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ON4UN's

Low-Band DXing

Fourth Edition

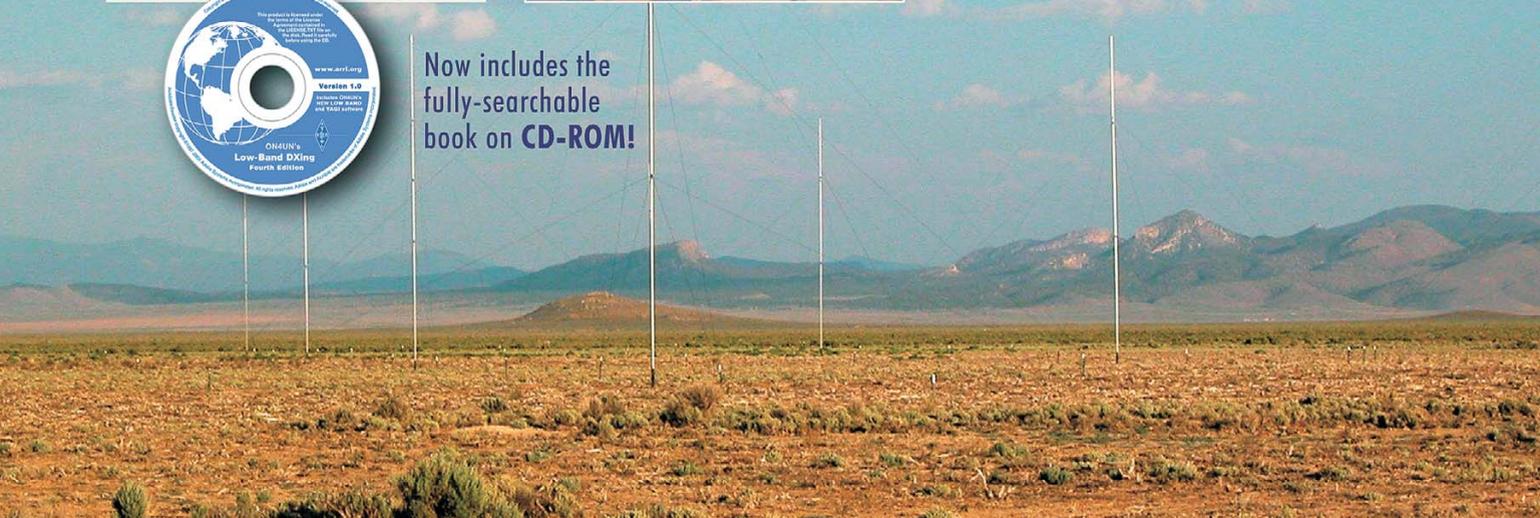
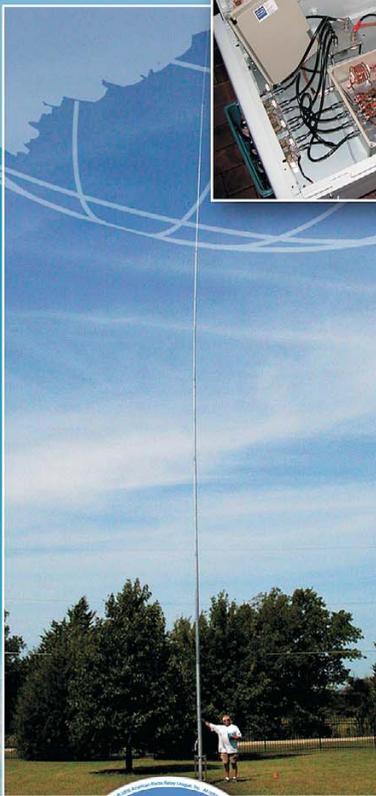
Antennas, Equipment and
Techniques for **DX**citement
on 160, 80 and 40 Meters



John Devoldere, ON4UN



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ON4UN's Low-Band DXing

Antennas, Equipment and Techniques for *DXcitement* on 160, 80 and 40 Meters

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FOREWORD

We at ARRL are pleased to publish a major revision of what has become an essential guidebook for low-banders: *ON4UN's Low-Band DXing* by John Devoldere. This book is a must-read for DXers, contesters and even casual operators who venture on occasion onto the 160, 80, and 40 meter bands.

Author John Devoldere, ON4UN, has long been recognized both for his outstanding achievements on the low bands and as a highly successful on-the-air contester and DXer. As in the previous three editions, you will find an amazing wealth of information springing from ON4UN's extensive hands-on experience and that of many, many collaborators and contributors. John must know personally everyone on the low bands! Newcomers and old-timers will both benefit from the vast store of practical information in this major revision.

Those of you familiar with the Third Edition published in 1999 will be pleased to find virtually completely new chapters covering phased arrays and receiving antennas.

Indeed *ON4UN's Low-Band DXing* covers everything you want to know about 160, 80 and 40 meters—with a strong emphasis on antennas, of course. The old adage, “You can't have too many antennas” still rings loud and true, especially on the low bands.

ON4UN also presents solid ideas for the ham with limited space, as well as for those fortunate ones who have the budget and the real estate to erect “monster antennas” where they wish.

As always, we want to hear back from you. Help us make the next edition even better than this new Fourth Edition. We've provided a handy form at the back of this book that you can use to share your ideas with us and with John.

David Sumner, K1ZZ
Executive Vice President
Newington, Connecticut
February 2005

PREFACE

“What can I add to the 4th Edition compared to the 3rd Edition?” I asked myself before starting this writing adventure. I sent out a questionnaire to over 500 low-band DXers and I give many thanks to everyone who took the time to fill out the questionnaire and to share their views and comments with me!

Often I heard the semi-joking comment, “Tell me how can I do as well as the big guns on 160 meters who have 100-acre antenna ranches!” Of course, this sounds a bit like, “How can I win a Formula One race with a Volkswagen?” Unfortunately, the truth is that you can’t win a Formula One race with a Volkswagen. But maybe there are some things you can do to avoid being the very last car in the race.

Lots of new things have popped up in the past 5 years, especially in the area of small (and not so small!) receiving antennas and high-gain transmit antennas. I deal with these subjects in much greater detail here than in the 3rd Edition of the book. I’ve completely rewritten the chapters on these subjects and now include two methods for objectively qualifying receiving antennas. No more wild stories; just go by the RDF and DMF numbers, please.

It took me 18 months to write this 4th Edition, clocking 1500 to 2000 hours of work. I personally visited a number of successful low-band DXers and contesters to try to unravel their secrets. I thank all of them for the wonderful hospitality they showed me. In this book they share their techniques with you.

A hobby is something you should enjoy. I enjoy working contests, especially on the low bands. I enjoy CW pile-ups. I enjoy building a competitive low-band and contest station. I get an immense kick out of working N4KG, who uses 5 W on 160 and 80 meters!

And most of all, I enjoy sharing my know-how, my enjoyment and my excitement with other hams. That’s why I have written so much over the past 15 years about subjects that are near and dear to my heart. I hope I have been helped bring about some growth of low-band activities in DXing and contesting. My induction into the CQ Contest Hall of Fame in 1997 was a great honor for me and filled me with joy and pride.

Once again, it was a great experience having a number of eminent experts acting as mentors for each chapter in this book. I found friends willing to coach, support, advise and help me with all of the chapters. I am indebted a great deal to these fine gentlemen and true friends. Thank you, Bill (W4ZV), Tom (W8JI), George (W2VJN/7), John (WØUN), John (K9DX), Robye (W1MK), Uli (DJ2YA), Georges (K2UO), Lew (K4VX), Klaus (DJ4AX) and Frank (DL2CC). It was also a great pleasure to work together with Dean, N6BV, who handled the editing of the 4th Edition for the ARRL. Thanks for all your help, Dean. [*You’re more than welcome, John!—N6BV, Ed.*]

I am especially grateful to all the authors and ordinary DXers/contesters who let me quote from their work, use figures from their publications or refer to their statements on various E-mail reflectors. Your contributions were essential.

Finally, I would like to thank my many readers. I hope that this new book, which is being made available at the onset of a new low-Sunspot Number era, will help further promote our wonderful hobby. Low-band DXing is something that makes Amateur Radio unique. Unique in a way that satisfaction does not come automatically but as a result of dedication, education, knowledge, perseverance and patience.

I hope that with this book the message from a serious part of the Amateur Radio community gets across to some manufacturers who remained deaf to our wishes and requests all too long. I hope we can all move the frontier of what we can achieve on the low bands one step further ahead.

To you all, enjoy the low bands and have fun! I dedicate this book to my grandsons, Arthur and Louis.

About the ARRL

The seed for Amateur Radio was planted in the 1890s, when Guglielmo Marconi began his experiments in wireless telegraphy. Soon he was joined by dozens, then hundreds, of others who were enthusiastic about sending and receiving messages through the air—some with a commercial interest, but others solely out of a love for this new communications medium. The United States government began licensing Amateur Radio operators in 1912.

By 1914, there were thousands of Amateur Radio operators—hams—in the United States. Hiram Percy Maxim, a leading Hartford, Connecticut, inventor and industrialist saw the need for an organization to band together this fledgling group of radio experimenters. In May 1914 he founded the American Radio Relay League (ARRL) to meet that need.

Today ARRL, with approximately 170,000 members, is the largest organization of radio amateurs in the United States. The League is a not-for-profit organization that:

- promotes interest in Amateur Radio communications and experimentation
- represents US radio amateurs in legislative matters, and
- maintains fraternalism and a high standard of conduct among Amateur Radio operators.

At League headquarters in the Hartford suburb of Newington, the staff helps serve the needs of members. ARRL is also International Secretariat for the International Amateur Radio Union, which is made up of similar societies in 150 countries around the world.

ARRL publishes the monthly journal *QST*, as well as newsletters and many publications covering all aspects of Amateur Radio. Its headquarters station, W1AW, transmits bulletins of interest to radio amateurs and Morse code practice sessions. The League also coordinates an extensive field organization, which includes volunteers who provide technical information for radio amateurs and public-service activities. ARRL also represents US amateurs with the Federal Communications Commission and other government agencies in the US and abroad.

Membership in ARRL means much more than receiving *QST* each month. In addition to the services already described, ARRL offers membership services on a personal level, such as the ARRL Volunteer Examiner Coordinator Program and a QSL bureau.

Full ARRL membership (available only to licensed radio amateurs) gives you a voice in how the affairs of the organization are governed. League policy is set by a Board of Directors (one from each of 15 Divisions). Each year, one-third of the ARRL Board of Directors stands for election by the full members they represent. The day-to-day operation of ARRL HQ is managed by an Executive Vice President and a Chief Financial Officer.

No matter what aspect of Amateur Radio attracts you, ARRL membership is relevant and important. There would be no Amateur Radio as we know it today were it not for the ARRL. We would be happy to welcome you as a member! (An Amateur Radio license is not required for Associate Membership.) For more information about ARRL and answers to any questions you may have about Amateur Radio, write or call:



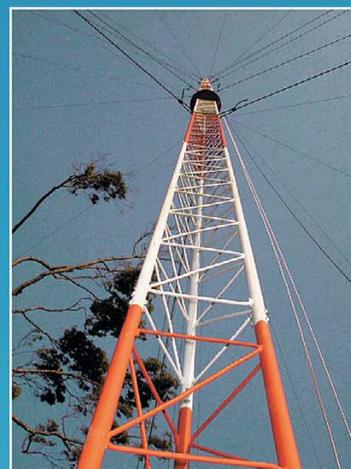
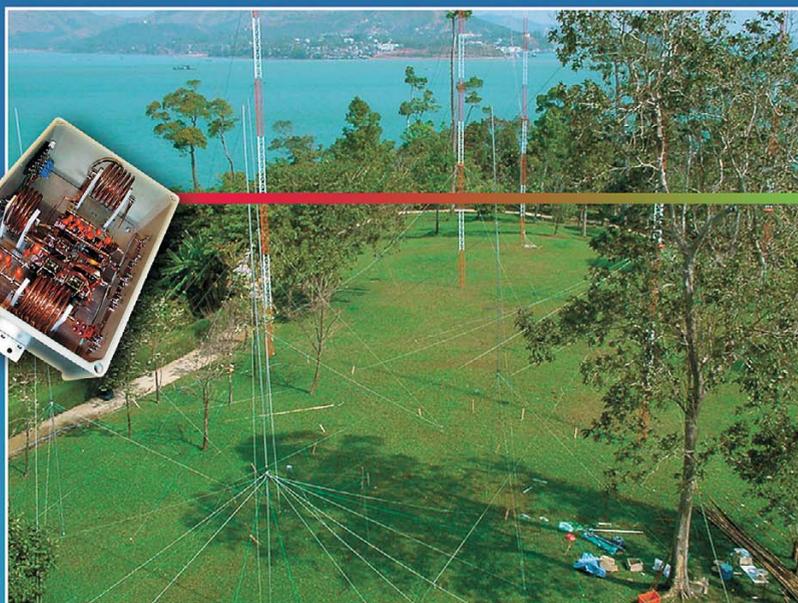
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Thoroughly updated!

Entirely new material on low-band receiving antennas and high-gain transmitting arrays. This 4th Edition features:

- If you can't hear them, you can't work them! The chapter covering **Receiving Antennas** has been completely rewritten, with brand-new material, new insights and new concepts.
- The chapter on **Vertical Arrays** has also been completely rewritten, including sophisticated phasing-network design techniques pioneered by Robye Lahlum, W1MK.
- Bundled with the book is a **CD-ROM** containing the complete book in fully searchable electronic form, using Adobe® Acrobat® Reader® for Windows® and Macintosh® systems.
- The CD-ROM also contains the **ON4UN Low-Band and Yagi design software** as well as almost 2100 quality pictures!



About the Author

John Devoldere, ON4UN, will need no introduction to those who are active on the low bands or in contesting, where his Amateur Radio station has often been activated using the call sign OTxT. John holds an engineering degree in electronics, and took early retirement in 1996 after a 30-year career with a major telecommunications company, where he held various management positions. A ham for about 45 years, John also holds an Extra Class license in the USA (AA4OI). ON4UN is actively involved in Amateur Radio society matters, and serves as president of UBA, the Belgian member-society of The International Amateur Radio Union.

Aside from being active on the DX scene on the low (as well as other) bands, John and his station are very active in international DX contesting. John feels that contests are the place where you can find out how good your station (antenna) really is. John holds a range of prestigious contest awards and plaques, including a group of "winner" plaques for CQ 160-meter DX (CW) contests, ARRL 80-meter contests and various other CQWW (Phone and CW) contests.

John's station is often operated as a club station during international contests; dozens of guest operators from all over the world have operated from his station during these contests. Elected to the CQ Contest Hall of Fame in 1997, John is, above all, a very keen CW operator.

On 160 meters, John has worked more than 295 countries and has the highest country score outside the USA. On Top Band, John also holds the prestigious WAZ (award #3), as well as WAS, which is particularly challenging from Europe. On 80 meters, ON4UN has 353 confirmed countries (all-time) and heads the DXCC listing worldwide. He also holds 80-meter DXCC #1.

The outstanding results are certainly not the result of pure luck. They are brought about by a professional approach, which John is delighted to share with readers of this book. Being retired now, John had the opportunity to spend more than 1500 hours rewriting and updating *ON4UN's Low-Band DXing*, known far and wide as the "low-bander's bible."



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