

VHF Operation and Field Day: FAQ's, Tips and Guides for Getting More Field Day QSOs

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When most hams think of Field Day, they automatically envision a stampede of activity on the HF bands. While this may be true, there is a gold mine of contact points on the bands above 30 MHz. **ALL** Class A and Class F stations are able to have a free VHF station to make extra QSOs towards their Field Day score. Adding an experienced VHF team to your Field Day effort can pay big dividends. Many efforts to gain points from a VHF station in the past have not succeeded because the operating protocols on VHF are not known to hams who operate mostly HF, and they simply do not know where or when to transmit. This guide attempts to answer some basic questions about VHF operating so your club can utilize their VHF station to its maximum potential.

Terrestrial VHF Communication

During the summer months, sporadic-E propagation comes into full force, opening the door for possible long-haul QSOs on 6 Meters across the country. During exceptional openings, Sporadic-E is possible on 2 Meters, too. Tropospheric enhancement on 2 meters and 432 can occur as well, allowing communications as far as several hundred miles. Sporadic-E is, by definition, unpredictable; nobody knows when it will occur. While it can occur at any time, it seems to occur most often in the afternoon and evening. Tropospheric conditions are generally best in the early-morning hours, especially on 2 meters and 432 MHz.

It is also possible to have VHF bands that are completely dead, or openings that only last a very short period of time. VHF bands generally do not function like HF, and require some enhanced propagation conditions to come to life. Two of the best tools for using the VHF bands are patience and perseverance.

General VHF Tips

Technician-class licensees have full privileges on 6 meters and up. However, don't make the mistake of leaving an inexperienced Technician (or any class licensee, for that matter) at the VHF station without some guidance; you may end up with a very dissatisfied operator. Recruit an experienced VHF operator to your team and let them provide instruction for those unfamiliar with VHF operating techniques.

Feedline losses are much higher on VHF frequencies than HF. If you're going to set up a VHF station, use high-quality coaxial cable. RG-8 is the bare minimum; do not even bother to use RG-58 or RG-59, as the losses will be substantial. Keep the runs as short as possible; the extra coax from a piece that is much longer than required is wasting your power.

Many VHF operators use Maidenhead grid squares to help identify their location more precisely. Some collect grids, much like HF operators try to work all States or DXCC countries. Know what grid square your Field Day operation is in; while exchanging grids is not required for a Field Day QSO, many VHF'ers you work will want to exchange grids. You can get more information on grid squares here: <http://www.arrl.org/grid-squares>

The VHF bands are generally "line-of-sight" bands, so antenna height is critically important on the VHF bands. "The higher, the better" is definitely true! If possible, set your VHF station at the highest elevation point of your Field Day site. If your Field Day site is in a valley or has high hills surrounding it, your VHF operations may suffer.

The band plans for 6 meters and 2 meters do not follow HF band plans. For example, if you think you will call CQ FD on 6 meter CW at 50.025 MHz because that's near the bottom of the band, you're not going to work a lot of people. Read the next section for tips on where to find the action.

CW/SSB

Most long-haul communications on the VHF bands take place on USB or CW. Horizontally-polarized yagis or loops are the preferred antenna for SSB/CW VHF communication. Even a dipole on 6 meters will work nicely, and is less than 10 feet long. Attempting VHF SSB/CW communication with a vertically polarized antenna, especially on 2 meters and higher, will reduce your ability to hear stations and be heard by others by as much as 20 dB. Make sure you use horizontally-polarized antennas when attempting SSB/CW VHF work.

Important 6 Meter SSB/CW tips:

- 1) 6 meter SSB activity is from 50.125 to 50.200 MHz, and can go up to 50.300 MHz if the band is open and packed with signals.
- 2) 6 meter CW activity will range from 50.080 to 50.100 MHz. from 50.000 to 50.080 MHz, you can listen for CW beacons to help see if the band is open.

3) 50.100 to 50.125 MHz is the 6 Meter DX window, which is reserved for stations attempting intercontinental QSOs. **Do not make Field Day QSOs in the DX Window.** There are many non-Field Day operators that focus on 6 meter DX'ing and request the DX window be kept clear.

4) The 6 Meter SSB calling frequency is 50.125 MHz. If you spin the dial and don't hear many callers, you can call CQ on the calling frequency. However, do not monopolize the calling frequency; if the band is open, find a clear frequency above 50.125 and call CQ there.

5) If 6 meters is open, point your antenna in the direction of the location of stations you're hearing. If there isn't a big opening occurring, rotating your antenna in different directions every 15 minutes or so will increase your chances of being heard in different parts of the country. Under poor conditions, try to aim your antenna toward large population centers.

2 Meter SSB/CW Operating Tips

- 1) The 2 meters SSC/CW calling frequency is 144.200 MHz. As with 6 meters, please do not monopolize the calling frequency.
- 2) Activity will range between 144.170 to 144.230 MHz in densely populated areas. If you live in a more rural part of the country, activity will be much more centered around the calling frequency.
- 3) Once again, horizontally-polarized antennas are the custom. A 5 or 6-element yagi on 2 meters works very well, but larger is generally better. Higher is better, too!
- 4) If you're not working many stations, rotate your antenna about 30 degrees every 5-10 minutes to maximize coverage to all areas.. Point towards high-population areas when possible.

For 222 and 432 MHz, the calling frequencies are 222.100 and 432.100 MHz.

FM

For Field Day operating, FM is probably the easiest VHF mode to implement. You'll have little trouble finding FM rigs to use; even a hand-held transceiver can make a fine Field Day rig. **FM doesn't have the range of CW or SSB**, but it is the most popular communications mode on the VHF and UHF bands. You'll find the greatest amount of FM simplex activity on the 2-meter band, although 6 meter FM may be worth a try as well. **Remember that Field Day rules prohibit the use of repeaters.** This means you'll have to hunt for contacts on the recognized simplex frequencies.

Unlike CW and SSB, most FM operators use vertically polarized antennas. To maximize your signal coverage, you'll want to use vertical polarization, too. A small beam antenna mounted in the vertical-polarity position (elements perpendicular to the ground) is one suggestion. An alternative is a simple omni-directional antenna such as a ground plane. Since most of your contacts will be local, an omni-directional antenna may be nearly as effective as a beam.

There are many 6 meter FM operators, and if the band is open, 6 Meter FM could yield some long-haul QSOs. Monitor the 6 meter calling frequency at 52.525 MHz; simplex QSOs will be possible around the calling frequency. Open your squelch so weak signals will be heard. As with SSB/CW work, please do not monopolize the calling frequency.

SATELLITES

Satellites are a blast on Field Day! Of course, to use a satellite you have to know when it will be passing across your local sky. One easy way to obtain pass predictions is on the AMSAT Web site at www.amsat.org/amsat-new/tools/predict/. Just print the predictions for the satellites you intend to use. There are also satellite tracks apps for the iPhone as well as Androids.

FM Birds: SO-50

Do you have a dual band VHF/UHF FM rig that can receive below 437 MHz? Try **Saudi-Sat SO-50**—the only working FM repeater satellite as of 2013. Just use the frequency table below to program the radio's memories so that you can compensate for Doppler shifting by simply changing memory channels.

SO-50		
<i>Time</i>	<i>Transmit</i>	<i>Receive</i>
AOS (start)	145.840	436.805
AOS+3 Minutes	145.845	436.800
Zenith (maximum)	145.850	436.795
Zenith+1 Minute	145.855	436.790
LOS (end)	145.860	436.785

Note that you'll need to use a 67 Hz CTCSS tone on the 2 meter uplink to access SO-50.

One important thing to remember is that the ARRL Field Day rules have changed in regards to these single-channel FM satellites. Stations participating in ARRL Field Day are limited to one (1) QSO on any “birds” that fall into the single channel FM classification. This change is to allow more groups the opportunity to experience the thrill of satellite communications. *Once you have made one successful FM Satellite QSO, PLEASE allow other Field Day groups the same opportunity at bonus points that you had. Now that SO-50 is the only functioning FM satellite, usage will be exceptionally high.*

SSB/CW Satellites

If you can transmit and receive SSB on 2 meters and 70 cm, try **VUSat-OSCAR 52** or **Fuji-OSCAR 29**.

These are excellent SSB/CW birds and you can work it with a fairly minimal setup. The tricky aspect is that these satellites have *inverting transponders*. If you transmit LSB, the satellite repeats as USB. If you transmit at the high end of the passband (see below), the satellites will repeat your signal at the low end of the passband.

	<i>Uplink Passband</i>	<i>Downlink Passband</i>
OSCAR 52	435.220 – 435.280 MHz	145.870 – 145.970 MHz
OSCAR 29	145.900 – 146.000 MHz	435.800 -- 435.900 MHz

For more detailed information about satellite operating, pick up a copy of the ARRL Satellite Handbook. You can order on the Web at **www.arrl.org/catalog/** or call **1-888-277-5289**.

Some Final Considerations

When it comes to VHF/UHF operating, antenna height is everything (the only exception is satellite operation). To make the most of your VHF/UHF capability, you'll need to mount your antennas on portable supports or select a hill or mountain for your Field Day site. Feed line loss is substantial at VHF and UHF, so use the best coaxial cable you can find. If you exploit the VHF/UHF bands to their full potential, you'll be surprised at how many points you'll add to your score. And if the HF bands are dead, VHF and UHF may save the day!

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