Historical Notes of VHF Contesting and Operating

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General Notes

- Anyone having historical knowledge of VHF contest rules and/or VHF activities not mentioned below should send the information to w9gka@arrl.net.

- The SMC Area VHF high scores and records for most ARRL VHF contests have been compiled by reviewing back issues of *QST* between 1948 to the present and/or the ARRL web-site since 1997 to the present (unless otherwise noted below in the Notes on Specific Scores in the SMC Area). The compilation is thought to be reasonably accurate, although certainly not guaranteed. Any corrections, revisions, and/or updates should be sent to w9gka@arrl.net.

- Complete scores are available in *QST* for the January VHF SS. Scores for the June and September VHF QSO Parties are taken from either contest results published in *QST* or from claimed scores and score results contained in early "The World Above 50 Mc" columns.

- The SMC Area VHF Records and High Scores are provided across all time frames, for the sake of completeness of the historical record. However, scoring in various contests and categories has been dramatically altered over the years for a variety of reasons. Many of the changes have had the effect of increasing overall scores. It therefore may not be appropriate to directly compare results across different scoring epochs. In particular, the following events serve as significant breakpoints between scoring methodologies:

    - The adoption of QSO Points between the bands in the 1978 January VHF SS, instead of contact points regardless of band.

    - The adoption of DXCC countries as additional multipliers beginning in the 1978 June VHF QSO Party.

    - The incorporation of Maidenhead grid square designations for each band worked, beginning in the 1983 August UHF, as the multiplier for all VHF Contests (except the 10 GHz and the EME) instead of the use of ARRL sections.

    - The adoption of and then the revising of the Rover scoring methods between 1991 and 1995.

- Paul, K9PG and Brian, K9QQ/KH6 provided assistance on the initial development of the SMC Area VHF Records and High Scores. Brian continues to his invaluable abilities as webmaster, *par excellence*. Karl, K9BGL gave access to *QST*'s back to the 1930's (and complete sets, too!!!). Curt Roseman, K9AKS, has provided valuable comments and information on VHF contesting. Several others have given comments on various line scores including Bob, K2DRH, Pete, K9PW, and John, K9IJ. Thanks to all these hams for assistance.

Historical Notes on VHF Contests, VHF Operating, and the General Use of the VHF and UHF Spectrum

- **The Early Days of Radio.** Experimentation of spark gap transmissions by Henry Hertz in the mid 1880's may have occurred on wavelengths as high as 300 Mc. Spark gap transmitters and galena crystal receivers were then considered state of the art.

- The Bureau of Navigation of the US Department of Commerce initially had jurisdiction over the regulation of airwaves. In 1912, the Bureau authorized the first amateur radio transmissions. The American radio Relay League formed shortly thereafter, and the first issue of the League's magazine, *QST*, began publication in 1915.

- Hams initially referred to any radio activity above 30 Mc as being on a "ultra-high" frequency, abbreviated as U.H.F. It was not until after WW II that distinctions were made between VHF, then generally viewed as being between 50 and 400 Mc or so, and UHF, being the frequencies above 400 MHz.

- The reception and transmission of radio waves took a major leap forward when Edwin H. Armstrong first invented the super-regenerative receiver in 1922, and then further developed and advanced Frequency Modulation techniques. Armstrong's new FM methods necessitated the use of frequencies above 30 Mc where space was available for wide bandwidth transmissions.

- By the mid 1920's, a few hams had ventured onto a 5 meter band (65,000 – 75,000 kc) that had just been allocated to specially licensed amateurs. In March 1925, the Department of Commerce also allocated the ¾meter band (400,000 kc to 401,000 kc) for amateur use.

- A technical editor at the ARRL, Robert S. Kruse, contributed greatly to the early usage and development of 5 and ¾ Meters when he wrote numerous articles in *QST* on equipment and antennas at UHF frequencies, as well as writing a monthly *QST* column entitled "Experimenter's Section Report".

- In early 1927, the Federal Radio Commission was given jurisdiction over the regulation of the airwaves through Congressional amendments to the 1912 Radio Act.

- By March, 1927, regular two way contact on 5 Meters was occurring between a few stations located in close proximity to each other. For instance, repeated communication between 2EB in New York City and 2NZ in New Jersey some 15 miles away was considered worthy of note (*QST,* March, 1927, at 55). Several one-way signal receptions of far greater distances were also being reported. By May and June of 1927, came confirmed reports of 1000 mile two-way reception, although no relays or schedules could be established. Many hams hoped that 5 Meters would become quite useful in extending long distance communication abilities of the lower bands. Since distance records were increased when radio activity moved from the very low frequencies up to higher frequencies at 14 Mc, many hams initially held out the hope that DX potential might even be greater when transmissions moved to even higher frequencies on 5 Meters.

- With this background in mind, the ARRL sponsored a 5 Meter CQ Party on June 11-12, 1927, following a CQ Party format previously held on the lower bands. This 5 Meter event may have thus been the first organized gathering of hams on a VHF band. Prizes were given out for the being the "best" in various activities, but this CQ Party was not described at the time as a radio contest. Instead, it was more of an activity time with some "rules of the game". (See, *QST,* May, 1927, at 44). With the recent activity reports of very long distance contacts, the Party drew lots of interested parties and attention. Propagation turned out to be very puzzling however, as hams were unable to contact anyone but the most local of stations. To sort out the propagation characteristics of the band, another 5 Meter CQ Party was held on November 12-13, 1927, and more were scheduled for the following year.

- In 1928, the Federal Radio Commission made the 10 meter band available for use to amateurs. This new band quickly showed promise of DX abilities, with sustained relay traffic. Meanwhile, 5 Meters was developing a reputation for being rather quirky at best, and there was a general disappointment that the band seemingly did not support the hoped for long distance traffic typical of the lower bands. Further, equipment was very difficult to make by hand (for example, many of the best tubes of the day had to be physically modified and shortened in order to work at 5 Meters!). As a result, UHF activity dropped for a while as hams began experimenting with 10 meters. Many hams simply returned to the HF frequencies, forgoing further attempts at working DX on the "ultra highs".

- By the mid 1930's, equipment had become a bit simpler to make, and 5 meter usage was becoming increasingly common. People generally referred to as "bootleggers" and "would be" hams also were still populating the band, as there had been a history of casual experimentation at UHF frequencies from the earliest days of radio (individual and commercial transmission experiments at UHF frequencies had been conducted far before the development of federal radio regulations). Indeed, when the FRC opened up the 10 meter band, the Commission also provided a definition for the first time of who constituted an "amateur" radio operator, in an effort to stamp out the unauthorized use of all ham bands (*QST*, May, 1928, p. 14-15).

- With the success of radio schedules on the lower bands coupled with a general failure of regular DX work on 5 Meters, most UHF communication involved only local distances. Many hams felt that the ultra-highs were usable chiefly at line of sight distances, although some people continued to wonder how the 5 Meter band could produce occasional contacts of great distances.

- In this time frame, a young Australian by the name of Ross Hull worked at ARRL headquarters. In 1934, Hull erected a directive antenna at Seldon Hill in West Hartford, Ct, where many League staffers then lived. He immediately made contact with Boston area hams, some 100 miles distant. Over the next few weeks, it became obvious to Hull and other ARRL staff members that routine contacts on 5 meters was possible far beyond the line of sight. Hull wrote of his experiments in *QST*, and his activities on VHF were widely followed.

- In addition to 5 meters, homemade equipment in the early 1930's allowed for communication on 2 ½(112 to 116 Mc) and 1 ¼ meters (224 to 230 Mc), and some experimentation was also occurring on frequencies over 400 Mc. In 1932 and 1933, Marconi conducted his now famous experiments off the Italian coast at frequencies near 500 Mc. He was able to achieve consistent transmission paths over 150 km (90 miles). *(kck note: when did 112 and 224 come into existence?)*

- UHF activity in general was becoming so recognized by the late 1930's, that in December, 1939, the League started a column in *QST* exclusively devoted to the higher bands. Originally entitled "On the Ultra Highs", this column contributed greatly to knowledge of VHF activities in the early days of amateur radio. The column's title was changed to "On the Very Highs" in May, 1943, and was again changed to "The World Above 50 Mc" in December, 1945. Metric notation was adopted in January, 1976, and the column became known as "The World Above 50 MHz". Other than a brief interlude between August, 1944 through September, 1945 (the editor, Ed Tilton, W1DHQ, was then assigned to the Pacific with the US Navy), the column has run continuously to the present day, and has been a focal point for the entire VHF community.

- The ARRL attempted a continuous twelve month 56 Mc contest in 1936, but the entries were considered insufficient in number and quality to justify an award.

- The first record of any VHF contest being conducted and actually finished was from an article in the December 1937 *QST*, p.53, entitled "56 MC International Contest". The event was sponsored by the Radio Society of Great Britain (RSGB) and took place between January 1, 1938 and December 31, 1938, with fixed locations only operating on the 56 Mc band.

- By 1937, the 5 meter band (now confined to a 4 Mc bandwidth between 56 to 60 Mc) had become over-populated by very unstable oscillator rigs. In 1938, at the request of the ARRL, the FCC imposed stabilization and power supply filtering requirements on 5 meters similar to that required on the low bands. This initially reduced activity on 5

meters but also indirectly led to experimentation on even higher frequencies, as hams simply moved their unstable equipment from 5 meters to 2 ½meters.

- The first successful VHF contest in the US was announced in the September 1939 *QST* "U.H.F. Field Day and Relay", at p.33. Sponsored by the ARRL, operation was on 56, 112, and 224 MC. Distance points were given for the contacts as well as points for message origination and relay. 28 entries were submitted, and W3AC/3 had the highest total, at 308 points. Strapping a homemade collinear 56 Mc array to the side of an elevated patio, he then operated from a car! Many years later in 1967, the League noted that this 1939 contest was the "granddaddy" of the VHF SS and QSO party system.

- Eventually, crystal controlled transmissions and super-heterodyne receivers with relatively narrow IF's were developed for 5 meters, and that led to stable communications occurring over distances of 250 miles or more, especially on CW.

- Early ham-related ultra high transmissions showed evidence of tropospheric propagation, along with many instances of sporadic E and aurora propagation. For example, Vice Dawson, W9ZJB, of Kansas City, Mo in 1939 made the first 56 Mc "grand slam", having worked all 9 US area call areas, with several contacts being made by sporadic E. (Editor's note: This accomplishment was considered so monumental at the time that it was noted in Ed Tilton's very first *QST* column in December, 1939). Amateurs were making these types of contacts at a time when some professional engineers still doubted that atmospheric conditions could even be used for radio communications.

- In all, seven weekend UHF contests occurred between the late 1930's and the eve of WWII, with the last such contest running on April 26 and 27, 1941. Points were given for originating and passing or relaying messages, and also for distance and band used. Cross band contacts were allowed, and extra points were given for CW. The objective of these events was to pass "test messages" as far as possible. Several of the write-ups on the contests contained extensive descriptions and maps of relay paths for these messages.

- Various other "UHF Marathons" were sponsored by the League prior to WWII. The then four VHF bands of 56, 112, 224, and 448 MHz were included in some of these contests, although most of the contacts took place on the lower two bands. The marathons lasted several months, and QSO points were provided for various distances and bands. The last pre WWII marathon was actually stopped by US entry into the war on December 8, 1941 after attracting some 80 entrants from all over the country.

- As of 1941, UHF distance records were 2500 miles on 56 Mc; 335 miles on 112 Mc; 135 miles on 224; and 60 miles on 400 Mc. Both the 224 and 400 Mc records were set by mountain top stations in California, where much experimentation on the very high frequencies was underway.

- During the late 30's and early 40's, Dr. Grote Reber, W9GFZ, used a homemade 32 foot parabolic antenna and radio equipment designed for microwave frequencies to hear the "cosmic hiss". Listening from his backyard in Wheaton, Illinois, Reber was the first person to develop radio astronomy field surveys, and Reber's maps advanced the fledging science of radio astronomy immensely. For a ten year period before WWII, Reber was the world's only radio astronomer. Today, Reber's pioneering work is considered so historic that one of his early antennas has been reconditioned and is on display at the National Radio Observatory in Green Bank, West Virginia.

- With the advent of World War II came the cessation of all civilian, amateur band activity. During the war, hams served in all branches of the armed forces. Many amateurs distinguished themselves in the military services through their technical and electronic expertise initially gained through amateur radio. Additionally, hams provided communication expertise in many domestic civilian roles during the war.

- **Post WWII Amateur Activity.** Following WWII, hams received temporary privileges on 112 Mc on August 21, 1945. Various VHF contests were thereafter intermittently conducted. The first post WWII VHF event was the Connecticut 112 Mc QSO Party held in September 1945. It attracted 132 entries. The high scorer completed 50 contacts in 37 towns from a portable location in Prospect, Ct.

- In November 1945, the FCC moved the 56 Mc band to 50 Mc, and the 6 meter band was born. This was done to provide frequency allocation to TV channel 2, and the new 6 meter band was allocated space directly below that frequency (immediately touching off a never ending dispute between 6 meter hams and adjacent property owners with channel 2 TV set's!). In March 1946, the 112 Mc band shifted to 144 Mc, starting the era of 2 meters. There was much discontent among the ham community concerning both band moves, as almost all equipment and antennas had to then be rebuilt by hand. Additionally, many hams were concerned that the roominess of UHF activities in pre-WWII was being replaced by a general encroachment from the commercial interests (this concern is even greater today, with numerous threats to amateur frequency allocation occurring on a regular basis).

- Pre WWII Marathons were reinitiated to encourage the use of these new frequencies. Distance and frequency points were awarded for the 4 VHF bands of 50, 144, 235, and 400 Mc. Extra points were given for the use FM. The first VHF Marathon was held between May and December, 1946. Six stations worked between 24 to 27 states on 6 meters, seven stations worked over 100 QSO's on 6, and six stations contacted over 200 QSO's on 144 Mc. Today, all of these various contest events and activity weekends both before and after WWII are seen as predecessors to the modern day VHF contests.

- Radio amateurs studied and utilized meteor reflected propagation as early as 1946. Propagation enhanced VHF communications extended distance records on 6 meters by 1947 to over 10,000 miles, and over 660 miles on 2 meters.

- Over the years, certain technical achievements have had tremendous impacts upon amateur radio and radio contesting. One of the biggest such achievements initially occurred in 1948, when three Bell Telephone Laboratory engineers invented the transistor. This one little device revolutionized and forever changed all of electronics and communication. The invention led to the miniaturization of electronic components and ever more sophisticated communication equipment. The three engineers received the Nobel Prize in Physics in 1956 for their efforts.

- The development and popularity of the "big three" contests occurred within a very short time frame in the late 1940's. The weekend contest format was utilized. In 1948, the 1st Annual January VHF Sweepstakes debuted. The January VHF SS was designed to be the VHF counterpart of the HF Sweepstakes contests, complete with a club competition. The September VHF QSO Party also started in 1948. The June VHF QSO Party began in 1949, although a May QSO Party occurred in 1948. The dates shifted one month to take advantage of better band conditions. Thus, the VHF QSO Party in May of 1948 may have been considered at the time to essentially have been same contest format as the 1949 June QSO Party.

- The January VHF SS scoring system was initially based on contacts with no QSO Points given out for different bands, just additional contacts for each band. 1 point was given for receiving a transmission from another station, and 2 QSO Points were given if both sides acknowledged the exchange of information. ARRL sections only counted one time, with no additional sections being counted per band. The exchange followed the ARRL message relaying methods: QSO number, call sign, RST signal report, ARRL section, time and date.

- The QSO Party format was significantly different. Between 1948 and 1952, 1 QSO point was given for 6 and 2 meters, and 5 QSO Points were granted for contacts on 220 and above. Sections counted per band. The exchange for the QSO Parties was much simpler than the January VHF SS: only exchange the call sign and ARRL section. Signal reports were optional.

- With both types of contests, the contacts or QSO Points were then multiplied by the number of ARRL sections worked plus 10 (for the January VHF SS) or worked per band (for the QSO Parties) to arrive at the final score. All foreign stations counted for one additional multiplier (one added section for the January VHF SS, and one section per band for the QSO Parties), with all foreign contacts being grouped together as one section.

- Initially, time was kept in local standard time for all VHF contests, with stations on both sides of the contact having to be within local time frames of the contest for the contact to be counted.

- The first January VHF SS in 1948 attracted 347 log entries from 40 sections. W3DFV in New Jersey won the event, with 117 QSO's in 7 sections, operating only on 2 meters. All contestants used 2 meters, some were on 6 meters, and only 3 operated on

235 Mc (which was then moved back to 220 MHz in April, 1948). The club competition took place only in the January VHF SS, but was part of that contest from the start. This first club event was won by the Frankfurt Radio Club of Philadelphia, and the competition attracted 17 clubs. All clubs competed against each other. The subdivision of the club competition into three tiers would not even be contemplated for many years to come.

- In the 1948 January VHF SS, the only category was single-op. The 1949 January VHF SS provided for certificates to multi-op entries, but there was no indication on any of the line scores of multi-op efforts. Multis were listed as separate entries in the line scores starting in the 1950 January VHF SS. Meanwhile, the QSO Party format specifically defined a "contestant" as a single operator who did not receive the help of another person.

- The May VHF QSO Party of 1948 produced 146 entries from 38 sections. The highest recorded contact was made on 220 Mc, even though 420 Mc, 1215 Mc and even higher frequencies were in use by that time. The high scorer of this first post WWII QSO Party was W1CTW of Ct, with 126 contacts in 15 sections. The 1948 September QSO Party generated 98 logs from 29 sections. 220 Mc was again the highest recorded band used in any of the logs submitted. The winner was W1FZ, operating from Blue Job Mountain in NH, working 130 contacts in 15 sections on 5, 2, and 220 Mc.

- Portable and mobile activity was always popular, especially in the June VHF QSO Party. *QST*'s as far back as the late 1940's contain pictures and write-ups of both portable and mobile operations. However, the VHF contests initially had all types of entries (fixed, portable, and mobiles) placed together. Competition occurred only by ARRL sections (there were 71 sections at the time). VE8 / Yukon was treated and counted as an ARRL section though, for purposes of the VHF contests.

- **The 1950 to 1983 Period.** By the early 1950's, crystal controlled equipment was becoming universally accepted, and contributed greatly towards the enhancement of VHF equipment frequency stability. WWII surplus AM radio aircraft equipment was becoming a mainstay on 2 meters, and commercial equipment such as the early Gonset 6 and 2 meter communicators were being developed for and used by VHF oriented amateurs.

- A great controversy ensued throughout the 1950's concerning the use of horizontal versus vertical polarized antennas. Many hams used vertically aligned antennas, in keeping with the traditions of broadcasting and mobile commercial services. Others felt that horizontally polarized antennas performed better. Many emotional and non-technical reasons also were evident. The controversy continued with many of the more experienced operators using CW moving towards horizontal arrays, while many others still favored vertical alignment. The lack of consensus as to polarization evolved somewhat in future years into a SSB versus FM argument, with weak signal enthusiasts using newer yagi type of horizontally polarized antennas and better

equipment, while many other hams relied upon FM simplex (and by the 1970's, FM repeaters) having vertical polarization for their VHF activities.

- Beginning in June 1953, the QSO Party format was revised to count 1 QSO Point for contacts on 6 and 2 meters, 2 QSO Points for 220 and 420 MC, and 3 points for contacts made above 420. During this time period, most of the contest contacts were still occurring on 6 and 2 meters, but activity was gradually increasing on 220 and 420 Mc.

- In 1953, Novices were granted operating privileges on 2 meters. Technicians received privileges on 6 meters in 1955, and then on 2 meters in 1959. The popularity of Heath Tower's and Sixer's led to tremendous amounts of lower VHF band activity. Weekly AM check-in and RACES nets of 30 or more hams were common throughout the metropolitan areas of the US. All of this activity led to a veritable explosion of VHF contesting activity, and contest log entries of over 1000 per January VHF SS occurred between 1957 and 1967. 1500 entries were received in the 3 years between 1961 and 1963. A similar peaking in log submissions occurred for the QSO Parties. This time period has been referred to as the "baby boom" of VHF contesting.

- Beginning with the 1954 January VHF SS and both QSO Parties in 1954, certificates were given to Novices and Technicians having the highest score in any section where significant competition existed (which was defined as there being at least three Novice or Technician entries in any section).

- For the QSO Parties, lines scores were separately noted for Multi-op entries beginning in the 1954 June and September VHF QSO Parties. Multi's had become popular by this, especially in portable hilltop locations in the June contest.

- In 1955, Paul Wilson, W4HHK and Ralph Thomas, W2UK, won the ARRL Merit Award for their success with meteor scatter communications on 2 meters.

- The Soviets launched the world's first satellite on October 4, 1957. Named Sputnik I, it operated on a 20 MHz frequency, but could only send a continuous beep. The space race was on! Four months later, on January 31, 1958, The United States launched Explorer I, packed with scientific instruments. This first US satellite was instrumental in discovering radiation belts that would later be named after the scientist who was responsible for the experiments, Dr. Van Allen.

- Contesting activity produced a milestone in the 1958 June QSO Party when W4GJO in Florida worked 346 stations and 35 sections on only one band, that of 6 meters. This was the highest scoring, single-band entry to date for any of the three VHF contests. Meanwhile, the January VHF SS had over 800 entries.

- While VHF was once thought to be the province of only line of sight modes, by 1958 atmospheric reflected types of communication were becoming increasing common on

6 meters. It was evident that "ionospheric" propagation could be quite useful for practical communication on the VHF frequencies.

- *CQ* magazine also sponsored VHF contests (normally twice per year) between 1954 and 1964. These contests used counties as multipliers instead of ARRL sections and VE provinces. By the 1960's, *CQ* VHF contests had developed a "county equivalent" for international areas outside of the US. The use of county multipliers was almost prophetic in nature, having pre-dated the development of the grid squares by some 30 years!

- With the advancement of electronic equipment, specialty activities previously considered impossible or exceedingly rare had arrived on the VHF scene. The first amateur radio EME contact occurred between the EIMAC Radio Club, W6HB, and the Rhododendron Swamp VHF Society, W1BU, on 1296 MC in July 1960. Amateur radio activity on meteor scatter and aurora was becoming increasingly common, as well.

- The increase in the ranks of hams from the above noted regulatory changes coupled with advances in VHF equipment capabilities led to a high of 1563 acceptable logs being submitted for the January VHF SS in 1961. Club participation increased as well, with the number of clubs entering the VHF SS going up from 30 in 1995 to 69 clubs by 1962 and 1963.The 1961 June VHF QSO party also reached a high water mark of 558 submitted logs.

- In December 1961, the first amateur radio satellite was launched. Named Oscar I, the satellite contained a 140 milliwatt beacon at 145 MHz that transmitted a simple, repetitive CW message. It circled the Earth for 22 days. Within only a few years after the launching of the first Soviet and US satellites, the era of amateur radio satellites had begun. Oscar I was a remarkable achievement for amateur radio.

- Bell Labs built a giant cat's ear microwave Holmdel antenna in the early 1960's as part of a very early satellite transmission system called Echo. The antenna quickly became obsolete with the launching of the Telstar satellite in 1962. Two Bell Lab researchers, Arno Penzias and Robert Wilson, were then able to use the Holmdel antenna for radio astronomy experiments at microwave frequencies. They kept coming up with a background noise in the antenna system. They tried everything they could think of to eliminate the annoying noise from their receiving system - including removing several pigeons roosting in the antenna. After four seasons of putting up with this noise, they sought out theoreticians to explain the noise. Robert Dicke of Princeton University showed that the noise was really microwave remnants of background radiation emanating from the big bang. Penzias and Wilson had quite literally stumbled upon one of the greatest scientific discoveries of all time – proof of the big bang! For their efforts, Penzias and Wilson shared the Nobel Prize in Physics in 1978.

- In 1967, the League celebrated 30 years of VHF contesting in its June edition of *QST* (at p.66-67) by referencing the initial contests in Great Britain and the US (as noted above).

- After 30 years of VHF contesting, the use of local standard time was changed in the 1967 June and September VHF QSO Parties to Greenwich Mean Time (GMT), thereby eliminating the confusion that had always existed over the start and end time of a contest on both ends of the contact. The January VHF SS was not finally changed to GMT until some 13 years later in 1979!

- In 1968, Novices lost phone privileges on 2 meters, and lost all 2 meter privileges in 1972.

- The 1969 September VHF QSO Party changed participation time from 28 hours to any two 14 hour consecutive periods out of a 35 hour contest period. The June VHF QSO Party rules changed to two 14 hour consecutive periods in 1973. The rules were changed back starting in the 1974 June VHF QSO Party, with the two 14 hour consecutive periods being eliminated in favor of 28 non-consecutive hours in a 35 hour contest. Off times had to be at least 30 minutes in duration.

- Several hams in the US and around the world listened in on Apollo astronaut transmissions as they circled the moon in the late 1960's. Many of these transmissions occurred on 2.2 GHz. A short time later in 1969, Neil Armstrong became the first person to step on the moon. At the time, landing on the moon was considered a great American achievement. Today, while the Apollo program is still viewed as a significant accomplishment for America, the entire space program of the 1960's culminating in Apollo and a manned moon landing is considered to be even larger than a single country's success. Apollo is now being viewed as a technological milestone for the entire human civilization.

- Even though HF operating activities were generally adopting the use of SSB over AM, VHF activities were much slower to utilize the newer form of phonic communication. It wasn't until 1970 that SSB was firmly established on the VHF bands, even though it was clearly superior in terms of bandwidth usage. With so much AM VHF equipment now becoming outmoded and even scorned by some VHF enthusiasts, a difficult period developed on the VHF bands. While beginners were still having great adventures with their Twoers, more serious operators were becoming exclusively based on CW and SSB. Participation rates in the VHF contests of the late 1960's probably suffered as a result of these competing CW and voice technologies, as well as Novices losing all 2 meter privileges in 1972. By 1967, the number of acceptable logs for the January VHF SS had dropped to 1123. By 1975, only 600 or so log entries were received for the event. Club participation declined to a total of 21 clubs in the 1975 and 1976 January VHF SS.

- Starting with the 1974 January VHF SS, the exchange was modified to align with the streamlining of the exchange that occurred in the 1971 HF SS, with the contact

number, a power precedence, the call sign, check, and section information being exchanged. Meanwhile, the exchange for the QSO Parties was much simpler: call sign and section.

- The administration for the ARRL sponsored contests generally followed the practice of an informal idea or formal proposal being sent to the Contest Advisory Committee, which was composed of both HF and VHF contest operators appointed by the League. The CAC would then consider the matter, and if it approved of the item, would send it on to the League's Awards Committee. This Committee was in turn composed of ARRL staff members would then consider and ultimately act on the CAC's recommendation. If approved by the Awards Committee, the proposal would subsequently be approved as a rules change for future contests. The item could also be sent back to the CAC for further study. The Awards Committee was also in charge of the league's Award program, and hence its name.

- Long standing oral traditions in the club competition of the January VHF SS were expressly stated in 1974 when the CAC declared in writing that three club entrants were necessary for a club to enter the club competition; two-thirds of club participants in a multi-op must be members of the club, four club meetings a year must take place, and club members must live within 175 miles of the club to be eligible as a club entry.

- Beginning in the mid-1970's, specialty contests were being conceptually developed. Events focusing on Moon Bounce, the 10 GHz band, and the UHF bands were under active consideration. Numerous ideas were also being entertained for revisions to the existing contests.

- The January 1976 edition of *QST* marked a momentous occasion: this was the first issue with the wider paper format. The original size of 6 ½by 9 ½inches was chosen simply because that was the size that the local printer used in 1915. The smaller size was still commonly available for many years thereafter. As new printing presses were put into service however, larger page sizes were used, and over one inch of paper had to be trimmed from each *QST* to fit into the smaller size. When the price of paper skyrocketed in the mid-1970's, the League finally made the decision to move to larger size print.

- Because of conversion by the League to the new page size, publication of the rules for the 1976 January VHF SS was completely left out of both the December 1975 and January 1976 editions of *QST* ! In spite of this oversight, numerous VHF clubs got the word out, and the contest went on. The VHF community was only slightly ruffled by the experience, but none the worse for the effort. Overall, the experience just reinforced the importance of the VHF clubs in VHF contests.

- Put into effect for the first time in June 1976, codes were developed for 2304 MHz (f); 3300 MHz (g); 5600 MHz (h); and 10,000 MHz (i). The 3 QSO point rule above 420 MHz was still in effect, however for the VHF QSO Parties, while no extra QSO

points were awarded in the January VHF SS for any bands (just extra contacts for each band).

- With the publication of technical notes on VHF yagi designs in 1976 by the National Bureau of Standards (NBS), yagi antennas became increasingly common among amateurs. Considered an innovation at the time, NBS styled antennas for amateur work generally replaced the bulky collinear arrays that had been commonly used throughout the post WWII period. For years after the publication of the NBS notes, amateurs took great pride in finely crafting "hand rolled" NBS types of VHF yagis.

- FM rules caused consternation throughout the 1970's and early 1980's much as the rover rules continue to cause controversy today. FM simplex rules were put into effect experimentally beginning in the 1976 June VHF QSO Party, but caused problems for many years thereafter. FM repeater contacts were prohibited in 1976, and this rule was warmly received. The 1977 June QSO Party prohibited the use of the 2 meter FM national calling frequency, 146.52 MHz, as well as adjacent guard channels. A few months later in the 1977 September VHF QSO Party however, the use of the FM simplex calling frequency was allowed by any station for no more than 4 hours in the contest, but the prohibition on the guard channels remained in effect. The 1978 January VHF SS also provided for a 4 hour usage of 146.52, but by the 1978 June QSO Party, the 4 hour rule was modified to allow usage of the frequency in no more than 1 hour increments. The 1st August UHF Contest in 1978 effectively prohibited any FM contacts (see below). Starting in the 1979 January VHF SS, the 4 hour rule was also applied to 223.50 MHz. In June 1982, the use of 146.52 was completely prohibited. But the 4 hour rule on 223.50 was at the same time completely lifted so that simplex contacts on the 222 FM simplex call frequency could be allowed throughout the contests.

- The exchange was again simplified for the January VHF SS format starting in 1977: The serial number; call sign; signal report; and section. Gone were the power precedence and check.

- A major change occurred with the 1978 January VHF SS. QSO points were added for the first time, and were much more generous than in the VHF QSO Parties. 2 points were awarded for 6 and 2 meter contacts; 4 points for 220 and 432; 8 points for 1215 MHz; and 16 points for 2300 MHz and higher. As a result, station scores that used microwaves dramatically increased.

- Another major change took place with the adoption of DXCC countries as additional multipliers, beginning in June 1978. The change was in effect for both the January VHF SS and the QSO Parties. Each DXCC country that was not an ARRL section counted as a separate multiplier for each band worked (in addition to each ARRL section worked for the January VHF SS or worked per band for the QSO Parties).

- Throughout much of this era in VHF activities, the Mt. Airy VHF Radio Club (nicknamed the "Pack Rats"), completely dominated the club competition of the

January VHF SS. Having won the club competition 29 years in a row (and starting with their club win in 1961), the Pack Rats of the day set a standard for operating excellence that has never quite been matched by anyone else in the entire history of ham related VHF activities. For instance, in 1976, the club led an expedition to Barranquilla, Columbia so that K2UYH could become the first amateur to work all continents on 432 MHz. They made the contact off the moon to do it, and may have thus been the first EME station and EME contact in South America. An incredible feat both at that time, and to this day!

- The greatness of the Mt. Airy Club was made possible, in no small measure, by an intense rivalry with another great club, the Rochester NY VHF Group. The Rochester club challenged the Pack Rats throughout much of the 1970's and into the 1980's, only to see their efforts continually place second. This pattern continued even after the development of the three-tier club rule (see below), with both Mt. Airy and Rochester being the only groups at times to enter the Unlimited. Mt. Airy's continuous reign as club champion came to end only when the Rochester group took the Unlimited gavel in 1990, due to the Pack Rats only fielding 49 entries (the Pack Rats still had more points than Rochester, but were now put into the Medium club category, which they won, of course).

- A second major boom in VHF contesting took place in the late 1970's, and this was largely due to mass usage of Japanese manufactured multimode rigs. Log entries in the January VHF SS again climbed upward, peaking at 987 in 1980 after having declined to around 500 in the mid 1970's. The June contests also were notable for their large participation rates on 6 meters during E skip openings. 60 section totals and 100 section all-band totals were becoming common in almost all ARRL Divisions. All band QSO's in the June Party broke the 1000 contact threshold in the multi-op category during this time frame, and approached 800 or more contacts with several Single-Op entries.

- The first August UHF Contest took place in August 1978. Initially, a 1 x 1 degree square was used as a multiplier, with latitude and longitude headings, signal reports, and call signs being used as the exchange. 3 QSO Points were given for a contact on 220 and 430; 6 points for 1296; and 12 points for 2304 MHz or higher. Stations could be worked once per band, although if mobile, the station would not count for another contact but would then count as another 1 x 1 square if the station moved to another 1 x 1 square. Multipliers were the number of different 1 x 1 latitude / longitude squares worked per band. The use of 434-435 MHz was prohibited (this was intended to effectively prohibit FM contacts for this contest). Single and multi-ops could enter. The first UHF contest in 1978 thus saw the first use of a latitude / longitude type of square.

- In order to encourage smaller clubs to compete in both the HF contests and the January VHF SS, effective for the 1978 HF SS and the 1979 January VHF SS, the club competition was split into three groupings: Unlimited, Medium, and Small. Each group would only compete directly against each other. The unlimited category

was for those clubs with 51 or more entries, while Medium club were for entries between 11 and 50. Small clubs had 10 or fewer entries. Club radius and meeting requirements also varied for the three groupings: the unlimited and medium clubs had a 175 mile radius while local clubs had a 20 mile radius. Four club meetings were required per year. For members of the larger clubs living more than 50 miles away from the club center, 50% or more of the meetings must be attended, while no attendance rules were in effect of for the local clubs. SO and Multi's counted towards the club scores, but 66% of a multi's operators had to be club members, and both the guest and station licensee were to be club members for the guest SO's.

- The first EME Competition was held in 1978. The event was held over two weekends in the spring. The EME had competition by SO-single band; SO-multi-band; multi-op-single band; and Multi-op, multi-band. Use of non-amateur commercial equipment (i.e. radio telescopes) was listed separately. Each contact was given 100 points, and the multipliers were the DXCC countries plus the US and Canadian call sign districts worked on each band.

- Rules regarding multi-op operation were also reviewed in the late 1970's. Effective for the 1979 January VHF SS, multis could elect to give out consecutive serial numbers per band rather than one set of serial numbers for all bands. By the 1980 September VHF QSO Party, the multis could no longer make contacts with their own operators except on 2.3 GHz and higher. Further, in a prohibition primarily aimed at multi's using FM and SSB simultaneously, multiple transmitters could not be used on the same band at the same time. In 1983, a requirement of three multi entries per section before multi awards could be issued was dropped, and only the demonstration of a significant ability was thereafter required for the issuance of multi-op awards.

- By the early 1980's, contacts on successively higher microwave bands were being reported. The June 1981 QSO Party noted line scores with 24 GHz contacts (J). Laser rules were adopted by June 1981, providing for the use of coherent radiation on transmission and at least one stage of electronic detection on receive. One contact was reported on 48 GHZ (with a K designation) and light (300 GHz, with an L designation) in June 1982.

- In May, 1981, an ad hoc committee on VHF contesting had been established by the League and the CAC to study contest format changes.

- In 1982, the EME Competition was changed to two weekends in the fall, so that antenna work in preparation for the contest could be done in better weather. Thus, 1982 was the only year in which there were two separate EME contests: the 5th EME in April and May, and the 6th EME Competition a few months later in October and November.

- In June 1982, single-op, single band entry categories were added. The intent of this added category was to encourage the development of smaller stations into a

competitive class. These SO entries could work more than one band, but then only report for the one band that they wanted to enter in the contest.

- Distance points based upon differences in lat / long of the stations were added to the UHF in 1982 (for only this one contest, it turned out). Referred to as RANGE, the concept was initially developed by the Ramapo Mountain ARC in their Spring VHF Party held in March, 1981.

- For the January VHF SS format, the exchange was shortened in 1983 by dropping the consecutive serial number requirement. The exchange simply became the call sign, signal report and section. The exchange for the QSO Party format remained the same: just the call and section, with the signal report continuing to be optional.

- The June 1983 VHF shortened the duration of the contest to 33 hours, and then dropped the off time requirement. Thus, contesters could operate all or any parts of the event. This was done to encourage the use of time consuming activities such as meteor scatter and EME.

- Also tried out for the 1983 June VHF QSO Party, the multiplier was changed so that VE provinces were added as separate multipliers instead of using ARRL sections in Canada. Additionally, the West Indies, Hawaii, and the US controlled Pacific areas were considered to be separate DXCC countries, instead of merely treating them as ARRL sections.

- **The Era of the Grid Squares.** Collecting states and countries was a traditional activity for VHF operators to engage in. The VHF community felt the need for a smaller, more uniform and more geographic based multiplier, however. Europe had been using such a system with much success for a number of years, and by the early 1980's, the search was on for a similar system in North America. Distance points were tried out in the 1982 August UHF, but were awkward to calculate manually.

- The Central States VHF Society was instrumental in the development of the grid square concept. It experimented in the early 1980's with 1 x 1 squares similar to what was being used in Europe, and then gave out awards, referred to as WHG awards (for worked one hundred grids), to encourage the usage of these grids.

- The League quickly added to the mix, and within short order, the Maidenhead 2 x 1 grid squares were introduced in 1983. On an interesting note, Curt Roseman, K9AKS, authored the ARRL grid map in 1983, and Urbana, Illinois still has a prominent place on official grid maps, as that was where the grid square map was actually developed! Widespread usage of grid squares occurred very rapidly both in the United States and internationally. As one contester (KA1ECL) put it at the time: "The grid system is the greatest thing that has happened to VHF since the Twoer".

- In 1983, the League developed the VUCC program (VHF / UHF Century Club), and it was a huge success from the start. The VUCC award was designed to be the VHF

equivalent of the DXCC on HF. Awards were given for working and confirming 100 grids on 50 or 144 MHz; 50 grids for 220 or 432; and 25 grids for 1296. Endorsements for all bands were also provided for.

- The first VHF contest to use grid squares was the 1st VHF Sprint Sprints in 1983. The Sprints began as a way to encourage widespread usage of grid squares, and to also coordinate with VHF activity nights on the East Coast. These contests were four hour in length, single band events scheduled weekly between April to early May. (In 1983 only, the Spring Sprints were six hours long, and a second set of Sprints occurred in the fall as well, with those being four hours in duration). A new VHF/UHF band was worked each week and was considered to be a separate contest. The only category was Single-Op. The Sprints initially were held on the four VHF bands and 1296 MHz.

- The first existing VHF contest to use the grid squares was the 1983 August UHF. Distance points were abandoned, and a grid square designation for each band became the multiplier, instead. The following month in the 1983 September VHF, grid squares were first used in the VHF QSO Party format. In 1985, grid squares per band were used as multipliers for both the January VHF SS and the June VHF QSO Party. Grid square multipliers have been integral to the scoring system of all ARRL VHF contests (except for the 10 Gig and the EME) ever since. The adoption of grid squares was a spectacular event for all of VHF operating, and constituted a fundamental change in the scoring methodology used in the VHF contests.

- The 1983 August UHF eliminated the prohibition on FM usage in the 434-435 MHz band segment.

- The 1983 September VHF also revised the scoring rules slightly: 1 QSO point would still be given for 6 and 2; 2 points for 220 and 432; 3 points for 1296; but then 2.3 GHz and higher was awarded 4 QSO Points. This same QSO point system was implemented in the 1985 June VHF QSO Party, but the January VHF SS retained 1 to 16 QSO points for contacts across the various bands.

- Between 1983 to 1987, 10 operators achieved WAS on 222 through a series of portable EME capable Dxpeditions to states inactive on the band. Since that time, no other WAS certificates have been issued for 220 MHz, in spite of great advances in EME oriented technologies.

- Commencing with the 1985 January VHF SS, the exchanges was again shortened down, this time to just the exchange of grid squares. Dropped from the exchange was the signal report.

- Also in 1985, the League expanded the VUCC program to include additional microwave bands beyond 1296 MHz. 10 grids would be needed for a VUCC award on 2.3 GHz; and 5 grids for 3.4 GHz, 5.7 GHz, and 10 GHz. Later in the development

of the program, the VUCC award was made available for all bands higher than 10 GHz, with 5 grids being required for any band.

- In commenting on the numerous rule changes occurring at the time to the August UHF, the League stated: "The contest exchange / scoring format has undergone more changes recently than a chameleon in a kaleidoscope". Much the same could be said for all the rules changes being made during that era, regardless of VHF contest!

- With grid square related changes, came uniformity across contests. Aside from the differences between the QSO point calculation, the big three contests were now virtually identical in objective and scoring methods utilized. This was far different than when these contests first started in 1948. The January VHF SS and the VHF QSO Parties then had different scoring techniques, exchanges, and purposes to the contests.

- Amateurs were allocated a new band, 902 MHz, in 1986. All contests quickly included this new band in their scoring formats. Typically, 902 was given the same number of QSO points as was 1296. The VUCC program also adjusted for the new band, by giving a VUCC award for 25 grids confirmed on 902 MHz.

- The 1986 January VHF SS had the QSO Points lowered somewhat, to 1 point for 6 and 2; 2 points for 220 or 432; 4 points for 902 or 1296; and 8 points for 2.3 GHz or higher. The QSO points were lowered in order to adjust for the increased points in the SS coming from per band multipliers that were changed the year before.

- Use of non-amateur communication during a contest (i.e the telephone) to solicit a contact was always considered bad form. The Rules for the 1986 June VHF QSO Party for the first time indicated that such communication was inconsistent with the spirit and intent of the contest rules. The rule was initially widely misinterpreted as preventing scheduling in advance of a contest. In the write-up on the Results of the 1986 June VHF, the League's staff noted that only schedules done over non-amateur communication during a contest was prohibited.

- In 1986, the 10 GHz Cumulative was introduced. The scoring system was decidedly different than all other contests: Distance points plus QSO points equaled the total score. No multipliers were used. This type of scoring method encouraged working stations more than once, and sharpening operating skills to achieve ever further distance points. The distance scoring method for the 10 Gig thus borrowed from the tradition of the early, pre-WWII UHF Relays. The first Cumulative occurred over two weekends in September and October. Virtually everyone staked out high ground and was portable. Contestants participated as one class.

- The QRP Portable category started in the September VHF QSO Party of 1986. QRP Portable was added to the June VHF QSO Party in 1987, and to the January VHF SS in 1989. Entries had to run 10 W PEP or less from a portable power source and with portable equipment and antennas.

- E skip conditions on 6 meters were so astounding in the 1987 June VHF QSO Party that many operators felt that propagation was the best ever experienced.

- The Second Annual 10 GHz Cumulative in 1987 (and thereafter) was moved to two weekends in August and September.

- In 1987, the Spring Sprints added 902 MHz as a sixth single band contest, and 2304 MHz was added in 1988. Through 1987, the Sprint results were printed in QST. Starting the following year however in 1998, the posting of the results was transferred to the *National Contest Journal.* Log submissions plummeted, but activity generally remained high.

- In the 1980's, *CQ* resurrected their VHF contest. By 1987, The *CQ* WW VHF WPX had activity for 6 through 1296. Categories included SO, Multi-op high and low power, and portable. 1 QSO points was given for contacts on 50, 70, and 144 MHz; 2 point for 220 and 432; and 4 points for 902 and 1296. Multipliers were prefixes.

- The Club rules were amended slightly in 1988 to require all members of unlimited and medium clubs attend at least 2 meetings a year, instead of the previous rule that required only that people living 50 miles away from the club center to attend 50% of the meetings of the club per year.

- By the early 1990's, numerous hams had achieved WAC and WAS on several of the VHF bands through the use of EME (including 220 in the late 1980's). But DXCC eluded everyone. Finally, just past the peak of solar cycle 22, several stations confirmed 100 countries on 6 meters. By the fall of 1991, over 20 amateurs had achieved the 6 meter award. All eyes then turned to 2 meters. A great moon-bouncer, Dave Blaschke, W5UN, seemed the odds-on favorite to be the first person to achieve 2 meter DXCC. But disaster struck on March 19, 1990, when his "Mighty Big Array", or MBA as it came to be known, was destroyed by a nearby tornado. His DXCC count stood at 97 at the time. After clearing away twisted metal for a month, he slowly rebuilt his antennas through the summer of 1990. On October 28, 1990, W5UN passed the 100 country milestone by working a 2 meter contact with VS6BI. Shortly thereafter, W5UN was awarded the first DXCC on 2 meters. Both the 6 and 2 meters DXCC was all but impossible a few short years before. Through dogged and relentless persistence as well as technological improvements to radios and equipment, DXCC on the VHF bands was now a reality.

- The development of computerized antenna modeling programs in the early 1990's led to increasing sophistication of antenna design. The venerable NBS yagi design gave way to a complex design in VHF yagi's that improved receive and transmit capabilities of amateur radio operators enormously.

- Throughout the 1990's, amateur radio communication to the Space Shuttles was being routinely scheduled on a secondary basis, as numerous Shuttle astronauts also

held ham radio licenses. QSL card confirmations of contacts with Shuttles have become prized possessions within the amateur community. (By 2003, old QSL confirmations with any STS flight of the ill-fated Challenger or Columbia shuttles have become even more prized).

- In 1991, after several years of debate at the regulatory level, the bottom 2 MHz of the 220 band was awarded to commercial services. Amateur activity continued to go on between 222 and 225 MHz. Weak signal work shifted to 222.100 MHz +-.

- The addition of the participation pins to many of the ARRL VHF contests beginning in the early 1990's proved to be very popular among contestants. The plaque program for the top national scores has also proved popular.

- While the Pack Rats dominated the January VHF SS Club Competition over the years, the multi-op category has been equally dominated by just a few groups. By the early 1990's, only a few groups were in real competition for the national top multi-op spot. In fact, only one multi stood out above everyone else. W2SZ, the Rensselaer Polytechnic Institute ARC operating from Mt. Greylock Massachusetts, had become the dominant operation in the multi category, with long-standing contesting records and scores in the June VHF QSO Party. More recently, the Grid Pirates, K8GP, have developed an intense rivalry with Rensselaer for the unlimited multi-op top spot. This rivalry is akin to the duel between the Pack rats and Rochester in the club competition. Another great multi-op effort is that of W3CCX, sponsored by the Pack Rats, operating in the June QSO Party.

- **Expansion of the Categories.** Faced with the less than a competitive situation among the multi's, the Multi-op category in June 1991 was split into two separate categories, the Multi-Unlimited and Multi-Limited. The limited category competed on only four bands. These types of multis could operate on more than four bands, but then just submitted the best four bands for credit. All Multi-op records and high scores held prior to June 1991 were considered to be part of the Multi-Unlimited category.

- Many contesters felt that captive rovers of the big multi operations were also contributing to the problem. To deal with the matter, a separate rover category was added in June 1991. Prior to that date, rovers were considered to be either Single-Op or Multi-Ops entries, with the scores from each grid square visited by the rover being counted as separate entries. It was felt that a separate competition for the rovers would encourage operations independent of the big multi set-ups.

- The development of real time contest logging programs in the early 1990's revolutionized all of radio contesting, VHF included. Popular programs included CT, by K1EA, and NA, by K8CC, among others. Gone were paper logs and extensive manual dupe checking techniques. Computer duping, antenna steering, packet spotting, and other extensive accessories of modern day computer logging programs quickly became commonly accepted. (Editor's note: in 2003, K1EA moved his latest version of CT to shareware status, complete with easy downloading from his web-

site, and was agreeable to providing continuing updates and technical support for the program!).

- By the early 1990's, another technical innovation had arrived. The commercial application of VHF power transistors at practical power levels was making a considerable change in commonly used VHF power amps. Power tubes for moderate power levels, along with the attendant risks of potentially lethal high voltage power supplies, were being replaced by 100 to 200 watt transistor power amps, all running on much safer 12 VDC power supplies.

- In 1992, the *CQ* WPX VHF included SO, Multi I and II categories, as well as SO portable and rovers. Multi II was limited to 4 bands. 2.3 GHz and higher was added to the mix, and was given 6 QSO points for each contact. An interesting incentive for CW was added to the contest, with one additional QSO point being given for any CW contact. The next year, the *CQ* WPX VHF changed the multiplier to include prefixes per band plus grid squares per band.

- In 1993, a long-time amateur radio operator who was a Professor at the University of Massachusetts and Princeton in Astronomy and Physics, Joe Taylor, K1JT, was awarded the Nobel Prize in Physics for the co-discovery of binary pulsars. He credited his early interest in ham radio in propelling him towards advanced degrees in science (In 1958, at the age of 17, Taylor wrote an article in *QST* on "ionospheric scatter", after he and his brother decimated the competition in a VHF competition). Over the years, Taylor has maintained a continuing interest in VHF contesting. Most recently, he has developed a revolutionary software program for VHF scatter and moon-bounce (see note below). An amazing contribution to both science and hobby!

- In 1993, the VHF Spring Sprints retained 6 through 432 weekly contests between April and May. 902, 1296, and 2304 were merged into the same time period, with separate contests running simultaneously.

- Beginning in 1993, Field Day Rules provided for 100 bonus points and free station status for operations above 50 MHz. This bonus quickly became a favorite way for Field Day clubs to add extra points to their totals.

- By the early to mid 1990's, the regulatory granting of no-code technician licenses with VHF only operating privileges was making a dramatic impact upon the VHF community. Within the span of a few short years, the ham ranks went from virtually no newly licensed technicians to over one-third of all amateur radio licensees being VHF only technicians. Additionally, technical advances in phase lock loop technology and increased miniaturization of electronic components allowed for the introduction of 100 watts, multi-band, multi-mode VHF transceivers of a compact nature. For instance, the original ICOM 706 was considered a major breakthrough in HF and VHF equipment capability, and was extraordinarily popular among hams. The combined effect of the large increase in newly licensed VHF only hams coupled with technical innovations in radios produced an absolute explosion of VHF

operating and contesting activities. This era can now be seen as being a third major boom in ham related VHF activities.

- The scoring system for the new rover class proved to be highly controversial, and rules changes occurred in June 1993. These changes also were controversial, and modifications to the scoring system once again occurred in January 1995. The rover rules are still causing controversy, and may be changed yet again!

- Starting in January 1995, five new bands above 47 GHz were added to the scoring system for all categories.

- In 1995, the Rover category was added to the August UHF Contest.

- By the mid-1990's, Internet access was becoming increasingly common. What had started out a generation before as an experimental way to establish communications and coordination between government, academic, and commercial scientific sectors, had evolved into a mode of communication with broad mass appeal to consumer and commercial interests alike. At first, the existence of non-ham types of entertainment and activities of a technical nature was seen as a threat to the continuing vitality of ham radio as a hobby. It became quickly evident however, that Internet capability could be complementary to the hobby. Indeed, by the late 1990's, internet access was increasingly being used as a way to enhance the amateur radio hobby, complete with personal and commercial ham radio related web-sites, reflector lists, and even a section on E-Bay and entire web-sites (E-Ham and others) being devoted to ham radios for direct sale by hams to other hams.

- In the mid-1990's, the Toronto VHF Society, using the call VE3ONT, used the giant Algonquin Radio Observatory to participate in several EME Competitions, much to the delight of EME enthusiasts. Tremendous signal reports were noted.

- Starting in 1996, the 10 GHz Cumulative Contest was changed to include a second category for stations operating on 10 GHz and above, and the contest's name was changed to the "10 GHz and Up Cumulative Contest".

- In 1996, the *CQ* WW WPX VHF dropped any use of prefixes as a multiplier, and adopted grid squares per band as the only form of multiplier. The name of the contest then dropped the "WPX" reference.

- *CQ* commenced National Foxhunting Weekends (NFW) in 1997. Foxhunting has been growing in popularity in recent years, and invariably the radio "fox" will be some simple and small transmitter operating at VHF frequencies. Participants come equipped with direction finding antennas and other assorted specialized equipment and antennas. The ARRL has Radio Direction Finding (RDF) Coordinators, and the League also sponsors national ARDF championships in the summer months.

- In contrast to the League's formalized rules procedures, the governance of *CQ's* rules structure was more direct: the editor of the VHF column for *CQ* magazine made the decision on any rules changes, after informal consultation with magazine staffers and members of the VHF community. (Editor's note: This was evidently the procedure in effect in the mid-1990's, when the editor of the "VHF Plus" column commented that after much thought on the subject, he was dropping altogether the use of prefixes as multipliers). More currently however, *CQ* VHF contest advisory committee exists.

- In 1998, some 11 years after hams reported great conditions in the VHF contests, tremendous bands openings occurred in both the June VHF QSO Parties and with the VHF bonus station in the Field Day exercises held some two weeks later. Numerous Division records in all categories were broken in the June QSO Party, and some stations reported almost constant activity on 6 meters throughout Field Day. (The Editor of these Notes vividly recalls working still having an open 6 meter band at day-break on Sunday morning!). Band openings were so strong throughout the summer E-skip and tropo season that they were dubbed the "openings of the decade".

- Band conditions were so strong in the June VHF QSO Party during this solar cycle that in 1996, 1998, and 2000, a total of eleven stations broke the 1000 QSO barrier on 50 MHz, with eight of them being from South Texas. Several stations in this time period also worked over 100 grids on 2 meters in a single contest in both the June and September VHF events.

- The radius for local clubs was expanded to 35 miles in 1998, but then briefly returned to 20 miles the next year. The mileage limit was again expanded to 35 miles in 2000.

- The club competition was expanded in 1999 to include the September VHF QSO Party.

- In 1999, separate VHF clubs became responsible for each band contest of the VHF Spring Sprints. This proved to be severely disjointed and confusing, so the next year in 2000, the responsibility for the VHF Sprints was transferred to the East Tennessee DX Association. Fixed and rover categories were provided for by 2002.

- Also in 1999, *CQ* magazine began sponsoring VHF activity weekends, once a month between May and June. Separate weekends are devoted to FM, weak-signal, and specialty modes. Categories include SO QRP, SO QRO, Multi QRP, Multi QRO, and Rover.

- The 2000 *CQ* WW VHF Contest revised its format to include only 6 and 2 meters. Over the years, the CQ VHF contest has usually been in July, and is an interesting event since it has been one of the few multi-band VHF contests not sponsored by the League. However, it has had varying degrees of success, has dramatically altered its structure several times, has been poorly publicized, and only enjoyed broad participation in its very early years in the 1950's and 1960's.

- Effective January 1, 2000, the Single-op category was split into high and low power classes, with all records and high scores prior to 2000 being considered part of the high power class. Low power was defined as 200 Watts PEP on 6 and 2; 100 W on 222 and 432; and 10 Watts on 902 and above. SO High Power was considered to be any power levels in excess of the limits imposed on the low power class, but the rules did not expressly define the maximum power level allowed in the SOHP category.

- The QRP Portable category had a name change effective September 2000 to "Single-Op Portable", with only slight clarifications occurring to the category definition. All records and scores pre-dating the name change were considered to be part of the SO Portable category.

- By 2002, a Fall Sprints reminiscent of the original Fall Sprint in the 1980's had been resurrected. Run by the Southeast VHF Society, separate band events existed for 6, 2, 222, 432, and microwave activity.

- **The Present and Future of VHF Activity.** There are now six categories of competition in many of the VHF contests in which to choose from: Single-op high power; single-op low power; single-op QRP portable; Multi-op unlimited; multi-op limited; and rover. In 1948, only single-op was available. What a difference eight decades of contesting makes! Discussions are currently underway to again expand or vary the categories in some manner.

- Club participation rules were dramatically relaxed in November 2002 for both HF and VHF contests. Canadian clubs affiliated with the RAC could now participate in any ARRL sponsored club competition. The territorial mileage for unlimited clubs was changed to either 175 miles from the club's center or an entire ARRL section (but not both), and the local club territory was maintained at 35 miles. In a controversial move designed to bolster club membership, the League dropped the two meeting per year requirement for individual club members. Additionally, only 50% of a multi-op's participants would have to be members of the club in order for the multi score to count as a club entry. Lastly, the station owner of a guest op run no longer had to be a club member so long as the guest op was a club member and the station was located within the club territory.

- At the start of 2003, the Contest Branch of the ARRL clarified existing rules, stating that use of BEACONet is allowable, as it is only an automated CQing system that uses existing VHF bands and modes that are within the letter and spirit of the rules. Use of digital modes (such as JT44) is evidently allowed so long as no lat / long indicator is used in the ID or CQ message. This would constitute a prohibited form of self-spotting, according to E-mail information received from the League.

- Digital modes became expressly allowed in the EME Competition in 2003.

- Effective for 2003, the high power entry for all ARRL contests was changed to a maximum of 1500 watts PEP or maximum allowable by the national licensing authority, whichever is lower.

- The ARRL Awards Committee decided in 2003 that the club competition would again be expanded to include the June VHF QSO Party, effective for 2004.

- The "VHF/UHF Contesting!" column in the *National Contest Journal* has been instrumental in the development of both the Limited Multi and Rover categories. This column at one point even made formal proposals requesting the adoption of both Limited Multi and Rover categories. After extensive discussions by the Contest Advisory Committee, both categories were ultimately approved with some revisions. The column continues to be highly influential among the serious contest enthusiast, but its impact is tempered somewhat by the small subscription base of the *NCJ*.

- "The World Above 50 MHz" column in *QST* has also been instrumental in the development and encouragement of almost every VHF contest and VHF activity in the United States and beyond. This one column, with only six editors since 1939, has done more than any other single printed source in disseminating information relating to the VHF and UHF amateur radio spectrum. It continues to be a shining example of the long-standing support the League offers to the VHF community. Each of the editors of the column has been instrumental in VHF activities. They are as follows:

Ed Tilton, W1HDQ	1939-1960
Sam Harris, W1FZJ	1960-1967
Bill Smith, W5TVB	1967-1974
Bill Tynan, W3XO	1974-1992
Emil Pocock, W3EP	1992-2002
Gene Zimmerman, W3ZZ	2002-present

- The Central States VHF Society has been sponsoring a States above 50 MHz Award and contest since 1996. The contest is a year long event, and certificates are issued to any amateur who works at least 30 states on all VHF bands within the one year time period. Originally designed for both single and multi-ops, rovers were added in 2001 / 2002. Canadian provinces were added to state totals 2002 / 2003. Central States also sponsors a contiguous 48 state 50 MHz award, as well. Central States has been highly influential in the development of many items of interest to the VHF oriented amateur, with the most notable item being the development of the 1 x 1 squares that acted as a precursor to the ARRL grid squares. Its annual conferences provide a continuing treat to all VHF enthusiasts.

- The Six Meter International Radio Klub (SMIRK) has sponsored 6 meter only contests over the years. The format has varied little since the 1980's when grid squares became accepted: 2 QSO points for SMIRK members and 1 QSO Point for non-members. The multipliers are grid squares. Traditionally held the weekend between the June VHF QSO Party and Field Day weekend, the SMIRK contest has

been a relaxed and enjoyable affair, attracting many weekend 6 meter enthusiasts at the height of the E skip season.

- Two other groups deserve mention. The San Bernardino Microwave Society recently celebrated their 40th anniversary as a group, and the North Texas Microwave Society is very active, as well. Both groups have immeasurably advanced the overall interests of amateur microwave activities, and have been heavily involved in many technological innovations of great importance. They provide a rich and continuing source of technical microwave knowledge.

- Recently, web based technology has dramatically changed the way in which contest reporting has taken place. Traditionally, contestant line scores were listed in *QST*'s, and that practice went back to the earliest VHF contests. ARRL web-based *QST* contest articles started becoming available in 1997. Interactive sorting capability of score related spreadsheets were available by 2002. The June 2002 VHF QSO Party Results and the 2002 August UHF Contest Results, both of which were published in the January 2003 edition of *QST*, were the first contests to not contain the line scores from within the pages of *QST*. All line scores from these two contests forward would be listed exclusively within the pages of the ARRL web-site. The change represented the symbolic end of the print era for contesting, and many contesters are still wistful (and some are even resentful) over the line scores no longer being in print format.

- Additionally, the publication of contest rules for both HF and VHF contests have been moved from *QST* to an exclusively on-line availability. Only rules summaries are currently available in *QST*. This move has also proved to be highly controversial among serious HF and VHF contesters.

- Current usage of the VHF and UHF amateur radio spectrum includes many diverse activities. In addition to the "normal" types of amateur VHF / UHF activities of EME, microwave activity, E-skip, aurora, tropo ducting, and FAI, some other forms of radio communications include laser light activity, spread spectrum work, amateur satellites, ATV, 6 meter RC modeling, and RDF fox hunting.

- Today, technical frontiers by amateurs are being pushed as never before. For example, with the introduction of the WSJT and JT44 computer programs by K1JT, the new digital modes may propel weak signal work on EME and meteor scatter to a height never before even imagined. Computer software programs for high speed CW (HSCW) on meteor scatter and Digital Speech Processing are making large impacts upon operating abilities. Ham radio SETI experiments are other examples of innovative amateur radio activities occurring on VHF and UHF.

- Discussions are now underway to again revise the contest rules and vary the format of the VHF contests. Numerous ideas are being circulated within the VHF community. For a summary of some of the thoughts being bandied about, please refer to The World Above 50 MHz column, *QST*, April, 2003, at page 86-88, "VHF Contests

Reexamined: Changes in the Wind". Various VHF contest and operating reflectors also contain up to the minute discussions of possible VHF contest rules revisions.

A Few Notes on International VHF Contests

- The ARRL contests have been mostly involved North American activity over the years. Some foreign entries run in the June VHF QSO Party when the chance of 6 meter skip is high, but otherwise, there have been few log submissions from outside of North America.

- *CQ* magazine does have more international support for their VHF contests. In the 1960's, *CQ* used county designations in the US and county equivalents internationally as a multiplier, and actively encouraged international competition. Contests have in the past expressly provided for credit on the International 70 MHz band, in addition to all US bands.

- The EME Competition sponsored by the League does enjoy significant international support, however. Around half of the entries may be from abroad in any one year. Indeed, the EME contest is the annual highpoint of activity for moon-bouncers around the world, and virtually everyone that is moon capable will run the EME competition. The better stations in the event have reached over 300 QSO's on 2 meters and over 100 QSO's on 432. Over 200 logs coming from all over the world have been submitted in recent years.

- Europeans have an incredible number and variety of VHF contests (of which little is known about by the Editor to these Notes, unfortunately). Europe had a strong VHF community throughout the post WWII period. They led the way, in fact, regarding the usage of latitude and longitudinal designations in their exchanges, and the Central States VHF Society and the ARRL both relied heavily upon their example in the development of the Maidenhead grid squares. We could learn much from their continuing activities. Anyone with knowledge concerning international VHF contest events should send comments to w9gka@arrl.net.

Notes on Specific Scores in the SMC Area

- The score of Bob, K2DRH in the 2000 June VHF QSO Party should be SO Low Power, not SO High Power as listed in QST.

- The score of Bob, K2DRH in the 2001 August UHF contest was for the Central Division, and not the Hudson Division as listed in QST. The corrected listing was (and still is) a Central Division record.

- John, K9IJ provided a correction to the 2002 January VHF SS rover scores.

General References

Various *QST*'s between 1937 and the current time frame are the primary source material for the historical notes. Of special relevance are the *QST* issues containing contest rules and results on any of the VHF contests.

The ARRL web-site contains VHF Contest Rules and Results since 1997, and has thus provided easy reference points for those time frames.

"The World Above 50 MHz" column in *QST* has also been extensively referred to in the development of these notes. There is nothing quite like this one column anywhere else in the entire VHF community, and it contains invaluable historical commentary.

The "VHF/UHF Contesting!" column in the *National Contest Journal* has also been a valuable reference for many of the items contained herein.

Various ARRL Handbooks, Antenna Books, Operating Manuals, and the Satellite Anthology have also been used as reference materials.

CQ and *CQ VHF* magazines have been used for historical references to the *CQ* WPX VHF and *CQ* VHF Contests.

An article in *QST* entitled "Antenna Polarization on 144 Mc", January, 1950, at 15-16, by Ed Tilton, W1HDQ, was the source of comments regarding vertical versus horizontal polarization in the 1950's.

An article in *QST* entitled "Working Ionospheric Scatter on 50 Mc.", Joe Taylor, Jr, K2TIP, December 1958, at 28-29, was the source for both historical references to Taylor and to operational skills in the late 1950's.

The World Above 50 Mc column, July, 1959, and July 1960 *QST*, at 66-67, both by Ed Tilton, and in particular the accompanying graphs, were the sources for some of the material concerning participation rates in the January VHF SS stemming from regulatory licensing changes.

An article entitled "VHF Contesting", *QST*, August, 1981, at 80-81, by John Lindholm, W1XX, also was a source for some of the comments on participation rates.

An article entitled "A Brief History of North American VHF Contesting" in the VHF-UHF Contesting! Column, *National Contest Journal*, Nov/Dec 1990, at p.21-22, is the source for the "baby boom" and second boom verbiage contained in these notes. These Notes themselves, and separate VHF Reflector E-Mails in April and May, 2003 by both

Curt Roseman, K9AKS, as well as the Editor to these Notes, are the sources for references to a third boom in VHF contesting activity.

An excellent rendition of the early days of VHF radio is the primary source for many historical items contained in these notes, and it is cited as: "Our Early Heritage – A History of VHF", by Bill Tynan, W3XO, Proceedings of the 28th Conference of the Central States VHF Society, 1994, at 66-69.

An article entitled "The May 1998 Tropo 'Openings of the Decade' ", by Jon K. Jones, MD, N0JK, Proceedings of the 32nd Conference of the Central States VHF Society, 1998, at 44-55, is the source for details on the May 1998 6 meter E-skip openings.

A wonderful review of VHF Contesting over the years, "Seven Decades of VHF Contesting in North America", by Curt Roseman, K9AKS, Proceedings of the 36th Conference of the Central States VHF Society, 2002, at 18-25, provided valuable and numerous references on VHF contesting. Curt has also greatly assisted the Editor with additional details and comments for use with these Historical Notes.

The World Above 50 MHz column, *QST*, April, 2003, at page 86-88, "VHF Contests Reexamined: Changes in the Wind" is the reference for the on-going discussion of VHF Contest Rules Revisions.

The VHF Contest E-Mail Reflector has provided current comments regarding various proposals under discussion regarding contest rules revisions, as well as up to date thoughts on all the VHF contests.

The source for the section on "Notes on Specific Scores in the SMC Area" comes directly from the contest operators involved in the clarification or correction of the line scores.

Historical Notes last updated 9-2003