A VHF Contest Primer

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Introduction

This article is intended as an introduction to VHF/UHF contesting for those who have never tried it before, but are familiar with HF contesting. Many of you probably have HF + 6m or HF/VHF/UHF transceivers and have never really put the higher band capabilities to much use, except perhaps for communicating through the local repeaters. If you have listened in the SSB/CW portions of the VHF/UHF bands, you may have heard little or nothing. These segments are populated by many who are primarily interested in working good dx and may not be very active unless there is good propagation. The characteristics of VHF/UHF propagation mean that most of the time it is quite difficult to hear distant stations (compared to HF…but much easier than you would think if you are used to 2m FM only), making these bands more like 10m at the bottom of the sunspot cycle than they are like 20m. But as any experienced contester knows, during a major contest you can often make lots of QSOs on 10m, even without much cooperation from the sun. The same is true of VHF contests…the bands come alive, propagation or not.

Activity

There are a number of VHF/UHF-only contests throughout the year, though not as many as on HF, plus there are a few events which include both HF and VHF. Here is a list of the major ones (with asterisks beside those valid for sCCOre Award and a second asterisk for contests with a club competition).

January	ARRL VHF Sweepstakes* *
April	Ontario QSO Party (CCO, up to 2m only)*
April-May	Spring VHF Sprints (K9JK/W4SHG)
May	San Bernardino Microwave Society 2 GHz & Up Contest
June	ARRL June VHF QSO Party* *
	SMIRK 6m contest (Six Meter International Radio Klub)
	ARRL Field Day
July	RAC Canada Day Contest (up to 2m only)*
	CQ World Wide VHF Contest (6m & 2m only)
August	ARRL UHF Contest
	ARRL 10 GHz & Up Contest (1st weekend)
September	ARRL September VHF QSO Party* *
	ARRL 10 GHz & Up Contest (2nd weekend)
Sept.-October	Fall VHF Sprints (Southeastern VHF Society)
December	RAC Canada Winter Contest (up to 2m only)*

As a beginner you will likely find that the three major ARRL contests in January, June and September are the most interesting, though the Sprints can be enjoyable for those with a good single band capability. Another interesting way to get your feet wet is to add VHF capability to your Field Day, OQP or RAC contest efforts.

Most VHF contest activity is on SSB (always USB), with somewhat less on CW. Weak signal digital modes are starting to be used. FM is used in some areas, but not a lot in Ontario (except in the OQP and RAC contests, and on Field Day), and there are usually rules restricting what frequencies can be used. Crossmode contacts with one station on SSB and the other (usually weaker) station on CW are common. In general VHF contest rules allow one QSO with each station per band, regardless of mode, with the exception of Field Day, OQP and the RAC contests where a phone and a CW QSO are allowed with each station on each band, as on HF. Many VHF-only hams are not highly skilled at CW, though most are quite willing to use it when the going is tough. This gives experienced HF CW contesters something of an edge

in VHF events. The HF contester's abilities to copy in QRM and run at high rates are less useful in VHF contests but can provide a small advantage.

The most active bands are 2m and 6m, since most operators are equipped (or better equipped) for these two bands, because the propagation is usually better, and because the antenna beamwidths are wider than on the higher frequencies, meaning more people can hear a CQ. It is very common for two stations to make an initial contact on 50 or 144 MHz, and then QSY to whatever other bands they have in common. It is also quite accepted practice in VHF contests to make schedules by email, etc., before the contest to increase the likelihood of a contact. Operating techniques are much like HF contests but are usually conducted at a somewhat slower pace, with longer CQs, slower CW and repeated exchanges, since signals are often weaker and possible QSO rates lower. Many single operators use SO2R, SO3R and SO4R setups, so if you hear nothing interesting on a given band, there may be several people listening while CQing on another band, so a CQ is often worthwhile.

The frequencies normally used for contesting on the lower four bands are as follows.

50.090-50.100	CW
50.100-50.125	SSB/CW – for working stations outside Canada/USA ONLY
50.125-50.250	SSB, some CW
52.525	FM
144.100-144.150	Digital
144.150-144.270	SSB/CW
146.550,146.580	FM
222.070-222.160	SSB/CW
223.500	FM
432.070-432.160	SSB/CW
446.000	FM

Higher band activity is centred at 903.1, 1296.1, 2304.1, 3456.1, 5760.1, 10368.1 and 24192.1 MHz, mostly CW, with some SSB. There is also a little wideband FM activity on 10 and 24 GHz.

The VHF and up contests employ scoring based on the Maidenhead Grid Locator system (see http://www.arrl.org/locate/gridinfo.html) so you will need to know which one you are in. Most of the many 4-character grid squares in Ontario are never on the air, so if you feel altruistic, a contest expedition to one or more of the rare ones could be interesting. However, unless there is a big opening, such an operation is doomed to a very low score since the rare grids are all at least slightly remote from the activity centres. It could, however, add quite a bit to the CCO club totals if you put the rare multiplier in the logs of the higher-scoring members.

Activity levels are usually best in the mornings and in the evenings after dark, as the combination of availability of casual operators and tropospheric propagation is best at these times. There is very little activity in the wee hours of the morning unless there is a very good opening. This means that operators (like me !) who can not stay awake continuously can be more competitive in VHF contests than on HF.

Propagation

The workhorse mode of propagation is tropospheric scattering, which can provide in contacts of up to a few hundred km on any band between 50 MHz and 10 GHz, with the maximum distance on any given band depending on your power, antenna and how clear a horizon you have at your location.

Particularly in the summer (May-July) but occasionally at other times of the year, sporadic-E propagation can yield QSOs out to about 2500 km (and sometimes further in the case of double-hop propagation) on 6m, and very rarely also on 2m.

Tropospheric ducting occurs from time to time (most common in the summer and fall) and can propagate signals on 144 MHz and up with much stronger signals than tropospheric scattering and occasionally beyond 1000 km.

Strong auroras will reflect signals on 6m and 2m (and occasionally on 222 and 432 MHz) and gives good results in contests if it occurs. Most activity is on CW due to the distortion introduced by the aurora. Antennas need to be aimed at the aurora (generally north), not toward the station you are trying to work. But aurora can also be useful to induce Americans to turn their antennas north (i.e. towards Ontario !) so sometimes it is worth looking south during an Aurora for signals arriving via tropospheric scattering or ducting as well.

Some VHF contesters have been able to make good use of meteor scatter propagation using digital modes to pick up distant multipliers, especially on 6m and 2m.

Equipment

Equipment used by VHF contesters is extremely varied. My belief is that it is best just to start with whatever you have and get on the air ! Very few run anywhere close to the legal power limit, so smaller stations can be reasonably competitive, particularly in Canada where the overall level of competitiveness in VHF contests is not currently very high. VE3KZ has won many certificates using just an IC706MkIIG (albeit with some decent antennas at a very good location) and so have I, operating on more bands but with 10 watts or less, with all the antennas on an apartment balcony ! I am able to quite regularly work stations at over 500 km distance on 2m and much further on 6m in sporadic E openings.

Antennas on VHF SSB/CW are standardized on horizontal polarization, while on FM vertical polarization is used. There is quite a bit of loss involved in communicating between antennas of opposite polarization. However, this does not mean that contacts are impossible. If you have an antenna of any sort, I encourage you to try it and see what you can do. Don't forget that 40m dipoles and such can often be pressed into service on 6m with the aid of an antenna tuner. From KC6CQ (Palau) I even worked a bunch of JAs on 6m using 10 watts and a TH-2 tribander fed with about 150 ft of small coax !

Rovers

A well organized rover (in those contests that permit this type of operation) can usually get a bigger score than a fixed station with the same gear and can add a lot more to the scores of any nearby home stations due to being allowed to work everyone again from each grid visited.

Club Competition

In the ARRL January VHF SS (the only VHF contest with a long history of club competition) CCO has entered five times. The 2005 contest was notable for extremely poor propagation.

Contest	CCO score	No. of CCO Entries	Rank (Medium Class)	% of top Medium class score
January 2003	95,016	10	15th of 24	3
January 2004	110,983	11	14th of 23	6
January 2005	33,108	14	11th of 19	3
January 2006	223,984	15	7th of 26	20
January 2007	237,332	22	8th of 15	27

Our past club competition results in the ARRL June and September VHF QSO Parties (which share the same rules and scoring) are as follows. September 2005 featured quite good propagation favouring Ontario.

Contest	CCO score	No. of CCO Entries	Rank (Medium Class)	% of top Medium Class score
June 2003	107,571	9	19th of 22	3
June 2004	30,011	8	17th of 19	1
June 2005	284,647	14	14th of 23	8
June 2006	317,537	12	14th of 28	7

Contest	CCO score	No. of CCO Entries	Rank (Medium Class)	% of top Medium Class score
September 2003	171,068	10	11th of 17	7
September 2004	122,238	10	11th of 16	5
September 2005	689,275	19	4th of 19	19
September 2006	356,477	20	4th of 14	19

Generally we have advanced to the point where CCO is around the middle of the pack, and fairly close to the top in September. While our chances of winning the Medium (50 or less entries) club category in these contests seems slim at present, I think we can achieve a much higher aggregate score if we put some effort into it. By comparison, the Rochester VHF Group in western NY has won this category on a number of occasions, with a smaller population base than we have (although located a bit more centrally with respect to the bulk of activity).

A push towards a better club score should encourage greater activity generally in Ontario, which should keep more US stations' beams toward us, helping to increase our scores. If we get to the point of having a fairly competitive score, that may attract some further attention. With luck, such an effort may also encourage more Ontario hams to try out the less populated UHF and microwave bands in order to get more multipliers, which hopefully would help convince Industry Canada that they ought to remain Amateur allocations, at a time when nearly all our allocations above 148 MHz are under some degree of pressure from other spectrum users.