

# The W6TC (SK) Adventure 1956-2009

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*A history of the homebrew Ham Band Receiver developed by Ted Crosby, W6TC.*

What have Tom, Dick and Harry, evening meals, toothpicks, breadcrumbs, “wiggle-wobble,” chimneys, a “two-hand dance,” a perfect storm, scavenger hunting, moaning, a wow factor, a “crazy old coot” called “Cros” and even beauty contests to do with an amateur-built radio receiver — the answer can be found by reading *Recollections of a Radio Receiver...* by Jay Helms, W6HHT. The book covers (almost) everything you would ever want to know about the Ham Band Receiver (HBR) series of amateur band receivers first conceived by Ted Crosby, W6TC (SK) in the 1950s.<sup>1 2</sup>

My first encounter with an HBR receiver design was an HBR13C that had been donated to the SPARC radio museum in Coquitlam, British Columbia in 2008, along with a large box of coils and volumes of paperwork relating to its design and construction.<sup>3</sup> I was quite intrigued by this receiver, in terms of the circuitry, mechanical design — especially the plug-in coils — and the quality of workmanship, together with the use of an Eddystone slide rule dial (I am a bit of an “Eddystone man”) — so intrigued that I decided to write a short article on the HBR13C for the EUG Web site.<sup>4</sup> Soon after, Jay contacted me for permission to use my HBR article and others I had written as reference texts in a book he was preparing on the HBR — in return I unexpectedly received a copy of his book.

## **The E-book Experience**

I have read many, many books on radio over the years, but this text is a very unusual and interesting tome. It is quite different from what I was expecting before I opened the covers. Although the e-book format has a good indexing and hyperlink system, and you can easily search for key words, I found it easier to read and cross-reference by printing it out from the Adobe *Acrobat* file.

The human touch is provided by the numerous personal letters presented in the book. These letters are often reproduced in original copy and retyped for clarity. They help highlight a particular issue, character descriptions, the interaction of the various players in the story, numerous anecdotes, etc. I found this a great way of bringing the book to life — so much so that I actually got hooked. Altogether it was a bit like reading a good novel, rather than a textbook that you dig in and out of. Not that you can't use the book as a technical reference. There are all sorts of useful tidbits buried inside for

anyone interested in any form of HF receiver construction, from mechanical and circuit design tips to coil winding information and even operating techniques.

As an HBR newbie I found many of the technical details very interesting. One example is that the front end is designed to be regenerative to maximize sensitivity and increase the effective Q [selectivity — *Ed.*] of the coils for free (almost invariably, double superhetrodyne designs do their best to avoid regeneration in their front ends and regenerative receivers are simple, low tube-count sets).

This essential ingredient in the HBR design philosophy was sometimes lost, even by well-intentioned changes to the design by its builders. The author even admits to a boo-boo here, where an overly-neat wiring effort in his HBR13C caused it to fail to regenerate properly. Stray pickup in the wiring affecting the automatic gain control (AGC), resulting in reduced gain and below-par performance. I am sure that other details, such as the use of a Hartley oscillator to improve stability or the finer points of coil construction covered in Chapter 5, will mean even more to folks who have built an HBR, own one now (built by someone else) or are thinking of building one from scratch.

### **History and Technology of the HBR**

The book is divided into three parts: the first contains the major text, the second a series of HBR-specific references (reproduced in the book) and the third containing more general technical references pertaining to receiver design. Part 1 is preceded by notes on using the e-book format and a prologue that provides a brief introduction to the book's subject, a lexicon of terminology and index of *QST* articles on the HBR.

Chapter 1 opens the story with an introduction to the men who made the "HBR adventure" happen, the reasons why it did and the design concept of the receiver. Chapter 2 picks up on this concept, defining the design objective in four rules and then moving onto the set's specifications and the expectations of those constructing the receiver. An interesting reference presented here is part of an RSGB booklet on the contemporaneous GRB Thornley (G2DAF) homebrew receiver design originating in the United Kingdom, together with comments on the different methodologies of the two designers.

Chapter 3 is the start of the real technical meat. Each of the HBR models is described in a series of thumbnails along with the associated schematics and comments on differences between them, as well as details of some additional circuitry, such as slot and notch filters. The real in-depth discussion on the HBR circuitry and its evolutionary path from 1956 to 1969

is dealt with in Chapter 4. Here, the regenerative front-end is highlighted, followed by the various circuit elements — mixer stages, IF stages, marker oscillators, AGC, filters, detectors, audio and power supply, concluding in a “Things not to do” section.

The all-important plug-in coils are given the entirety of Chapter 5 (over 70 pages), which is illustrated by photographs and diagrams. Achieving receiver stability (“staying put” in 1950’s radio jargon) was one of the holy grails of receiver construction in a world without low-cost synthesizers and digital electronics. Chapter 6 is devoted entirely to this subject. Here you will find discussions of various factors that may affect receiver stability, from power supply issues through mechanical stability, circuit design, components and thermal effects. Included are some very good discussion on the use of temperature compensation capacitors and methods for testing receiver stability.

For anyone constructing a receiver from scratch, alignment is one of those things that can be a daunting prospect. Fear not, as Chapter 7 covers HBR alignment (which is actually quite straightforward) and also includes voltage check tables to help troubleshoot other problems in a newly-constructed or restored HBR.

The HBR design is a bit different from the norm. It is the first receiver I have seen that has a mixer gain control and Chapter 8 provides the reader with some very useful tips on how to operate these rather unique sets. The main text concludes in Chapter 9 with a review of the development, repose and revival phases of the HBR story, stretching from 1956 through 2009. An interesting contrast of the driving forces for building an HBR in the late-1950s and in the early 2000s is provided here and even some speculation into the future of the HBR design.

### **Notes and References**

Part 2 includes a chapter on “HBR Builders Notes” for the HBR14, HBR16, HBR11 and HBR13C, plus many other technical tidbits, notes on the author’s ‘HBRXX’ receiver and details of the popular Eddystone 898 dial mechanism. Part 3 comprises a compendium of ARRL *Handbook* extracts, information on inductors, including the Meissner *Radio Coils and Circuit Applications* instruction manual and even cover and spine inserts if you decide to print the book or sections of it.

My only suggestion as to how this book could have been improved would be that although the text is extremely detailed, there are many times when a diagram or photo would have helped enormously in visualizing what is being described — especially if you do not happen to have an HBR sitting beside you. Although photos would enhance the readability of certain parts

of the text, their absence does not detract from the overall value of the material presented.

### **Summary**

In conclusion, this is no “brain dump,” no dry technical treatise on a long-forgotten homebrew amateur receiver design, but is a real story, about real people who were dedicated to achieving the very best receiver performance they could with the proven technology of the time. What is more, Ted Crosby’s design philosophy was that any Tom, Dick or Harry should be able to replicate his design and achieve similar performance. To this end Ted spent much of his spare time helping others by corresponding with homebrewers and by producing simplified and expandable versions of his receiver design.

The author must be congratulated for being able to thread the human story, the design philosophy and the vast amount of technical information presented into a coherent, readable book. It is not only useful as a historic piece about the development of Amateur Radio in the mid-twentieth century but also as a great technical reference and compendium of information for the HBR builder, owner, operator and anyone interested in constructing and operating radio receiving equipment. If you are one of these folks, then this is one of the best \$10 you will ever spend.

“[Recollections of a Radio Receiver](#)” is available as a 568 page, PDF formatted e-book on CD.

*All photos by Gerry O’Hara, VE7GUH.*

*Gerry O’Hara, VE7GUH, was first licensed as G8GUH in 1972 in the United Kingdom. Gerry was active on VHF and microwaves into the mid-1980s. He spent a year in the Falkland Islands in the 1980s as VP8BDE operating on HF. Gerry moved to Vancouver, Canada in 1997 where he currently lives operating with the call sign VE7GUH. His ham radio interests include restoring vintage domestic and communications receivers, in particular post WWII Eddystone valve receivers. Gerry can be reached at 1529 Eagle Mountain Dr, Coquitlam, BC V3E 2Z3, Canada.*

<sup>1</sup>T. Crosby, W6TC, “Ham-Band 14-Tube Double-Conversion Receiver,” QST, Jul 1957, pp 11-17, 148, 150

<sup>2</sup>J. Dilks, K2TQN, “Vintage Radio,” QST, February 2009, pp 96-97

<sup>3</sup>[Society for the Preservation of Antique Radio in Canada](#)

<sup>4</sup>[Eddystone User Group](#)