A Project-Based Approach
to VHF-UHF Technology

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What is a Project?

Our Stations are Projects!
Typical KK7B Project:

a little Art

a little Science

Deceptively Simple

Full Break-In, VFO, digital mode stability, PIN TR switch

2 stage high-voltage-device linear amplifier scale models
Define Project:

- about 50 hours
- unanswered questions
- undeveloped skills

A good project takes you twice as long as it would if you knew what you were doing

Notebook sketch, design, build, functional test, repeat... finish

differential keyer
What do you gain from your 50 hour investment?

some answered questions
some new skills
Maybe a piece of a bigger project
some things you’ll do differently next time

Every project is part of your personal history
After 50 projects you are pretty good at this stuff (1000 hours)...after 500 projects (10,000 hours) ...some sort of mastery

Practice: Chose interesting and challenging projects that become part of your portfolio
A common theme: Modular Projects

Premix Oscillator

Bandpass Amplifier

Variable Frequency Oscillator

Modules break projects down into manageable chunks, and greatly improve performance
Build and test...then squeeze them all into a box.

several bad ideas here...I learned a few things
Walk Through a Project

A nice-looking 1960s radio that doesn’t work very well

First Project:
Remove everything
Clean panel, chassis and controls

Then start notebook sketches: 7 MHz 144 MHz and 1296 MHz receiver that sounds really good
The big Slide Rule dial is already calibrated from 7.100 to 7.300 MHz

Leave slide rule dial, main tuning capacitor, and dial calibration capacitor in place
Built a 7.000 to 7.300 MHz VFO in a die cast box

From VHF-UHF we know that high performance requires individually shielded modules
Screw on the lid and VFO project is done

Lots of room on top of cleaned chassis to mount 2m and 1296 receive converters
Now build and test the remaining modules:

R2pro IQ downconverter

Each module was a separate project at one time but is now available commercially

Everything doesn’t always have to be a project

...the last time I ran 10 band June VHF contest...
The R2pro modules mounted under the chassis

Note: VFO phase shift/splitter in die cast box
All finished with converters for 144.000 to 144.300 and 1296.000 to 1296.300 MHz

It still has vintage appeal, but 2015 performance VFO output available for SSB transmitter
But who cares? Important project specification...

A project is useful if it inspires someone else

...Jim Davey at the first Microwave Update...
Some projects are more personal:

100 mW carrier 100% modulated 2m AM rig

Left modules are NZIF experimental AM receiver
Some projects are a means to an end:

1296 transverter for IF service on higher bands

The hardest part was all the discrete T R logic
Old radios don’t have a monopoly on Cute:

a little Art

a little Science

1296 yagi

Designed using EZNEC

This project is being used to teach 2 young women how to use a fully manual metal lathe
Project Recap:

a little Art

a little Science

about 50 hours spread over a month or two

Chose projects on the edge of your capabilities, don’t rush, embrace the learning experience

If it took twice as long as you expected, then you had twice as much practice

Then declare it finished, so you can move on to the next interesting and challenging project
Projects appeal to the next generation:

a little Art
a little Science
some difficult skills to practice

Something you can point to and say: “I did this”

Ana studying for her Tech exam -- aced it