

# Bidirectional Mapping Radios— The Wave Of The Future

**W**hen the topic is radio location, the term “bidirectional” refers to the capability of a global positioning system (GPS) receiver and mapping unit to send and receive latitude and longitude position fixes. A GPS mapping receiver, on its own, will display your current position on a map screen, generally accurate to the diameter of a 15-foot circle.

That same GPS might also offer a NMEA 0183 output data stream that can upload to a two-way radio to transmit a position data burst. There are hundreds of radio systems that would upload single-direction position fix data bursts, but “going bidirectional” could allow that same GPS mapping device to display the precise position of other units on the same frequency.

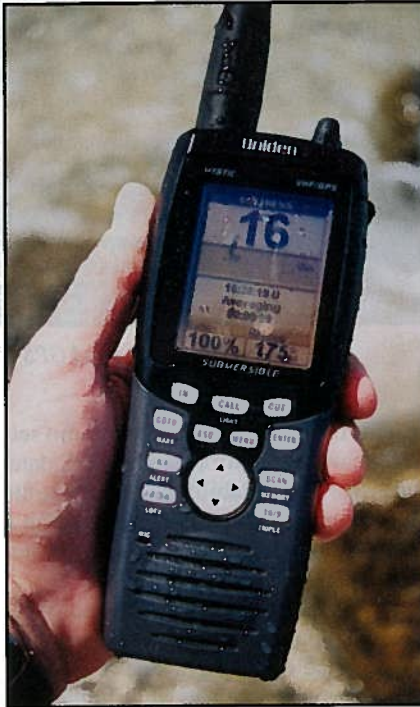
Garmin ([www.garmin.com](http://www.garmin.com)) was granted an FCC experimental waiver of the rules to test bidirectional portable GPS equipment on Family Radio Service (FRS) channels. One potential use for this equipment would be enabling a scout leader to call out to another distant FRS radio, and not only hear the response on the speaker, but actually see his or her position on the FRS screen.

“We regularly get letters from wilderness trekkers who say their Garmin FRS bi-directional GPS radio equipment had located a lost party,” says a Garmin representative at a local electronics trade show.

## What You See Is What You Get— And More!

For boaters, kayakers, or fishermen out on a lake, another radio, an under-\$400 submersible marine 55-channel VHF handheld, includes bidirectional signaling with a GPS receiver built in! It’s manufactured by Uniden and is called Mystic. You can obtain more information at [www.uniden.com](http://www.uniden.com).

The trans-reflective LCD screen will also show land mapping, including lakes and rivers with a MapSend Streets CD-ROM, or detailed ocean charts from

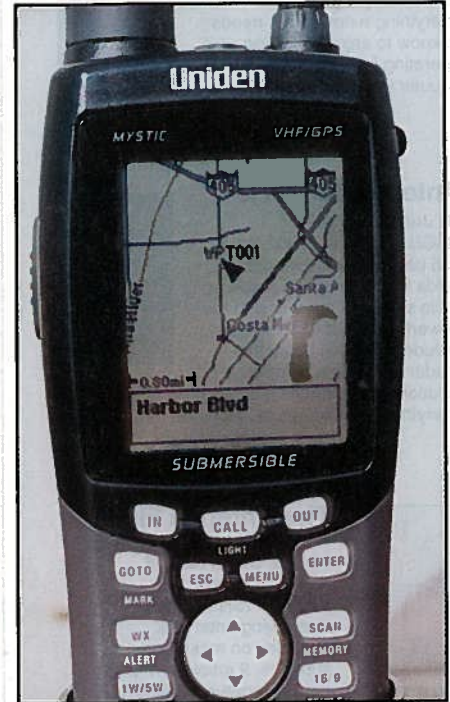


The Uniden Mystic as a radio.

Magellan BlueNav. The detailed mapping software adds another \$150 to the \$399 price, but what you get is a powerful marine VHF radio, completely submersible, with a built-in GPS, detailed screen mapping, and the ability to send and receive GPS data bursts using marine digital selective calling (DSC) data bursts on 156.525 MHz, VHF Channel 70.

“I went overboard and I watched my boat slowly sail away,” says a lake fisherman who owes his life to bidirectional radio/GPS signaling. “I realized I had my Mystic handheld on my belt, so I grabbed the radio, turned it on, and pushed the red distress button. I did it a couple of times to make sure the GPS had acquired my position fix,” adds the lucky overboard fisherman. Within minutes, park patrol marine police units picked up the emergency DSC alert and headed for the position indicated on the GPS equipment attached to the marine radio.

Without pushing any buttons again, the soggy fisherman was happy to hear a friendly voice coming from his speaker



The Uniden Mystic as a GPS charting receiver.

since the DSC radio knew to switch automatically to Channel 16 when it received a digital acknowledgement. This handheld marine radio may ONLY be used on navigable waters, and it is NOT intended for use onshore.

## Historical First

Until recently, park rangers and other marine rescue squads required two separate pieces of equipment to manage the VHF radio system and GPS charting. For the first time in marine VHF radio history, a trans-reflective color radio screen now turns into a bidirectional 25-watt radio charting device. It’s manufactured by Standard Horizon ([www.standard-horizon.com](http://www.standard-horizon.com)), a competitor of Uniden, and has been seen for under \$999 with one included C-Map marine chart cartridge.

The Standard Horizon GPS radio chart plotter, model CPV350, offers a seven-inch diagonal, 256-color TFT (thin film transistor), sunlight-viewable, high-resolution screen.

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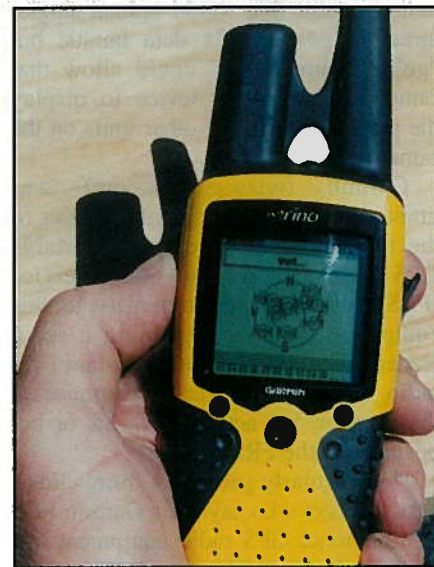
Combo radio and GPS charting radio from Standard.

This big screen can read out radio settings, navigation information, GPS data, and also offers the ability to customize the display windows that could also tie in a depth sounder, radar, or an underwater search camera.

The 55-channel marine VHF radio presents a unique positioning of tuning controls, angled on the right side of the unit. This lets you dial around while holding on for your life in heavy weather! The radio system also incorporates a loud hailer, complete with fog signals, bell sounds, whistles, horns, and, when rolling Code 3 out on the lake, an electronic siren.

The VHF radio is continuously running, even though the screen may be filled with mapping information of the local harbor, bay, lake, or river. C-Map cartridges for inland fishing, lake boating, river rafting, or ocean navigating are available from \$99 to \$199, depending on how much of a region you want to have stored on the tiny chip card. The C-Map electronic charts are vector-based and come in three geographical sizes: local, wide, and super wide. Slip the cartridge in the bottom of the radio navigator, and watch the screen go all the way down to individual dock pilings and piers.

The bidirectional signaling could allow position polling of other Standard VHF radios in the area. If someone in your group hits a hot fishing spot, you can poll their position and read out bearing and distance to the blinking x on the screen. Of course, emergency calls instantly turn the radio into a powerful digital direction finder. Like the marine



Garmin RINO GPS and position sender.

VHF handheld, the Standard Horizon GPS radio chart plotter is intended specifically for on-the-water use.

## Ham Hopes

Ham radio operators were hoping Kenwood Corporation would include a built-in GPS to their popular D-7 handheld. It hasn't happened yet, but the Kenwood D-7 now has a plug-in, bidirectional GPS mapping receiver, the AvMap G4T ([www.avmap.us](http://www.avmap.us)), coincidentally manufactured by C-Map.

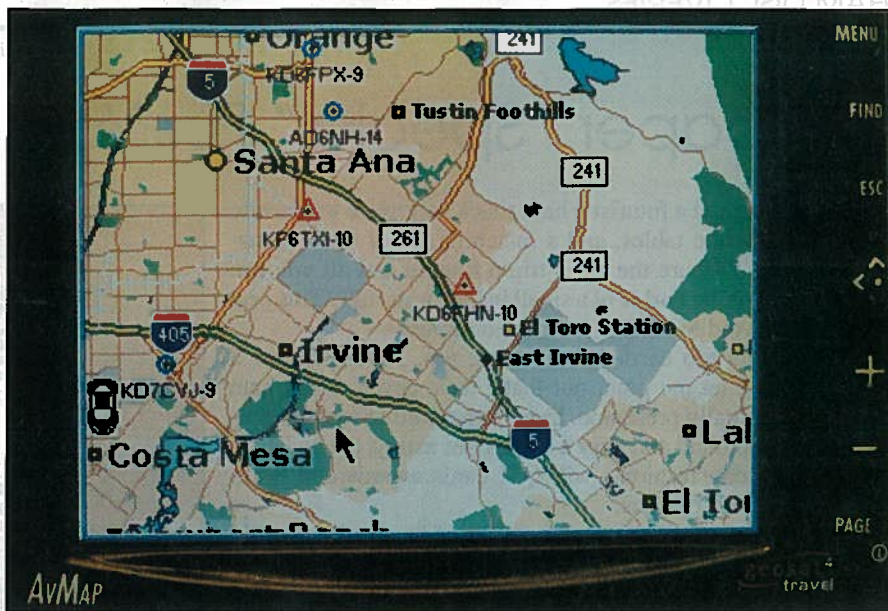
"The ultra bright five-inch TFT color screen features preloaded North American mapping on an included 2-GB SD card,"

says Don Arnold, W6GPS, AvMap guru. The color screen is daylight viewable, and the AvMap G4T is entirely portable with its own built-in batteries. This means you can take it along on the next geocache and work it into bidirectional signaling with the portable Kenwood D-7 or mobile Kenwood D-700.

When the Kenwood ham radio is in the APRS mode on 144.390, the AvMap GPS will show all incoming position fix data bursts as callsigns on the screen. It also will show if the other ham is moving or stationary. The Kenwood radio automatically transmits your own position every 30 seconds or at any specified interval of your choice.

The bidirectional capabilities of the GPS gives the radio YOUR position fix, and the radio gives the AvMap other position fixes and stores that information in an APRS incoming signal folder.

Here in Southern California hams who are members of our local Orange County Red Cross chapter can be seen on the portable screen as roving red triangles as they head to a call. Once they get to where they're going, they turn into a blue circle along with their callsign. You can watch other units on the screen sending their positions with Kenwood equipment or



AvMap tied into the Kenwood D7, showing bidirectional signaling.

ICOM and Alinco equipment with the optional built-in APRS software and external GPS receiver.

### No Two Ways About It

This new technique of bidirectional radio and position exchange of informa-

tion will be the wave of the future for GPS and radio. We already have GPS built in to tiny cell phones, so it should be only a matter of time before the hams get one radio that does it all, much like the marine Mystic portable charting radio or the 25-watt big screen radio and mapping monitor.

It's only a matter of time. ■

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