The Beverage Antenna Handbook, 2nd edition 1987

by Victor A. Misek W1CWR A92-1-1

. This book first appeared over 10 years ago, and its basic outline has not changed too much since then. Although it describes Beverage, or wave, antenna theory, the emphasis of the book is on the "steerable wave antenna" developed by the author and optimized for reception of the lower amateur radio HF bands. It is perhaps not a book one should dive into without at least some previous knowledge of Beverage antennas.

If you do have some experience with Beverage antennas, the chapter on the single wire wave antenna is very informative, as Misek discusses the effects of antenna length, terminations, wave velocity and ground losses. He also describes a "cone of silence mode": a method for determining the optimum length of a Beverage antenna for best front to back ratio. Unfortunately, this length is only applicable to reception of a limited frequency range such as a single amateur radio band.

Misek is a proponent of approximating a lossless ground when using a Beverage antenna, as incoming sky-waves are already tilted on HF, and do not need the tilting effect of a lossy ground to make the antenna work properly. This lossless ground is approximated by running a wire or wires along the ground parallel to the wave antenna, and is especially important in his steerable wave antenna, in order to predict values of matching transformers etc. Strangely however, he does not always include this ground wire in his diagrams. The lossless ground is perhaps not so important to the overnight DXpeditioner, but there is room for experimentation.

From the single wire, Misek moves on to the meat of the book, the theory and uses of the steerable wave antenna (SWA). This is an antenna using two parallel Beverages connected to various components to allow nulling of offending signals. Those who are familiar with Beverage's early work will recognize the origins of this antenna, and there is also some similarity to the Bailey/Hutton/Connelly phased antennas. However, Misek's antennas can also be constructed of coaxial cable or twinlead and even in the open wire version, the wires are spaced a mere 12" apart. One drawback here is that he does not mention if there is any difference in reception capabilities with varying distance between the wires, although this point is addressed in the first edition of the book. Interestingly, Misek works from his SWA theory into a "micro SWA" theory. The Micro SWA uses wires less than $\frac{1}{4}$ wavelength long, which places it in the same area where Mark Connelly has done so much of his work. Misek found that the longer and lossier the antennas, the less stable the null, and so leans toward somewhat shorter antennas in spite of the reduced signal pickup.

The section on practical SWA construction includes details on the phasing units. Although it describes Beverage's original circuit, it recommends a simple RLC circuit (dating back to the first edition), then goes on to describe a more complex active circuit using a V-MOSFET, which can provide nulls over 360°, and uses only two potentiometers for nulling. However, for MW users, switched values of inductors and capacitors would also be needed, but it looks interesting!

The second edition of this book has so much new material in it, that it is practically a whole new book. For those who already have the first edition, a couple of further points of comparison. The second edition has twice as many pages (80 vs. 39), though it much be admitted that its print is somewhat larger...and clearer. The first edition relied somewhat on mathematical formulas to describe the action of the antennas. While the second edition does not avoid formulas, it tends to intersperse them through the text, so they are supported by a good deal of plain English, as well as a number of diagrams. Although the first edition used antenna plots to clarify the text, the second edition uses quite a number of computer generated plots of antenna patterns in elevation and azimuth to make it easier to comprehend the results of changes in antenna length, loss factor etc. One other positive aspect of the second edition is that it suggests the use of relatively simple test equipment to determine wave velocity and ground losses rather than simply using mathematics. Math may not always be able to predict what a Beverage antenna will do in the real world!

Unfortunately, it may be difficult for the MW DXer to construct Misek's circuits for use below 1.8 MHz. Some number crunching is necessary here, and the MW Beverage DXer will need some knowledge not provided in the book in order to calculate correct transformer winding for example. As Misek's circuits are often quite different from anything in the Club reprints, there is a lot of scope for MW experimentation.

Even if your interests are above 1.8MHz, this is not a book for beginners in Beverage antenna work, but it is a good mix of the theoretical and the practical, and should provide inspiration for the diehard MW Beverage DXer with time on his hands for experimenting---are there any?

Thanks to John Bryant for lending me his copy of the Beverage Antenna Handbook. Now I have to get a copy of my own. John's copy came from Universal Shortwave, but he hasn't seen it mentioned in their lists. You might write direct to Victor A. Misek, 142 Wason Road, Hudson, NH 03051 for information. The book costs US$14.95.

--NHP