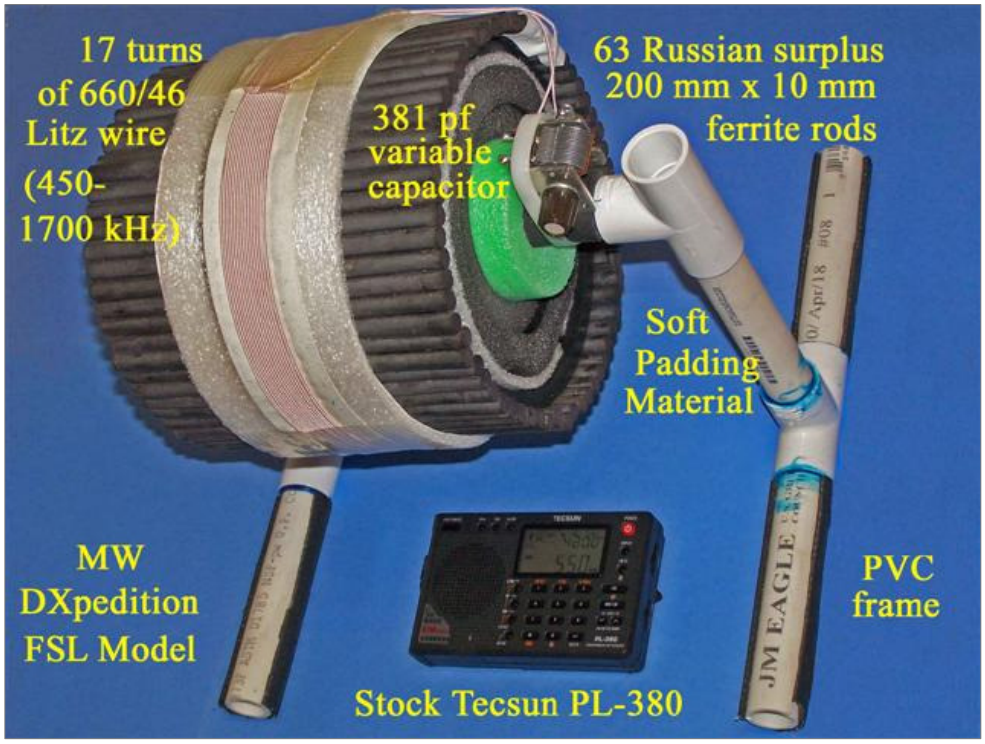
July 2011 Oregon Beach Ultralight DXpedition

The Dream Antenna for Pocket Radios Makes its Astonishing Debut

By Gary DeBock, Puyallup, WA, USA August 2011

Introduction Ultralight radio transoceanic DXing has never been for the faint of heart. Except for those of us fortunate enough to live on isolated ocean beaches (away from major population centers) we face a pretty rough challenge in tracking down the more exotic DX countries. The recent introduction of l kHz DSP filtering in the Tecsun models has improved our chances of success somewhat, but our Ultralights still need a quantum leap in weak-signal capability to be competitive. We can only chase DX on one frequency at a time, and our tiny radios had better be competitive on that one frequency. We need a low noise, extremely high gain antenna to give us a fighting chance to receive exotic DX with our not-so-exotic radios--- preferably one which can follow us anywhere, set up on a picnic table, and fit in a small plastic tote. And oh yes, the antenna must be razor sharp in tuning, cover the entire MW band, and outperform antennas many times its size.

The concept of such a dream antenna has been in the realm of science fiction since our hobby began, but now it's time to wake up from the dream and enjoy an exciting new reality! An innovative ferrite-based antenna has been designed, refined and deployed—giving Ultralight radio DXers the awesome new capability to enjoy outstanding weak-signal performance from an antenna about one cubic foot in size. The Ferrite Sleeve Loop antenna has arrived, and competitive models are already transforming the entire experience of DXing in extremely tight spaces.



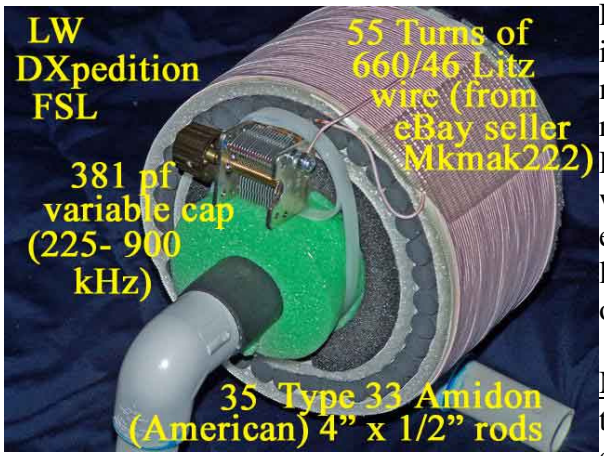
The Impossible Challenge
Around February my wife gave me the surprise news that her sister and niece from Hong Kong would accompany us during our summer vacation to Oregon this year, during which I had planned to chase South Pacific DX as usual. While eager to welcome them, I gasped at the idea of our Toyota Corolla accommodating five passengers, all their vacation necessities and also competitive DXpedition gear (you can probably guess what would be the lowest priority!). It seemed that no high-gain antenna on the planet would be able to fit into the compact car trunk, which was certain to be absolutely crammed. Even the 3' portable PVC air-core loop (from last July's Oregon trip) was completely out of the question. It seemed like competitive transoceanic DXing during this year's Oregon beach trip would be impossible—or would it?

Graham Maynard Introduces a Bizarre New Antenna Just before resigning myself to the fate of a summer without exotic South Pacific DX, I received an extremely welcome advance copy of noted U.K. experimenter Graham Maynard's Ferrite Sleeve Loop Antenna article (later published in the March edition of Medium Wave News). The article described a very compact, high-performance antenna composed of multiple ferrite rods arranged in a cylindrical pattern , then wrapped with a coil of wire tuned by a variable capacitor. Although several of Graham's theoretical concepts became the focus of interesting "discussions" on the Ultralightdx Yahoo group list, from my own standpoint I knew that if such an effective, compact antenna could indeed be designed and refined, it would not only solve the problem of my impending lack of exotic summer DX, but also could completely revolutionize the effectiveness of Ultralight radio transoceanic DXing on ocean beaches. Such a compact, high-gain system would finally allow us to set up in extremely tight spaces on high cliff sites overlooking the ocean, providing the ultimate combination of portability and weak-signal DXing effectiveness.

Because the time was short before our summer vacation, I decided to devote maximum resources to designing and refining several FSL test models prior to the July Oregon beach trip (presumably, much to the benefit of the astonished sellers of surplus Russian ferrite on eBay). Trusted Ultralight radio group experimenters Steve Ratzlaff and Kevin Schanilec also participated in this effort, building their own FSL antenna test models (the results of which were shared privately, among our small group). Steve's discovery of the most effective Litz wire (660/46) was particularly helpful in my own experimentation. Within a couple months of relentless A/B testing and tweaking of various FSL antenna designs in my back yard, both an 8" diameter Medium-wave FSL model and 6.5" diameter Longwave model were chosen for the DXpedition. In what seemed to border on science fiction, both of these refined FSL test models had finally reached the point where they clearly outperformed the much larger 3' and 4' sided PVC air-core loops that were used for last year's two Oregon beach summer DXpeditions! Their superiority was based on their lower noise pickup, giving them a crucial signal-to-noise advantage in fringe DX signal reception.

Not only were my summer DXing hopes completely revived, they were given an additional adrenaline boost. The compact size of the new FSL antennas would allow both MW and LW-optimized models to be taken along on this summer's trip to Lincoln City, along with five passengers (and all their travel necessities) in our Toyota Corolla.

Deploying the "Dream Antennas" The FSL antennas essentially provide a new DXing option for Ultralight radio (and other portable) users—the option of having extremely high gain from an extremely compact antenna. This option comes with the side effects of significant cost and weight, however, making it unlikely that the antenna will be the first choice of every DXer. The cost of so many ferrite rods is the main challenge, making it wise to use surplus Russian ferrite (available on eBay) if possible. A high-quality variable capacitor and optimal 660/46 Litz wire also add to the cost, resulting in a fairly steep price of construction (and an unofficial nickname of the "Financial Sinkhole Loop").The weight of so many ferrite rods makes it wise to use quality frame materials, as well as many layers of inner padding to protect the relatively fragile ferrite rods. Full details on the DXpedition FSL model development and testing will be contained in an upcoming experimental article, as well as MP3 recording links documenting its reception advantage over much larger air core loops.



Last-Minute Changes Experimental testing showed that the performance of an FSL antenna could be enhanced by simply placing the assembly on a 5' high PVC base, allowing the antenna to perform higher up in free space, without any nearby conductors. This made sense, since earlier FSL testing had also shown that a smaller performance boost could be obtained simply by placing the antenna on an elevated PVC frame, and getting it up off of any supporting table. Multiple configurations of variable capacitor mounting were also tried, in an effort to obtain both razor-sharp tuning and the capability to null out nuclear-level pests. After about 10 configurations were tried (and an entire package of plastic tiewraps had been sacrificed), I felt confident that the optimum configuration had been nailed down, and that the compact FSL's were ready for the Oregon beach.

The Bizarre Antennas Meet Even Stranger South Pacific Propagation As the fully crammed Toyota Corolla made its way south to the ocean I felt very confident that the new FSL's would give a great account of themselves in Lincoln City, if only the propagation would cooperate halfway. As it turned out, that was a pretty accurate description of the entire week's South Pacific propagation!

The DU conditions were up and down like a roller coaster, with every bad day being followed by a good day, and vice versa. This odd pattern continued for the entire week—something that I had never experienced in ten Pacific beach trips.

The new FSL antennas were highly effective on the "good" days, though, allowing a stock Tecsun PL-380 Ultralight to make several breakthrough South Pacific receptions that had never been possible previously with the 3' and 4' sided air-core loops. 666-Noumea in New Caledonia was finally strong enough to confirm parallel French International programming with 738-Tahiti, resulting in an all-time new Ultralight DX country from North America (it had never produced a trace for John Bryant or me at Grayland). The 6.5" Longwave FSL model made an even more astonishing DX reception from the South Pacific—the 1,000 watt aeronautical beacon 270-FA in Samoa, at over 5,000 miles from the Oregon beach. The 5 kw New Zealand Maori-language station 603-Waatea had apparently never been heard by anyone at Grayland (even with top-of-the-line equipment), but it was at a decent level with the Ultralight and 8" FSL in Lincoln City. Finally, the 2 kw New Zealand National Radio relay station on 639 kHz in Alexandra (4YW) is another station which doesn't show up on any Grayland logs, but it was almost certainly the DU English station recorded at a fairly decent level on the PL-380 (with the FSL's help). The entire week's propagation was heavily slanted to favor New Zealand at the expense of Australia, leading to unusual DXing opportunities on several frequencies.

DXpedition Summary As detailed in the companion Longwave DXpedition report (posted at http://www.mediafire.com/?9snw5mr2f504wzv) Murphy's Law struck often and hard during this one week beach trip, resulting in miserable weather, an unplanned Longwave FSL drop test (from 5 feet high) and even a visit from the Lincoln City Police at 0400 local time (during which I attempted to explain my early morning presence in the "Day Use Only" beach park). Despite all the challenges and weird propagation both of the new FSL antennas proved their DXing effectiveness in a major way, confirming that a thrilling new option exists for weak-signal transoceanic reception in extremely small venues. As Ultralight radio enthusiasts with FSL's search out the prime beach parks located on high ocean cliff sites I wish them the very best of transoceanic DXing luck (but perhaps with a little less excitement than what I experienced in other aspects :-)
