

Crystal Sets to Sideband

Written by Hans Summers

Monday, 29 June 2009 17:36 - Last Updated Sunday, 02 January 2011 17:21

Revision 10, July 2006

A Guide to Building an Amateur Radio Station

By Frank W. Harris, KØIYE

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NOTE: There is a Spanish translation of this book here: <http://www.ea2ry.com/libroradio/>

REQUIRES ADOBE ACROBAT READER.

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Chapter 13

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- Does it have to be so complicated?
- Planning your receiver

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- Direct conversion versus superhetrodyne
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- Start with a single-band, single-conversion superhetrodyne
- How do modern digital receivers do it?
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- Reception on 80 meter and 160 meters is aided by a tuned transmatch
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- A practical homebrew mixer made from discrete parts its harder than it looks
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- Not all MOSFETS work equally well
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- All 9.000 MHz crystals arent equal
- Using the BFO oscillator to match crystals
- Switch in filters with a rotary switch
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- Lessons learned from a dual-gate IF amplifier
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[OLD-TECH VACUUM TUBE RADIO](#)

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- How old can radio technology be and still be used on the air today?
- Why bother with vacuum tubes?
- Glowing filaments, colored plasmas & Jules Verne glass envelopes
- Power supplies for tubes
- High voltage power supply safety
- The old-tech QRP transmitter
- Vacuum tube amplifiers
- The three roles of the triode filament
- RF sinewave oscillator
- Quartz crystals
- Triode and pentode oscillators
- Old-tech voltage regulation big, crude, expensive, but beautiful
- The travails of triode tubes
- The oscillator and buffer
- The final amplifier triodes chirp
- The transmitter power supply
- An inadequate supply from a 1935 radio
- A good power supply made from cheap, modern, boring parts
- How to check out junk power transformers
- A complex but adequate supply made from ancient parts
- It works! No one suspects its old and its a success on todays 40 meter band
- An old-tech receiver
- A super regenerative receiver made from ancient tubes
- The power supply
- Super-regen on the modern hambands
- Lots of fun, but not up to modern QRM & QRPs - back to the drawing board!

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[THE NOBEL PRIZE FOR SIDEBAND](#)

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- It cant be that hard! Want to bet?
- The sideband generator how it works
- The 9 MHz oscillator / amplifier
- The audio amplifier
- The balanced modulator
- Building your own crystal ladder filter
- Decoupling the power supply leads
- Getting rid of RF feedback - RF filtering for all inputs
- Tuning and testing
- Using the generator for AM modulation and CW
- Moving the 9 MHz SSB signal to a hamband
- Move the SSB only once!
- No wonder most ham rigs are transceivers
- Moving the 9 MHz signal to the difficult HF hambands
- Move the VFO first, then mix it with the SSB 9 MHz.
- Pick your oscillator and VFO frequencies carefully
- Hearing your own VFO in the receiver
- The hardest band 17 meters
- Covering the widest band 10 meters
- A linear sideband QRP, VFO-tuned module
- All stages must be linear and low distortion
- All gain stages should be broadband to prevent oscillation
- Sometimes high pass filter output is needed & not the usual low pass
- Checking out the generator
- Driving a 50 watt linear amplifier

Chapter 16

ANCIENT MODULATION

- Defining amplitude modulation
- Modulating vacuum tube final amplifiers

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- Plate, screen & cathode modulation
- A "collector modulator"
- Converting a MOSFET keyer into a modulator
- Generating AM with an SSB balanced modulator
- Compensating for non-linearity
- Compression by accident
- You probably don't need to build a compressor
- Ham TV - The old way
- Fun with an ancient flying spot scanner TV camera

In conclusion:

Homebrew ham radio is never complete - when it works perfectly and does all the latest stuff, the hobby is over. Not likely. Long live homebuilding!

Thanks for reading my book.

73's Frank W. Harris, KØIYE