

Preface

It hardly seems like 51 years since I was first licensed as WV6KUQ. Several of us from Fremont Union High School in Sunnyvale, CA went to San Francisco and took the Novice test in the F.C.C. office. My interest in radio began long before this.

My folks noticed when I was about 10 that I liked to experiment and read. I had been reading science books and looking at articles on radio. They got me a neat gift: a true crystal set. We could only hear two stations, KGO and KNBC, but I would listen on it for hours using the W.W. II carbon headset.

My continuing interest in radio led to making an experimental breadboard of sorts. It used Fahnestock clips (remember those?) on pegboard attached to various primary parts. Next was a remote-control, servo-steered boat. I walked alongside as it made its way in a nearby creek. That was a neat place.

Allied Radio was making Knight Kits. My folks saved enough to buy me a Band Spanner radio and we built it as a family. We strung up a long piece of wire and listened to foreign shortwave radio broadcasts. This was really incredible, as we were listening to something that was invisible.

My Dad would bring home old / reject parts from IBM: disks used on the first disk drive (RAMAC) and pluggable units, which were a dual-triode tube logic unit. We figured out how to make a simple computer of sorts that could count, multiply and display in binary neon bulbs. Right – neon, not LED.

We had a High School radio club, WA6DVV, built a radio telescope, went to Stanford and experienced EME and helped out on the first amateur satellite program, OSCAR. A high school science fair brought about my first radio invention. It transmitted sound from a local radio station over an incandescent light beam and then to a my “receiver” several feet away. It found its way into more science fairs. Apparently all this launched me into a special program, as I was selected to attend a conference at U.C. Berkeley, tour their particle research facilities and listen to a lecture by Dr. Edward Teller. Although I was very interested in music (trombone), it eventually took a backseat, attending San Jose State (University), transferring to the University of Minnesota, squeezing in 3 or 4 semesters at a private

art school (was also attracted to art, specifically metal sculpture) and then for a first job programming on IBM mainframes. That was really great, as they were bundled at the time and I took every class they offered on Bill of Material Processing and operating systems (my employer was pleased). I became an independent contractor, specializing in operating systems, BMP/MRP and high speed disk access techniques.

Mid 70's found me back in CA to work with my Dad, who was manufacturing in the Orient and needed a computer system. We became partners and remained so for over 30 years, starting several companies and traveling all over the world. In 1992, my Mom was battling cancer and we sold out of a company that had been founded on a radio patent I had. I began building antennas for friends as kind of a diversion, I think. One thing led to another and we started our antenna company in 1993, developing new designs, focusing on efficiency and strength. My Dad retired in 2005 and in early 2008 we sold the product line. He turned 90 in late 2008 and passed on in 2009. We had just talked and he asked me what I was going to do next. One goal was to finish this book, mainly to document what had been discovered, encourage others to keep trying new things and share the enjoyment of amateur radio.

The latest for me is working on a new antenna design, called the “Bravo” series, first run in CQP 2009. The new venture is presently through two web sites: my call sign, N6BT and Take 5 Tactical. Am continuing contesting, Team Vertical, make myself available for speaking engagements and conventions and do limited antenna/tower work.

Special thanks for enduring encouragement go to so many people, including Andy Faber, Bob Ferrero, the NCCC, George Varvitsiotis, Dean Straw, Natan Huffman, Bob Wilson, Carl Cook, Rich Smith, Dave Leeson, Rusty Epps, Bruce Swearingen, the CADXA, Kenny Silverman, Bill McFarlen, Team Vertical, Fred Cady, Mike Kelly, Larry Miller, John Crovelli, Jeff Poll, Ken & Kay Anderson, Susie Blackwell, Tyler O’Grady, my family and faith partners.

Please enjoy the candid nature of this book, encourage young people and keep looking forward!

ARRAY OF LIGHT

Third Edition, 2010

Introduction

Thank you for selecting this new edition of Array of Light. The first was written in the mid-late '90's from my experiences in designing and producing antennas after founding Force 12, Inc. with my Dad, Hank. He and I had been partners in several companies for close to 20 years and were in-between doing "something." Several close friends encouraged us to see if we could not only make a new generation of antennas, but also correct the many "errors" in marketing specifications. The latter comment is aimed directly at gain figures made by the majority of antenna companies and many reference texts. Another is that over time, VSWR had been moved to the foreground as the primary metric for measuring performance of an antenna. Before embarking too far, a couple very important statements should be made.

The term, "amateur", or "amateur radio" is somewhat of a misnomer. It means that those who do the transmitting and receiving do it for themselves, similar to an amateur track meet where the skilled athletes compete for no monetary rewards. The term does not relate to the ability or intelligence level of those involved. Within every vocation and avocation, there are those who understand a lot and those who do not understand a lot. Many within amateur radio are professionals. It is hoped this book will enhance antennas and related subjects, so that those in both amateur and commercial radio will understand and enjoy the activity more.

Writing an antenna book is usually paving the way to become a target for criticism. That is a possibility; however, I'd like to think of it as sailing through the Pillars of Hercules, an area surrounded by lots of mythology, yet sailing through to discover the truth.

There are certain events that prompted a new edition of this book. One is the creation of three (3) charts,

enjoyment of amateur radio, based on antenna gain vs. performance. These charts were developed from sharing knowledge from scores of experienced operators who had made long term observations of antennas and their impact on performance.

Another is the beginning of and a decade of records by "Team Vertical" who re-wrote the book on vertical antennas. A third is a challenge from Dean Straw, N6BV regarding the charts.



The charts contain a range of gain on the bottom of the chart, beginning at -18dBd and increasing to 8dBd . The -18dBd was noted as being a light bulb and Dean asked me if I had actually tried it, which I had, but only on random occasions. One thing led to another and I found myself entering the 2000 ARRL CW DW Contest using a light bulb, which later was described in an article entitled, "Everything Works" in July, 2000 QST. Most of all, however, is that the driving force behind this book is the continuing accumulation of useful information about antennas so that you can have more enjoyment with amateur radio.

One item in the accumulated information is a procedure for debugging an antenna that was developed while speaking with thousands of amateurs over the phone and in person regarding their questions. Since I was rarely actually at the antenna site with firsthand knowledge, I was the "remote analyzer." This required me to write a definite path to follow in order to offer a solution for their questions. Besides this path for me as a manufacturer, it also was written to educate customers and assist in their understanding of antennas and what to do in the event of a problem.

Additional knowledge gained as a manufacturer from building more than 20,000 antennas, having more than 140,000 elements in the field, creating new fundamental designs and also setting close to 20 world records with Team Vertical contains more practical information that should be shared. Others have claimed some of this work product, but it is probably only because they have forgotten the true origins. So much credit goes to all the members of Team Vertical over the years and also to several close friends who have urged (“pushed”) me to keep trying to do break-through efforts.

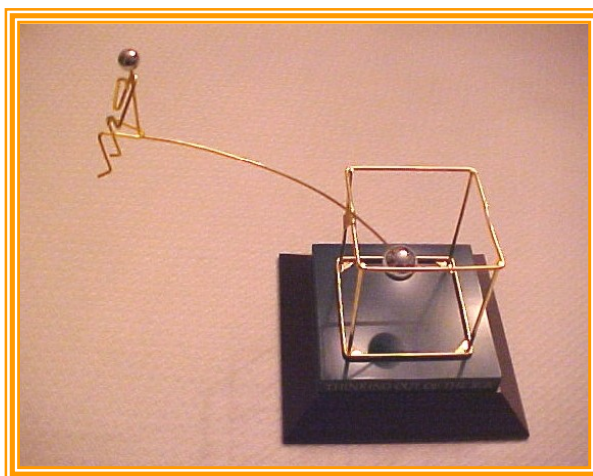
The previous paragraph has another important implication. It means that the information presented in this book is the “real deal.” Often times we read a book on antennas, complete with lots of specifications and drawings, but they have not been built and tested. Not so in Array of Light. This is a work product from designing, testing and manufacturing antennas for close to 20 years – the real deal!

New concepts are never quick and paradigm shifts are on the rare side. They often have taken years and this is discussed in this new edition, too. When you see a company come out with a new product, it might serve our community best to see if they copied someone else’s development efforts and expense, or actually did it on their own. When we buy, we reward the company – seems better to reward the right folks.

There have been dozens and dozens of presentations made by me at conventions and club meetings for more than 20 years. Much of this information is included in this new third edition and maybe you will find some familiar information that you saw at your club. Overall, the focus continues to be the sharing of meaningful, useful information in a simple, easy to understand language and format.

Read on !!

Think out of the box.....



Signed

Thomas H. Schiller, N6BT

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