

Worldwide Fun with 100 W and a Dipole



Make contacts domestically and around the world on 10, 12, and 15 meters with a modest station.

Carl Luetzelschwab, K9LA

We're around the solar maximum for Solar Cycle 25, which offers consistent day-to-day propagation on 10, 12, and 15 meters in the fall and winter months (except when we have a disturbance to propagation).

Frank Donovan's, W3LPL, October 2024 *QST* article "What to Expect from the Solar Cycle 25 Surge" provided detailed summaries of expected propagation on 160 through 6 meters during this solar maximum period. This article will discuss short path versus long path and use of the *Voice of America Coverage Analysis Program (VOACAP)* to predict propagation. See the sidebar "A Deep Dive into 10 Meters" for more information on the band and the upcoming ARRL 10-Meter Contest.

Short Path and Long Path

The shortest distance between any two locations on Earth is a great-circle path. There are two great-circle paths between any two locations — short path (less than 20,000 kilometers) and long path (20,000 to 40,000 kilometers). Which path is available depends

A Deep Dive into 10 Meters

Every class of US license has allocations on 10 meters, and the ARRL 10-Meter Contest is right around the corner on December 14 and 15. It's a 48-hour contest, but you can operate as much as you want — the main goal is to have fun. For the full list of rules, visit <https://contests.arrl.org/ContestRules/10M-Rules.pdf>.

Signals can be very strong on 10 meters. This is due to minimal ionospheric absorption and longer hops on the band, as well as bigger antenna arrays because 10-meter antennas are physically the smallest of our HF antennas. Additionally, these antennas can be very effective at relatively low heights. A simple dipole at 20 feet will do wonders at 100 W on SSB, CW, and FT8 (FT8 isn't allowed in the ARRL 10-Meter Contest).

on the maximum usable frequency (MUF) for the path (if there's enough ionization to refract the signal back to Earth) and the loss for the path (if the loss is low enough to hear or decode the signal). The long-path heading to a distant location is 180 degrees opposite to the short-path heading.

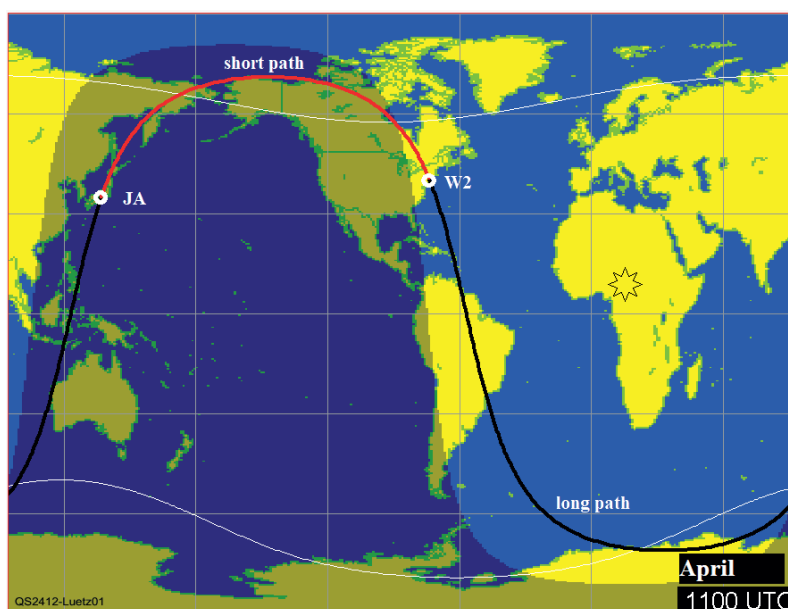


Figure 1 — East Coast 10-meter long path on an April morning.

Because we're around the solar maximum, there's a common long path on 10 meters (and on 12, 15, and 17 meters to a lesser extent) that can occur in the spring, summer, and fall months. It occurs right after sunrise at one end of the long path. Figure 1 (from the propagation prediction program *W6ELProp* at www.qsl.net/w6elprop) depicts this long-path opening from the US East Coast to the Far East and Southeast Asia on an April morning at 1100 UTC (about 40 minutes after sunrise). Note that the heading out of the East Coast is to the southeast.

The short path is not available, as much of the path has been in darkness for a long time with low MUFs in the F2 region. The long path is open because most of the F2 region is in daylight with high MUFs.

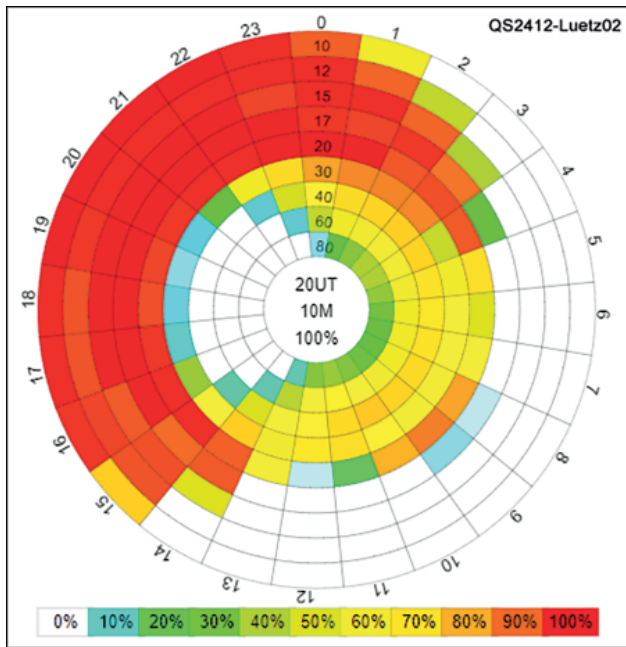


Figure 2 — December 2024 prop wheel for K9LA's location to Los Angeles.

A similar long path on 10 meters occurs in the late evening from the US West Coast to Europe and the Middle East. For this long path, the heading out of the US West Coast is to the southwest. For more details on these long paths and general comments on long path, visit https://k9la.us/A_Refresher_on_10m_Long_Path.pdf.

Using VOACAP

VOACAP is a well-respected propagation prediction program that will tell you the best time and band to contact a desired station. VOACAP Online for Ham Radio (www.voacap.com/hf) by Jari Perkiömäki, OH6BG; James Watson, HZ1JW, and Juho Juopperi, OH8GLV, will take your inputs and give you probabilities for times and bands to make a successful contact. I strongly recommend reading the "User's Manual" found at the bottom right of the home page for information on the parameters that you must input for a prediction.

After inputting your parameters, you'll see a Mercator-projection map depicting your desired path with a selection for either a prop chart (propagation chart) or a prop wheel (propagation wheel). I believe the prop wheel is the best way to see what band and time are best. Figure 2 shows the prop wheel for a path from my location in northeastern Indiana to Los Angeles, California, on a December day in 2024. I selected my mode, output power, and antennas. The smoothed sunspot number, which is what VOACAP uses to correlate with the state of the ionosphere, is automatically

predicted for up to 9 months from the current month; anything later must be manually inputted. Please note the smoothed sunspot number section on page 11 of the website's manual.

The probabilities for a successful contact are color-coded for each of our HF bands (VOACAP only makes predictions from 2 to 30 MHz; there are no predictions for 160 or 6 meters) and for each hour of the day.

As you can see, I have many great possibilities throughout the day to complete my contact. This is typical around solar maximum for a relatively short-distance path (3,004 kilometers). For longer-distance paths (and long path), the possibilities will generally be less. We should have great propagation for contacting Los Angeles (and the entire West Coast) during the ARRL 10-Meter Contest.

Final Comments

Based on the needed smoothed sunspot number of 100 for 10-meter propagation, we should expect to have 10-meter propagation until 2027 and expect 12 and 15 meters to be available through 2027 (and maybe into 2028), as these two bands require a smaller smoothed sunspot number.

When using 10-, 12-, and 15-meter directional antennas, you generally should point them to "follow the sun." In the morning, point them Northeast through Southeast for Europe, the Middle East, and northern Africa. In the late morning and early afternoon, point them Southeast through Southwest for southern Africa, the Caribbean, and South America. In the evening, point them Southwest through Northwest for the Pacific, VK/ZL, the Far East, and Southeast Asia.

Take advantage of where we are in Cycle 25. As W3LPL mentioned in his article, solar minimum between cycles 25 and 26 will be around 2030. These three higher HF bands will be very spotty unless there is sporadic-E propagation during the summer months.

Carl Luetzelschwab, K9LA, started his radio career as a shortwave listener in the late 1950s. He received his Novice-class license in 1961 and selected K9LA as his call sign in 1977. He enjoys propagation, DXing, contesting, playing with antennas, and fixing and using vintage equipment. Carl's a graduate of Purdue University (where he earned his master's degree in electrical engineering) and worked for Motorola and for Magnavox (now Raytheon) as an RF design engineer. He retired in October 2013. Carl can be reached at k9la@arrl.net.

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