QRP
What, Why & How

Phil Salas - AD5X
ad5x@arrl.net
QRP: Decrease Power
- Or, QRP?: Shall I decrease power?

Originally used to give some relief from the broad spark signals in the early maritime wireless service.

In Amateur Radio, it refers to low power operation.
97.67(b)…Amateur stations shall use the minimum amount of transmitter power necessary to carry out the desired communication.

How often is this adhered to?
History of QRP

1960: K6JSS started the QRP Amateur Radio Club

Definitions:

- Low power: < 100 watts input (200 watts PEP)
- Medium power: 100-500 watts input
- High Power: > 500 watts input
Increase equipment and antenna efficiencies
- Careful impedance matching
- More efficient output coupling
- More effective antennas

Improve operating proficiency
- Bands vs time-of-day
- Frequency vs desired distance
- etc.
Many formerly high-power hams dropped below 100 watts (input power), to the 5- and 10-watt levels and found they could do surprisingly well.

In 1979, the QRP ARCI defined the QRP limit as 5 watts output power (after a big internal battle).
QRP Levels

◆ 5 watts CW output
◆ 10 watts PEP SSB output
◆ $\text{QRP}_P$: Milliwatters
  ● Less than one watt output power
QRP Motivation

◆ Challenge of low power contacts
  ● 5 watts is 13 dB below 100 watts (two S-units)
  ● 5 watts is 23 dB below 1000 watts (four S-units)

◆ No interference to TV, stereo, intercom, telephone, etc.

◆ Simplicity of home-brew QRP equipment
  ● Learn to apply electronic theory
  ● Build low power emergency/portable equipment

◆ Low cost way to get on the air and get that code speed up!
“Make an effort to avoid technical complacency. Don’t rely on commercial equipment when assembling your amateur station. Experience the thrill of building transmitters and receivers, and gain valuable experience in the process. Half of the fun associated with our grand pastime is based on communicating with equipment we have built.”
QRP Rules for Success

◆ Call strong stations
  ● If a weak station is QRO, he may not hear you.

◆ It is better to answer a CQ
  ● Choose a very clear frequency when calling CQ
  ● Call CQ properly

◆ Use an effective antenna
  ● Only a masochist uses a poor antenna with QRP

◆ Be prepared to listen a lot
QRP Rules for Success (cont.)

◆ Use the QRP calling frequencies
  ● Two watts on 20 meters is more effective than two watts on 40 meters

◆ Upgrade

◆ Believe it can be done!
<table>
<thead>
<tr>
<th><strong>CW</strong></th>
<th><strong>SSB</strong></th>
<th><strong>Novice</strong></th>
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<tr>
<td>1810</td>
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<tr>
<td>50060</td>
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</table>
Check out 30 meters!

**30 Meters is a GREAT QRP Band**

- Activity is friendly with little QRM
- DX is very good
- Maximum output power permitted is 250 watts
- Only CW and digital modes are permitted
- Basic antennas are the rule
  - Dipoles
  - Verticals
How far can you go?

- You can work the world on 5 watts.
- Can consistently work Europe, Japan, & Australia on 30 and 20 meter CW.
- At the sunspot peak, you can do the same on 10 meter SSB with only 5-10 watts PEP.
**Worldwide Beacon System**

Northern California DX Foundation, Inc. on 14.100 Mhz.

<table>
<thead>
<tr>
<th>Minute #</th>
<th>Callsign</th>
<th>Location</th>
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<tbody>
<tr>
<td>00</td>
<td>4U1UN/B</td>
<td>NY City (UN bldg)</td>
</tr>
<tr>
<td>01</td>
<td>W6WX/B</td>
<td>Palo Alto, CA (Stanford)</td>
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<tr>
<td>02</td>
<td>KH6O/B</td>
<td>Oahu, HI</td>
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<tr>
<td>03</td>
<td>JA2IGY</td>
<td>Ise City, Japan</td>
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<td>04</td>
<td>4X6TU/B</td>
<td>Tel Aviv, Israel</td>
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<td>05</td>
<td>OH2B</td>
<td>Espoo, Finland</td>
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<td>CT3B</td>
<td>Funchal, Madeira Island</td>
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<td>07</td>
<td>ZS6DN/B</td>
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<td>08</td>
<td>LU4AA</td>
<td>Buenos Aires, Argentina</td>
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<td>09</td>
<td></td>
<td>No Transmission</td>
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</table>
W6WX in Palo Alto, CA also transmits on:
- 21.150 Mhz on minute 2
- 28.200 Mhz on minute 3

Beacon Sequence
- QST QST DE Callsign @ 100 watts
- --------------- (long dah @ 100 watts)
- ..------------- (2 dits, long dah @ 10 watts)
- …------------ (3 dits, long dah @ 1 watt)
- ….----------- (4 dits, long dah @ 0.10 watt)
- SK DE Callsign @ 100 watts
G-QRP Club (SPRAT)
- http://www.gqrp.com

NORCAL QRP Club (QRPp)
- www.norcalqrp.org

QRP ARCI (QRP Quarterly)
- www.qrparci.org

American QRP Club
- www.amqrp.org

And many others…
What kind of equipment?

- Normal 100 watt rigs turned down to QRP levels
- New QRP Rigs
  - SGC-2020
  - MFJ-9xxx
  - FT-817
  - IC-703
  - Argonaut V
- Kits
  - Ten-Tec
  - Wilderness Radio
  - Small Wonders Labs
Older used rigs
- Heath HW7/8/9
- Ten-Tec Argonaut 505/509/515
- Yaesu FT-7
- Kenwood TS-120V & TS-130V
- Index Labs QRP+
◆ Homebrew
  ● ARRL books
  ● QRPp, SPRAT, QRP Quarterly
  ● QST, CQ, 73, Communications Quarterly

◆ Printed Circuit Boards for most articles:
  ● FAR Circuits, 18N640 Field Ct., Dundee, IL 60118
  ● www.cl.ais.net/farcir
Conclusion

- QRP challenge: Use the least power necessary to establish and maintain communications.
- QRP reduces QRM, and re-introduces an element of adventure & challenge that was part of amateur radio’s earliest days.
- QRP gear is compact and portable.
- QRP gear is great for the experimenter & homebrewer.
What can you do with QRP?

- Anything you have the skill, tenacity and patience to do!!

Just remember:

- “Power is no substitute for skill” (QRP ARCI)
- “Use wits, not watts” (unknown)
- “It is vain to do with more, what can be done with less” (William of Occam, 1290-1350)
Finally

◆ 72 OM
  ● “Wishing you good QRP”
  ● Adopted by all QRP organizations