Ham’s Experimental VLF Signal Heard in the UK, Europe

In what’s believed to be a “first,” a very low frequency (VLF) signal from a ham radio experimenter in New York was heard across the Atlantic. Bob Raide, W2ZM, was transmitting on 29.499 kHz under a Part 5 Experimental license, WH2XBA/1. His very slow-speed (QRSS) frequency shift-keyed CW signal was initially detected in the UK just before 0000 UTC on March 3 by Paul Nicholson, an SWL, and later by Mike Dennison, G3XDV, and Markus Vester, DK6NM, in Germany. Nicholson also copied a 29.501 kHz transmission from Dex McIntyre, W4DEX, in North Carolina, operating as WH2XBA/4.

“In recent weeks a number of amateur tests have been running from the USA to Europe around 74 kHz and at 29.499 kHz using several hundred watts to large antennas,” [blogged](http://g3xbm-qrp.blogspot.com/) Roger Lapthorn, G3XBM.  He said that signals on 74 kHz were “well copied,” but that “the surprise” was detecting the 29.499 kHz signal. “As far as I know, these 29.499 kHz VLF signals are the first amateur VLF [transmissions] to span the Atlantic — fantastic results by well-equipped stations using suitable receivers and good software.”

Warren Ziegler, K2ORS, who is on the Experimental license as WH2XBA/2, told ARRL that he and several other radio amateurs have obtained Part 5 licenses to experiment on 500 kHz and on 137 kHz. “It got so 137 kHz was becoming routine, that my signal was copied hundreds if not thousands, of times all around Europe, North America, and South America,” he said. Ziegler has been a participant in the [ARRL-sponsored experimental operations](http://www.500kc.com/) on 500 kHz as WD2XSH/23. He said Raide wanted to be the first amateur signal to span the Atlantic on VLF, which he defined as between 3 kHz and 30 kHz, so Ziegler applied for and received the WH2XBA Experimental grant, and included Raide and 4 others on the license.

“I was ready,” Raide told ARRL. His transmitter has a 3CX3000A7 tube in the final, running grounded grid and generating 800 W. The effective isotropic radiated power (EIRP), however, was estimated to be approximately 1 mW. To operate on 10,000 meters, Raide has a 90 foot vertical antenna using a reconfigured Zepp, fed via a huge loading coil that is 4 feet tall, more than 1 foot across and comprised of some 2000 feet of #14 wire. He employs a few thousand feet of “chicken wire” for his radial system.

The transmission consisted of “XBA” sent at a rate of 180 seconds per dot of CW. Nicholson copied the signal on software using a PC sound card with a preamplifier ahead of it. His antenna is a pair of orthogonal loops, each 20 meters square, at ground level, transformer coupled to the preamplifier.

“It is actually a makeshift temporary antenna set up for a site test about 3 years ago,” Nicholson explained. This summer he hopes to rebuild it with a larger area and more copper in the loops to improve sensitivity “and steel guys to make it sheep proof.”

Ziegler said German and UK experimenters have been experimenting at frequencies “ below 9 kHz,” which is unregulated. Stefan Schaefer, DK7FC, was detected in Iceland — some 900 miles distant — while transmitting in this frequency range to a kite-borne antenna.