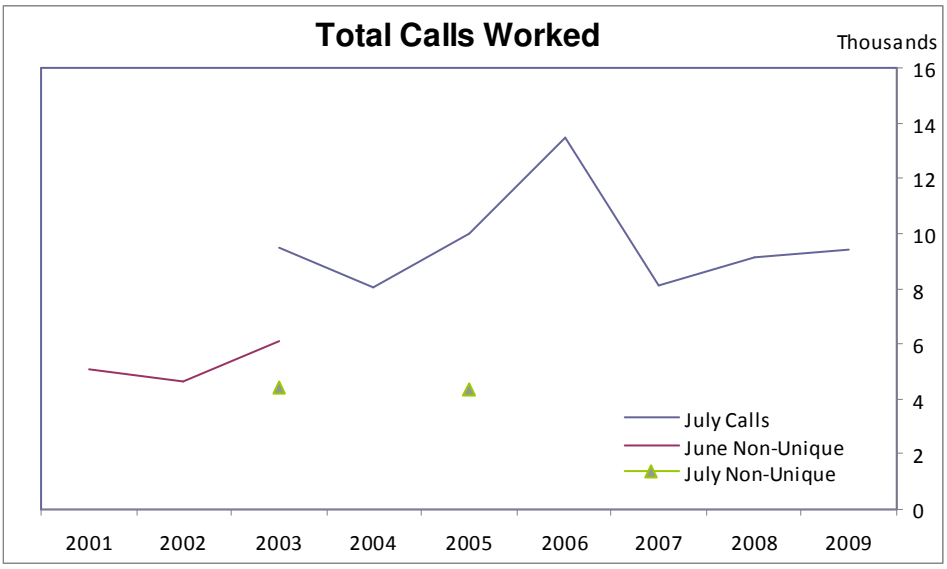
In 2000, yet another dramatic rules change occurred in the CQ structure, this time generating a positive response from contesters. W3ZZ led the effort to make the CQ VHF into a 6 and 2 meter only contest, while W1XX became director. For a few years, the contest continued with only a core following. But as the HF + 6 / 2 rigs made their appearance on the VHF bands, the popularity of the CQ VHF took off. In the ensuing years, July CQ VHF has surged in participation. In 2009, 873 grids were activated world-wide. Figure VIII shows a lockstep pattern between June and July since 1992.

Jones [2010] believes the simpler format is ideal for beginners and returns us to a basic "old school" type of event. The contest has certainly filled a niche in VHF operating, exclusively focusing on the two lower bands. In this regard, the affair is considered another specialty event, something akin to the August UHF, 10G, and EME contests.

But in other ways, the CQ VHF has become so popular that it may be considered a fourth VHF major event of the contesting season. The log count in the 2010 CQ VHF is very likely to exceed the September VHF QSO Party, with initial log entries in July at 701 while September may be far lower (see below analysis on September VHF). If so, this would mark one of the only times that the CQ VHF has exceeded an ARRL VHF major, in either of the era of the CQ contest.

July is the only US terrestrial VHF contest with a significant international presence. Indeed, the CQ VHF is a true, worldwide VHF event, similar to the CQWW in scope and vision. The number of total call-signs worked from both domestic and international sources is truly staggering (shown in Figure IX as "July Calls").

Figure IX – Call Signs Worked, CQ VHF and June VHF



ARRL maintains some information on "non-unique" calls, which are considered to be those call signs worked more than once in a contest. CQ has occasionally released similar information, as well. This data is shown in Figure IX as June and July non-uniques. It is designed to show the total level of activity in a contest among all stations worked repeatedly, and not from just those stations submitting a log. Both the July CQ VHF and June VHF have similar non-unique data points, at least as to the available but rather sketchy information. Having data on total grids activated and total non-unique calls would be quite helpful, as it would lend greater depth to the analysis.

The sponsor indicates that the 2010 results will show gains in Japan, in much the same way that increased coordination and publicity has taken place in Thailand, Ukraine, and European Russia [Lindholm, 2010]. With so many amateurs in Japan, any contest growth there could produce further strength in the event. The sponsor also is working on rules changes which incorporate new technologies. Further, club competition started in 2010, which may produce additional interest. This all bodes well for the event.

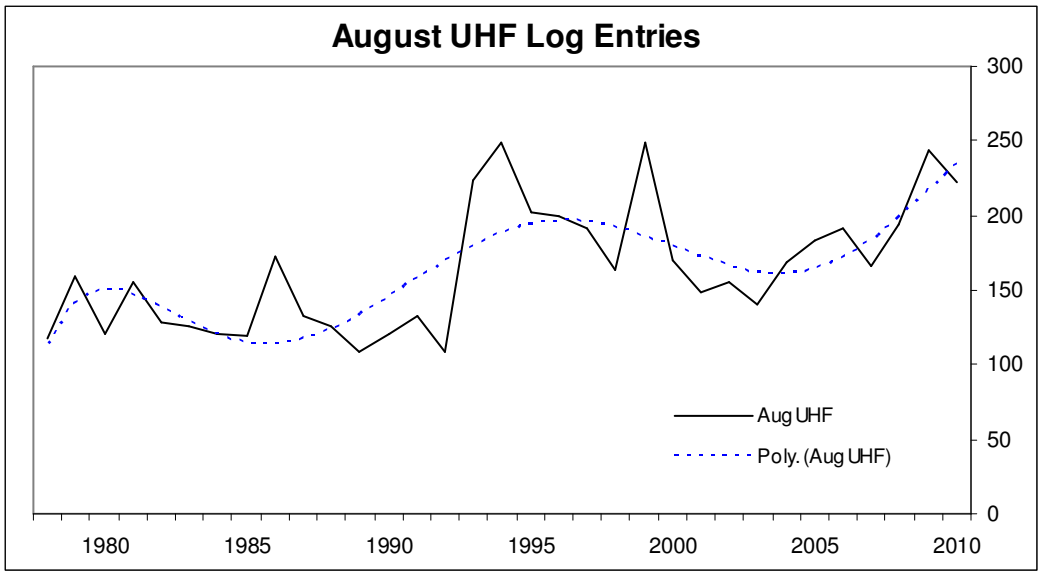
At the current time, the July CQ VHF has a definitely positive trend.

August UHF

This is one of three specialty events developed by the League to foster greater variety in VHF contesting. Started in 1978, the focus was on 222 and above. A 1 x 1 grid field was initially used for the multiplier. In 1982, a one-year experiment was attempted using distance scoring and a complicated exchange based on lat / long coordinates [*QST,* 1982]. In 1983, the UHF moved to 1 x 2 maidenhead grids as the multiplier. Most other ARRL contests also moved to grid squares and away from sections between 1983 and 1985.

As shown in Figure X, the contest experienced a peak in the early 1990's, the same as other ARRL events. But activity declined thereafter. In the League's 1999 contest announcement on the UHF, the ARRL asked the contesting community to take a serious look at the future of the event. This set off a huge one-year log increase, as people rallied behind the contest. The next year in 2000, however, the contest continued its decline. Concerns were being openly expressed that sponsorship of the UHF could be ended.

Figure X – August UHF, 1978 - 2010



The clubs then stepped in, especially one club, the Northern Lights Radio Society. Coming up with a snappy name of Rovermania, NLRS in 2004 encouraged rovers from several states to converge on St. Paul, Minnesota. The effort proved to be a great success, and Rovermania has continued since then. The impact of NLRS's heightened activity has been felt in two entire ARRL divisions, with the percentage of total logs coming from the Dakota and Central Regions doubling almost immediately, and then remaining at heightened levels for several years, and only returning to a more typical percentage in 2010.

Figure XI – Increase in Division Activity, 2004-2010

	Dakota	Central	2 Div	% of Ttl
2010	13	18	31	13.96
2009	25	25	50	20.49
2008	15	20	35	18.04
2007	16	23	39	23.49
2006	18	25	43	22.51
2005	15	18	33	18.03
2004	21	14	35	20.71
2003	8	12	20	12.82

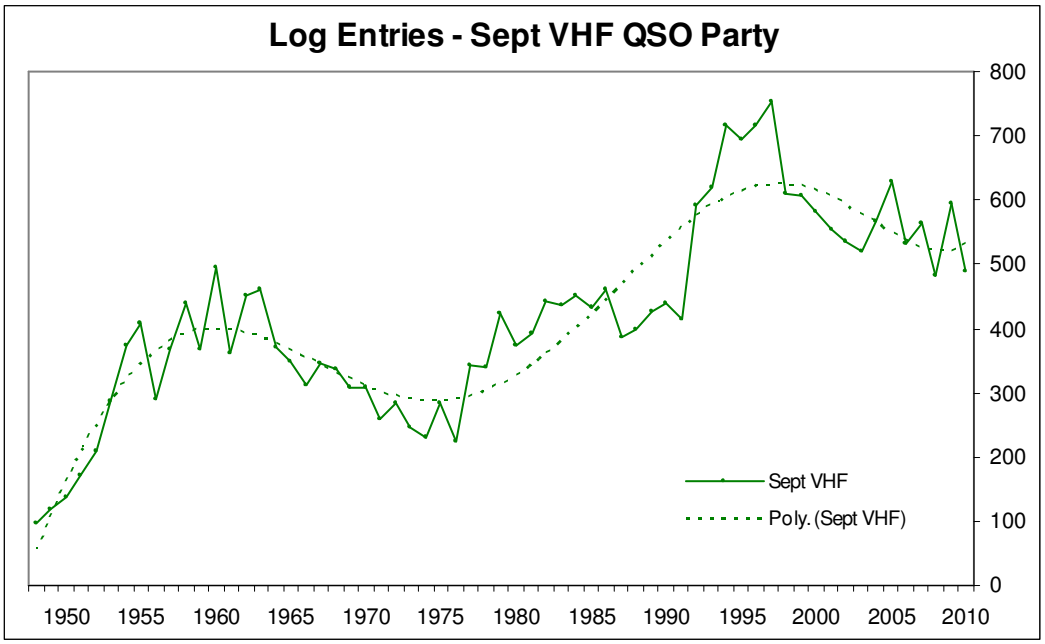
Other clubs have also stepped up efforts to increase their activities. In 2009, club competition in the UHF commenced. SCCC fielded eight "toolbox" rovers to win the medium club competition. Most significantly, in the first year of official club competition, clubs accounted for 45% of all logs. It took September several years to achieve this range of club participation, and June has never reached this percentage. The second year of club activity climbed to an amazing 61%, far above the current club participation levels in other VHF contests. This shows that the clubs were already active in the UHF prior to the development of the club competition, and thus were able to generate sizable number of logs in the first two years of official club activity.

In 2009, the UHF had 244 logs, very close to the record of 249 set in 1993 and 1999. 2010 logs counts were at 222, with over 800 non-unique stations on the air, and 217 total grids activated. These are very healthy numbers for this contest, and August is definitely in a positive situation. In many ways, dedicated club activity has saved this contest from oblivion. There is a concern however that the contest currently is limited in geographical participation, with most activity centered in the Northeast, upper Midwest, and southern California. But even this critique is not overly negative, as the obvious answer would be to increase club and group activity levels in other areas of the nation.

September VHF QSO Party

This contest clearly shows the distinctive double peak of other ARRL contests, even more so than the June VHF. In the early years of VHF contesting, June and September had such low log counts compared with the January VHF Sweepstakes, that both VHF QSO Parties were almost afterthoughts in the contest calendar. After the first peak, contest activity declined so dramatically that the ARRL publicly floated the idea of ending the September VHF [*QST*, 1971]. The trail-off in September was so significant that by 1976, log totals in this contest were at an all time low, at 223. As VHF activity recovered beginning in the 1970's, all three VHF majors expanded, with both June and September becoming increasingly popular. This is part may have been due to technological advances which allowed solo operators to compete effectively even without a club being present in the local area.

Figure XII – September VHF QSO Party Logs, 1948-2010



After the decline from the 2nd peak in the 1990's, September continued its descent even as June began to accelerate. Without e-skip that was readily present in the summer events, the September affair was experiencing difficulties. In 1999, club competition started in an attempt to bolster activity levels. The decline in log counts continued however.

In 2009, it looked like the situation may have stabilized somewhat, with a 100 log surge over 2008. This higher log count in 2009 may have partially due to good tropo being reported in some areas of the country. But certainly the huge drop in logs in 2008 was due to the Hurricane Ike making landfall into the Gulf Coast during the contest weekend. Many states in the South and even the Midwest and East were dramatically impacted by this hurricane [2009, *QST*].

In 2010, matters again appear rather poor, with only 489 logs submitted, back to the weather-induced 2008 levels, but only without the bad weather. Thus, the overall decline in log counts could still be underway. Many contestants observed normal to somewhat good tropo on the higher bands, but participants in the 2010 event also reported very low levels of activity in most antenna directions.

Currently, the problem in September may simply be the result of no one club or group of operators overly caring about the event. January has traditionally seen intense competition among the clubs. June and July now have tremendous activity on 6 and 2 meters from HF + 6 operators, as well as developing interest from HF oriented clubs. August has been adopted by NLRS / Rovermania, as well having enhanced rover activity from SCCC and others. The 10G and the EME both have diehard adherents. Even the

Spring Sprints may be developing new interest. No particular groups or clubs seem to be very motivated by September, however.

So, what can done for this venerable event? Jon Jones [2010] believes the September VHF QSO Party may be evolving into a de facto higher band event. With little or no Es on 6, microwave bands have become essential to produce high scores. The general VHF population may thus be dropping out of the event, being unable to effectively compete against 8 to 10 band stations. Possible solutions include moving September to a 3 or 4 band lower VHF contest (Author's note: a 4 band contest was actually proposed by the Ad Hoc Committee in 2004 for the June VHF QSO Party, but did not receive any general support at the time). A limited event might attract more of a casual VHF or HF type of audience. Or, we could more expressly recognize the event as a microwave contest, and combine it into the August UHF.

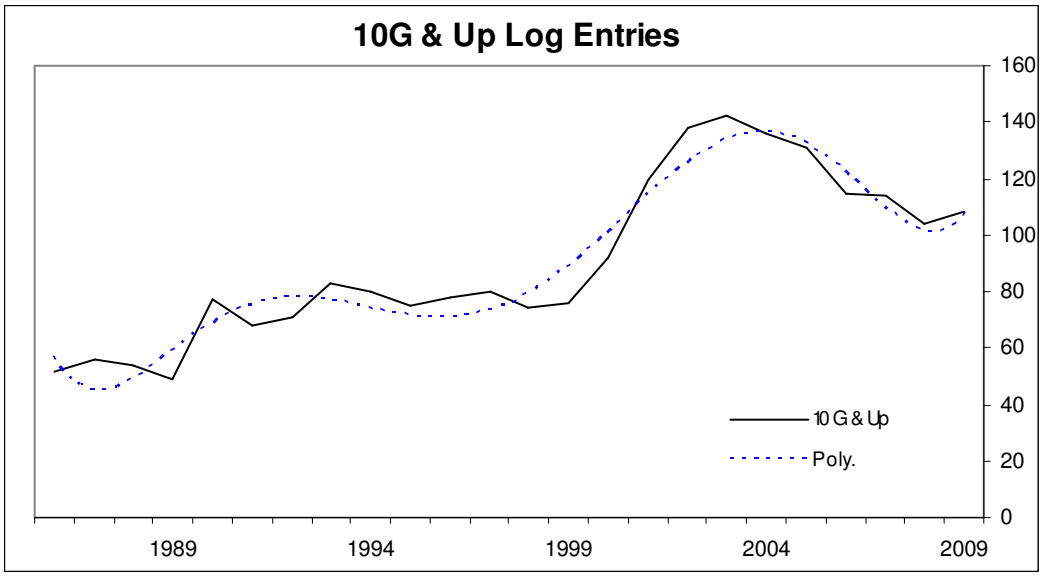
W3ZZ has been a long-time proponent of distance scoring for a wide variety of VHF contests, and recently has suggested August and September as "natural" vehicles for distance-based methods [Zimmermann, 1999, 2009]. A distance scoring working group has extensively studied the general concept. In a poll of its users, September was the most preferred event in which to develop a new scoring formula [Distance Scoring Group, 2009]. While the concept may be radical to some observers, distance scoring is the predominant scoring method used outside of the US. Numerous issues would have to be worked through before a serious multi-band effort could be undertaken in America. One such item is the strong regional difference in geography and demographics which could severely hamper effective participation in distance events in certain areas of the US [Overbeck, 2010; CS VHF, 2010]. But it is a concept that should at least be studied more closely.

Please send the author any other suggestions that might be helpful in generating enthusiasm for September or other VHF events.

10G and Up

Begun in 1986, this event was designed as a specialty affair focusing on the X band of 10 GHz. The contest is unique in several respects, from the usage of distance scoring; to re-contact being allowed every 16 km rather than at grid square intersections; and then to the two weekend format. In 1996, another category was added for the "up" portion of the radio spectrum above 10G. Most participants operate portable, although fixed stations with mast mounts are emerging in areas of high activity. Often, groups will use the two weekends to switch from a high mountain-top or hill to operating as a rover or portable on the run. Although almost all activity is coordinated in nature, no club competition exists.

Figure XIII– 10G and Up Logs, 1986 - 2009



The peaking of log data in the 10G does not appear to be related to the explosion in no-code technicians in the early 1990's, as the frequencies involved in the contest are typically used by individuals with long-standing interest and experience in the microwave spectrum, and certainly are not associated with entry level licensees. Additionally, the 10G peak occurred several years after the mid-1990's peak of the ARRL majors.

Instead, the increase in logs in the 2000's may be related to increasing availability of off-the-shelf transverter equipment as well as microwave equipment hitting the surplus markets. As recently as 2001, the event was still described as an "experimenter's delight". The DB6NT transverters were noted in the 2007 write-up. Most recently, 10G operations have been described as being a blend of commercial and homemade equipment, varying between simple FM gunnplexers all the way to narrow-band transverters, some of which run 20 plus watts of power and 6 foot dishes. Most participants are running narrow-band with 1 to 8 watts of power fed to some type of dish [*QST,* 2009].

Another explanation for the recent fall-off in logs may simply be that fewer people are submitting logs, even as the number of calls signs worked by the leading stations has been going up [*QST*, 2008, 2009].

As technology advanced over the years, distances worked have increased almost exponentially. In the initial years of the 10G, almost all distances were less than 100 km, and many QSO's were far closer. Much longer distance contacts were noted by 2005. 16 separate 1,000 km QSO's were accomplished in 2007, and a continental tropo record of 1,460 km was set in the same year.

Even without club competition, the clubs and numerous groups have been very active in this event for many years. NLRS was noted in the 2003 write-up. Camelback Mountain and members of Mt. Airy were mentioned in 2004. The N. Texas and San Bernardino Microwave Societies were referenced in the early contest results.

Logs, general activity levels, and points are clustered into certain areas of the country, and more specifically, the upper Midwest, Southern California, and the North East. This has resulted in an abundance of log entries from the 1st, 6th, and 0 radio call districts.

At the present time, overall activity levels appear to be stable. But log counts are substantially off the peak years, and without a clear understanding as to the reasons behind this.

Fall Sprints

This set of contests is similar to the Spring Sprints, only set in the Fall. Initially, the Spring Sprints in 1983 proved to be so popular that another series of weekly single-band events ran in the fall of the same year. The Fall version of the Sprints was only four hours in duration. This shorter format (1983 Spring Sprints was six hours in duration) was well-received, so much so that the four hour length was then adopted in the 1984 Spring Sprints. Both versions of the Sprints in 1983 had good activity levels. But no Fall Sprints were scheduled for 1984, and the Sprints were set only in the Spring from that point on.

Then in 1999 when the League gave up sponsorship of the Spring Sprints, the reaction from the amateur community was so favorably inclined to keep the Sprints going, that the Spring Sprints were quickly scheduled and the Fall Sprints were resurrected. Various clubs / groups took administration for each week. Both the Spring and Fall Sprints in 1999 had very good participation, with many of the weekly sprints setting all time high log counts, some of which stand to this day.

Starting in 2000, The Southeastern VHF Society began sponsorship of all weeks of the Fall Sprints. Since that time, the Fall Sprints generally have had similar rules to the Spring version, but some interesting variations exist. The use of telephone, packet, or internet methods to coordinate contacts has been acceptable, but most recently in 2010, assistance was limited to only the microwave Sprints, and the full exchange of information must still be conducted via the radio. The Fall Sprints scores rovers similar to the way mobile activity was originally handled, with scores being calculated separately for each grid traversed. The scores in the each grid are then summed for a composite score (rather than all contacts and grid multipliers being multiplied). This produces a far smaller rover score than with the current ARRL rover rules, and may be an implied response to pack rovers posting huge scores per the ARRL rules. A QSO point schedule for the various bands is also currently in effect. Beginning in 2010, 6 digit locators were mandated for the 432 and Microwave Sprints, but all weekly sprints retain grid square multipliers and have not moved to distance, as the Spring Sprints has done. For many years, the Spring Sprints has strongly encouraged six character locators, but has never required six digit exchanges.

Thus over time, there is increasing variation in rules between the Spring and Fall Sprints. While the ARRL VHF contests have generally become more similar to each over the

years, the two versions of the Sprints are growing apart, developing individualized rules. The following table contains the statistical information that is available on the Fall Sprints.

Figure XIV – Fall Sprints Contest Activity

Year	Logs	Stations	6	2	222	432	902	1296	2304	3456	SO	Rover
2009	180	99	26	61	45	34		14			167	13
2008	132	65	21	45	31	25		10			118	14
2007				41		40						
2006	138	79	21	38	41	29		9			124	14
2005	118	68	17	30	33	28		10			101	17
1999	180	79	24	41	34	33	16	17	9	6		
1983	355	201	69	163	45	59		19				

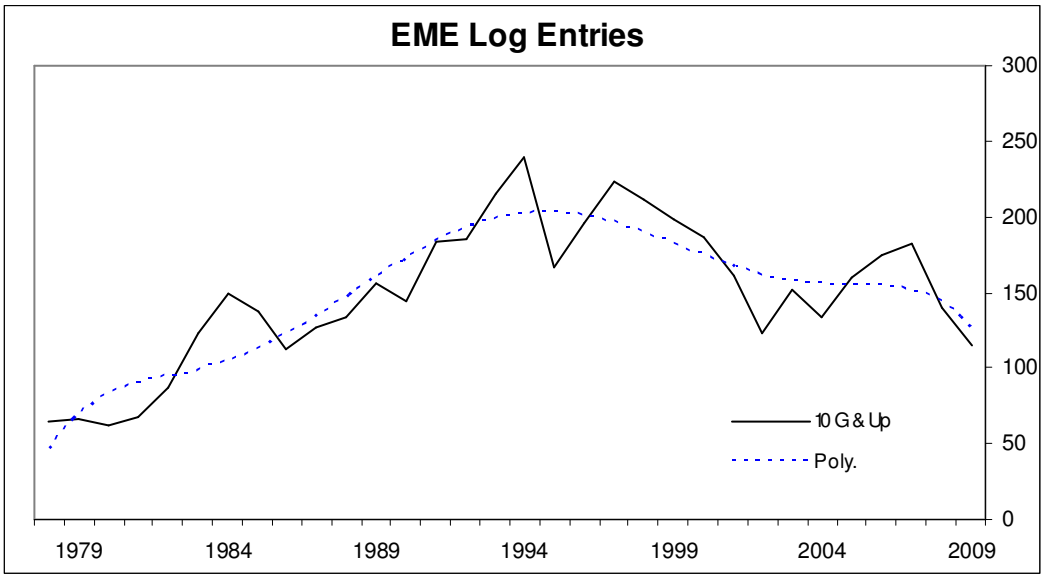
Due to the lack of data being available for six of the last ten years, no real conclusions can be drawn as to the trend in this contest. Many contesters are glad to have both versions of the Sprints in the contest line-up, however.

The ARRL EME

This is the third specialty event sponsored by the ARRL. Started in 1978 over two weekends in the spring, DXCC entities, US states, and VE provinces are used for the multipliers, and the required exchange is both call signs and a signal report, plus an acknowledgment of the calls and report. In 1982, the event was changed to two weekends in the fall. With an overlap of the seasons, 1982 thus became the only year in which two EME contests occurred (the 5th EME in the spring and the 6th EME in the fall). The contest was expanded in 2004 to three weekends, with an additional weekend devoted to microwave QSO's. The exact dates for contest weekends are generally selected based on projected EME path conditions.

Assistance using packet spots was approved for the single-op class in 2005. Digital and analog developed into two separate SO categories thereafter. Classes have been revamped several times over the years, with many changes occurring by category (SO, multi), by band (single, multi, all), and mode (digital vs analog). By 2007, numerous categories existed, causing consternation to many participants. Several categories had little or no activity [*QST*, 2007].

Figure XV – EME 1ogs, 1978 - 2009



In the last several years, digital and assistance issues have created a huge rift inside the EME community. See, Ward Silver, N0AX, for a thoughtful piece on digital and analog technologies [*QST*, 2007]. The complexity of the categories as well as digital and assistance issues became increasingly contentious. In 2009, the categories were reduced to four – SO, Multi, CW or All Mode, although awards were still given for each band of operation. At the same time, the assistance debate became so heated that all assistance categories were deleted. This created something of a backlash, with some stations engaging in a boycott of the competition. 25 fewer logs were submitted in 2009 versus 2008.

The VHF / UHF Advisory Committee (VUAC) initially considered the matter in 2008, resulting in the above-noted revisions to assistance in 2009. After the 2009 EME contest, VUAC again studied the assistance issue in early 2010, and various options were considered. A report was then submitted by VUAC to the ARRL Program and Services Committee (PSC) briefly outlining the EME matter [VUAC, 2010]. In July, 2010, the PSC tasked VUAC to further study SOLP power levels, but did not task the committee with any further work on EME assistance. Thus, no changes were made for the 2010 EME contest. Another rumored boycott may be occurring in 2010. The controversy continues within the EME community.

Probably of greatest concern is the long, declining trend in the data. A highpoint of 224 logs was reported in 1994, with a significant trail-off after that. Even aside from the 2009 log count, more recent contests have been producing only 140 to 180 logs, far below prior levels. With technology rapidly advancing in this area, one would think that activity in the EME would go up rather than down. Even though digital modes have produced a revolution in the ability to work signals off the moon, the newer technologies many have actually destabilized contest participation. Recent events in this contest may be a powerful example of how emerging technologies can challenge the status quo [Platt, 2010].

Another possible reason for the decline in logs may be the relative lack of log submissions compared to overall contest activity. This would be similar to analysis in the 10G where logs are declining even as call signs worked are holding steady. But data on total stations worked, as well as unique and non-unique information, would be needed before any determination on such a possible cause could be made.

Still another reason for the lower log counts may be that EME events have started in Europe. Participants may be dividing their energies between various world-wide EME events rather than exclusively focusing on the ARRL EME.

The multi-tiered complexity of the rules has also been cited as a complicating factor in the EME, especially for participants whose primary language is not English [Taylor, 2010].

Between the 16 year slide in logs and the more recent debate regarding assistance and digital modes, the current status on this contest is of some concern. While the event certainly attracts a dedicated and core group, the lack of internal cohesion has disrupted the tight-knit band of stations inhabiting the EME sub-bands.

Meteor Scatter Contests

Rallies and contests based on meteor scatter (MS) have been held in the US since 1998. Western States Weak Signal Society (WSWSS) initially sponsored a high speed CW contest, dubbed the NA HSMS Contest. It was set for the Eta Aquarids shower in early May of each year. This shower has short bursts associated with it, which would be ideal for high speed work.

In 2002, the WSJT user's group took over the event, styling it as more of a "rally". By this time, digital was replacing high speed CW as the dominant means of faster types of meteor scatter. For a while, any form of meteor scatter communication was deemed acceptable in the Rallies, including SSB and regular CW. By custom however (and sometimes by the rules themselves), the event attracted a digital only audience.

The day time nature of the Eta Aquarids was thought to be a limiting factor, so another meteor scatter contest was scheduled during a night-time shower, the Geminids, taking place in December. This pattern of two contests per year continued through 2007. Due to the extensive time it took for the administration of the contests as well as declining participation in the Eta Aquarids, starting in 2008 only one rally was held each year, during the Geminids. The WSJT group continues to be quite active however, sponsoring weekly random activity hours, as well as giving awards for achieving various milestones on MS.

Given the nature of the emerging high speed technology, considerable variation and experimentation has occurred in the rules. Various classes have existed based on power

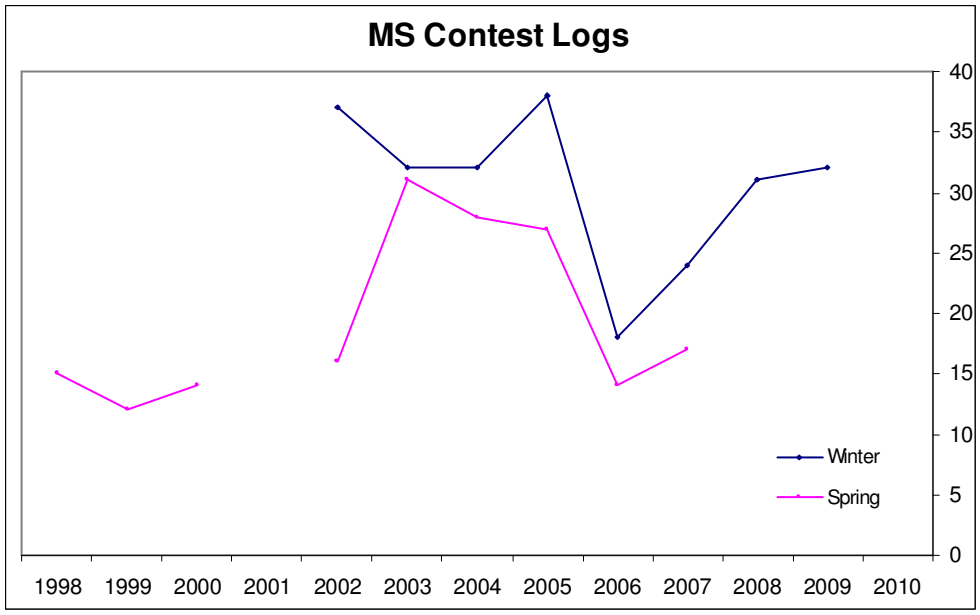
levels, bands of activity, assistance, and random work. Contacts have been weighted by band, random, and unassisted. The definition of assistance has changed over the years, as well. At one time, passive reading of Pink Jockey and other real time web-sites was considered unassisted, but more recently, any real time endeavors have been classified as assisted. The most recent contest encourages all use of assistance, without creating a separate class for random or unassisted contacts and without extra QSO points, either. Additionally, in the early years of the MS events a call-sign could be worked only one time during a contest, regardless of grid square. This restriction has gradually given way to rover rules that are closer to other VHF contests, resulting in greater rover activity.

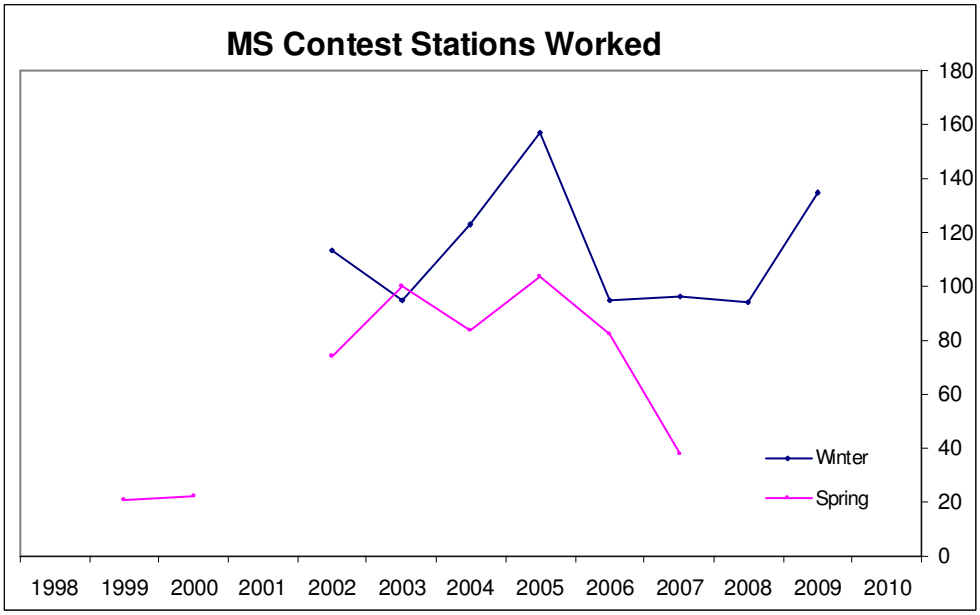
Distance scoring was tried in the 2009 Winter Rally. Logs, total stations worked, and total grids activated were up. But western stations felt limited by the new rule, stating that low population density areas (as well as being generally able to work only in one direction) posed a significant disadvantage in a MS contest. The 2009 rules also provided for any means of communication via digital, and not just meteor scatter. In 2010, the Winter Rally has returned to the more typical QSO points * grids formula, although a distance bonus is now contained in the rules, so that the score = (QSO points + bonus if QSO > 1000 miles) * grids.

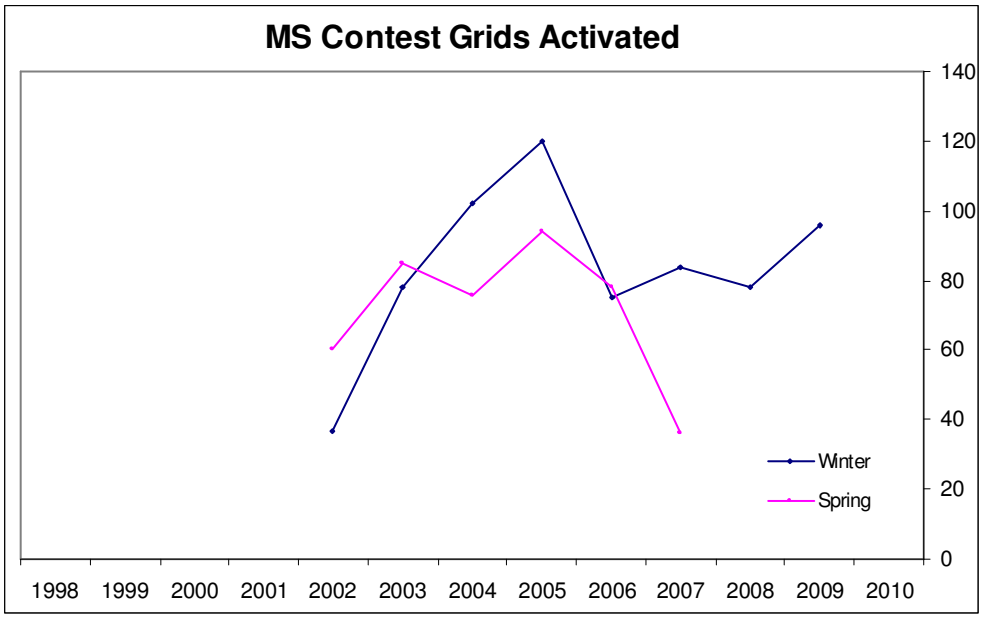
The 2010 Rally is a MS digital only event, bringing the event back to its roots of exclusive meteor scatter communication. Classes are single vs multi-band; and high vs low power. QSO points are 1 point on 6 meters; 2 points on 2 meters; 4 points for 222; and 8 points for 432.

One of the nicer features of the administration of this contest is the availability of a wide array of data. The following graphs display not only log information, but also stations worked (referred to by the sponsors as “unique” calls), and total grids activated (referred to as “unique” grids).

Figures XVI, XVII, XVIII – NA Meteor Scatter Contests


MS Contest Logs
40
35
30
25
20
15
10
5
0
Winter
Spring
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010


MS Contest Stations Worked
180
160
140
120
100
80
60
40
20
0
Winter
Spring
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010



Currently, the contest appears to be at stable participation levels, with an increase recently after losing activity in 2006. With greatly enhanced abilities of communication via digital methods, it is curious why more people do not partake in the MS Rally. Perhaps, the learning curve of the digital software is hampering greater participation in this interesting event. One of the organizers of the event, Tip, WA5UFH, believes that the limiting factor of the Rally is related more to the trajectory of the meteor showers themselves, making many MS contacts limited in distance and largely restricted to the incoming angle of the meteors.

Conclusion

The following table is a quick recap of current conditions on the aggregate and individual contests. The "Current Status" column is a succinct summary of comments contained in the main text, and is essentially a subjective evaluation of the contests. The last two columns state the evaluation in more objective, quantifiable terms. The third column is the average log count in the most recent 5 to 6 years since 2005 (January, June, August, and August contains 2010 results, so these events have 6 years of data averaged). The fourth column is the percentage change (or in statistical parlance, the geometric compound annual percentage change), over the same 5 to 6 years. A positive percentage change indicates an upward slope in the recent data, a negative change represents a downward trend.

Figure XIX – Status of US VHF Contests

Contest	Current Status	2005-10 Ave Logs	2005-2010 % Change

Aggregate	Mixed to slow growth	2,319	2.5%
January Sweeps	Mixed to stable	744	-0.3%
Spring Sprints	Interesting experiment	229	5.5%
MAD	Insufficient data		
SBMS 2G +	Insufficient data		
June VHF	Very positive	1,028	7.8%
SMIRK	Insufficient data		
July CQ VHF	Very positive	488	17.8%
August UHF	Positive	200	4.7%
September	Mixed to negative	548	-2.0%
10G	Stable to mixed	114	-4.5%
Fall Sprints	Insufficient data		
EME	Mixed to negative	154	-2.9%
MS Contests	Stable	29	0.0%

It is interesting to compare conclusions drawn by other reviewers. Platt [2010] generally agrees with the conclusions. Zimmerman [2010] believes that the aggregate is barely stable; June is very positive on 6 meters, but barely stable on higher bands; the 10G is stable to declining; and the EME is declining and definitely not mixed.

Overall, September poses the most concern among the major eventss. January should also be watched closely, however. The EME community needs to work through assistance and digital issues, as well as being concerned with the long decline in logs since the mid 1990's. The 10G has been in decline for some time on the log counts, although contest write-ups suggest that total station activity may have remained the same. This again points to the need of supplementing log data with other important information.

On the positive side, June has become the preeminent US VHF contest, with the CQ VHF, the August UHF, and Sprint Sprints all having very interesting and positive things going on in them. Sponsors of the CQ VHF and the ARRL EME should be applauded for extending their events internationally. And while ARRL are CQ are commonly viewed as the primary sponsors of the VHF contests, it is noteworthy that three societies (Central States / K9JK; Southeastern VHF Society; San Bernardino Microwave Society) are now sponsoring innovative and interesting specialty events.

From a policy perspective,

- The possible downtrend in September should be seriously discussed, along with appropriate remedies, if any.

- The EME community should be encouraged to discuss the various issues on digital and assistance, with an eye towards some type of eventual resolution.

- The contest rules structure should be adept enough to take advantage of quickly developing newer technologies while maintaining consistency of the rules set.

- Club activity should continue to be encouraged.

- It is requested that the following data be made available on a routine basis, as that would provide better comparability between various contests and between years of the same contest. Non-unique call-signs and total grids activated (highlighted in blue type in Figure XVII) are probably the most important supplemental statistics. Current availability by sponsor is noted in the columns.

Figure XX – Requested Contest Data

Information	ARRL	CQ
Total Logs; logs per band	Data-base	Write-up
Total call signs worked		
Uniques, non-uniques, bad calls		
Total Grids Activated; & by band		Write-up in last few years
% of Dupes, Aggregate		Write-up
% not in log, Aggregate		Write-up
% error rate; Aggregate		Write-up
Total QSO's; QSO's / band	Data-base	Write-up on Ttl QSO's only
Total Mults; ttl mults / band	Data-base	Write-up on Ttl Mults only
Total Points; ttl pts / band	Data-base	Write-up on ttl points
# of clubs	Data-base	
Club logs	Data-base	
Club Points	Data-base	

Supplemental Notes

Biography, Revisions, Reviewers

Kevin Kaufhold, W9GKA, has extensively written and spoken on several areas of VHF contesting and operating activities. This article is designed as a working document, and is essentially a continuation of the VHF contest trend series of articles and presentations. The paper focuses on trends in individual VHF events.

Kaufhold is currently on the SMC Board of Directors; the moderator of the VHF Distance Scoring Working Group; a co-founder and member of the FFMA user's group; a member of the St. Louis Area Microwave Society (SLAMS); regularly participates in Central States VHF Conferences; and is the VUAC representative from the Central Division. None of these organizations have sponsored or requested development of this article. All opinions and commentary expressed in this paper are undertaken by the author in his individual capacity.

Revision dates

- 1st Draft, 10-2010;
- 2nd Draft, 10-2010 added reviewers comments in a supplemental section; added more data on Spring Sprints; added new sections on Fall Sprints, the 2G+ contests, the NA HSMS Rally, and SMIRK.

Reviewers

The author thanks the following individuals for reviewing early drafts of this paper. They have provided great insight, resulting in substantive revisions to this article. The ordering is generally by date of review / response.

- Gene Zimmerman, W3ZZ
- Tom Frenaye, K1KI
- Steve Clark, AG4V
- John Lindholm, W1XX
- Wayne Overbeck, N6NB
- Jon Platt, W0ZQ
- John Kalenowsky, K9JK, comments and data on Spring Sprints
- Jon Jones, N0JK
- Karl Bretz, access to *NCJ* issues for Spring Sprint data
- Jim Worhsam, W4KXY, data on Fall Sprints
- Curt Roseman, K9AKS
- Joe Taylor, K1JT
- Tip, WA5UFH, comments regarding the MS contests

Comments / Reviews on Statistical Modeling

Many peer reviews to early drafts of this paper, as well as responses to presentations made by the author in 2009, commented on various aspects of the statistical model. Some of these thoughts have evolved into a lively and on-going discussion of VHF contesting. The following is a condensation of this interesting thread.

Measures of Contest Activity. Lindholm [2010] believes that logs received is not necessarily an accurate measure of participation. Many casual operators will simply come across the summer contests, with no intention of submitting a log. With the CQ VHF having only the two lower bands, the amount of casual activity may be especially high there. Log submissions can be highly influenced by club activity, popularity of event, and overall reach of the sponsor. Zimmerman [2010] even describes log counts as primarily being a popularity poll. The stations worked statistic would not be so easily influenced.

Overbeck [2010] notes that the statistical evidence of declining logs counts in the last 1970's is contradicted by national records and high QSO counts which were being set at the same time.

Zimmerman [2010] is even blunter in his comments, arguing that log counts, and statistical analysis in general, misses much of the underlying factors involved. For instance, all three ARRL specialty events show the distinctive increase in log counts consistent with the 2nd peak of contesting in the 1990's, and yet regulatory changes at that time had absolutely nothing to do with increasing log entries in the 10G and the EME.

Total non-unique calls minus total bad calls (i.e. dupes, broken calls, not in logs, not in country data base) would be a much better measure of contest activity than logs received [Zimmerman, 2010]. Overbeck [2010] notes however that a focus on non-uniques would eliminate many valid QSO's by stations who have contacts with only a well-equipped station.

After considering the reviewers thoughts, the author suggests the relevance of the following variables. Note that the first four variables go far beyond what is currently used for statistical analysis in the main text (that of log counts).

- Stations Worked. This may be the broadest of contest measures, indicating the level of total activity generated by the development of a contest. Unfortunately, this variable would have bad and busted calls within it, and thus could substantially overstate the true level of station activity in a contest.

- Non-Unique Calls. This is stations worked that has been worked in two or more logs submitted for the contest. This removes many of the bad calls of the stations worked variable, but may now somewhat understate the level of contest activity, as it would exclude valid contacts by stations who have QSO's with only one station who entered a log. Overall, this variable would at least provide a good "close estimate" of station activity.

- Total QSO's. This variable would not be based on the number of stations participating in an event, and thus would potentially provide more depth to the statistical analysis. However, total QSO's would likely be affected by contest activity, and also propagation characteristics and by long-term technological impacts. Thus, this variable may be useful for identifying both changing propagation and technological related items.

- Total Grids Activated. This is another way of measuring contest activity without the use of log counts, and thus may be another type of data would couple prove very useful to statistical analysis. This variable might also be somewhat influenced by propagation and technology, but would display a very interesting geographic and possibly demographic pattern by band and / or by contest.

- Logs Submitted. This is likely the narrowest of contest measures, identifying only those stations who turned in a log. Log counts are likely driven by club competition, section and band award incentives, the desire to see one's calls in the line scores, and a sense of dedication and loyalty to the contest itself or contest sponsor. Of course, one needs many logs to be submitted for the other above noted variables to be useful. Log counts have been the traditional measure of contest activity, since almost all contest results publish either the line scores or the number of logs submitted with the various clubs in an exclusive club competition event (e.g. SBMS 2G+).

Technology. Many comments were received on technological impacts. The conversion in the 1960's and 1970's from AM to FM could be measured by identifying the clubs with AM net activity that moved onto FM [Zimmerman, Outline, 2010]. Several observers note that the 1st generation of commercial VHF SSB equipment in the 1960's (Heath SB-110, Swan 250, TR-6) and the 1970's (TS-700, and competing rigs from Yaesu and ICOM) became a major catalyst for the uptrend in contesting activity [Overbeck, 2010; Clark, 2010]. Jones [2010] feels that the move away from AM initially increased QSO counts, as FM simplex surged by the early 1970's. Jones also mentions the impact from commercial VHF radios, and believes that the advent of solid state radios and amplifiers greatly enhanced portable and mobiling activities.

The introduction of the ICOM 706 series in the late 1980's and early 1990's was certainly a major technological improvement, but may not have increased activity levels greatly during the 2nd peak. It is just that the 706 was frequently used by the influx of no-code technicians in the early 1990's. Similarly, the introduction of digital modes has not attracted a huge group of new contesters. So far, digital has largely been used by existing VHF contesters in search for more multipliers and QSO points. But the overwhelming consensus is that the HF + 6 radios introduced by the early to mid-2000's did have a huge impact on summer VHF contests, with HF operators flooding onto the 6 meters band with the newer radios.

Roseman [Outline, 2010] has proposed that technology changes could be tested with dummy variables in successive eras.

Propagation. Some individuals feel that propagation affects log counts in specific years. Years of good propagation could be identified and then tested for correlation to log entries [Roseman, Outline, 2010]. Overbeck [2010] notes that successive years of poor propagation in September may be giving a false impression of declining activity. Zimmerman [2010] mentions the reverse in June, where great propagation on 6 meters has created a belief of increasing popularity, even though the activity may just be an indication of better propagation, and with upper bands possibly being in decline.

QSO data provides numerical sources of data that are currently not in the model, and this may provide a new data variable. Propagation in June could also be reviewed for effect upon log counts by analyzing some of the bigger M-U, SOHP, and SOLP QSO totals [Zimmerman, Outline, 2010].

Rules Changes. While rules changes have not been shown to statistically generate increased log counts, Jones [2010] believes that the 1983 change to grid squares dramatically affected the nature and quality of VHF contesting. When there is little or no propagation, local rover activity can still make for a quite lively contest. As far back as the late 1980's, the combination of solid state equipment and mobiling towards the grid corners was making an impact on scores of bigger stations. (W9GKA comments: There were even some indications in the write-ups that mobiles / cars were in use to some extent before 1983, in order to provide new sections on each band). The development of the maidenhead grid system was a driving factor in propelling portable / roving activities, according to Jones..

Socio-Economic-Demographics. Zimmerman [2010] believes that socio-economic and demographic factors are much more important than even regulatory changes. Such factors, of course, are only contained in the residual error term of the statistical model, because of the inability to statistically measure them.

Solar Numbers. While testing has not shown any correlation between sun spots and VHF activity, there have been two defined periods in which even the contest write-ups highly suggested such a linkage. The tremendous F2 conditions in the late 1950's coincided with the largest boom in VHF contesting history, and the 1970's downtown in logs occurred at precisely the time of a solar downturn. Roseman [Outline, 2010] has suggested lagging solar numbers by 1 to 4 years. A regression on particular time periods could be conducted, but may only amount to data mining.

Administrative Items. The ARRL reporting mechanism has also been cited as a factor that is keeping log counts artificially low [Zimmerman, 2010]. With many problems having occurred with computerized log submissions, many people participating in a contest do not even try to enter a log. The complexity of the rules set and the loss of line scores from QST also may be aggravating factors [Taylor, 2010]. (W9GKA comments: I know of several long-standing contesters who regularly operate VHF contests but do not submit logs, due to their frustration over the line scores).

Forward Projections. Overbeck [2010] believes that it is hazardous to make long-term projections without assessing more variables, some of which cannot be easily measured statistically. Such variables include the age-wave among VHF operators, the emergence of competing avocational activities that cannot be predicted in advance (i.e. Twitters, Facebook), and the arrival of new radio technologies.

Comments / Reviews on Distance Scoring

Reviews of this paper also discussed the distance scoring concept which was noted in the Spring Sprints and September VHF sections of the main text. Comments on the topic were also received at the 2010 CS VHF Conference, as well as being received on an on-going basis from the Distance Scoring Working Group. A summary of all recent thoughts given to the author follows ---

In general, there has been some concern expressed that EU examples of distance scoring may not be applicable in the US, with less density population and greater open spaces. There is also a belief from both midwest and western stations that the distance scoring would inevitably favor the high population centers of the North East.

Further, some feel that the consistency gained over 25 years of scoring based on grid squares has great value that should not be quickly tossed aside. There is also a belief that much of the impetus behind distance scoring is really an anti-rover attitude, and in particular, an anti pack-rover mentality.

Conversely, distance scoring was the predominant means of scoring in the US between 1927 and 1947. Thus, moving back to distance for selected events would be well within the heritage of US VHF contesting. Many proponents believe that distance scoring would provide greater diversity in the rules set. This could possibly alleviate burnout and fatigue from contesters who have grown tired of a monotonous rules regime, and well as from individuals searching for relief from the never-ending debate on rover rules. These individuals do not see distance-based efforts as an affront to roving, but only as a request to try something new and different from current scoring methods. Additionally, a distance event would not have to be universally deployed across all VHF contests. Some people would be happy to have just one multi-band distance contest developed.

Author Comments

On Statistical Models. The numerous thoughts expressed on statistical processes have been most illuminative. Many of the suggestions have great merit and should be explored further.

The statistical modeling conducted to date can certainly be improved upon. All statistical and mathematical efforts are essentially imperfect simplifications of complex, real world endeavors. Adding more variables for propagation, technology, and QSO data should be attempted. Developing additional data for non-uniques and total grids activated show the greatest promise, as the depth of information would increase significantly. It is very likely that our beliefs toward the "current state" of vhf contesting would undergo major revisions and adjustments if such data were publicly available.

Even if descriptive and statistical models are naïve in many of their simplifying assumptions, such endeavors at least attempt to provide objective information in deductive and inferential ways. In this regard, mathematical models primarily serve as a baseline of discussion, reducing much of the emotional rhetoric which often surrounds intensely held beliefs. Professional business and technical occupations routinely utilize and rely upon statistical and mathematical processes in a wide array of applications. To this extent, the amateur radio community is just now beginning to approach professional-level analysis. Already, we have learned a great deal about the explanatory factors in

VHF contesting. It is still up to the policy makers to factor that learning and knowledge into contest administration.

On Distance Scoring. We now have conducted a very extensive analysis of the concept, including an open discussion and publication of a significant report. Seven simulations of various distance rules have been done using actual contest log data. Proposed baseline rules and calculation methodologies have even been enunciated. Results of the 2010 Spring Sprints suggest the validity of single-band distance events in the US.

Before we implement a multi-band distance event however (and especially in a major such as September), it would be prudent to undertake sequential steps. Such steps could initially include the continued development of the Spring Sprints, then running simulations of distance scoring rules on an entire data base of an existing multi-band contest. The proposed baseline distance rules, along with several alternate ideas, could thereby be statistically evaluated without adversely impacting existing events. The information gained from that simulation could then be tested out in a variety of ways, including a live experimental multi-band event using distance scoring rules; a contest within a contest (sometimes referred to as a parallel contest); or the cumulative award of the Spring Sprints could be expanded into a broader, multi-band competition.

Of course, at any stage along the way, this sequential process may only prove up the difficulty or impossibility of implementing distance scoring in the US. If so, we are none-the-worse-off for the effort, and would still quite likely learn many other things in the process. The author is therefore generally in favor of continued study and exploration of the concept in a sequential fashion.

References

Data Sources

Before 2002, data is based on manual counts of all ARRL and CQ VHF contests. Historical contest data is contained in the W9GKA VHF Data file, available at:
http://www.w9smc.com/SMC%20VHF/uvhfdata.pdf

After 2002, most ARRL data is available from the data-base located at the ARRL web-site. A few years of ARRL non-unique station counts were obtained from the 2004 ARRL Ad Hoc VHF Committee Report, by K1KI. 10G unique data is taken from the 10G on-line Results articles. CQ VHF log data is based on manual counts, while other data of that contest (total grids activated, non-uniques, etc) is taken from summaries contained in the CQ VHF results articles.

Data on the VHF Spring Sprints is based on manual counts of published line scores for the years 2007-2010, available at the Spring Sprints web-page, as well as being contained in the CS VHF Conference Proceedings. 2000-2005 log counts and 2006 estimates come from K9JK, who collected the data from E. Tn DX Assn. Source of data for 1999 Sprints were manual counts of results contained at the NEWS and VE2PIJ web-sites. 1998 Sprint data was provided by the ARRL / KX9X. 1987-1997 log information was based on manual counts of *NCJ* Results. 1983-1986 Sprint numbers are based on *QST* Results.

As to data on Fall Sprints, 2008 and 2009 results were available at the South Eastern VHF Society web-site. Results from 2005-2007 were obtained from W4KXY. 1999 data for all weekly sprints was available through the NEWS web-site. 1983 Results were printed in *QST*.

Data and information on the SBMS 2G+ Contest come from the San Bernardino Microwave Society web-site and newsletters. Information on the SMRIK contest is taken from the SMIRK web-site, while data, rules, and information on the MS events were extracted from the NAHSMS web-site as well as from comments of WA5UFH.

Articles, Presentations, etc

References are listed in chronological order, and then generally by author or title.

2010, ARRL VUAC Committee Executive Report to ARRL Board of Directors

2010, Steve Clark, AG4V, correspondence reviewing early drafts of this paper.

2010, "Distance Scoring in VHF Contests", CS VHF Society Conference Proceedings and technical presentation

2010, Jon Jones, N0JK, correspondence reviewing early drafts of this paper.

2010, John Lindholm W1XX, correspondence reviewing early drafts of this paper.

2010, Job Platt, W0ZQ, correspondence reviewing early drafts of this paper.

2010, "Outline of Descriptive Model and Bibliography on Trends in VHF Contesting", available at: http://www.w9smc.com/SMC%20VHF/Outline.pdf

2010, Wayne Overbeck, N6NB, correspondence reviewing early drafts of this paper.

2010, Simulation 7, “Analysis of the Spring Sprints”, Distance Scoring Working Group, in draft stage as of October, 2010.

2010, Joe Taylor, W1JT, Correspondence reviewing early drafts of this paper.

2010, Louis Tipton, WA5UFH, Correspondence on the HS MS contests.

2010, Gene Zimmerman, W3ZZ, Correspondence reviewing early drafts of this paper.

2009, 10G & Up Contest Results, *QST,* Expanded ARRL on-line version.

2009, “Cyclical Trends in VHF Contesting”, CS VHF Conference Proceedings and technical presentation

2009, John Kalenowsky, K9JK, “History of the Spring VHF / UHF Sprints”, 2009 CS VHF Conference Proceedings, at 31.

2009, “The Past, Present, and Future of VHF Contests”, *QST,* Oct, 2009, p.80.

2009, VHF Distance Scoring Report, available at:
http://www.w9smc.com/SMC%20VHF/DistanceScoring2009Report.pdf

2009, Gene Zimmerman, W3ZZ, The World Above 50 MHz, *QST*, May, 2009, at 89-91

2008, *QST* results of 2008 September VHF QSO Party contained on-line and in March, 2008 *QST*.

2007, 10G & Up Contest Results, *QST,* Expanded ARRL on-line version.

2007, “Are Changes ‘Blowing in the Wind’ on VHF?”, March, 2007, *National Contest Journal*

2007, EME Contest Results, *QST,* Expanded ARRL on-line version, including comments of Ward Silver, N0AX

2006, “A Statistical Model of VHF Contest Activity”, CSVHF Society Conference Proceedings.

2005, “A Descriptive Model of VHF Contest Activity”, *NCJ*, May/June, 2005, p. 14-16.

2005, "Other Impacts on VHF Contests", available at:
http://www.w9smc.com/SMC%20VHF/OtherImpactsarticle.pdf

2005, 10G & Up Contest Results, *QST,* Expanded ARRL on-line version.

2005, 2004, Gene Zimmerman, W3ZZ, Correspondence regarding contesting trends

2004, “The Role of Clubs on VHF Contest Log Entries”, Mt. Airy VHF Club *Cheese Bits,* January, 2005; and SMC *Black Hole,* Dec. 2004, p.3 +.

2004, 10G & Up Contest Results, *QST,* Expanded ARRL on-line version.

2003, 10G & Up Contest Results, *QST,* Expanded ARRL on-line version.

2003, VHF Contesting Reflector Archives on development of MAD’s

2001, 10G & Up Contest Results, *QST,* Expanded ARRL on-line version.

1999, “Distance Scoring: Time to Change the Rules?”, Gene Zimmerman, 1999, *CQ*, March 1999, at 23.

1999, ARRL announcement on Spring Sprint sponsorship.

1982, August UHF Results, *QST*, Dec, 1982, at 91

1981, June *QST*, Contest Corral for announcement of SMIRK contest.

1971, September VHF QSO Party results, *QST*, Dec. 1971