

## Magic Band, Magic Contesting

We've all heard of "the Magic Band," 6 meters, and no doubt you've pushed the 6-meter button on your radio. The good news is that sporadic E openings occur from coast-to-coast, especially during the summer months. The bad news is that all too often you'll hear nothing. Being the Magic Band, it can just make propagation appear at will, and when openings do happen, they can be great fun for contest or casual operating.

### VHF Contesting

Joel Harrison, W5ZN, describes VHF contesting this way: "Magic bands with super results from average stations." For me, VHF contesting is the niche that fits my current operating restrictions and provides a fun, competitive outlet, even for my small station. For example, while the CQ World Wide SSB attracts more than 38,000 entries, the CQ World Wide VHF Contest attracts some 750. A few operating categories in the VHF event might just match your station and operating preferences perfectly. Those include 6 and 2-meter single band entries, hilltopper, QRP, and — my favorite — rover. The contest takes place each July.

The ARRL VHF contests are held in January, June, and September. While all events include 6 meters, the June contest is far and away the best for sporadic E openings. Entry categories include single operator low and high power, portable for QRP entries, FM only, three-band only (6 and 2 meters and 70 centimeters), multioperator, and rover. For June 2019, just over 1,300 logs were submitted. I'm confident there's a category where your station could be competitive.

As always, contests are an excellent way to add DX to your logbook. While VHF isn't the best for increasing your DXCC total, it is a great way to add grids to your VUCC total. A four-digit grid square, such as EM12, represents 1° latitude × 2° longitude. In the central US, that equates to 70 miles (112 kilometers) north to south by 100 miles (160 kilometers) east to west.

### VHF Propagation Modes

Six meters forms a twilight zone between HF and VHF propagation modes. On the HF side that includes F<sub>2</sub> propagation, signals bouncing off



Six-meter stressed Moxon from PAR Electronics.



The K5ND home station. This may not be an average setup, but getting started only requires having a radio available for 6 meters.

the ionosphere's F layer, which only happens on 6 meters during the high point of the sunspot cycle. On the VHF side, that includes tropospheric ducting and auroral scatter. Aurora is solar storm driven, and it helps if you're in the northern latitudes. Tropospheric ducting can happen on 6 and higher bands for modest but surprising distances. But, for me the magic is sporadic E or E — also known as E-skip.

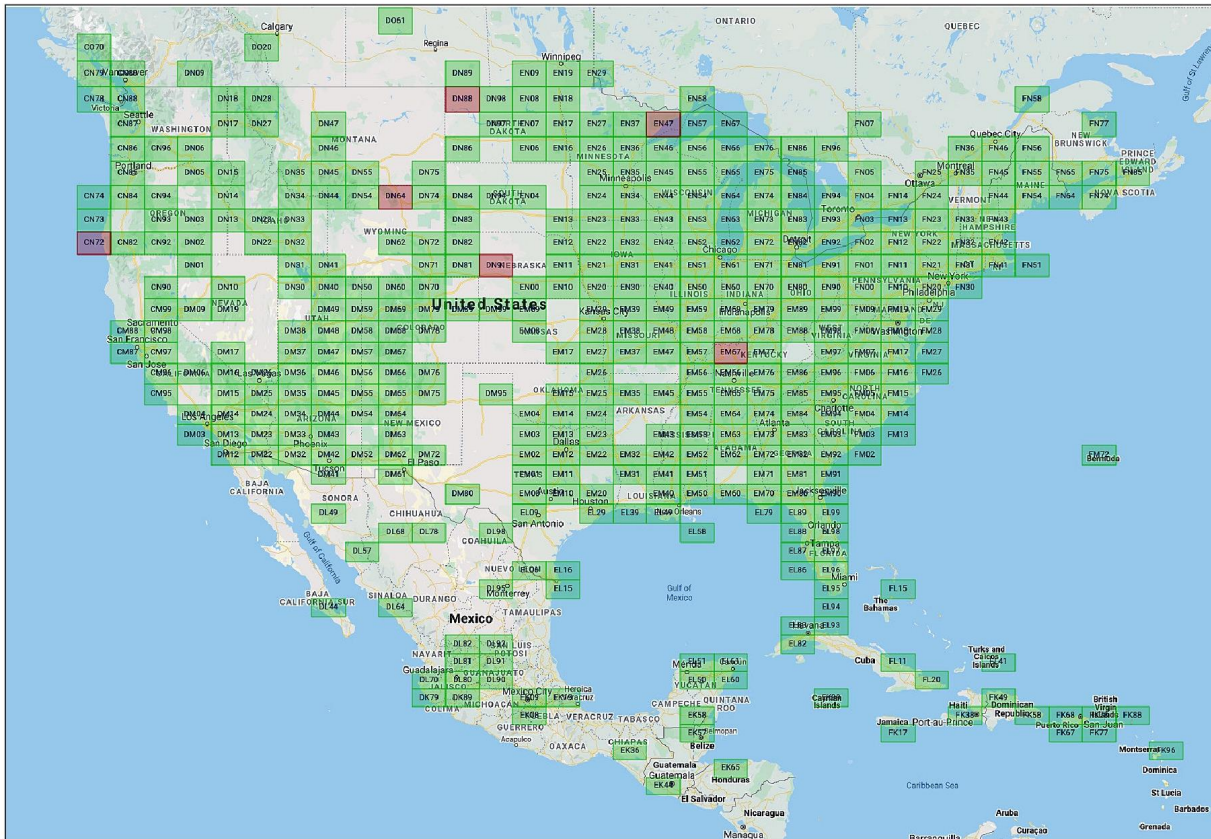
Sporadic E involves bouncing signals off the E layer of the ionosphere, with typical distances in the range of 500 to 1,200 miles — longer for multiple hops. The magic comes in because sporadic E, which happens primarily in the summer months, is not dependent on the

solar cycle. That means it's still happening *now*, during the solar minimum.

Another mode that is independent of solar activity is meteor scatter. Here meteors are entering the Earth's atmosphere and burning up and, as a result, ionizing the E layer allowing signals to bounce off. This takes special digital modulation modes, primarily MSK144 of the *WSJT-X* suite of software. A beam is needed to direct your signal, and higher power can certainly help.

Trans-equatorial propagation (TEP) happens along the equator, with stations above and below the equator working over extreme distances. I've made contacts from North Texas into Argentina, Uruguay, and Chile via TEP.





Grid square map, courtesy of WG7J's GridMapper, showing K5ND's 6-meter grids to date.

Moonbounce, or Earth-Moon-Earth (EME), is another mode that can take significant antenna gain and power.

While all of these modes can be used during a contest, you're most likely to encounter tropo, E<sub>s</sub>, and meteor scatter during a contest.

### Average Stations

Press the 6 meter button on your HF + 50 MHz rig; 100 W is just fine. Attach a 6-meter antenna. A 6-meter Yagi is quite a bit smaller than an HF Yagi. Suitable antennas also can include a dipole (just 9 feet long) or a small beam with a low-cost TV antenna rotator. Your 6-meter antenna doesn't need to be all that high in the air; most consider about 30 to 40 feet to be optimum. This takes into account the ground effect and the fact that E<sub>s</sub> signals are coming in from many elevation angles — not necessarily the lowest angle. I use a 20 – 25-foot push-up mast and get excellent results. My rover antenna has a maximum height of 12 feet.

Once the magic starts happening, an average station can be quite effective in taking advantage of nearly every opportunity.

### Antennas

At my own station, I've managed to get on the air with both verticals and dipoles that appear to work just fine. While VHF weak signal modes are generally conducted with horizontally polarized antennas, I've found that verticals can be quite effective on 6 meter E<sub>s</sub>. In fact, I've worked more than 100 grids from North Texas using a vertical dipole, and that includes contacts with Scotland and the Canary Islands.

My favorite antenna is a 6-meter Moxon — a small, two-element beam that's pretty easy to place on a TV antenna rotator and a push-up mast. I've used this at home and on my VHF rover for contests. On my VHF rover I've also used a painter's extension pole for the mast and the Armstrong method of rotating the antenna.

### SSB, FM, FT8, MSK144 — Lots of Options

Contesting is all about generating lots of contacts, picking up multipliers along the way. VHF contesting works the same way, with grids as the multiplier. The trick with VHF contesting is to find the

other stations and work them. Not only that, but with VHF contesting there are no special entry categories tied to CW, SSB, or whatever. It's down to using whatever works to get stations in the logbook.

These days, stations on 6 meters are typically using *WSJT-X* FT8 mode, although we may start seeing some FT4 in VHF contests. Quite a bit of meteor scatter takes place using MSK144. Many dedicated VHF operators lament that both CW and SSB have nearly disappeared during the contests. That is unfortunate, chiefly because you can run stations very quickly on both modes when the band is open.

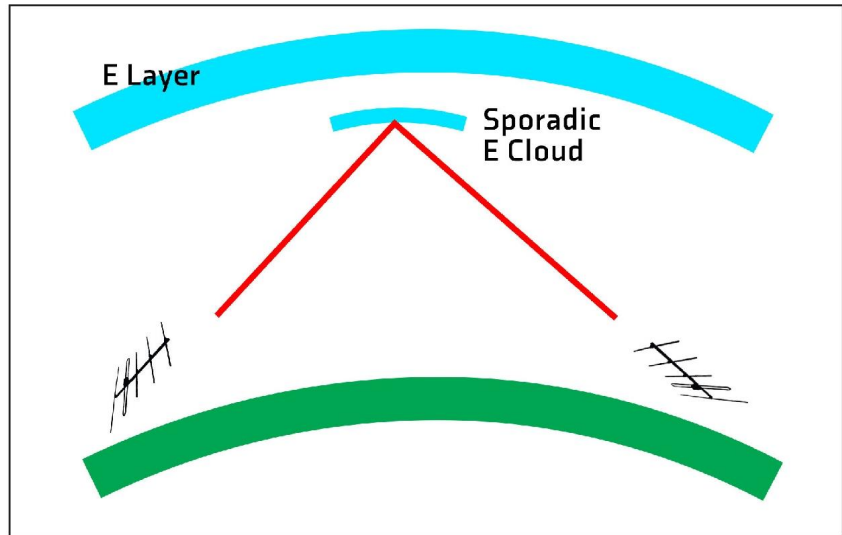
While hanging out on the FT8 frequency of 50.313 MHz may be *de rigueur* these days, it's wise to look at the standard calling frequencies from time to time, particularly during E<sub>s</sub> openings. Those frequencies are 50.125 for SSB, and 50.100 and below for CW. Note that 50.100 to 50.125 is considered the DX window. Don't call CQ there. But do try calling CQ Test on the standard calling frequencies and see what happens!

**VHF Contesting Assistance**

A few years ago, ARRL opened up the VHF contest assistance rules. DX spotting systems can be used. I like *DX Maps* to see the openings. In addition, you have access to chat rooms such as PingJockey, ON4KST, and Slack VHF-Chat. On these systems you can announce that you're transmitting on a particular frequency, mode, etc, as well as pointing your antenna in a particular direction. You can also work with specific stations on timing, frequencies, and more. You just cannot exchange contact details. The ARRL rules even allow telephone calls and texting. I use this when I'm roving, to let stations know when I'm in a new grid. Note, however, that the CQ VHF Contest prohibits this type of assistance.

**Magic Band — Entry Level Drug**

*I'm Jim, and I'm a 6-meter addict...*  
Well, that and 2 meters, 1.25 meters, and more. I've resisted the microwaves for the moment, but 6 meters can get



Sporadic E happens near the ionosphere's E Layer in what are thought to be ionized clouds. Now that is real magic; we don't even know why it happens.

into your bloodstream. Sporadic E openings, often into Europe, South America, and Asia, are absolutely amazing. I've worked New Zealand and Japan with 100 W and a Moxon. You can too. And, all this is even more amazing when a contest is running.

As a contester, there's also the fun of generating a large score. Plus, you are building your list of grids for the VUCC awards. Something new to chase!

**Get on the Air and Try It Out**

These VHF contests are coming to a rig near you.

- ◆ ARRL June VHF — June 13 1800 UTC to June 15 0259 UTC
- ◆ CQ WW VHF — July 18 1800 UTC to July 19 2100 UTC
- ◆ ARRL September VHF — September 12 1800 UTC to September 14 0259 UTC
- ◆ ARRL January VHF — January 16, 2021, 1800 UTC to January 18, 2021, 0259 UTC

As Humphrey Bogart said to Claude Rains in the movie *Casablanca*, "Louis, I think this is the beginning of a beautiful friendship." That friendship is between 6 meters, VHF contesting, your station, and one whole lotta fun.

**Further Reading**

Contest University — W5ZN presentations on VHF contesting: [www.contestuniversity.com/files/](http://www.contestuniversity.com/files/)  
World Wide Radio Operators Foundation Webinars Archive — [wwrof.org/category/webinar-archive/page/2/](http://wwrof.org/category/webinar-archive/page/2/)

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