



THE WORLD OF QRP

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A newcomer to amateur radio glancing through most magazines concerned with the hobby could be excused for thinking that to get on the air it was necessary to have very sophisticated, high-powered and expensive equipment.

This is not the case and there is a world-wide movement within amateur radio dedicated to using inexpensive, sometimes very simple and often home-built, low-powered equipment. This is the world of QRP—a world of challenge, where patience is a necessity rather than a virtue!

What is QRP?

The code QRP is used by radio amateurs to refer to low power operation. This has been adapted from the International Q code, where QRP? means "Shall I reduce power?" and QRP means "Reduce power".

The G-QRP Club in this country defines QRP as low power radio communication using five watts input or less. The QRP Amateur Radio Club International, in the USA, defines it as five watts output although for many years they called 100 watts QRP and 5 watts was QRPP, extra low power! The important thing is that the power levels are lower than those normally used, thus providing a challenge to try harder, and to use your equipment more skilfully, than other operators.

Many QRP stations operate with c.w. (Morse code) because, in a situation where every aspect has to be optimised to be successful, c.w. is the most effective mode of communication in the crowded h.f. bands. Telephony has its place however and there are QRP stations who operate almost exclusively on the microphone.

Construction

The sophistication of modern amateur radio tends to give the impression that home construction must be a thing of the past for all but the most talented, and much of

what is made today is usually ancillary equipment rather than the actual transmitters or receivers.

This is where the keen QRPer scores. There are many circuits and designs available for rigs capable of putting out a few watts of c.w. These circuits are not too difficult to make, don't make too much of a hole in the pocket, and give enormous satisfaction when they result in amateur contacts tens, hundreds or thousands of miles away. Of course all the ancillary equipment can be home-made as well. It is not necessary to use the heavy duty components specified for use with higher powers. There is plenty of scope for experiment, and circuitry can often be simplified.

G-QRP Club

The G-QRP Club is the largest QRP club in the world, although it was started in 1973 almost by accident. The Rev. George Dobbs G3RJV found he was working a number of other QRPer on 3.5MHz (40m). Whilst in contact with G2NJ he hit on the idea of bringing together the QRPer in the UK to exchange circuit ideas etc. He publicised the idea, about 30 people replied, and the club just grew from there. Membership is now world-wide and, at the time of writing, stands at over 1300.

The title for the club's journal—*SPRAT* (Small Powered Radio Amateur Transmission) was suggested as a joke but the name stuck. It is now a quarterly publication containing many circuits, technical hints and ideas for QRP projects, together with club news, award and contest information and other items of interest to QRP operators.

The club has a data sheet service, Morse training tapes, and awards scheme which culminates in a QRP Master's award, and a QSL bureau. A new venture, published in 1982, was a Circuit Handbook, which is literally "the best of *SPRAT*" and which is essential reading for all QRP enthusiasts.

On all amateur bands there are internationally known QRP frequencies and the club has regular activity periods each week, together with special activity weekends several

times a year, centred round these frequencies. A particularly successful event is the QRP Winter Sports which is held in the week after Christmas and which results in some fine contacts over quite remarkable distances. The high spot of the 1981 event was the performance of the Japanese station JA6VZB using five watts, who worked six European QRP stations in England, Scotland, Italy, Czechoslovakia, Sweden and Holland.

There were plenty of transatlantic contacts with both Canada and the USA. One station, member WB2RZU, in Long Island, worked GM3OXX in Edinburgh using only 500 milliwatts.

The club was particularly honoured to be asked by the Radio Society of Great Britain to provide the transmitting station for the RSGB h.f. Convention held near Oxford in June 1982. The main station was a Ten-Tec Argonaut 515, with five watts input, but home-constructed equipment was also used. The club mounted an exhibition of equipment made by members and there was considerable interest in the station and the exhibition throughout the convention.

World QRP Federation

A fairly recent development in QRP affairs has been the formation of the World QRP Federation, which was formed on the initiative of the G-QRP Club in September 1980 on the suggestion of Gus Taylor G8PG, Communications Manager of the club.

WQF has member organisations in all continents and in the short period it has been in existence it has revolutionised the world QRP scene. Regular contact has been maintained between all members so that major activities are publicised on a world-wide basis. Inter-continental two-way QRP communication is becoming more and more commonplace. Smaller and newer organisations are able to draw on the support and experience of the larger groups during their formative period and it is possible to get world agreement on matters of common interest, including the definition of QRP power levels, QRP frequencies for international working, and so on.

There is a considerable exchange of technical information and now there are international project years in the QRP field. The project for 1982 was for all member organisations to increase membership by at least 10 per cent and it looks as if that was more than achieved. This year's project will probably be a drive to increase the amount of home-construction and experimentation amongst QRP operators.

WQF is a remarkable achievement, demonstrating how groups of radio amateurs world-wide can work together in a common interest. In the process they are breaking down barriers and fostering international understanding and friendship. As Gus Taylor, now WQF Secretary, says,

Table 1

World QRP Federation Members

Club Name	Country
ARI QRP Club	Italy
DL AGCW	West Germany
EA8 QRP DX Club	Canary Islands
G-QRP Club	United Kingdom
Grupo QRP Do Brasil	South America
Michigan QRP Club	USA
JARL QRP Club	Japan
QRP ARCI	USA
VK QRP CW Club	Australia
Benelux QRP Club	Netherlands & Belgium
QRP Klub YU3EOP	Yugoslavia

"this alone would be enough to justify the existence of WQF".

Operating Pleasure

It would be misleading to suggest that QRP operating consistently results in long distance contacts. That is not its objective. QRP is always a challenge, whether the other station is near or far. Conditions are rarely ideal, although sometimes the signal report received from the other station is quite surprising, and the satisfactory completion of a contact is always a pleasure. There is usually something interesting about a QRP transmission to a higher-powered station, that adds to the QSO, but the best of all is when the other station is also QRP. There is an immediate common bond, and a willingness to be patient and to persevere when other stations would give up in difficult conditions. This leads to a need to develop good operating skills and the ability to get the best from the transmitter, receiver and antenna system. The friendliness, courtesy, high operating standards, the difficulties to be overcome, the triumphs and the disappointments all bring back something from the earlier days of amateur radio, and for many this is the attraction of QRP.

Although many QRP contacts are made through c.w. there are stations who use telephony as well. There are, perhaps, not so many home constructed transmitters for this mode, but there are available commercially several transceivers designed specifically for low-power working, or having the facility to reduce power to QRP levels. Eminent amongst the former is the Ten-Tec Argonaut, much beloved by its owners, and giving five watts input on both c.w. and s.s.b. from 3.5-30MHz.

The G-QRP Club has a s.s.b. net but probably the best example of what can be done here is to be found in the QRP sections of the various international contests each year, when some quite staggering scores are built up from contacts around the world.

Antennas

QRPers go to a lot of trouble to get an efficient transfer of power from the transmitter to the antenna. A beam would seem to be the obvious choice to ensure that all the transferred power went in the same direction. Yet, surprisingly, many QRP operators do not use beams at all, and the most popular antennas seem to be various arrangements of dipoles, ground-planes or long wires.

One operator who does use a beam, however, is Chris Page G4BUE, who spent many hours adjusting his four-element trap beam to get the best possible match on his favourite frequencies without the need for an s.w.r. bridge or a.t.u. in the feed line. He then dropped the input power of his Argonaut progressively from five watts to five milliwatts. At one watt he worked 51 countries, 500mW gave him 17, 150mW produced 7 and with 5mW he crossed the Atlantic on two occasions. Amongst all these were countries like Haiti, Iceland, Mauritania, Iran and Zimbabwe, which many operators rarely work with higher power!



The Argonaut 515 QRP transceiver

During a contest in May 1981 Chris lowered the power of his rig even further. He obtained four transatlantic reports on 21MHz with an output power of less than 1mW, and two of these were at 200 microwatts!

He obviously spent a great deal of time and trouble on these experiments but it is a remarkable demonstration of what can be done with extremely low power.

Looking Back

There is nothing new about QRP. The RSGB's *T and R Bulletin* reported on a "One Watt" competition in 1931 which showed that communication could be maintained over 800-1000 kilometres on the 7MHz (40m) band with reasonable consistency. The winner of the contest, incidentally, was G2OL of Ealing with a score of 165 points.

In June 1925 *QST*, journal of the American Radio Relay League, reported a number of low power contacts using powers ranging from 1.95W to 3mW. The star of the report was Edwin Miller 8KW, who, in 14 days worked 29 stations at distances between 483 and 1770km using an input of between 1.7W and 200mW with a one-valve transmitter. A particularly interesting transmission was that between G5SI in Shrewsbury and IPL in the USA, a distance of 5311km using 1.95 watts input. The report commented, "the beauty of this work is not only the results, if any, are spectacular, but that the apparatus required is inexpensive, easy to assemble and adjust". The message is exactly the same today!

Table 2
G-QRP Weekly Activity Periods

Sunday	1100-1230GMT 1400-1530GMT	on all c.w. calling frequencies
Wednesday	2000 local time	3-560MHz

Table 3
International QRP Calling Frequencies

Band	c.w. MHz	s.s.b. MHz
3.5MHz (80m)	3.560	3.690
7MHz (40m)	7.030	7.090
14MHz (20m)	14.060	14.285
21MHz (15m)	21.060	21.285
28MHz (10m)	28.060	28.885

Reduce Your Power

QRP is worth a try, and there's no need to go for five watts straightaway. If you can reduce the power of your rig to, say, 20 watts, you will be quite surprised at what you can do. After that, keep reducing the power until you become a true QRPer! No more TVI, and, if a lot of other stations did the same, think how much quieter the bands would be!

The challenge is there. The sense of achievement has to be experienced to be believed. It need not be so demanding technically as some other aspects of amateur radio but it is just as satisfying, challenging and absorbing as any of them. Above all, it's fun!

Whether you are an experienced operator or a newcomer to the hobby, why not give it a try?

Information

Information about the G-QRP Club from Rev. G. Dobbs G3RJV, 17 Aspen Drive, Chelmsley Wood, Birmingham, B37 7QX. Please send a large s.a.e. ●