

# QRP Adventures

for  
Education, Challenge & Enjoyment

7 Sept 2007, W2NED



# QRP -- Not Just For CW...

- Although tonight's focus is on CW –  
(because, that's what I do...)
- Much of the discussion also applies to...
  - SSB, or
  - PSK 31(Each with a bit more complexity 😊)



# Discussion Topics

- Adventure Radio Society
- Does QRP Make Sense ???
- The Trail Friendly Radio – an Evolution
- ARS operating events
  - Spartan Sprint
  - Flight of the Bumble Bees
- Some URLs



# The Adventure Radio Society

- 1700 Amateur Radio Operators
- Promotes a sense of adventure by supporting radio operation from beautiful and remarkable places.
- Supports imaginative equipment & antenna designs.
- Encourages “human powered travel” to reach out-door operating sites.
- Go to: <http://www.arsqrp.com>
  - ARS Sojourner – monthly on-line magazine
  - Info on popular operating events and awards

From ARS Web Site <http://www.arsqrp.com>



# Why QRP works...

- With 100 watt transceiver as a reference...
- 5 watts is 13 db down...
- One S-Unit is about 6 db...
- Therefore, 5 watts is about 2 S-units weaker than a 100 watt signal – all else being equal.
- But 5 Watts is 1/20 the power, with correspondingly less
  - Size,
  - Weight,
  - RFI,
  - Etc...



# The TFR – Trail Friendly Radio

- Light weight: < 1 pound
- Low power: < 40 ma on receive
- Easy to operate while sitting on ground
- Controls on top.
- Large controls -- easy to use even with gloves.
- I/O ports -- styled and positioned to avoid confusion
- Self contained -- i.e. internal batteries
- High performance receiver
- See Wayne's (N6KR) Paper – *Anywhere, Anytime HF*  
[http://www.arsqrp.com/ars/pages/back\\_issues/2003\\_text/1203\\_text/N6KR.html](http://www.arsqrp.com/ars/pages/back_issues/2003_text/1203_text/N6KR.html)



# HW-8 – “pre-TFR”

HW-8



Screen clipping taken: 9/6/2007, 9:10 PM

<http://www.theheathkitshop.com/hw-8.html>

- 1976 to 1983
- Part of the popular HW 7, 8, 9 Series
- Discrete components
- Direct conversion
- Multiband 15-20-40-80
- 1 - 2 watts out
- Popular, portable – but not a TFR
- \$130



# NorCal-Wilderness-Elecraft Evolution



- At Left
  - SST
  - Nor Cal 40
  - Sierra
  - K2
- Then came (not shown)
  - K1
  - KX1

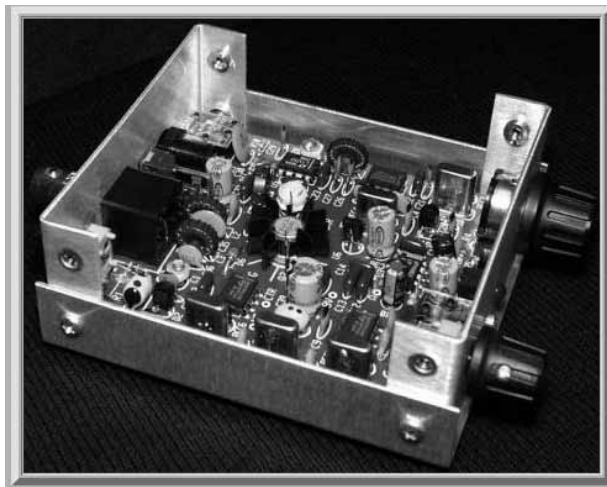
From: <http://www.elecraft.com>



# SST



- Single band units
- 20,30 or 40 meters
- SuperHet Receiver
- Stable VXO – 10KHz / no RIT
- 3-pole Xtal filter
- 1-2 watts output
- 15 ma receiver
- Fast / clean QSK
- Utilizes mixer / amp ICs
- Very good performance
- Not Quite a TFR
- \$90 -- still available



From Wilderness Radio: <http://www.fix.net/~jparker/wild.html>

# The Nor Cal 40



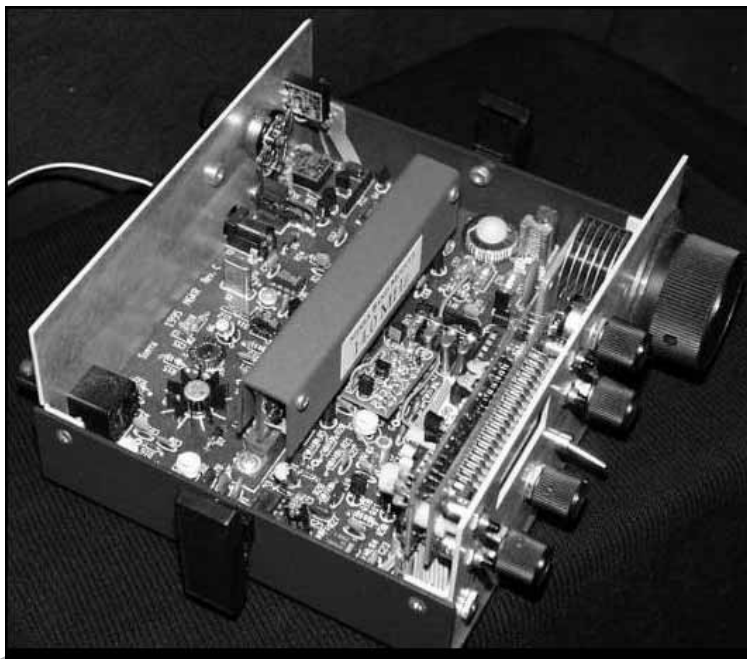
- Started as a Nor Cal QRP Club Project
- Third generation QRP Kit...
- SuperHet 5 MHz IF
- Leverages ICs
  - NE602 mixer / amplifiers (3)
  - LM386 Audio amp
- 2 watts output
- 20 ma on receive
- Audio AGC
- Audio and RF Gain
- 4-pole Xtal Filter
- VFO – 40 KHz
- Internal Keyer
- RIT
- Good performance – very popular
- \$140

From Wilderness Radio: <http://www.fix.net/~jparker/wild.html>

# Sierra



- Signal path same as Nor Cal 40
- 1.5 - 2 watts Output
- 35 ma receive current
- Multi-band w/ plug-in modules
- 80, 40, 20, 17, and 15 meters
- VFO – 150KHz
- Frequency read-out
- \$245 w/one band +\$30 / additional band



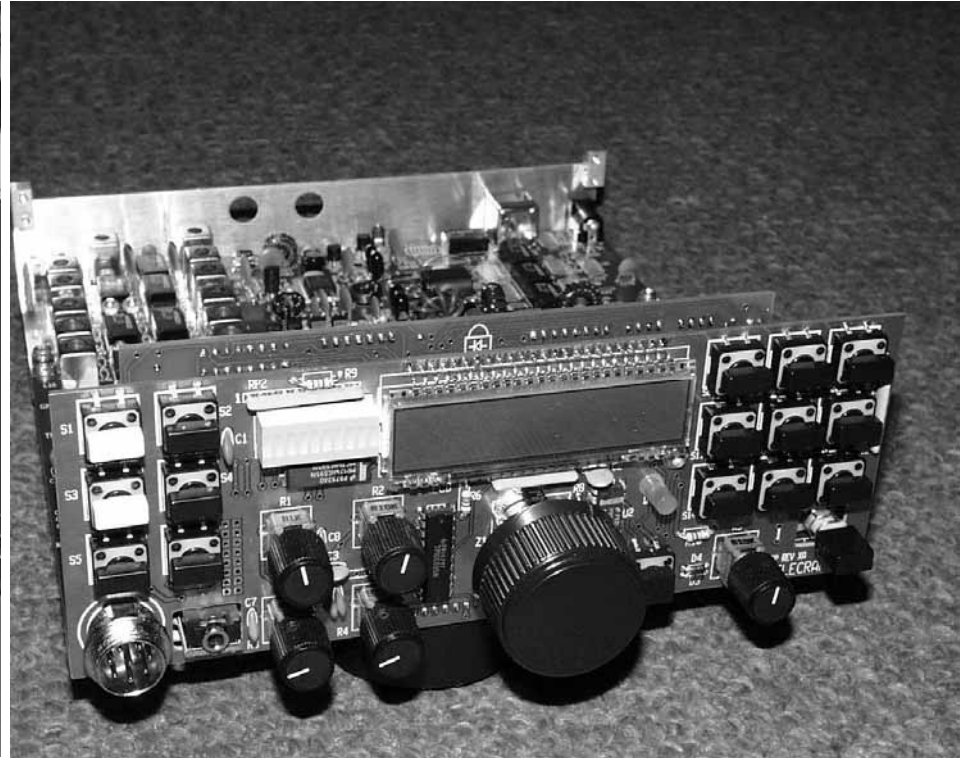
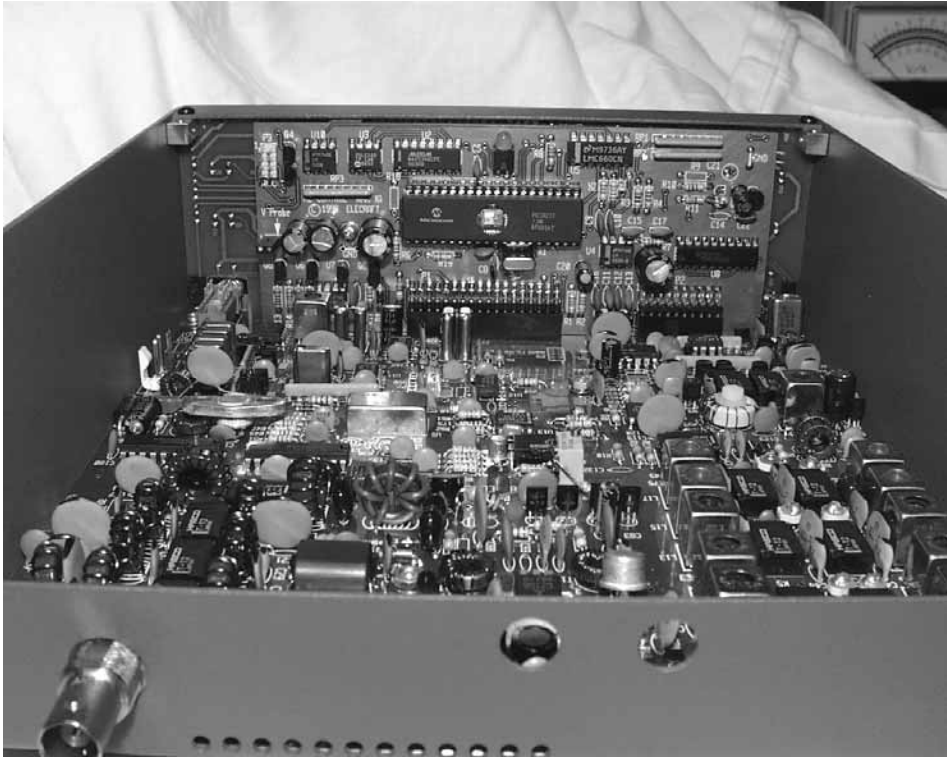
From Wilderness Radio: <http://www.fix.net/~jparker/wild.html>

# And Then, The Elecraft K2



From Elecraft: <http://www.elecraft.com>

# K2 Interior



From Elecraft: <http://www.elecraft.com>

# K2 Design Info...

- Start with the time proven
  - Signal Path & features,
  - Full QSK,
  - Light weight,
  - Low power, etc.
- Achieves superb sensitivity, S/N & BDR
  - Pre-Amp, low noise front end & receive mixer –
  - Low noise, PLL Synthesizer – Full Ham band coverage
  - Superb filtering – great BDR.
- Great UI and flexibility
  - Multiple PIC controllers for UI, I/O and control.
  - Latching relays to minimize current
  - IF based AGC loop
- Pricing...
  - Starts at \$700 for 15 Watt CW rig...
  - Fully loaded rig can double price...
- Great features...
  - CW Full Break-in; Diode Switched TX/RX
  - Programmable Memory Keyer (*9 memories*)
  - 'Hunt and Pounce' Band Search Mode
  - 120ma Low Current RX Mode
  - Built in Test: Freq. Counter, Volt/Amp Meters
  - Self Calibration Firmware
- Lots of Options...
  - SSB w/ 7 pole xtal filter
  - Internal Battery
  - DSP
  - 10:1 Antenna Tuner
  - 100 Watt Amp
  - Transceiver extendibility...

K2 is not exactly a TFR, but it is very portable, and gives Elecraft technical & business **field position**...

# Elecraft K1



- Same NE602 signal path
- Uses PIC controller for I/O, control and display functions – Big increase in UI...
- Latching relays to minimize current requirements
- 80, 40, 30, 20, 17, 15
- VFO -- 150KHz
- w/ 2 or 4 switched bands per module
- 5 watts out (minimum)
- 55 ma receive current
- 4 pole Xtal filter (5Mhz)
- Internal antenna tuner & battery pack
- Starts at \$370 w/ one four-band module
  
- Near TFR...



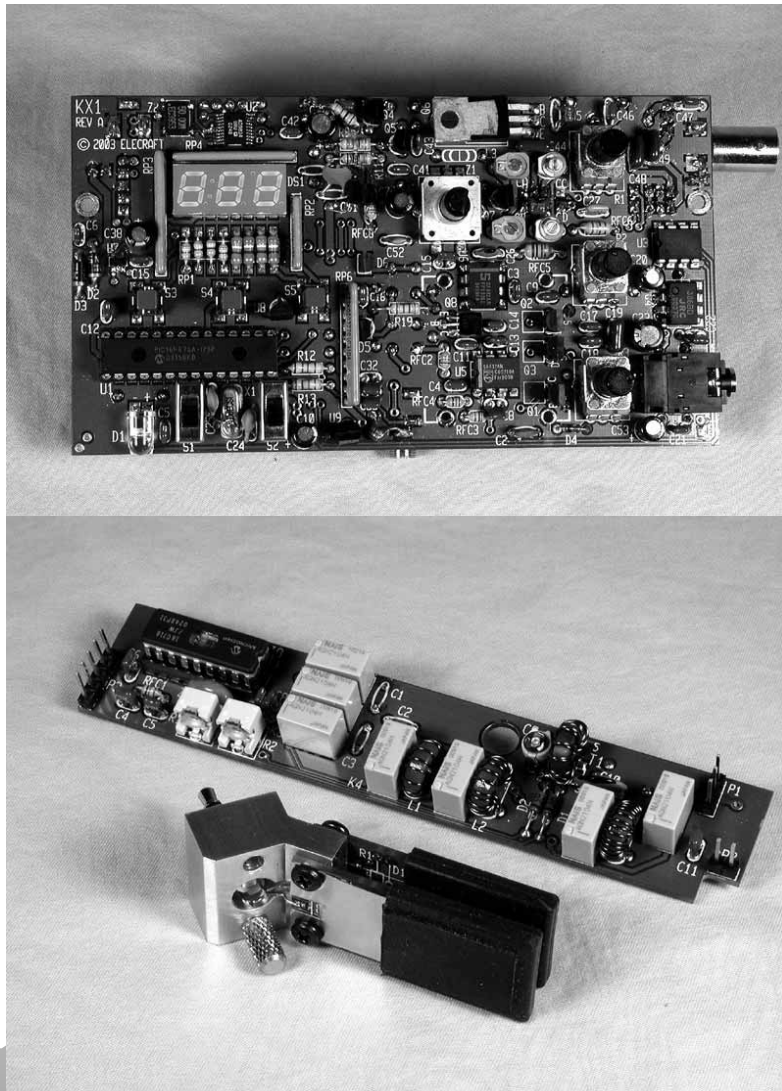
# KX1 The Ultimate TFR



- TFR Features...
- 2, 3 or 4 Bands
- SWL Bands Rx.
- Up to 4 watts out
- 9 oz + batteries
- Plug-in paddle
- DDS VFO – full band coverage
- 3 digit display
- Log lamp



# KX1 Continued...



- DDS
  - simplifies design
  - Increases flexibility
- 80, 40, 30 & 20 meters – complete
- Plus SWL bands
- Optical encoder tuning
- Antenna tuner (lower Picture)
- Starts at \$365 for four band unit.
  
- Meets most TFR requirements

# ARS – Spartan Sprint

- First Monday of each month
- 9pm - 11pm eastern time
- 5 watts max
- Score
  - Contacts / pound, or
  - Number of contacts
- Features portable ops

Band	QSOs This Month	QSOs Last month
80m	132	109
40m	1287	723
20m	1055	842
15m	7	1
10m	1	2
Total	2482	1677

# The Flight of the Bumble Bees

- Last Sunday in July
- 1PM - 5PM Eastern time
- BBs get number and must operate portable
- Contacts with BBs get 3x multiplier
- Best view and best adventure gets featured

Band	2006	2005
40M	753	939
20M	2339	3213
15M	98	248
10M	1	5
<b>Total</b>	<b>3191</b>	<b>4405</b>

# Some Ops are Intense



From ARS Web Site <http://www.arsgrp.com>



# And Some Ops are Less So



From ARS Web Site <http://www.arsgrp.com>



# Some URLs

## **Kits:**

Elecraft

<http://www.elecraft.com/>

Oak Hills Research

<http://www.ohr.com/>

Small Wonder Labs

<http://www.smallwonderlabs.com/>

TenTec

<http://radio.tentec.com/kits/>

Wilderness Radio

<http://www.fix.net/~jparker/wild.html>

## **Antennas:**

The N2CX HALFER

<http://www.njgrp.org/n2cxantennas/halfer/halfer.html>

BuddiPole Antennas

<http://www.buddipole.com/>

## **Societies:**

Adventure Radio Society

<http://www.arsgrp.com/>

American QRP Club (was NORCAL & NJQRP)

<http://www.amgrp.org/>

## **Other Links:**

<http://www.wb8nut.com/links.html>

