

QRP





Why QRP?

The Joys of
Low-Power Ham Radio

Colorado QRP Club
www.cqc.org

What is “QRP?”

A telegraphy Q-signal

“QRP” = To lower ones power

“QRP?” = Can you lower your power?

Five watts RF output power (or less!)

Use a “QRP” rig, or

Turn down your present radio

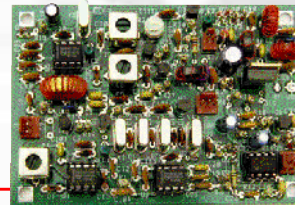
Only 5 watts?
You must be
kidding...

QRP

Part 97, FCC Rules

“Run only the power necessary to maintain the desired communications.”

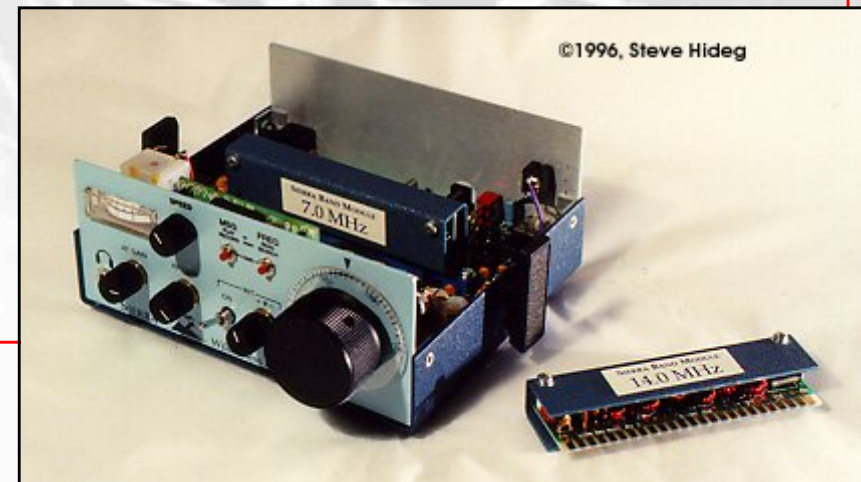
There is, of course, room for interpretation...



Small Wonder Labs SW40+

Why QRP?

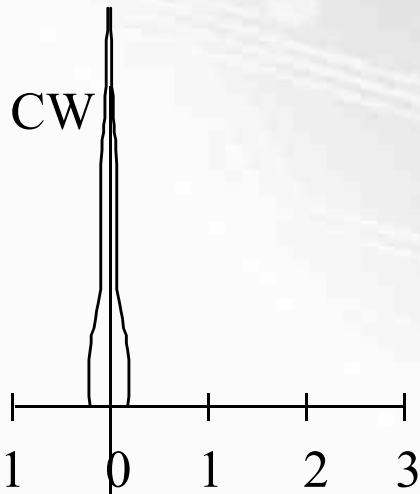
- Signal strength allows it
- Safer for you, your family, and the public
- Quality and simplicity of equipment
- Joys of homebrewing & kit-building
- Excellent way to improve skills
- Backpacking
- It's fun!



Wilderness Sierra

QRP

CW vs. SSB



CW signal bandwidth = 100 Hz

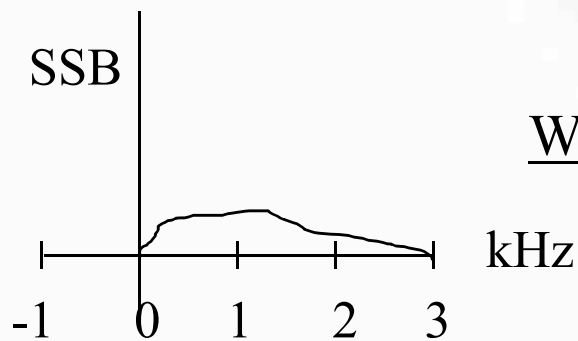
SSB bandwidth = 2000 Hz

Morse has much lower throughput...but...

Average power density

CW - 1 watt/Hz

SSB - 0.05 watts/Hz



Which leads to...

Gain = $10 * \log (1.00/0.05) = 13 \text{ db!}$

Output power = 100w

5w CW is equivalent to 100w SSB!

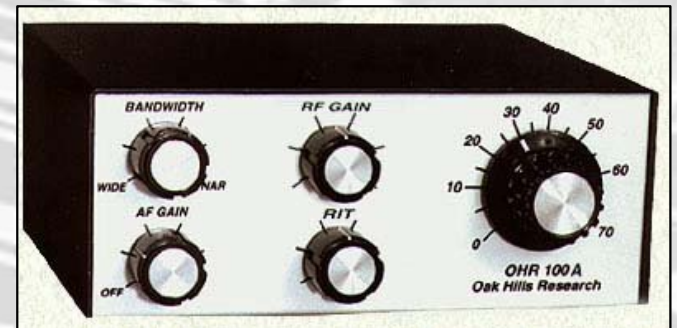


What Does This Mean?

- **Most (but not all) QRP QSOs are CW QSOs**
- **Thus, if you plan to try QRP...**
 - Learn code, practice code, use code, dream code, etc.**
- **So who does QRP SSB/digital?**
 - Lots of people**
 - An even bigger challenge than CW QRP**

QRP “Optimization”

- 1) Size & weight increase with maximum output power
- 2) Minimize current draw
 - No lamps (except LEDs)
 - No digital display unless LCD
 - Maximize TX efficiency
- 3) Use few components & pack the board tightly
- 4) Use ICs if possible
- 5) Sensitive RX - If you can't hear 'em, you can't work 'em



Oak Hills Research 100A

Size and Weight vs. Max. Power

Conventional 100w setup	Icom 735, etc.	12 lbs.
	Tuner	6 lbs.
	<u>Astron RS-20</u>	<u>25 lbs.</u>
	TOTAL	43 lbs.
	TRANSPORT	Trunk of Car
QRP setup	QRP rig	2 lbs.
	Tuner	2 lbs.
	<u>Power supply/battery</u>	<u>3 lbs.</u>
	TOTAL	7 lbs.
	TRANSPORT	Small Briefcase



Power Requirements for a Day

To run for 24 hours - 10% xmit, 90% receive:

Conventional, compact HF rig (IC-706, Yaesu FT-890)

Receive - 2 amps...Xmit - 4 to 20 amps (avg. 10 amps)

TOTAL CONSUMPTION - 67.2 A-H (a car battery)

QRP-optimized rig

Receive - 100 milliamps...Xmit - 500 milliamps

TOTAL CONSUMPTION - 3.36 A-H (a 3-lb. gel cell)



QRP

Kitbuilding & Homebrewing

We are natural builders and experimenters

- * Complete radios have been built from old TVs
(Tubes are harder to kill than transistors)
- * Thousands of schematics are available



The Pixie Transceiver

Kits

Hundreds of kits are currently available

Single- and multi-band transceivers

Antenna tuners (automatic ones, too!)

SCAF audio filters, electronic keyers

Made for a wide range of abilities

“U-scrounge-em”

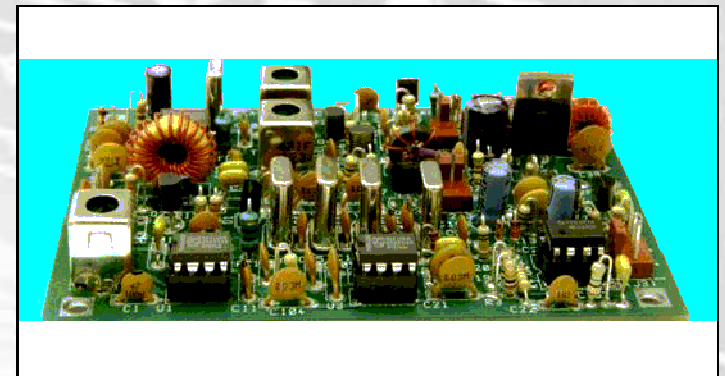
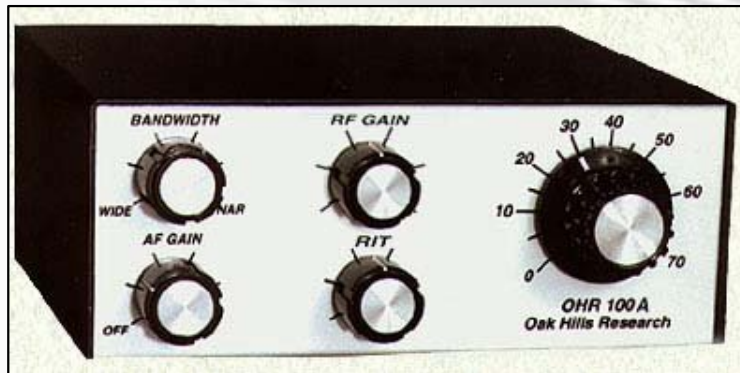
“Bag-o-parts and a board”

“Complete and fully documented”



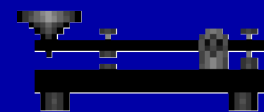
Wilderness NC40A

Kits



QRP

Kits



QRP

Antennas!!!

The most important part of ANY station

A radio hooked to a dummy load will hear nothing

Good coax

Good antenna tuner (with non-resonant antennas)

Well-built antennas

Beams work wonders, as do full-size loops

Dipoles and verticals work OK, too

*A poor antenna system hurts your
receiver AND transmitter*



Taking to the Field

Mountaintop operation adds to a radio's performance!

Complete station:

Single-band/multi-band rigs

Dipole cut to proper length, with coax & cord

Straight key or iambic paddles w/electronic keyer

Small battery

Pen & paper for logging

Nice campsite with tall trees

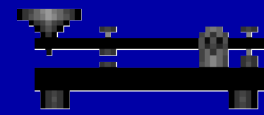


Taking to the Field



QRP

Can you spot the ham in this picture?



QRP

NØLX working the world from 13,800 ft. in Colorado



QRP

NØLX Bicycle Mobile...

...using his FT-817



QRP



QRP DXing

There are two rules for QRP DXing:

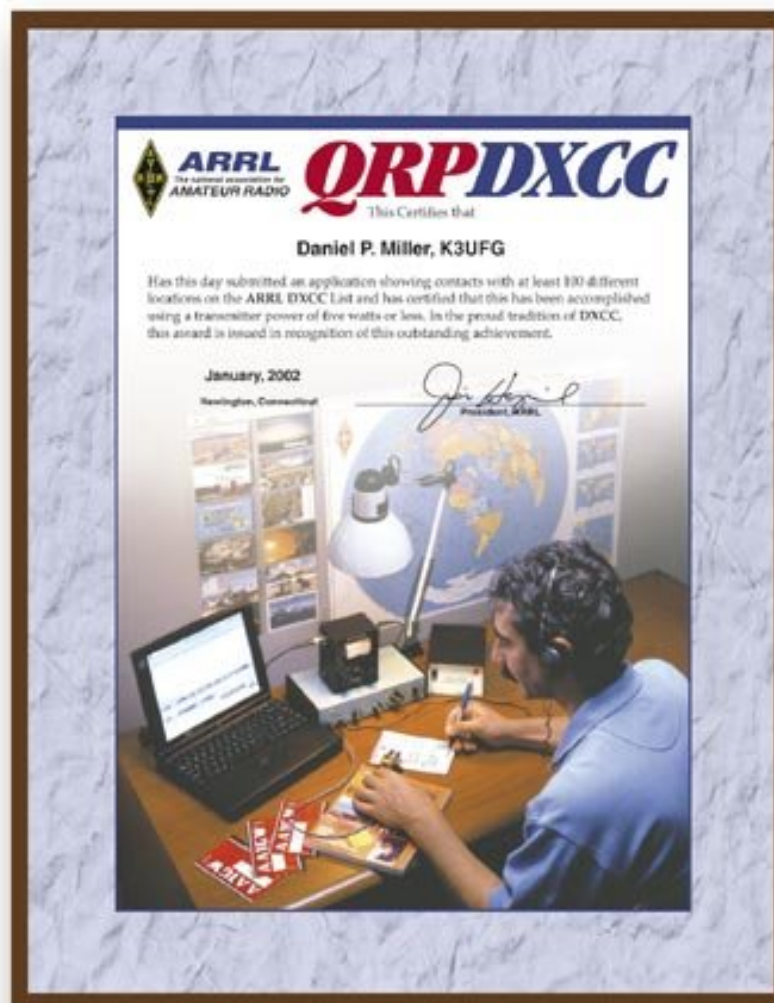
- 1) Listen, listen, listen**
- 2) When in doubt, see rule #1**

Put your signal where and when the others ain't

Let others QRM each other, and pick your spot

Try to get in BEFORE the pileup starts! (see rule #1, above)

QRP DXing



QRP



QRP Contesting

Great way to pick up QSOs, countries, states, continents

Good operators with good ears

Equipment & antennae are optimized

Lots of QRP-only contests

Sponsored by clubs

Many QRP categories in larger contests

You DO have a chance!

QRP

QRP Contesting



QRP

QRP Contesting



QRP

A Favorite Thing to Hear...

“HOW much power are you running?”

“5 watts?”

“Really?”

“No way.”

“Way.”



QRP

QRP Contesting



QRP



VHF QRP? Yes!

5 watts into a 20-element Yagi can do VERY well
Much 1296, 2304, 3456, and higher equipment must be
homebrewed, and is already QRP

On 6 meters, 5w and a dipole is more than adequate
Sporadic-E season is upon us
Lots of people DO have beams
Use THEIR antennas to your advantage



QRP



Why QRP?

Because it's fun!

Because it's a challenge!

Because it's what 'ham radio' is all about!

Join the fun today!

Contact the Colorado QRP Club to learn more.

www.cqc.org

QRP

Colorado QRP Club

Uhhh... Dit

Uhhh... Dah

Uhh.....



QRP