

# QRP Operating

# Communicating using Minimum Power

# What is “QRP?”

**Five watts** RF output power (or less!)

- Turn down your present radio
- Special purpose “QRP” rig

# What is “QRP?”

## Telegraphy Q-signal

- “QRP” = To lower ones power
- “QRP?” = Can you lower your power?

# What is QRP Operating

QRP is ham radio shorthand for low power operating, using just a few watts of power to span the oceans. Like marathoners among the all runners, QRP enthusiasts emphasize skill and technique, to communicate with a minimum amount of power.

# FYI “QRP<sub>p</sub>?” is another low power mode

**One watt** RF output power (or less!)

- Milliwatting
- Transmit into a Dummy Load & connect antenna via attenuator

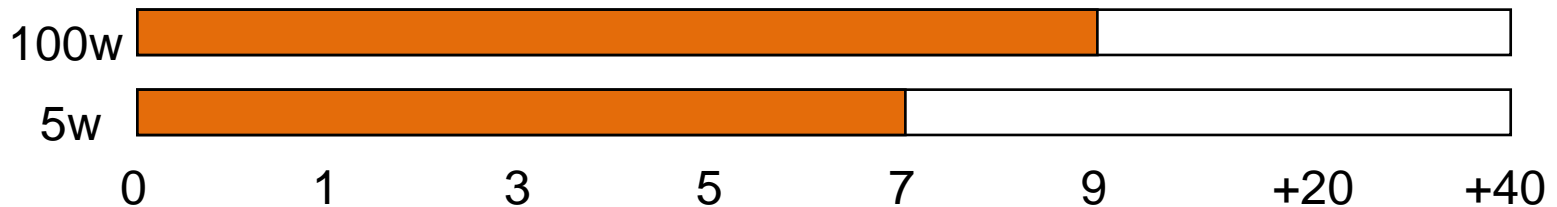
# Why QRP?

- Quality and simplicity of equipment
- Excellent way to improve skills
- Great for Backpacking
- Joys of kit-building
- It's fun!

# Don't think it will work for you!

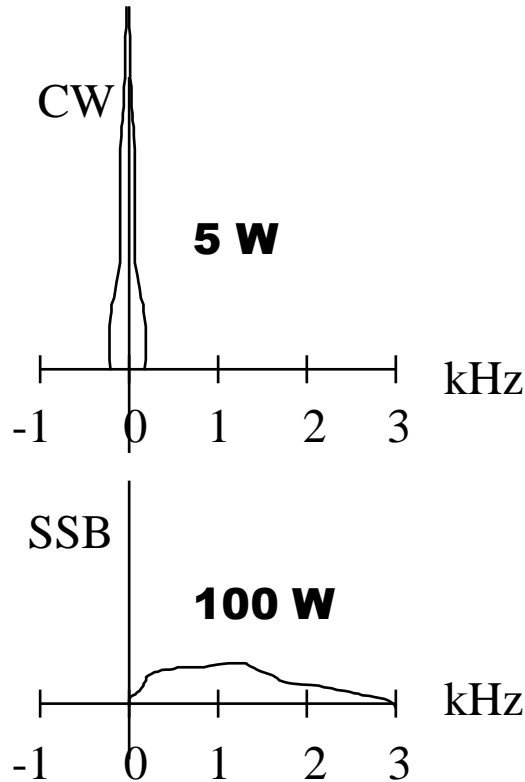
## Try this simple test on your transceiver

- Switch in a 10db db attenuator (on receive)
- Look at your signal strength meter
- If you can still hear the other station, the other station can hear you as a QRP station



(not exactly 100w vs. 5w = 13 db difference)

# 5W CW / PSK are better than 100W SSB



CW signal bandwidth = 100 Hz

PSK-31 signal bandwidth = 33 Hz

SSB bandwidth = 2000 Hz

Morse has much lower speed

Power Density

CW - 1 watt/Hz

PSK-31 - 3 watt/Hz

SSB - 0.05 watts/Hz

Gain Advantage of narrow modulations vs SSB

CW Gain = 13 db

PSK-31 Gain = 18 db



# What does all this signal stuff mean?

- Anyone can work QRP!
- It is just learning a new mode
- Cost is lower for QRP equipment
- Many options are available

# QRP DXing

There are simple rules for QRP DXing: Listen, listen, listen

Put your signal where the others are not operating

Let others QRM each other, and pick your spot

Try to get in BEFORE the pileup starts!

Be prepared and get the pattern before transmitting

# 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 are sponsored by clubs

# Taking to the Field

- Mountaintop operation adds to a radio's performance!
- Complete station:
  - QRP rig
  - Delta Loop, tested, with coax & fish pole
  - paddles w/electronic keyer or PSK decoder
  - LiPo battery
  - pen & paper for logging
  - Picnic lunch
  - nice campsite with tall trees



# Power Requirements for a weekend

Weekend (3 X 8 Hours) 24 Hours of operation is 95% receive

Modern HF rig (IC-718, Yaesu FT-450)

Rx - 2 amp & Tx - 5 to 20 amps (avg. 10 amps)

59 Amp-Hours for a weekend

You need a car battery (100 Amp-Hours) for a weekend

Modern QRP rig

Rx – 0.1 amp & Tx – 0.3 to 0.7 amps (avg. 1/2 amp)

3 Amp-Hours for a weekend

12 Oz RC Plane LiPo (5 Amp-Hours) for a weekend

# Size, Weight and Power

Typical 100 Watt Transceiver System	12 lbs.
Tuner	6 lbs.
25 Amp Power Supply	<u>25 lbs.</u>
<b>TOTAL</b>	<b>43 Pounds</b>

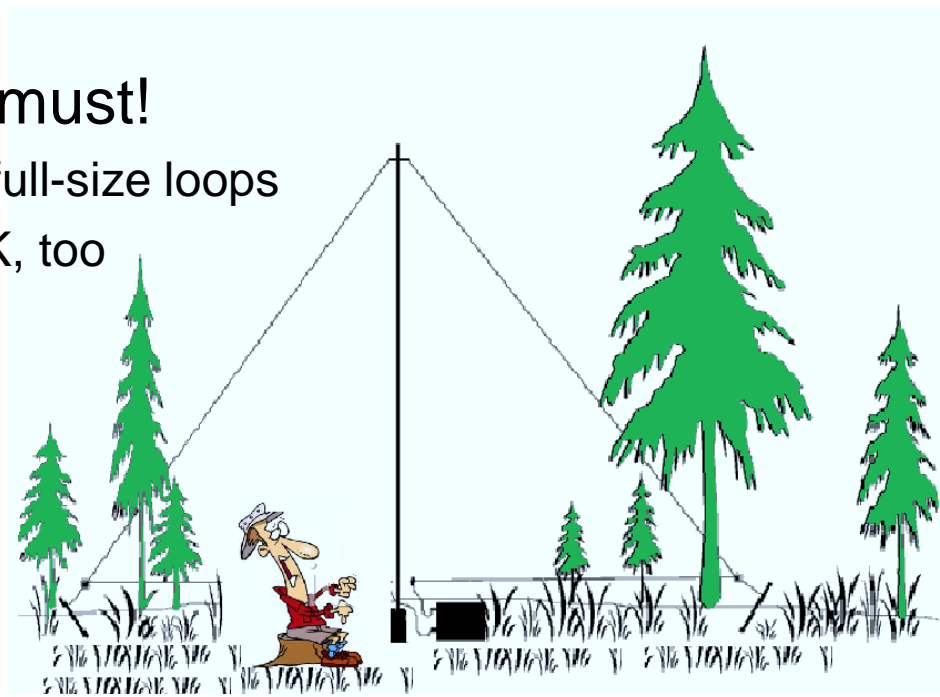
Typical QRP Transceiver System	< 2 lbs.
Tuner	< 1 lbs.
LiPo Cell	<u>&lt; 1 lbs.</u>
<b>TOTAL</b>	<b>4 Pounds</b>

# QRP “Optimization”

- Size & weight increase with maximum output power
- Minimize current draw
  - No lamps, use LEDs
  - LCD displays
  - Maximize Transmitter efficiency
- Use few components & pack the board tightly
- Sensitive RX - If you can't hear 'em, you can't work 'em

# Antennas

- The most important part of your station
- A radio hooked to a dummy load will hear nothing
  - Good coax
  - Leave the antenna tuner at home, use a resonant antenna
  - Efficient antennas are a must!
    - Beams work wonders, as do full-size loops
    - Dipoles and verticals work OK, too





# Ramsey Transmitter **Kit**

**40M, 30M, 20M**



**\$49**

# QRP-Cub CW Transceiver **Kit**

**40M**



**\$89**

# NorCal 40A Kit

40M



**\$179**

# Ramsey TxRx System **Kit**

**40M, 30M, 20M**



**\$149**

# MFJ-9200

40M



**\$229**

# HB 1b MK2 Kit

40-10M



**\$299**



# 4 Band QRP Go Pack **Kit**

## 40-10M



**\$399**

# FT-817

**HF, 6M, VHF, UHF**



[www.rigpix.com](http://www.rigpix.com)

**\$649**



# Flex-1500

160-6m



**\$629**

# Argonaut VI QRP 1-10 Watt

160-10M



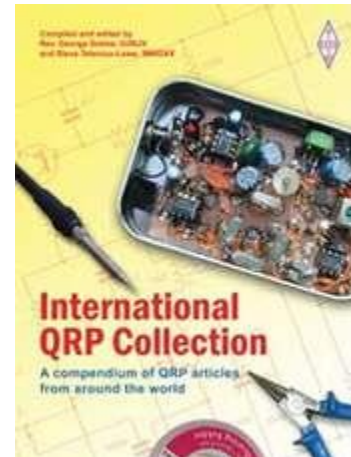
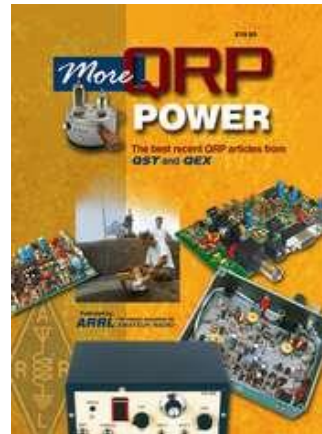
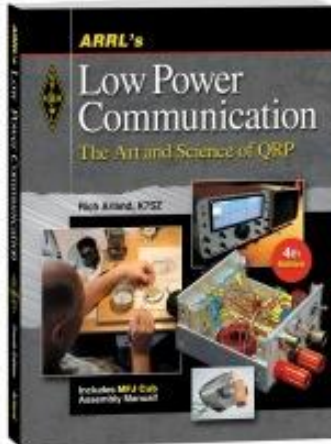
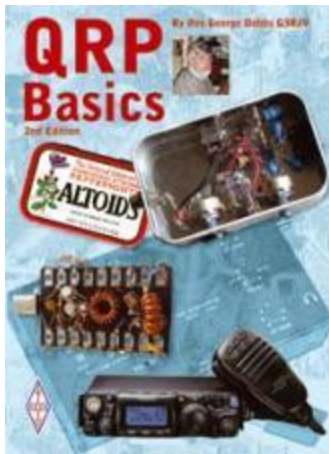
**\$999**

# What Does This Mean?

- Most (but not all) QRP QSOs are CW QSOs
  - CW is an powerful aid (hi hi)
- What about QRP Digital?
  - QRP PSK-31 has the same advantages as CW QRP
- Can I do QRP SSB?
  - QRP SSB requires better; planning, antennas, taking the time to listen

# QRP Books

- *QRP Basics 2nd Edition*
- *ARRL's Low Power Communication 4<sup>th</sup>*
- *More QRP Power*
- *International QRP Collection*
- *Low Power Spratbook*



## **Part 97, FCC Rules**

Run only the power necessary  
to maintain the desired  
communications