

QRP



When you care  
to send  
the very least!

# **A Brief History of (my) Time**

- **Age 5 in an auto salvage yard**
- **Age 6 with an 8 transistor AM radio**
- **Age 9-10 with CB walkie talkie kits**
- **Age 10 a shortwave radio for Christmas**
- **Age 10-11 WN6SVQ: Finally a Ham!**
- **On the air with CW and a few crystals**
- **Frustrated builder: I can't do it!!**
- **But...I taught Electronics shop at my High School**
- **Viet Nam, served in US Air Force, Brazil mission**
- **Gave up radio, started Pre-Med at University**

# **Brief History Dragged Out Longer**

- **Electronics and Ham Radio became hobbies**
- **Building a computer instead of dusting shelves**
- **2-way Radio Technician, then Supervisor**
- **Maintaining and Building Repeaters**
- **My first real RF Engineering job**
- **Now Everybody Thinks I'm an Engineer, so...**
- **11 yrs RF Consulting biz, then VP of Engineering**
- **Director of Wireless Eng, GM at 3Com, Apple**
- **Now "retired" to Roku, just for fun**

# Me and My Friend, Mr. Morse

**.. -. -. .- -. - -. --- .. - !**

- **I learned Morse code in Boy Scouts—easy!**
- **Getting on the air was a different story**
- **My ham elmer's trick to help me pass the test**
- **Sweating out each contact, until one day...**
- **Taking the 13 WPM code test in the “old days”**
- **So...what happened to me since then?**

# CW and Hams



- **FB OM ES TNX FER QSO 73 ES BK TO U**
- **QSO QSL QTH QRM QRN QSB QRL? QRP**
- **Humor: QRS vs QRQ, QLF, HIHI, 72**
- **Contests at 35 wpm: “K7DAA 5NN ATNS TU”**

# **CW: The Last Word**

- **Farnsworth and Koch—don't practice slow code!**
- **DON'T COUNT dits and dahs!**
- **Listen, listen, listen, and then listen some more**
- **Software: CW Skimmer , Morse Runner, FLDigi**
- **See yourself on [www.reversebeacon.net](http://www.reversebeacon.net)**
- **Helps a bit to be a musician—I guess...**
- **Keep at it—I slow down a lot after a few weeks**
- **Foreign languages require constant practice, too**
- **Imagine you're in the WWII French Resistance!**

# **QRP: It's A Philosophy**

- **QRP is 5 Watts CW, 10W SSB and Digital**
- **Cute stuff—small & fun—either buy or build**
- **Hotel travel, hiking, biking, camping—low weight and size**
- **Batteries are really the limitation, aren't they?**
- **How small can you make it? Film cans, Altoids tins, etc.**
- **How low (power) can you go and still make a QSO?**



Mountain Topper Radio  
Designed by "Mtn Solder"  
Steve Weber-KO1TV

HOLD for:  
(S) Code Speed  
(M) Memory  
(D) Digital Mode  
(P) Presets

Click->  
M3  
MENU

DPE Mem  
RT

TM M1  
TUNE M2

40 20 40 20

BEERLES  
ESPRESSO CORNER  
GOAT



# QRP: Interesting Math

- Comparing 100 watts SSB to 5 watts CW:
- Reducing 100 watts to 10 watts = 10 dB less
- From 10 watts down to 5 watts = 3 dB less
- Total from 100 to 5W is:  $10\text{ dB} + 3\text{ dB} = 13\text{ dB}$
- One "S-Unit" = 6 dB, therefore 5 watts is about 2 S-Units lower than 100 watts
- CW vs SSB: CW has 11 dB more "gain". Why?
- 5 watts CW vs 100 watts SSB: 2 dB difference

# QRP “Disadvantage”?

## Top Finishers Last 2 Field Days

### 2016 ARRL Field Day

Entries 1 to 25 of 2696 listed

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#	Call	Score	Category	QSOs	Power Mult	GOTA Call	Section	Participants	Club
1	W3AO	30,034	17A	8,910	2	KE3Q	MDC	70	Potomac Valley RC & Columbia ARA
2	K6EI	19,245	12AB	2,007	5	W6ZZZ	SCV	22	West Valley AR Assn
3	W4EZ	18,990	8AB	2,008	5		NC	47	Orange Cty Radio Amateurs/Durham FM Assn



### 2015 ARRL Field Day

Entries 1 to 25 of 2719 listed

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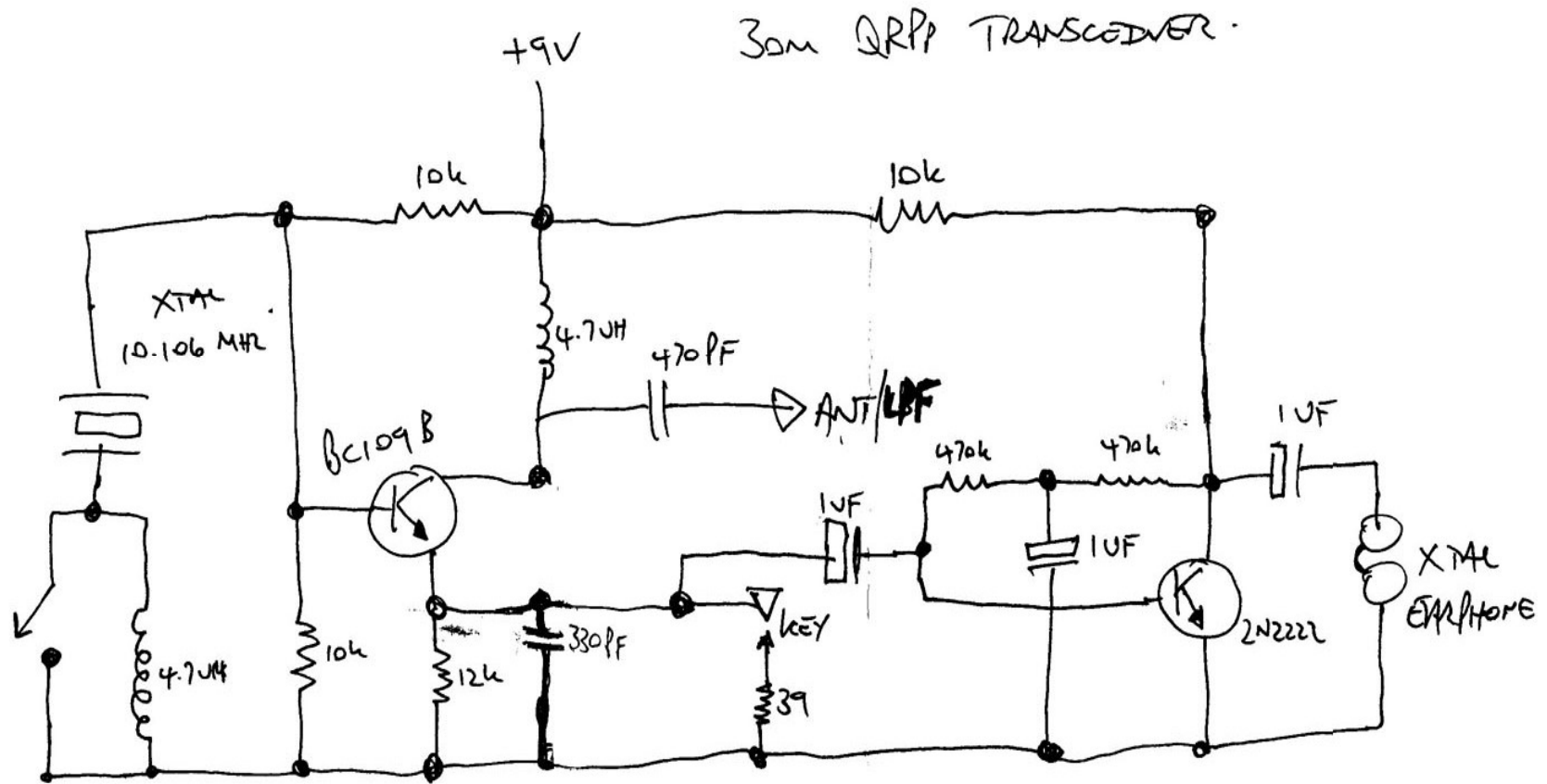
Page: **1** 2 3 4 5 6 · 10 · 20 · 30 · 40 · 50 · 60 · 70 · 80 · 90 · 100 · 109

#	Call	Score	Category	QSOs	Power Mult	GOTA Call	Section	Participants	Club
1	W3AO	31,452	18A	9,700	2	KE3Q	MDC	91	Potomac Valley RC & Columbia ARA
2	K6EI	21,400	11AB	2,287	5	W6ZZZ	SCV	22	West Valley ARA
3	W4EZ	18,175	9AB	1,929	5		NC	51	Durham FM Assoc/ Orange Cty RA
4	W5YA	17,680	3AB	1,699	5	AD5A	NM	12	Rancho Escondido ARC

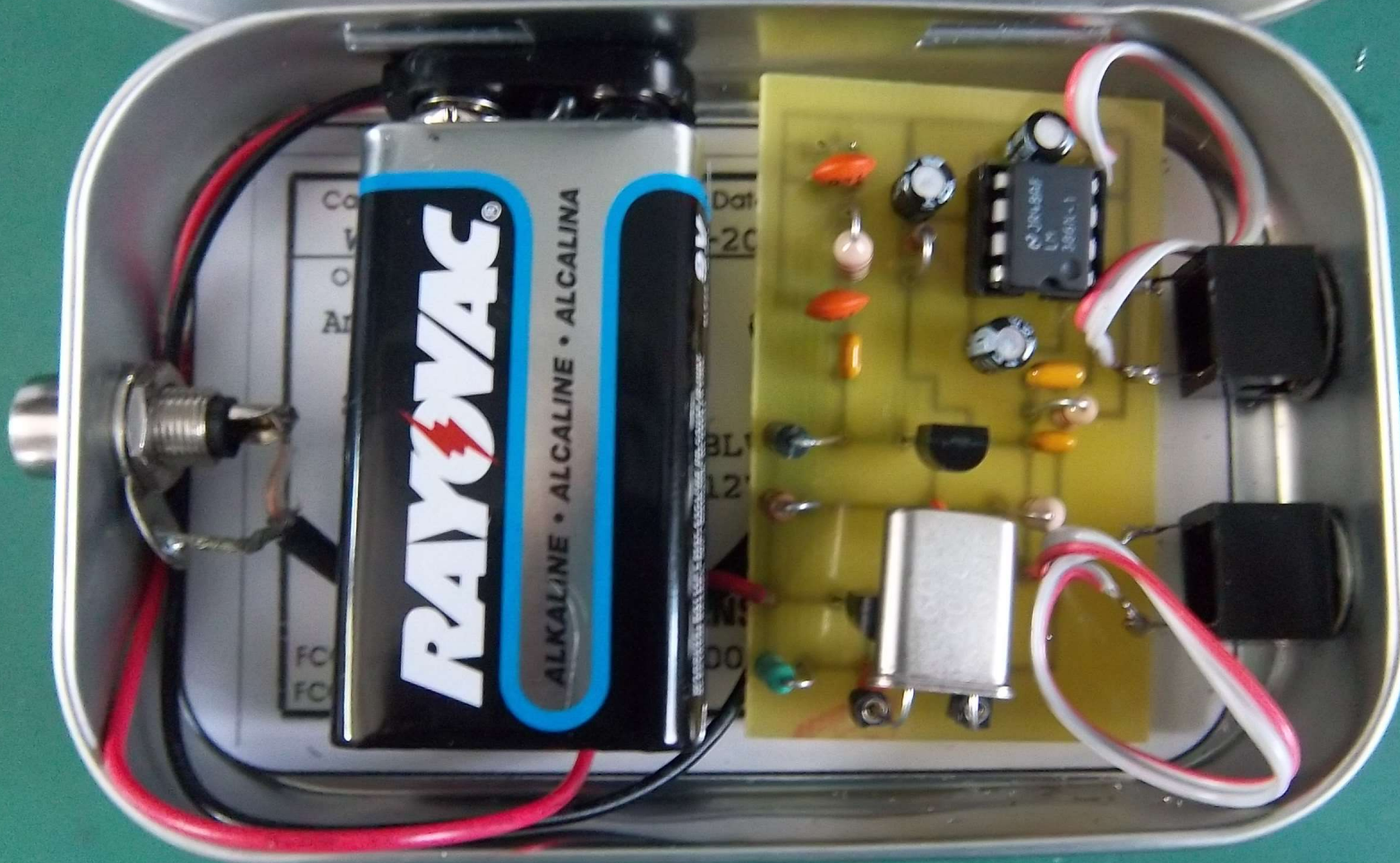


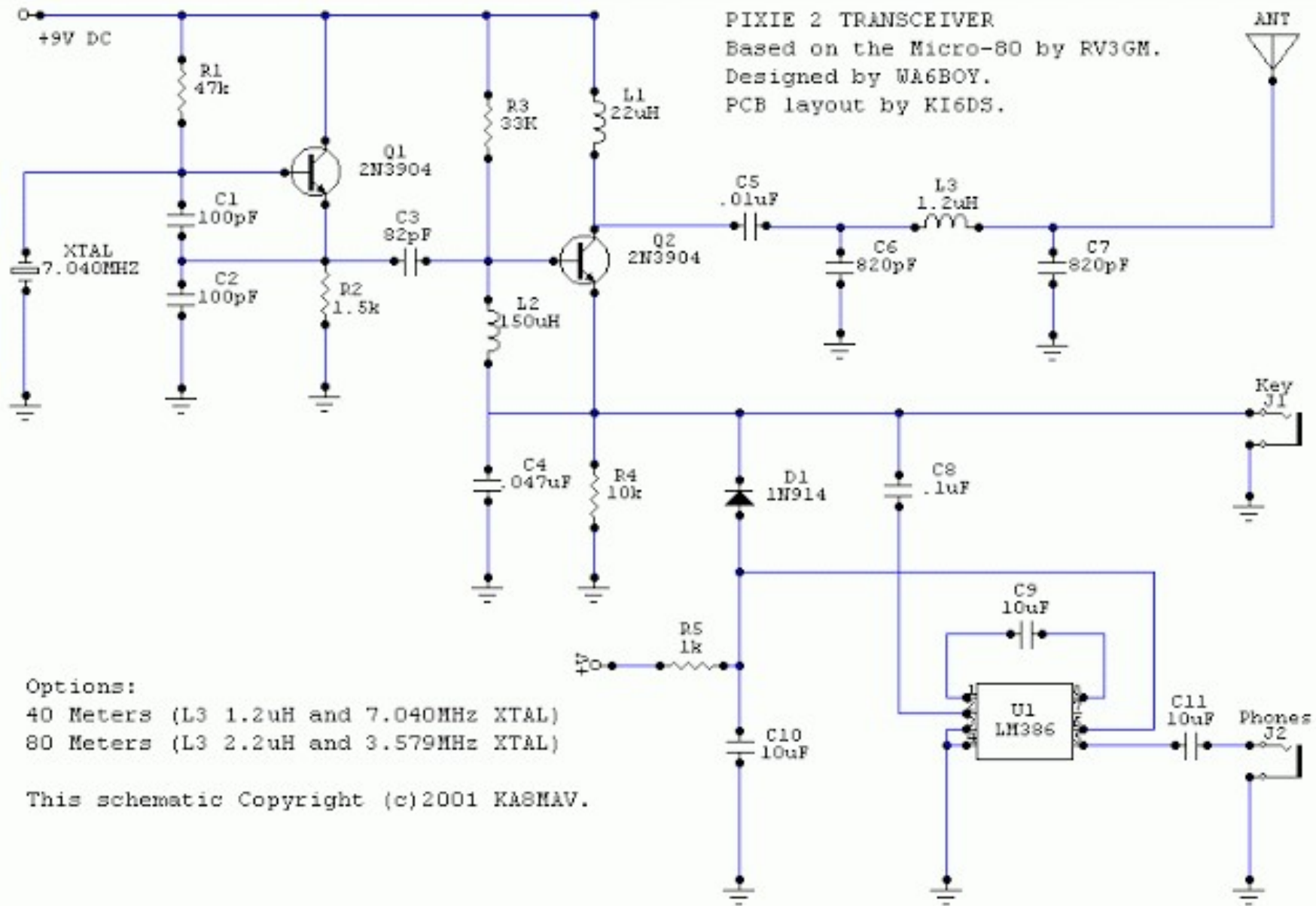


# QRP is Often Simple & Cheap

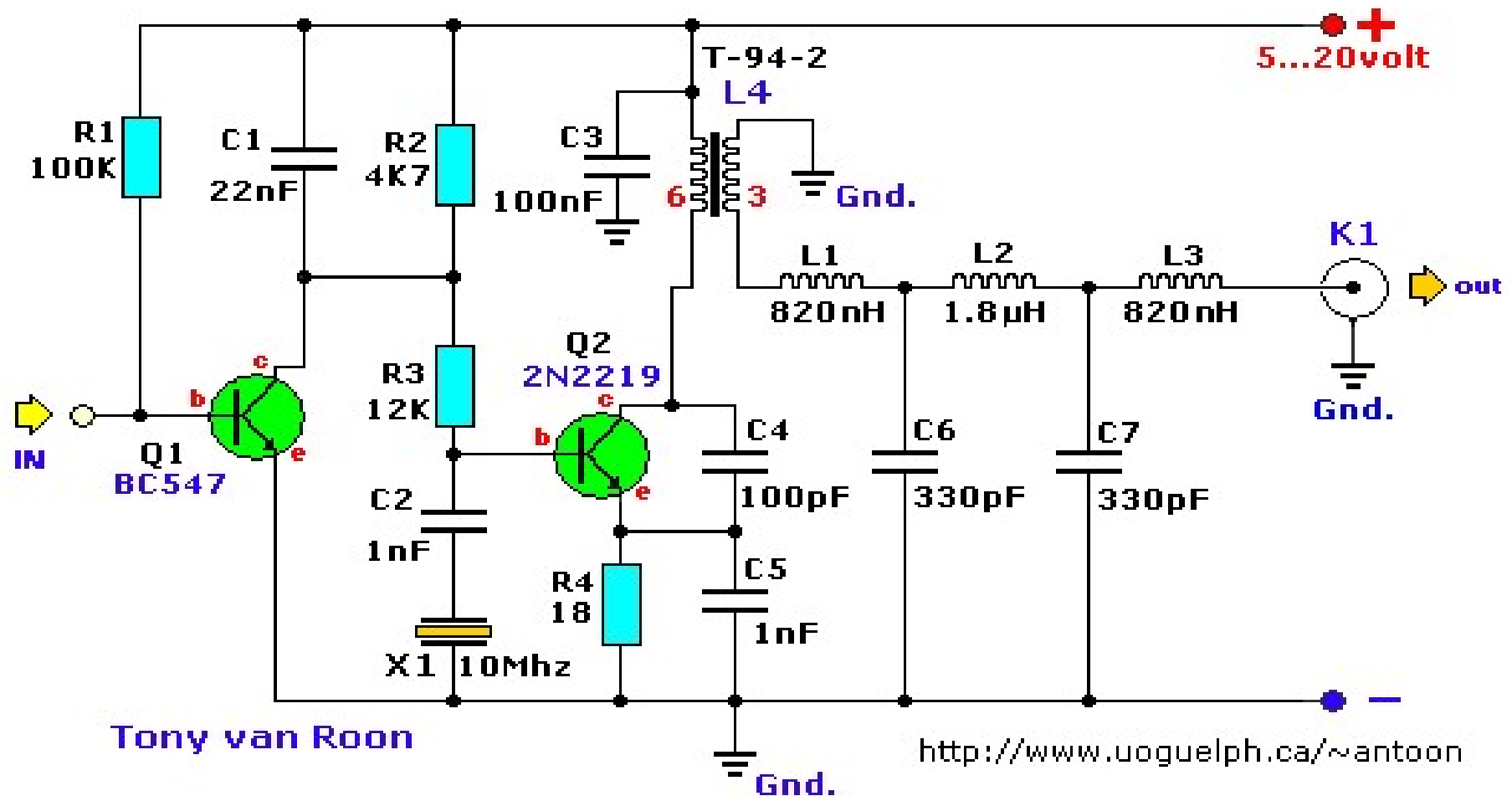


# The "Pixie"



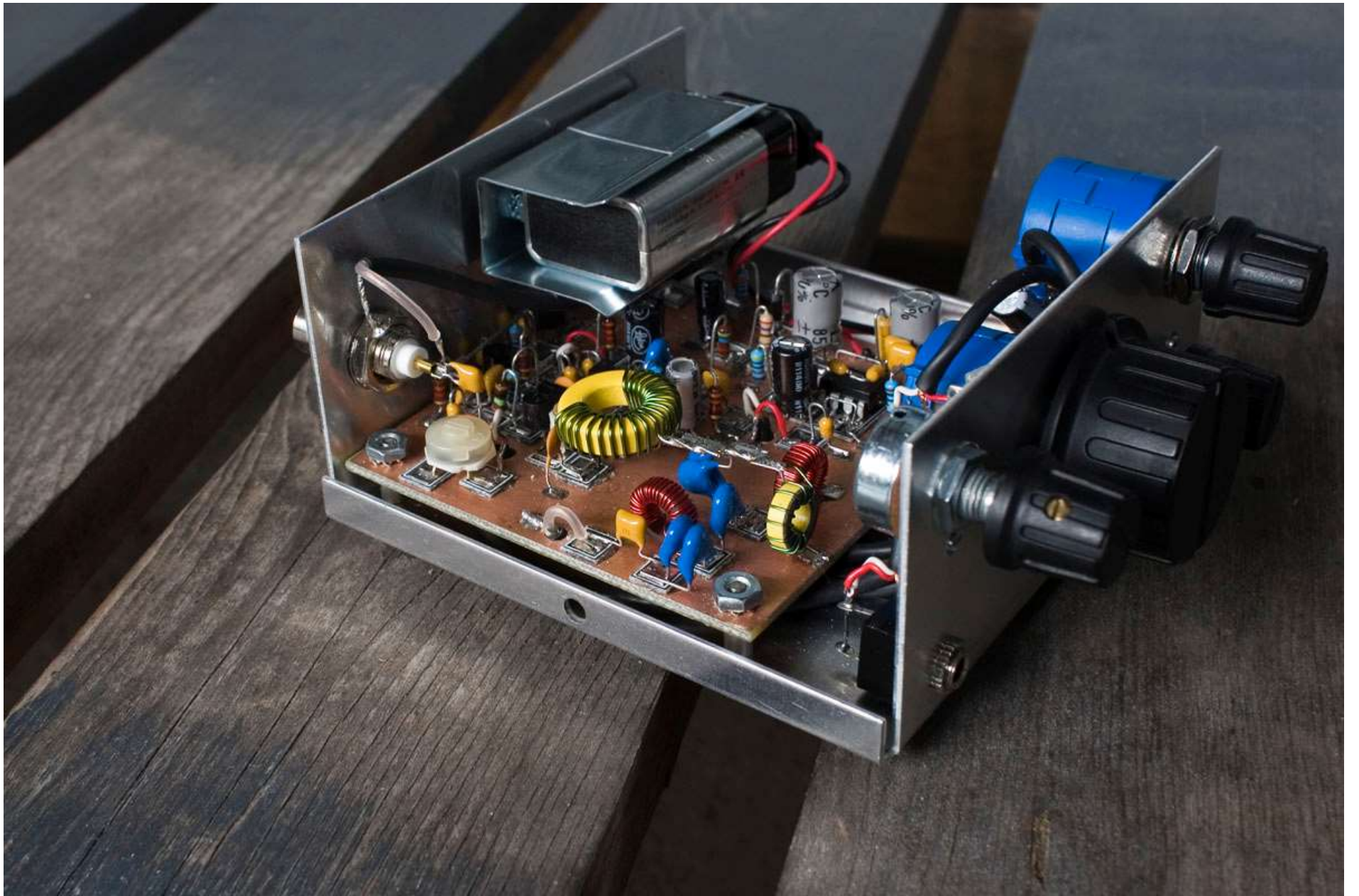


# Simple \$8.00 CW Transmitter





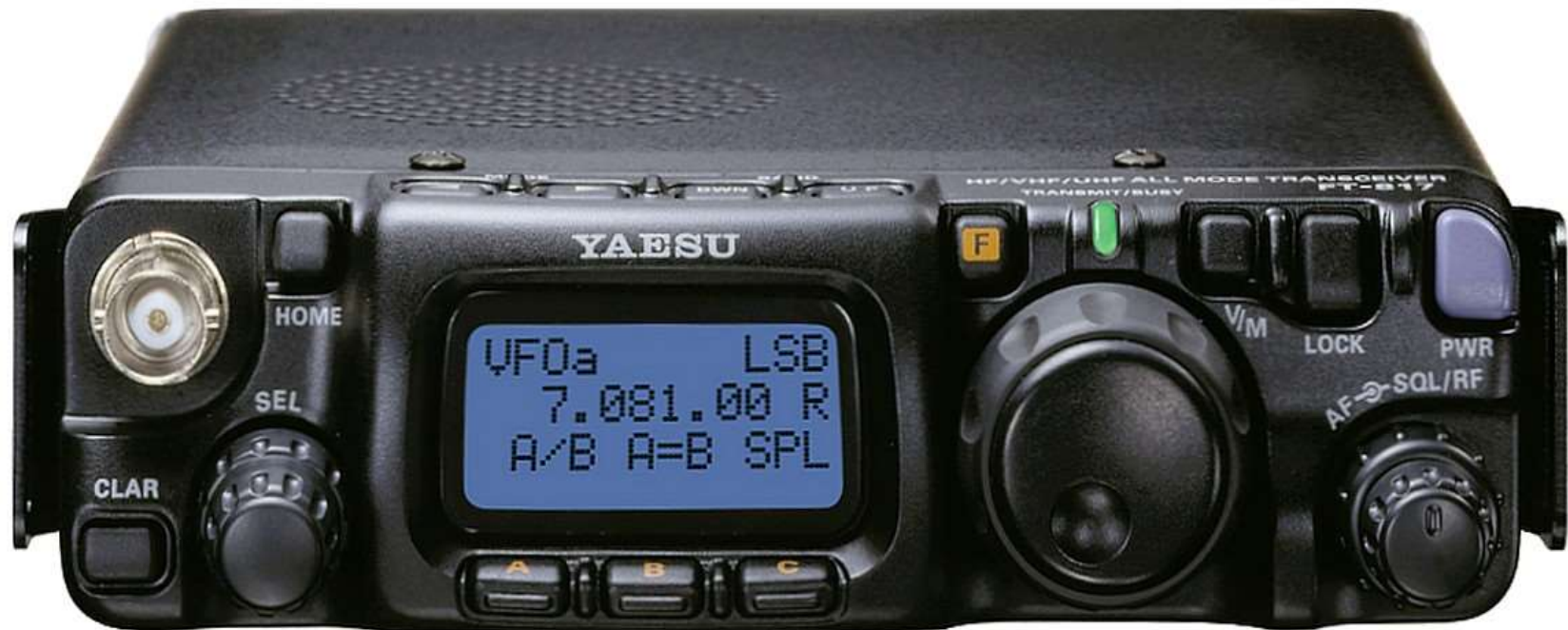




# A Bit of QRP History: 1970's



# 2001: A (small) Space Odyssey



Copyright © QRPTRANSCEIVER.COM

# Elecraft Ships the K2 in 1998



# Followed by K1, KX1, KX3, and KX2



K1



KX1



KX3



KX2

# The Icom 703 and the Flex 1500



# And We've Been Building Our Own

- **Small Kit Designers and Builders Have Been Busy For Many Years**
- **“Famous” kits from NorCalQRP, 4SQRP Club, GQRP in Britain, Arizona Scorpions, etc.**
- **Individuals: KD1JV, W1REX, G3RJV, W1FB, K1SWL**
- **Many Great QRP Books and Software**
- **Very Good YouTube and Other Videos**



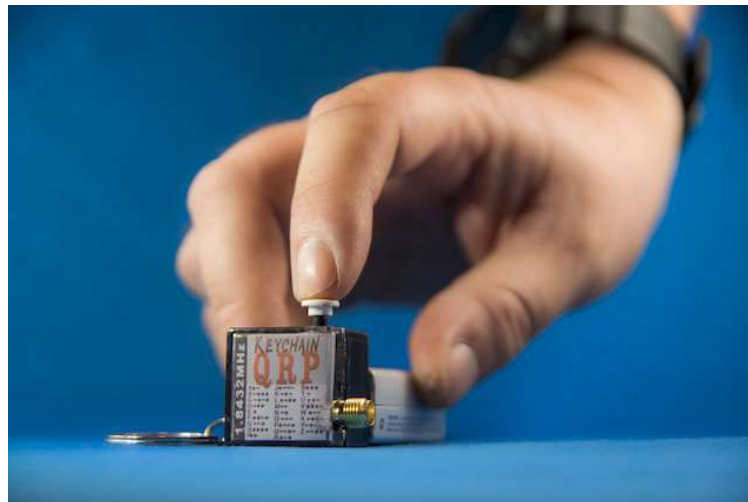
# **QRP Is Really About Building Your Own**

- **Try a simple receiver—add features to it as you go**
- **Try a modular approach, better mixer, better filtering, upgrade from an earphone to a speaker**
- **Try a crystal-controlled low-power transmitter then add a VFO, maybe digital with readout**
- **Then add more power...if you want...?**
- **Add more accessories—power supply, CW keyer, automatic T/R switching—all easier to do when you're dealing with 5 watts or less**



# How Low Can You Go???

- Crazy people do **QRPP**: because 5 watts is just too much power!!
- 1,000 miles per watt award
- Worked All States QRP
- DXCC @ QRP = Lots of Respect from the rest of us!



QRP Amateur Radio Club International<sup>SM</sup>

# 1000 Miles Per Watt Award

Be It Known That  
**Fred Kemmerer, AB1OC**

Has as of January 25<sup>th</sup>, 2014 been elected a full member of the 1000 Miles Per Watt Club  
#3389

Election was based on submission of satisfactory proof of a contact between  
QRP station **AB1OC** located in **Hollis, New Hampshire** running 5 Watts  
And station **VK7BO** located in **Tasmania, Australia**  
Which represents successful communications equivalent to

**2094 Miles Per Watt**

17m Band # 49  
CW Mode # 1895

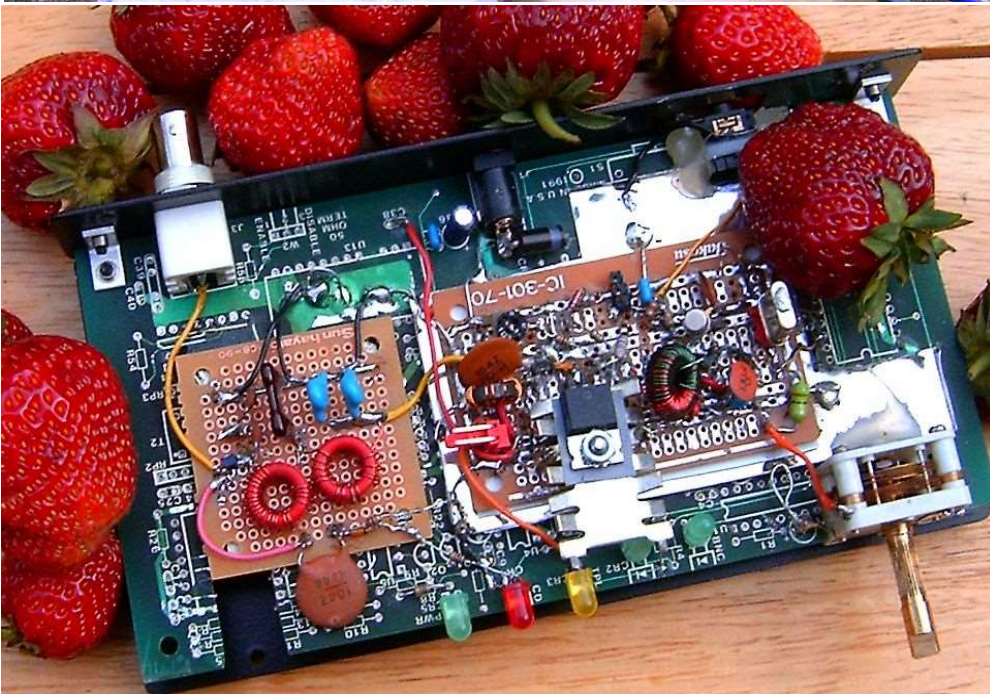


*John A. Jones AK4VL*  
Awards Manager QRP ARCI<sup>SM</sup>















All Mode 160-6 Meter SDR-DSP Transceiver

LNR  
⊕⊖

LD-11  
11 Band

RxA 13.2V USB  
7.160.000  
S 123456789+204060  
10kHz IF.

ON/OFF



AF



PRF/ATT



LOCK



STEP



F



MODE/NF



TUNING



▲/NR



MEMO



MENU

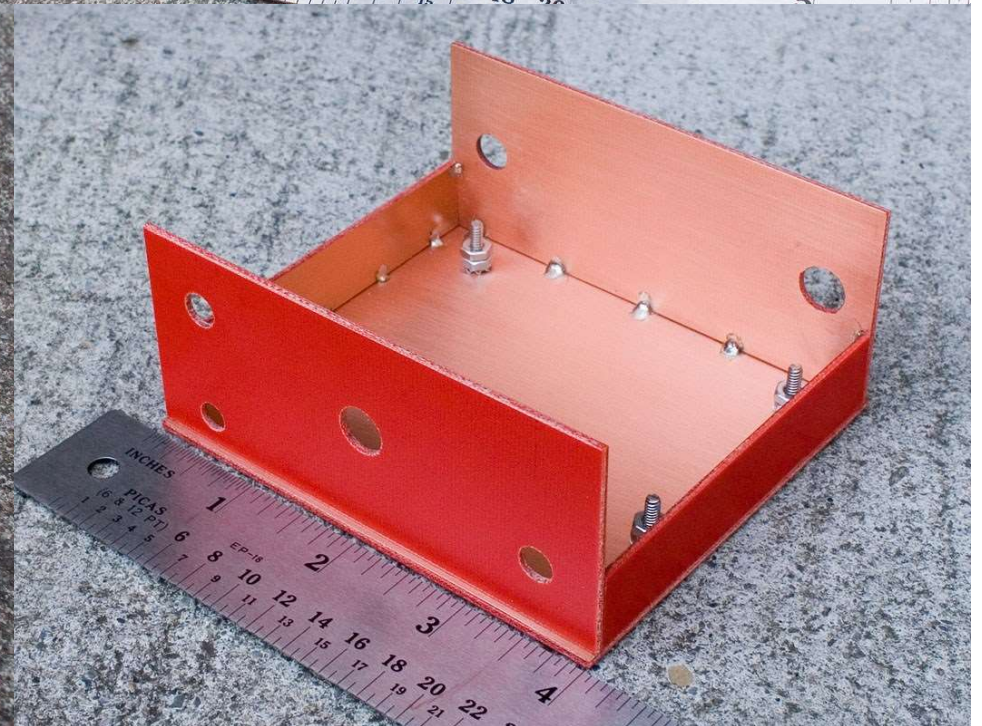
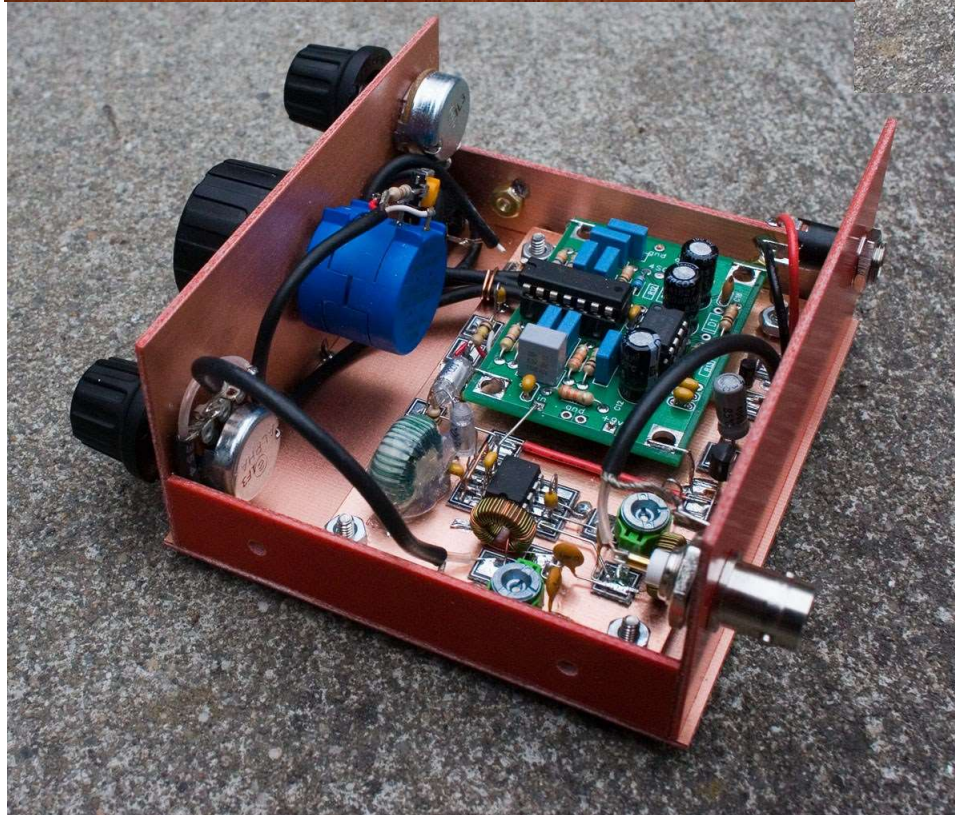


▼/NB RIT / SPLIT



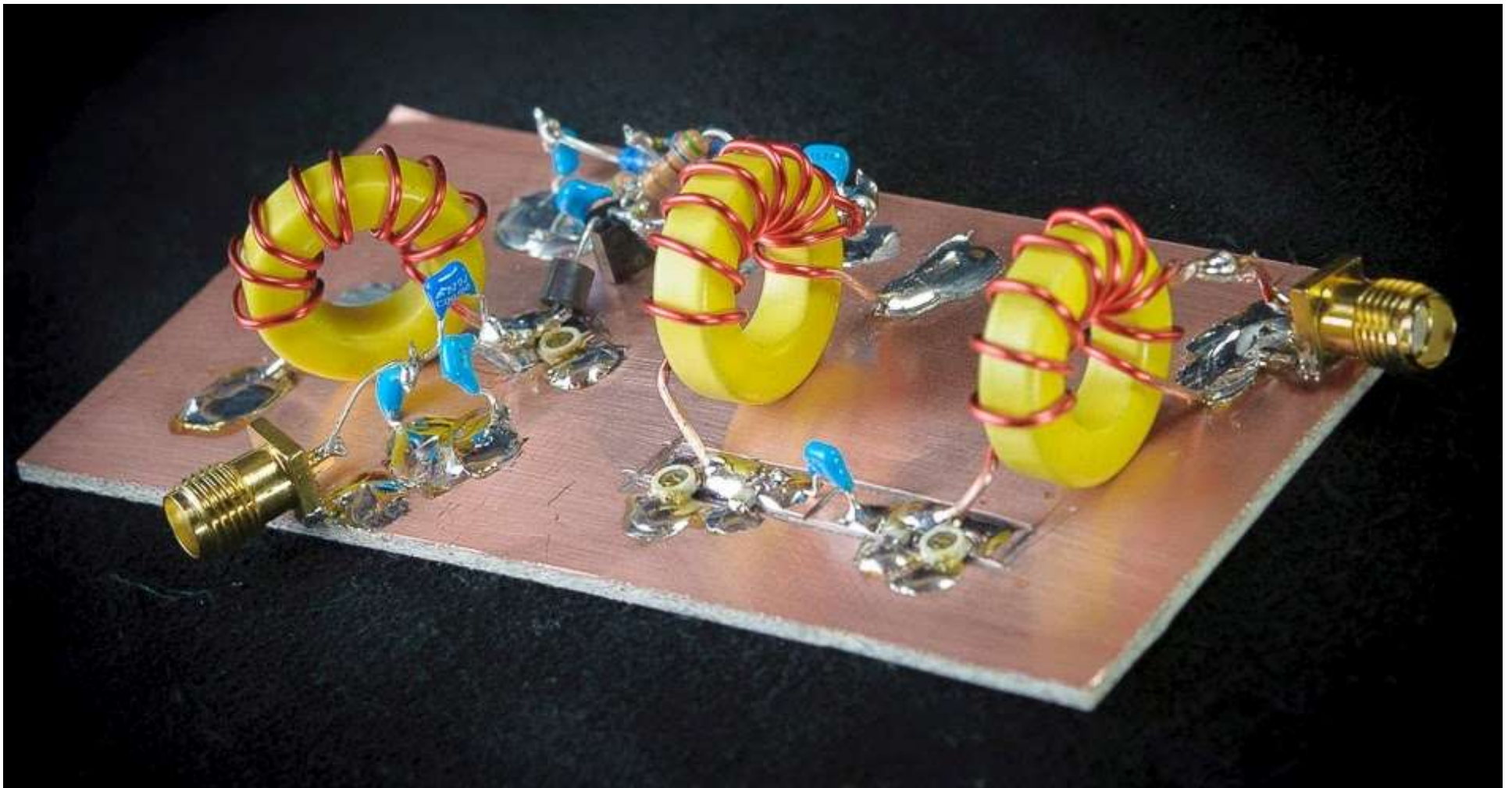
VFO A / B







May Be Ugly, But It Works Super!  
Express Yourself On A Copper Canvas



## “Safe” Radios You Might Try: Non-kit

- Elecraft KX2: SSB & CW, \$750 + extras
- Elecraft KX3: SSB & CW, \$1200 + extras
- Yaesu FT-817: All modes, all bands, \$500-699
- LNR Precision Mountain Toppers, CW, \$250-380
- MFJ 9400 series SSB & CW any one band \$250
- Several radios from <http://www.youkits.com>

# “Safe” Radios You Might Try: Kits

- BitX-40, 40 meters SSB, super easy to finish, \$59
- BitX-17 or -20 17 or 20 meters SSB, full kit \$190
- MFJ Cub, 80-10 meters CW (pick one) full kit \$99

# Parting Thoughts

- QRP is not for everyone, or even for most of us
- Do I recommend calling CQ or saying that you are running QRP power levels? Yes...and no
- QRP power + crummy antenna = Frustration x 10
- Get out away from power lines and noise
- Hilltops that decline in the direction you want your signal to go are sometimes worth +20 dB
- What are you? Builder, designer, thinker, communicator, craftsman in wood, metal, plastic?
- Memorable contacts I've had when QRP

# Antennas That I've Known & Loved

- Pacific Antennas PAC-12 all-band vertical: \$120



- Pacific Antennas 20/40M Trap Dipole: \$25





# Antennas Cont'd

- Homebrew Magloop: \$10-100



- Par End-Fedz  $\frac{1}{2}$  wave end-fed dipoles: \$60



# Antennas Cont'd

- SuperAntennas YP-3 portable 3-el Yagi: \$400



# Thanks, and Have Fun!

Download this presentation and tonight's notes at:  
<http://www.k7daa.com>

