

QRP What, Why & How

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- ◆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.



FCC Power Requirements

◆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



QRP Objective

- 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.



Down Down Down ...

- 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
- ◆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!



W1FB's QRP Notebook

• "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."

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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!



QRP Calling Frequencies

<u>CW</u>	<u>SSB</u>	Novice
1810	-	_
3560	3985	3710
7040	7285	7110
10106	-	-
10123	-	-
14060	14285	-
21060	21385	21110
24900	24950	-
28060	28360	28110
50060	50885	-

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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.

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Worldwide Beacon System

Northern California DX Foundation, Inc. on 14.100 Mhz.

Minute #	<u>Callsign</u>	Location	
00	4U1UN/B	NY City (UN bldg)	
01	W6WX/B	Palo Alto, CA (Stanford)	
02	KH6O/B	Oahu, HI	
03	JA2IGY	Ise City, Japan	
04	4X6TU/B	Tel Aviv, Israel	
05	OH2B	Espoo, Finland	
06	CT3B	Funchal, Madeira Island	
07	ZS6DN/B	Pretoria, South Africa	
08	LU4AA	Buenos Aires, Argentina	
09	09 No Transmission		

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Worldwide Beacon System (cont.)

- 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



QRP Organizations

- ◆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



Equipment (Cont.)

◆Older used rigs

- Heath HW7/8/9
- Ten-Tec Argonaut 505/509/515
- Yaesu FT-7
- Kenwood TS-120V & TS-130V
- Index Labs QRP+



Equipment (Cont.)

- **♦**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)

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♦72 OM

- "Wishing you good QRP"
- Adopted by all QRP organizations

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