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the

Milliwatt:



NATIONAL JOURNAL OF

QRPP

DEVOTED EXCLUSIVELY TO UNDER FIVE-WATT  amateur radio

VOL 1 #2

APRIL 1970



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SUBSCRIPTIONS: \$2.00 PER YEAR (SIX ISSUES); NEWSSTAND PRICE 40¢.

ARTICLES UP TO 2800 WORDS INVITED. TRANSLATE YOUR QRPP SAVED INTO BENEFIT FOR OTHER OPERATORS BY WRITING IT UP. ANY TOPIC OF INTEREST TO QRPP'RS IS ACCEPTABLE, RANGING FROM OPERATING PROCEDURES, TECHNICAL THEORY AND APPLICATION, PROPAGATION, ANALYSIS OF OPERATING DATA, TO POINTING OUT DIFFICULTIES OF INTEREST TO QRPP.

CONSTRUCTION PROJECTS RELATED TO QRPP ARE INVITED. THESE CAN INCLUDE TUBE AND TRANSISTOR RIGS, ANTENNA TUNERS AND FEEDERS, DUMMY LOADS, ATTENUATORS, VFO'S, MATCHING CIRCUITS, AND OTHER PRACTICAL APPLICATIONS OF THEORY.

ARTICLES AND CONSTRUCTION PROJECTS SHOULD BE SENT TO ADE WEISS K8EEG/Ø, MECKLING, SD 57044

OPERATING NEWS OF EVERY SORT IS WELCOME, INCLUDING LOG REPORTS, ACCOUNTS OF YOUR SET-UP AND EXPERIENCE AS A QRPP'ER, OBSERVATIONS ON YOUR OPERATING HABITS, WAS QRPP STANDING. WRITE US A NICE LETTER SOMETIME AND LET OTHER QRPP'S KNOW WHAT YOU'VE BEEN DOING. SEND TO YOUR AREA EDITOR. FOR THE EAST, TO WES MATTOX K6EIL/2, 115 PARK AVE., BINGHAMTON, NY 13903; MIDWEST (W4, W6, W9, WØ) TO MIKE CZUHAJEWSKI W8BMCQ, ROUTE 3, PAW PAW, MICH 49079; WEST (W5, W6, W7) TO ADE WEISS K8EEG/Ø, MECKLING, SD 57044.

SUBSCRIPTIONS TO MIKE CZUHAJEWSKI W8BMCQ, RT. 3, PAW PAW, MICH 49079.

PASS THE WORD ABOUT THE NEW QRPP MAGAZINE
CONTRIBUTE INFORMATION ABOUT YOUR QRPP ACTIVITIES AND RIGS

QRPP WAS STANDINGS

50 W4UM (3w)	39 K8EEG/Ø (900mw)	23 W7A7HQE (400mw/4w)
47 W8BMCQ (800mw)	27 W9PNE (540mw)	22 K6EIL/2 (125mw/3w)
47 W911L (3-5w)	25 K4DCD (2w)	17 W4EZW (144mw)
49 W2BIV (2-7w)	23 W7PUL (400mw/4w)	13 W8BAEX (1w)
	11 WØRHI (180mw, 160 METERS)	

BEFORE YOU SHELF THIS ISSUE OF THE MILLIWATT, PLEASE DROP US A LINE ABOUT THE NUMBER OF STATES YOU HAVE WORKED WITH QRPP, AND NOTE THE AMOUNT OF POWER THAT YOU HAVE USED. A QSL CARD WILL DO, UNLESS YOU WANT TO TELL US MORE ABOUT YOURSELF AND YOUR QRPP ACTIVITIES. JOIN THE MOVEMENT!! QRPP IS THE 'IN-THING'.

RE TEN-TEC PI-3/PI-3A (WITH BUILT IN KEYING SYSTEM): THE PI-3 IS A SECOND GENERATION DESIGN, AND INCORPORATES A PI-NET OUTPUT CIRCUIT. THIS SHOULD GAURANTEE TVI-LESS OPERATION. WE INVITE AN OWNER OF A PI-3 TO REVIEW IT FOR US.

THE TEN-TEC LINE OF GEAR IS HANDLED BY AN AVID QRPP'ER, STAN BURGHARDT, WØIT, OF BURGHARDT SUPPLY, INC., P.O. BOX 73, WATERTOWN, SD 57201. STAN WILL BE GLAD TO ANSWER ANY QNERIES ABOUT TEN-TEC, AND CAN SUPPLY THIS LINE OF EQUIPMENT. YOU ARE INVITED TO WRITE HIM.

FOR SALE: MIKE CZUHAJEWSKI W8BMCQ HAS SOME CRYSTALS FOR 7290 KC IN CR1A/AR HOLDERS FOR SALE. COST 50¢ EACH.

THE MILLIWATT: NATIONAL JOURNAL OF QRPP

. . . devoted to under-five watt amateur radio

April 1970

Vol. I, #2

Editorial Lucubrations . . .

The first issue of The Milliwatt has been received with an enthusiasm which, I feel, has justified the great amount of work which went into its production. It should be borne in mind, however, that it still falls short of its goal: except for its small size and limited appeal, The Milliwatt is intended to be on par in quality with the other ham magazines, both in appearance and content. With the addition of a professional type compositor and high-grade paper in the near future, The Milliwatt will compare favorably in appearance. In regard to content, there is a problem that faces us: size limitations. It was originally intended to hold the line at 20 pages with a corresponding limit of 1400 words on articles; we will, however, extend these limits to 30 pages and 2800 words per article in recognition of the fact that certain topics require lengthier treatment. Further, we will split a lengthy article into two parts to be published in subsequent issues if circumstances warrant it. For example, one of the feature articles in this issue, 'Hunting for Losses,' is very compressed and touches the surface of a very important area of consideration for the QRPP operator; it could easily be expanded to twice its length in a discussion of the important questions with which it deals. In short, space limitation will not be allowed to interfere with significant contributions to the subject of QRPP amateur radio.

What sort of topic is relevant to the purpose of The Milliwatt? Actually, any topic, either technical or practical, that deals with the generation and transmission of rf signals. You may object: but the same principles hold for both KW and QRPP operation; and we agree. But there is a whopping difference between the significance of a given principle in KW and MW operation. The KW can afford a loss of 15, 20, or even 50 db and still be an S-9 signal; the MW, if it loses even 3 db, can be a washout! Hence, the fact that old, worn-out coax exhibits a loss of 1.7-3.4 db per 100 feet doesn't really affect a KW; but it is a crucial fact in regard to a signal that cannot afford even a 1.7db loss! It is extremely important, therefore, that we QRPP'rs become aware of the existence of such facts, and that we

discover practical solutions. Those of you who are seasoned QRPP operators have probably considered many areas in which loss occurs, and probably have arrived at some solution. Those of you who are new probably will wonder whether a particular part of your set-up is the culprit. Both of you are potential article writers! Remember, articles serve at least two functions: an article may raise questions, or it can answer questions. In short, what are the problems, and what can we say about solutions? WØBE's title sort of sounds a very important battle-cry for QRPP's: 'Hunting for losses;' indeed, hunt for losses, find them, and eliminate them!

The QRPP boom. . .

There has been a marked increase of interest in QRPP in the past year that has been occasioned by many factors, including the development of new r.f. transistors, and the entrance of commercial concerns such as Ten-Tec into the QRPP field. Although only available for some five months, the Ten-Tec rigs are met on the ham bands with increasing frequency, and despite the price tag, the Ten-Tec rig has attracted many hams who do not like to build transistor gear into the folds of QRPP operation. It is exciting to think that in a few years nearly every other signal will be QRPP, that beside the KW will be a QRPP rig in nearly every ham shack, that two-way QRPP QSO's will be the rule rather than the exception! Very exciting indeed! I think that The Milliwatt thus comes at a very opportune moment, and can serve this growing segment of hams as their forum for the exchange of ideas, experiences, and suggestions. It is essential that everyone interested in QRPP hear about The Milliwatt, so, pass the word around about our new QRPP magazine--that's the best kind of advertising we can get.

--K8EEG/Ø

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QRPP Operation in a Rowboat

In the last issue (p. 17), we mentioned the rumour about W7IGV's rowboat QRPP. Here is Bob's account of this unusual mode of operation.

I first became interested in QRPP operation because of the advantages it offers for portable hamming. My first QRPP rig consisted of a regenerative receiver along with a transistor transmitter that featured parallel transistors in the power amplifier. It ran about one watt input with 8 D-cells carried in a lantern case. This rig had worked just about everywhere I'd tried it, and I thought that

operating it from a rowboat out in the lake would prove interesting because of the fact that the water should help wave propagation. My set-up was as follows.

The rig was loaded into the rowboat. I used headphones and a mini-knife switch with sponge rubber as a key return spring for the key. I combed the beach and found a 10 foot driftwood pole and stuck it in the boat after first lashing my antenna system to it. My antenna consisted of a loading coil wound on the wooden roller of an old window shade. The wooden roller was hollow, which facilitated sticking the aluminum antenna element into it. At one point, I considered using the spring inside the roller as the loading coil. but that proved impractical! So, with the loading coil and a short whip inserted into the roller, all I needed was a handy length of lampcord for a leadwire to my transmitter output tank, which was designed for voltage feed. The coil whip leadwire combination was adjusted to make the antenna system an electrical half-wave length so that it was easily matched to the transmitter tank with minimum detuning. I didn't think that I'd need a ground, but that lake probably would have made a dandy ground!

At about 8 in the morning, I took to the water, and while still close to the shore, I contacted Seattle, a distance of about 300 miles. According to the book, results would be better from farther out in the lake, so I kept on rowing. However, my signal did not improve when I reached the middle of the mile-wide lake. At this point, I became kind of leary. I knew that my neighbor was watching me through his field glasses to see whether I needed help.

At about 9 a.m., California did hear me, but my signal was rather weak. At one transmission, the California group gave me a low signal report, and I discovered that I had left my dummy antenna lamp in the circuit, since it didn't light up bright enough to see.

One of my biggest problems was that whenever the sun came out from behind the clouds, the heat caused the sensitive regenerative receiver to drift immediately. I had to constantly retune. So, what with retuning and rowing the boat, I was kept pretty busy. Evenso, the experiment was a success. But if I tried it again, I'd do it after dark!

Bob Darham W7IGV

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The Ten-Tec PM-1 Solid State Transceiver

The Ten-Tec transceiver has met with instant success among hams interested in QRPP. The following review will fill readers in on what it is and how it works.

My first introduction to Ten-Tec was during the summer of 1969. The president of Ten-Tec, Al Kahn, saw a note about the QRP ARC I Club in CQ with my name in it, and called me long-distance. He was interested in promoting his soon to be produced line of QRP gear, and wanted to hit the QRP Club which should prove fertile ground. I was immediately fascinated by his product. Originally he had four modules, a VFO, synchrodyne detector, audio amplifier, and a transmitter, all solid state and prewired. From this beginning, Ten-Tec has come to its present line, consisting of an 80-40 meter transceiver, a 40-20 meter transceiver, a keyer, QRP SWR-Power meter, QRP antenna coupler, the original four modules, and other accessories.

Mr. Kahn's original ads read "To Help the Beginner Start Right" or something similar. He had an inexpensive way to get started in ham radio. However, more than beginners bought Ten-Tec equipment. Many old-time hams also bought the gear, for it was perfect for portable and low power operation.

I finally broke down and purchased the four module set (MR-1, \$30.00). After building them into a chassis, I had a complete 80-40 meter station which could be crystal controlled, or used as a full transceiver. Power was supplied from a 12 volt d.c. source. The PM-1 (\$49.95) and PM-2 (\$54.95, including cabinet) consist of the same four modules built into a beautiful case complete with full switching, front panel controls, and slide-rule dial calibrated for 80-40-15 meters. The combination is rated at 2 watts input, and achieves high efficiency. The PM-3 (\$69.95) has a rated input of 5 watts, and is v.f.o. controlled on 40-20 meters; it is available with break-in keying (\$79.95).

The receiver section is similar in design to the Direct Conversion receivers described in April, 1969 QST. The signal from the v.f.o. module (80-40 meter) is fed into the detector module, which employs a dual-gate MOSFET. This signal is heterodyned against the incoming signal to provide a beat signal in the audio range. The audio signal is then fed into an integrated circuit audio amplifier with 100 db gain. Volume with headphones is more than adequate, and a small speaker could be added for use on stronger signals. Selectivity is rated at 2 kc, and the receiver is quite sensitive. In a word, it is 'fantastic.' It just has to be heard in order to be believed!

The transmitter is a two stage design with a 2N4427 in the final, running 2 watts input on 80-40 meters. It can be used (crystal controlled) on 20-15 meters if desired. On

30-40 meters, it can be either crystal controlled or controlled by the receiver's v.f.o.

The v.f.o. deserves special mention. It is an oscillator-buffer design, with a 2 volt output on 80-40 meters. Coverage of either band is accomplished with almost a full 180 degree rotation of the tuning capacitor. It is mechanically stable as well as electrically, and no drift is noticeable. Care must be taken when wiring the v.f.o. bandswitch, however, to insure that wires to the switch do not vibrate. This could cause the v.f.o. to be sensitive to someone walking across the floor if the wires are not stable.

Nothing is perfect, not even Collins gear. Ten-Tec is no exception. First, I found it necessary to put a large 500 mfd. capacitor across the battery terminals; otherwise the receiver would oscillate at about 1 kc. When wiring the v.f.o. bandswitch, I had to use RG-175 coax and secure the cable, as movement of the wires used earlier made the unit a bit unstable mechanically. But this is just common sense and applies to any v.f.o. I find that the transmitter gives me severe TVI. I have a very sensitive TVI situation here. Other hams have told me that they have no problem TVI-wise with Ten-Tec gear, so it depends upon your situation. Transistors are known to be big TVI generators, since they generate harmonics like crazy. And the Ten-Tec unit has a simple tank circuit which doesn't discriminate against harmonics. Such a tank was the best choice in the interests of low cost bandswitching and simplicity. If needed, you could use a TVI filter or install a pi-net in the output circuit. My unit draws rather high current on transmit, so I found it necessary to use a bigger heat sink than the one supplied to afford better protection for the 2N4427 final. You probably won't need it though.

Although nothing is perfect, the advantages of this rig far outweigh its bad points. It is a very nice unit, well worth the price! It is available from Ten-Tec Inc., Sevierville, TENN 37862, and they will be happy to send you a catalog and a users-comments sheet upon request.

Mike Czuhajewski WA8MCQ

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Hunting for Losses . . .

It is obvious that if a 100 watt rig is 30 db over S-9 on a reasonably calibrated meter, a 100 milliwatt signal will read S-9. So often we find that the low power

station is weaker than he should be in regard to this ratio, and we wonder whether the S-meters are wrong, or whether some magic threshold exists in the ionosphere. Actually, neither is the case. We are conditioned to the thoughtless use of "low-power" coaxial lines, "low-power" antenna tuners, small wire which would burn up at KW levels, and other lossy components, with low power rigs. The QRPP station won't arc across bad insulators, nor burn up bad connections, but the losses in the coax, the antenna tuner, the wiring, and the bad insulators or connections subtract just as many db. from a one watt signal as they would from the kilowatt signal (provided the kilowatt rig would tolerate them). For good signals with low power, use the largest coax that you can afford, use the KW-size tuner, and observe the same precautions in wiring and insulating as if you were going to run several KW.

If you don't own a high-power rig, borrow one sometime, or take your tuner over to a friend's QRO station to test it out. If anything overheats, arcs across insulation, or otherwise misbehaves at high power levels, correct it before you try serious QRPP operation. Stay away from "ten-watt" antenna tuners, wind your coils with #14 or larger wire, make good connections with a lot of solder--remember that power losses can not occur in pure inductors or capacitors, only in their resistances. If all the avoidable losses are eliminated--naturally some are unavoidable--the db. scale will work in your favor, and the extra efficiency which is available from transistor finals can be realized. A good many 100 watt rigs on the air are considerably less than 20 db. over a good 1 watt transistor rig, and watching the S-meter for a while convinces us that when conditions are good, 20 db. is not too important. When conditions are bad, however, a few db. might make a big difference, but these are the nights when the QRPP operator can read good books, build new equipment, or engage in philately, clock-collecting, or girl-chasing; an amateur is balanced!

Bob Schoening WØBE

* * * * *

The Decision

<p>Some QRPP'rs are more fanatic than others, even to the point of creating for themselves a Sartian no-exit dilemma which inevitably dooms them to experience a soul-destroying wave of existential nausea. For those of you with such inclinations, read on.</p>
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At this point, our hero stopped his seemingly futile attempts to check into the QRP Net. After thirty minutes of trying unsuccessfully to make contact with Mike and Ade, and remembering that it had been several weeks since he had spoken with them, he decided to open the closet door, take his DX-40 off the shelf and put it on the air. Yet he hesitated. He had, after all, vowed the vow of QRPP. He had sworn to himself and in view of all that is noble that never again would he run more than five watts. It's better, he often thought to himself, to run his two watts and not be heard on the Net than to run QRO and never be able to look at himself in the mirror.

He called again with his QRPP rig. No answer. Suddenly a fever swept over him, and he snatched the DX-40 out of the closet. Plugs were plugged in, switches were switched on, and a call went out. He was heard! But then our hero's wife entered the ham shack. She saw the red AC-ON light glowing on the face of the DX-40, she saw the rig itself and exclaimed, "What are you doing! Oh no!" And at this point our hero's conscience caught up with him. After several good-bys, he checked out of the Net, and dismantled the DX-40. He was so ashamed of himself that he nearly puked. His wife was so ashamed of him that she had doubts about giving him a year's subscription to 73 for Christmas. The DX-40 was returned to the closet. Our hero decided to sell it as soon as possible. Until then, and with his wife's help, he began to remove, one by one, the mirrors off the walls. . . .

Wes Mattox K6EIL/2

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QRP Amateur Radio Club Awards for QRPP

The QRP Amateur Radio Club International has two awards which are especially for the QRPP operator. These are the "Thousand Miles per Watt Award" and the "WAS-QRPP Award." The "1000 Miles per Watt," or "KM/W," is issued to anyone transmitting or receiving signals such that the distance between stations divided by the power of the signal in watts equals or exceeds 1000 miles per watt of input power. The award is issued for both different modes and different bands. (For example, one ham has the award for 20-10 meter c.w., and another for 20-10 meter SSB) Application should include full log data, including band and mode, QTH of both ends, power inputs on both ends and reports exchanged. A fee of \$1.00 (\$.75 to members of

the QRP ARC I) should accompany the application.

The "WAS-QRPP Award" is issued for working a minimum of 20 states while running 5 watts or less input power. Endorsements are issued for 30, 40, 45, and 50 states. Application should include the list of contacts, calls, states, bands, times, dates, and a voucher signed by two hams of the veracity of the claimed contacts. A fee of \$1.00 (\$.50 to members of QRP ARC I) should accompany application.

Applications are to be sent to Hugh Aeiker WA8CNN, 929 South Park, Charleston, WVA 25304.

Mike Czuhajewski WA8MCQ

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The Lazy Man's KM/W

Still trying for your 40 meter KM/W late at night or during the early hours of the morning? Take it easy. Get a good night's sleep, wait until the sun is high in the sky and then try. It sounds impossible, I know, but contacts made at K6EIL/2 over the past five months demonstrate that KM/W is possible of 40 meters even at high noon. The secret? Very little power is required for a one or two hop transmission distances during the daylight hours. What follows is a partial listing of 40 meter KM/W QSO's I have had.

NR	DATE	TIME	STATION	POWER	RST	DISTANCE	KM/W
1	1/31/70	1330Z	WB4LQV	125mW	549	225	1.800
2	2/12	1445Z	WB2ZTS	125mW	559	150	1.200
3	1/12	1530	WA3GKF	125mW	549	125	1.000
4	3/15/70	1730	WA2HZU	125mW	559	150	1.200
5	3/26	1900	W2BVR	125mW	539	125	1.000
6	4/4	2030	W4HVL	125mW	349	225	1.800
7	3/13	2230	WA2CRE	125mW	569	150	1.200
8	1/4	2315	WB2ADD	125mW	349	150	1.200
9	11/30	0015	WA4CAW	125mW	239	225	1.800
10	3/12	0030	K8ORD	125mW	569	375	3.000
11	10/25	0230	K8EEG/ø	1.01W	439	1075	1.060
12	11/2	0745	W9YT	400mW	339	675	1.680

(N.B. OCT. & NOV. DATES 1969; TIME IN GMT)

As you will note, nr. 11 and 12 were nighttime QSO's; nr. 9 and 10 took place shortly after sunset, and nr. 8 at dusk; but nr. 1-7 were daylight QSO's.

I initiated all the seven contacts with one to two watts input, then QRP'd to 125mW (25volts at 5 ma.) either immediately or sometime after a signal check at 400mW. The transmitter used has a pair of 3S4's link-coupled directly to a two-band dipole, whose 40 meter legs range from 25-35 feet above ground.

The data is reasonably consistent. First, excepting QSO's nr. 1 and 6, the transmission distances for the daytime QSO's equals approximately 150 miles. This 150 mile path, sec-

only, seems to be open from sunrise to sunset; for with increasing darkness, skip lengthens to 375 to 675 to 1075 miles.

The E and F₁ layers, ionized from sunrise to sunset, are of course responsible for the 150 mile circuit. The theoretical radiation angle of my relatively low dipole is about 80 degrees, an angle which, as trigonometry shows, will reach 150 miles after two bounces off the E-layer. I prefer to think, though, that one-hop, F₁ layer propagation is responsible because in seven months of operation from this QTH I have never contacted anyone less than 100 miles distant while using skip.

Whatever the case, the point is that the E and F₁ layers are not the energy-eaters and monsters that they are made out to be. Rather than hindering or preventing 40 mtr KM/W, the two ionization layers can help and in fact cause it. So, instead of losing sleep over KM/W, prune down your transmitter's input and get on 40 meters during the daytime. Readable copy, as the signal reports show, is quite possible at the 100 mw level and over distances greater than you might think.

---Wes Mattox K6EIL/2

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(N.B. K6EIL/2'S ARTICLE IS AN EXCELLENT EXAMPLE OF HOW TO GO ABOUT MAKING SENSE OUT OF YOUR LOG. WHY DOES IT EXHIBIT PARTICULAR PATTERNS, WHAT ARE THE PATTERNS, HOW DO YOU SUGGEST WE USE OUR KNOWLEDGE OF THEM?)

Some Operating Tips for the QRPP Ham. . .

(The following passage was inadvertently omitted from K6EIL/2's article:)

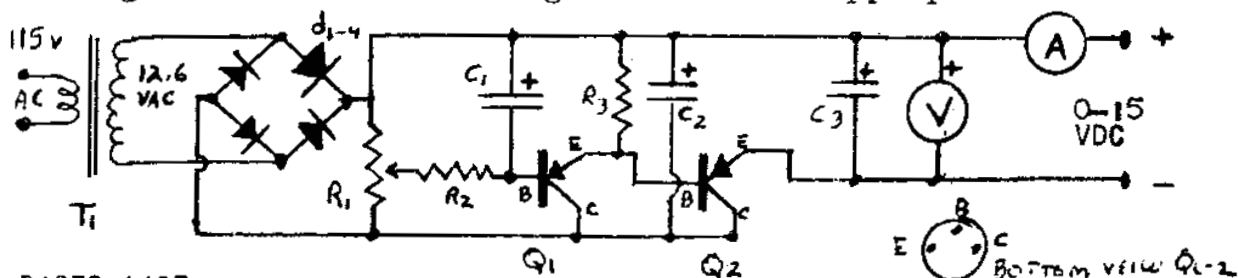
Answer a U.S. station's CQ DX: Don't hesitate, for you are DX, especially if your power is at the milliwatts level. I have never QSO'd a DX'er who begrudged answering me. Indeed, running a half-gallon or more themselves, they are excited by QRPP, and fellows have on occasion decreased power to about what I was running. DX'ers usually have excellent receivers and antennas, and are technically sophisticated. Finally, if you ragchew with a high-power DX station, his QRO will keep the frequency clear and possibly even attract other stations who might hear the QRPP and join in themselves.

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CONSTRUCTION PROJECTS

W8CM (ex-W8CHO) Regulated 0-15 VDC Power Supply.

Most of us power our first QRP transistor rig with a reliable old lantern battery which, after some time, wears down, necessitating either recharging or replacement at a cost of several dollars. This regulated variable DC supply will cost only as much as the first few batteries and will never wear out, in addition to providing calibrated method of increasing or decreasing input to the rig. The supply incorporates cheap and readily available parts into a worthwhile unit. Power from a standard 12 volt transformer delivering about 2 amperes is rectified through a full-wave bridge consisting of cheap silicon diodes with a 500 ma rating, a configuration which produces up to 1.4 input voltage. Electrolytic filter capacitor of relatively high capacitance provide stability, and are available as surplus from computer boards which abound on the market and are cheap. Voltage control is accomplished by means of a 400 ohm 2 watt potentiometer. 2 pnp transistors provide regulation. Both voltage and current are registered with appropriate meters.



PARTS LIST:

T₁-12.6 VAC FILAMENT TRANSFORMER, 2 AMP
 D₁₋₄-SILICON DIODE RECTIFIERS, 500 MA
 R₁-400 OHM 2 WATT POTENTIOMETER
 R₂-100 OHM 2 WATT RESISTOR
 R₃-1000 OHM 1 WATT RES.
 C₁-50MFD ELECTROLYTIC CAP.
 C₂-2000MFD ELECTROLYTIC
 C₃-100MFD ELECTROLYTIC
 Q₁-2N217 Q₂-2N242
 V-0-15 VOLT DC METER A-0-500 MA METER

Either point-to-point or circuit board wiring can be used. If a circuit board is used, be sure to make the copper strips at least 3/16" wide to avoid unnecessary resistance. It is a good idea to increase the current capacity of these strips by adding solder along the length of the strip. If you wish, a 2 amp fuse can be inserted in the primary lead to insure protection. Parts values are not very critical.

— W8CM C.A. 'Chuck' Koppe

NOTES: OVERHEARD RECENTLY ON 75M SSB. 'BOY, YOU GOT THE LOUDEST SIG FROM _____ THAT I'VE HEARD IN TEN YEARS. WHAT KIND OF ANT. YOU USING?' 'WELL, RTG RUNS 2KW PEP INTO A DIPOLE CUT FOR 3941 KC EXACTLY WITH AN SWR OF EXACTLY 1:1.' 'WOW, THAT ANTENNA SURE WORKS!' MORAL: LET US NEVER NEVER UNDERESTIMATE THE IMPORTANCE OF A GOOD ANTENNA SYSTEM!

A Grass-Roots QRPP Rig.

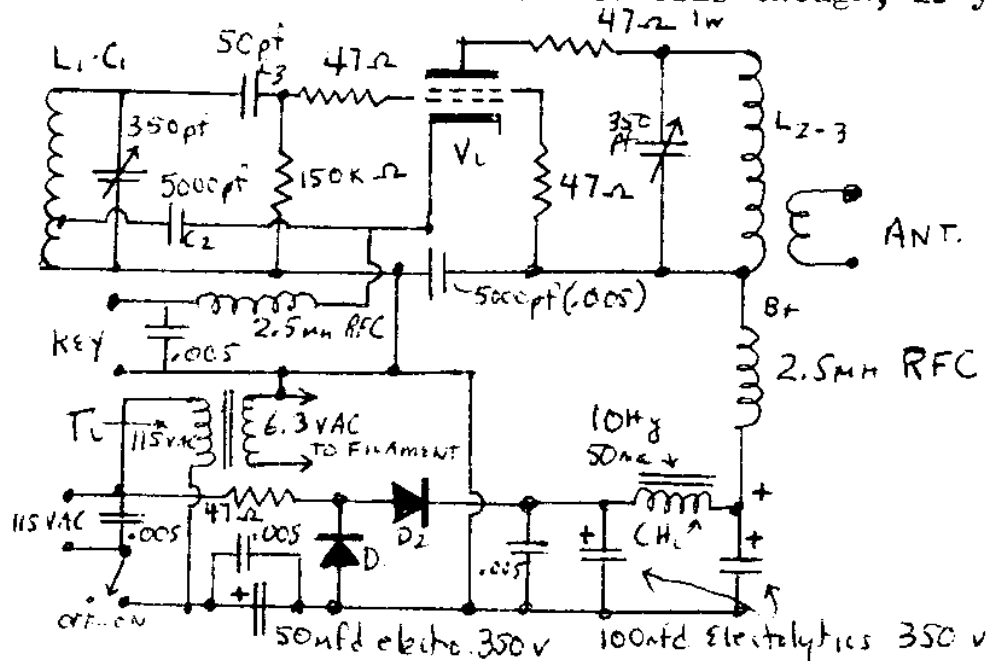
This little rig does what an amateur transmitter is supposed to do--transmits clean signals at reasonable cost. It represents an effort to design a genuine QRPP rig, one that will produce an effective FCC-acceptable signal for a small cost and minimum electronic sophistication. To be honestly QRPP, the plate-screen power input should be less than 5 watts. Crystal control is out; where power is low, frequency flexibility is a must--you've got to work them where they are, not where they ain't.

I chose the good-old 'electron-coupled' Hartley circuit because, when properly constructed, it is two-stages in one: it provides some measure of isolation between the frequency controlling elements of the circuit and the load. Further, by 'doubling' between oscillator and output, the effect of a swinging antenna or other load variation upon frequency is all but eliminated. I prefer the 3.5 mc band for serious QRPP work for two **big** reasons: first, it is easier to achieve good stability and signal quality at this frequency; secondly, because of less 'DX-pressure' on this band, the fellows seem more patient and interested in weak signals that originate on this planet. Further, at 3.5 mc, high-Q, high-C tank circuits are easy to build, and quash spurious radiation effectively. Despite the paucity of shielding in my rig, I experience no TVI on a rabbit-eared 'boob-tube' in the next room.

As for the circuit, any small tetrode or pentode works well; mine is wired for the 6V6, 6L6 series, but if you wish to use a miniature like the 6AQ5 or 6CL6, go ahead with the proper tube connection changes. From the standpoint of engineering excellence, the 6AG7 is preferable because of its superior shielding. I use a voltage doubler supply circuit since it eliminates the cost and vibration problems of a power transformer. However, if the problem of possible shock bothers you, use a low-cost 115VAC-115VAC isolation transformer. If good quality electrolytic capacitors are used, regulation and purity of D.C. will be good. Silicon diode rectifiers with a 300 volt rating should be used. If you have a utility supply that delivers at 40 ma, you can use that and build just the r.f. section.

The parts values are not very critical, except in the r.f. section. Improvisation was the rule in my rig, as I set out to use parts that could be easily obtained. For example, the coils are wound from common #20 bellwire available in any hardware store or 'five-and-ten,' and the coil forms are nothing but 2 $\frac{1}{4}$ " plastic tumblers, also available

in any small town store. Likewise, my chassis consists of a 6"x9" rigid plastic 'Rubbermaid Drawer Organizer': the use of such a plastic chassis will all but eliminate the shock problem. Also, plastic seems more likely to avoid stray mechanical vibrations than is metal, and provides great insulation. You can use a metal chassis though, if you wish.



PARTS LIST:

D₁₋₂ - SILICON DIODE 350 VOLT RATING, 50 MA
 T₁ - 6.3 VAC .5 AMP FILAMENT TRANSFORMER
 CH₁ - 10 HENRY 50 MA FILTER CHOKE
 V₁ - 6V6, 6L6, 6CL6, 6AG7, 6AQ5

L₂ - RESONATE 3.5 MC: 12 TURNS #20 ON 2 1/4" FORM. L₃ IS 3 TURN LINK OVER BOTTOM END OF L₂. ADJUST AND VARY FOR BEST OUT PUT TO YOUR ANTENNA

C₂₋₃ - PREFERABLY SILVER MICA RESISTORS 1 WATT RATING.

L₁ - RESONATE 1.75 MC AT FULL CAPACITANCE OF C₁: 20 TURNS #20 BELLWIRE AROUND 2 1/4" PLASTIC FORM. TAP AT 4 TURNS FROM BOTTOM.

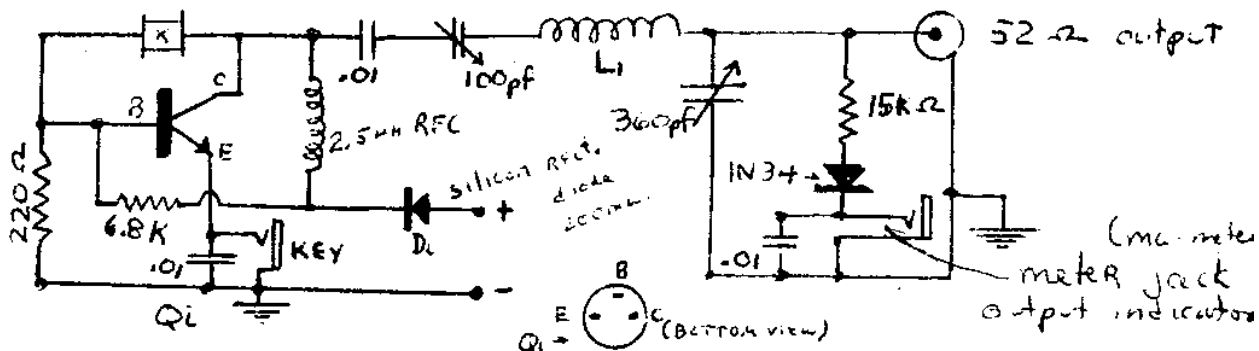
When wiring the r.f. section, establish a common ground point somewhere near the center of the system, and bring all R.F. ground connections to this point. Be sure to tie-down all small parts at both ends to insure stability—a machine screw through the plastic chassis will provide convenient tie points. A 180pf mica padder may be placed across L₁ in order to facilitate 'spotting' the VFO at the 1.75 mc frequency with the full capacitance of C₁. Wiring connections for the various tubes listed can be found at the back of the ARRL handbook, or in any tube manual. DO NOT CONNECT THIS RIG TO AN EXTERNAL GROUND!!! When fully loaded, the rig normally runs 7.5 watts input with 250 v. at 30 ma.

I've had dozens of contacts using this rig at all times of day and night. One of the amazing things is the consistency and reliability of contact using less than 10 watts input. This is true even during the busy early-evening hours.

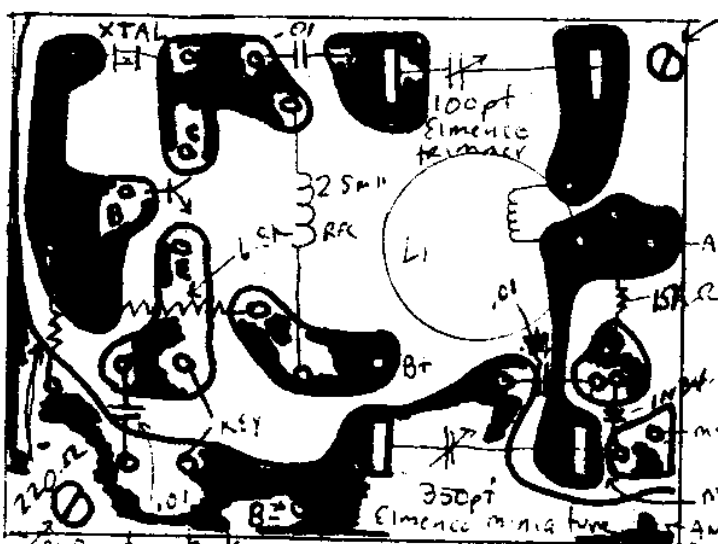
— C. F. Rockey W9SCH

A Beginner's Transistor QRP Rig

Most hams like to try a new thing in a limited fashion, and the multi-stage rigs that are published nowadays aren't very limited. Here is an ideal rig to begin your transistor career with. The circuit is extremely simple and almost foolproof, will load almost any antenna on 40 and 20 meters, and has a built-in output indicator circuit into which a VTVM or similar meter can be plugged.



I use a 2N5053 in my rig, but other types, such as 2N3053, 2N2102, 2N1316, 2N697 will work at the 1-2 watt level with a 12 volt supply. With a 28 volt supply, the 2N5053 puts out about 3 watts, at which level there is little trouble making solid QSO's. A fundamental crystal is used, and although the output tank is designed for 40 meters, it works just as well on 20 meters with a 20 meter crystal, and should work any other band with overtone types. L1 is 28 turns #22 on an Amidon T-68-2 core (Amidon Assoc., 12033 Otsego St., N. Hollywood, CAL 91607, 60¢ each), or use a 1/2" slug form, or any coil actually. The following template is for a circuit board.



mounting hole for screws.
 THE PARTS SHOULD FIT ON THIS BOARD WITHOUT CROWDING. IN ANY EVENT, MEASURE EACH OF YOUR PARTS WITH HOLES INDICATED & MAKE NECESSARY ADJUSTMENTS. THE TRIMMER CAPACITORS FOR WHICH THE HOLES ARE DESIGNED ARE THE ELEMENTO MINIATURE TYPES THAT CAN BE HAD FROM NEWARK ELECTRONICS. BE SURE TO PUT THE PROPER TRANSISTOR LEAD IN ITS CORRECT HOLE—NO PROBLEM WILL OCCUR IF YOU REMEMBER THAT THIS IS A BOTTOM VIEW. THE PARTS WOULD BE ON THE OTHER SIDE

OF THIS PAGE. A COMPLETE CIRCUIT ETCHING KIT CAN BE GOTTEN FROM ANY OF THE POPULAR SUPPLY HOUSES. IT IS A VERY SIMPLE JOB. MOST BOARDS PROVIDED IN THESE KITS ARE STANDARD 3" WIDE LIKE THIS DESIGN. ONE CAUTION: THE HOLES FOR THE XTAL SOCKET ARE FOR THE SMALL VARIETY—NOT FT SERIES!! YOU WILL PROBABLY WANT TO PUT THE XTAL SOCKET ON THE CABINET ANYWAY, IN WHICH CASE TWO WIRES FROM THE HOLES TO THE SOCKET WILL SUFFICE. THE TRANSISTOR SOCKET MAY ALSO BE USED IN THE SPACE PROVIDED.

— VAL BUCCICONE, W911L

QRPP OPERATING NEWS

(AS A REGULAR FEATURE OF THE MILLIWATT, WE WILL PROVIDE AN IN-DEPTH REPORT ON QRPP ACTIVITIES ON AND OFF THE AIR. ANY INFORMATION THAT WILL PROVIDE INSIGHT INTO QRPP OPERATION AND THE NATURE OF QRPP WILL BE INCLUDED. AMONG THE THINGS WE WISH TO REPORT ARE: PROFILES OF QRPP OPERATORS, ACCOUNTS OF THEIR EXPERIENCES, ADVICE DRAWN FROM THEIR USE OF QRPP BOTH IN REGARD TO DESIGN, CONSTRUCTION AND OPERATION, DESCRIPTIONS OF THE QRPP RIGS THEY HAVE USED AND THE SUCCESS THEY'VE HAD WITH THE RIGS, PROBLEMS AND SOLUTIONS THEY'VE FOUND, OBSERVATIONS OF THE RELATIONSHIP OF PROPAGATION AND QRPP, ANTENNAS AND QRPP, AND EVERY ASPECT OF QRPP.

WE ENCOURAGE YOU TO SEND REPORTS OF YOUR QRPP ACTIVITIES SO THAT IT CAN BE PASSED ON TO OTHER QRPP OPERATORS. YOUR REPORTS AND CORRESPONDENCE SHOULD BE ADDRESSED TO THE ASSOCIATE EDITOR FOR YOUR AREA, AS FOLLOWS. EAST (W1, W2, W3): WES MATTOX K6EIL/2, 115 PARK AVE., BINGHAMTON, NY 13903; MIDWEST (W4, W8, W9, W0): MIKE CZUHA-JEWSKI W4BMCQ, RT. 3, PAW PAW, MICH 49079; WEST (W5, W6, W7): ADE WEISS K5EEG/0, MECKLING, SD 57044.

THE PURPOSE OF QRPP OPERATING NEWS IS MANIFOLD. BASICALLY IT ATTEMPTS TO GATHER AND PRESENT AS MUCH DATA AS POSSIBLE ABOUT ALL ASPECTS OF QRPP. IT IS NOT A REPORT OF OUTSTANDING ACHIEVEMENTS, OF IMPRESSIVE ACCOMPLISHMENTS, ALTHOUGH THESE ARE RELEVANT. IT SIMPLY IS INTENDED TO PROVIDE DATA ON WHAT STATION USING WHAT TYPE OF RIG, POWER, ANTENNA WAS ABLE TO DO OR TO NOT DO UNDER CERTAIN CONDITIONS SUCH AS DATE, TIME, DISTANCE, PROPAGATION CONDITIONS. FOR EXAMPLE, BOB K400E NOTES THE FOLLOWING PHENOMENON:

I DON'T KNOW WHAT TO SAY ABOUT (PROPAGATION AND CONDITIONS) TO RUSSIANS FROM HERE. I CALLED AT LEAST 30 RUSSIANS (WITH QUAD POINTING A LITTLE EAST OF NORTH) BEFORE FINALLY HOOKING UP WITH ONE. THEN THE BAND CHANGED (20 METERS) OR SOMETHING BECAUSE I'VE WORKED ABOUT 75 DIFFERENT ONES SINCE THEN INCLUDING 11 DIFFERENT AREAS OF THE USSR, ALL WITH 5 WATTS INPUT. WHAT HAPPENED? WE DON'T REALLY KNOW, BUT THE MESSAGE IS 'KEEP RIGHT ON TRYING UNTIL SOMETHING DOES HAPPEN, BECAUSE HERE IS PROOF THAT IT CAN AND WILL!'

EVERYONE CAN CONTRIBUTE SIGNIFICANT DATA IN THIS RESPECT IF YOU HAVE TRIED QRPP ON THE AIR. IN REPORTING YOUR ACTIVITIES, IT IS IMPORTANT TO INCLUDE MINIMUM DATA SUCH AS POWER INPUT, ANTENNA TYPE AND HEIGHT, DISTANCES COVERED (OR NOT COVERED), DATE, TIME, AND CONDITIONS, IF POSSIBLE. WE ARE NOT TRYING TO IMPRESS ANYONE WITH SUCH DATA!!! ANY SCIENTIFIC CONCLUSION ABOUT A PHENOMENON IS BASED UPON FACTS AND DATA, AND SUCH A CONCLUSION IS VALID IN PROPORTION TO THE EXTENT OF THE DATA UPON WHICH IT IS BASED. HENCE, IF 15 QRPP STATIONS SHOW A CONSISTENT PATTERN OF QSO'S UNDER 300 MILES, AND ALL THESE STATIONS (OR A LARGE PERCENTAGE OF THEM) USE ANTENNA SYSTEMS ABOUT A QUARTER-WAVE IN HEIGHT, THEN THIS DATA IS SIGNIFICANT IN TWO WAYS: IT TELLS ALL QRPP'RS WHAT SUCH SET-UPS HAVE DONE AND PERHAPS WHAT CAN BE EXPECTED OF SIMILAR SET-UPS, AND SECONDLY, IT SUGGESTS CERTAIN CONCLUSIONS REGARDING ANTENNA HEIGHT-PROPAGATION RELATIONSHIPS.

IN SHORT, YOUR EXPERIENCE WITH QRPP HAS RESULTED IN SUCH DATA, AND IT IS IMPORTANT THAT YOU SHARE THAT DATA WITH BOTH PROSPECTIVE AND SEASONED QRPP'RS. FOR THE BENEFIT OF THE QRPP CAUSE, DO CONTRIBUTE REPORTS ON YOUR OPERATIONS.

* * * * *

(EDITOR'S NOTE: DO NOT FEEL THAT YOUR REPORT MUST BE ELOQUENTLY WRITTEN IN FLOREATE KING'S ENGLISH. WE HAVE A PH.D. IN ENGLISH ON THE STAFF WHO WILL GLADLY EDIT YOUR REPORT, OR WRITE THE WHOLE THING BASED UPON YOUR SCRIBBLED NOTES. THE MILLIWATT IS PERHAPS THE ONLY JOURNAL IN EXISTENCE WHICH OFFERS THIS TYPE OF EDITORIAL ASSISTANCE.)

DE. • K6EIL/2, WES MATTOX, 115 PARK AVE., BINGHAMTON, NY 13903:

20 METER ACTION HERE IS ONLY SO-SO. NOTHING OVER 400 MILES WITH 2 WATTS. I'M HAVING TROUBLE MAKING CONTACTS, BUT, ODDLY ENOUGH, MY SIGNAL REPORTS ARE NEVER BELOW S-6. THE TROUBLE IS, I

THINK, THAT THERE ARE SO MANY QRO STATIONS AND SO MANY HIGH-GAIN ANTENNAS ON THE BAND THAT FELLOWS KEEP THE RF GAIN DOWN PRETTY LOW. I CERTAINLY AM GUILTY OF THIS MYSELF! AND SO THEY JUST DON'T HEAR ME. WISH I COULD RUN SOMETHING OTHER THAN MY DIPOLE ON 20, BUT. . . I DON'T LOAD AS WELL ON 20 AS I DO ON 40; ONLY ABOUT 1/2 WATT INPUT. I WOULD LIKE TO SKED OTHER STATIONS. I CAN BE ON 20 ON SAT. AND SUN. MORNINGS 1400-1700 GMT ON 14.075 KC. MY ONLY OTHER ROCK IS FOR 14.030. BY THE WAY, THESE XTALS ARE NOT THE MOST ACCURATE I'VE SEEN IN THE WORLD, AND I HAVEN'T HAD A CHANCE TO TEST THEIR ACCURACY YET. BUT MY CHIRP CAN BE EASILY RECOGNIZED, SO FREQUENCY ACCURACY IS NOT MUCH OF A PROBLEM IN FINDING ME!

ABOUT MY 125 MW RIG. I'VE USED THAT POWER TO OBTAIN KM/W SEVEN TIMES. I'VE ACCOMPLISHED KM/W NINE TIMES OF 40 METERS. I'LL SAVE THE DETAILS FOR A STORY I'LL WRITE FOR THE MILLIWATT, BUT THE GIST OF IT IS THIS: I HAVE DISCOVERED THAT FOR SHORT, ONE-HOP DISTANCES OF AROUND 150 MILES, ONLY 100 MW OF POWER IS NEEDED TO CARRY ON A QSO (DURING THE DAY) AND THE MINIMUM POWER REQUIRED DOES NOT SEEM TO BE TERRIBLY DEPENDENT UPON THE TIME OF THE DAY. WITH 125 MW, I MADE KM/W AT NOON AND 6 PM, AND FROM MY EXPERIENCE I'M BETTING THAT IT COULD BE DONE IN THE DEAD OF THE AFTERNOON, SAY AROUND 3 PM (YOU BET IT CAN-ED). IN THE MID-MORNINGS ON 40 METERS I QSO LONG ISLAND (150 MILES AS THE CROW FLIES) CONSISTENTLY. AVERAGE REPORTS WITH 125 MW: S-4/S-5.

NEW STATES ARE GETTING HARDER TO FIND (I HAVE 22 NOW). THAT ARK. STATION JUST ISN'T GOING TO GIVE ME A QSL, IT SEEMS. I WAS ON 40 EARLY THIS MORNING, LOOKING FOR NEW STATES, AND DOGGONE IF I HEARD BUT COULDN'T CONTACT GA, SC, AND KY. I'M GETTING DESPERATE FOR THAT LAST QSL.

I LISTENED TO THE QRP NET LAST FRIDAY (JAN. 23). I WAS ON FREQUENCY (7080 KC) FROM 0100-0200 GMT WITHOUT HEARING EITHER OF YOU (WABMCQ, K8EEG/Ø). WHY DO YOU THINK THERE IS SO MUCH TROUBLE COPYING MY 2 WATTS? IN FACT, I'M GETTING OUT. ON DEC. 19, I HAD A ONE-HALF HOUR QSO WITH W9JUO FROM 0202 TO 0235 RIGHT ON THE NET FREQUENCY. NO ONE ON THE NET COPIED EITHER OF US! I ASKED W9JUO TO BREAK INTO THE NET SEVERAL TIMES AND HE TRIED, UNSUCCESSFULLY. (ED. SKIP PHENOMENON)

DE. . . K4DCD, JACK BURCHFIELD, 7609 KONDA DRIVE, KNOXVILLE, TN 37920:

MAIN INTERESTS HERE ARE QRP RECEIVER/TRANSMITTER DESIGN AND CONSTRUCTION, AND QRP RAGCHEWING AND DX HUNTING. I RUN QRP ABOUT HALF THE TIME I OPERATE, WHICH IS MOSTLY IN THE EVENING ON 40 AND 20 METERS. I FIRST STARTED IN QRP BACK IN 1950 WITH A 117L7GT CRYSTAL OSCILLATOR RUNNING ABOUT 1 WATT INPUT. I ENJOY QRP AND INTEND TO CONTINUE USING QRP FROM TIME TO TIME. I HAVE NEVER USED MY QRO RIG TO ESTABLISH A QRP QSO—ALWAYS CALL AND MAKE CONTACT WITH QRP. IN THE AUGUST, 1969 QRP PARTY IS OPERATED UNDER THE CALL OF W2EIK/4 FROM TENN RUNNING 2 WATTS INPUT. MANAGED 39 QSO'S IN 17 STATES DURING THE 24 HOUR PERIOD

AS FOR THE FIGURE OF MERIT IN DETERMINING AWARDS SUCH AS KM/W, I THINK THAT THE FORMULA OUGHT TO BE SOMETHING LIKE MILES/WATT DIVIDED BY THE FREQUENCY IN ORDER TO EVEN THE DIFFERENCES IMPOSED BY LONGER SKIP DISTANCES ON THE HIGHER BANDS.

AT PRESENT, I AM USING THE TEN-TEC POWERMITE (PM-1, SEE REVIEW ABOVE P. 3) AT 2 WATTS INPUT. MY ANTENNA SYSTEM INCLUDES A 136 FT. LONG WIRE END FED WITH OPEN LINE UP 70 FEET FOR THE LOW BANDS, AND A 3 ELEMENT TRIBANDER UP 50 FEET FOR THE HIGH BANDS. I HAVE MANAGED ABOUT 120 QSO'S IN 25 STATES WITH QRP. IN ADDITION, I'VE QSO'S OK2, HC1, AND LU9 FOR DX.

DE. . . WA6GER, JIM CATES, 3241 EASTWOOD RD., SACRAMENTO, CAL 95821:

RECEIVED MY 7080 KC CRYSTAL FOR THE QRP NET FINALLY. GMT 0100 IS TOO EARLY FROM THE WEST COAST. CAN BE ON FROM 0500-0700GMT. PERHAPS SOME NIGHT-OWL BACK EAST WILL LISTEN FOR ME. OTHERWISE, I CAN ARRANGE SKEDS FOR SATURDAY EVENING.

I HAVE A OE 20A FOR HIGH POWER WORK (20 WATTS), BUT PREFER TO USE MY 3 WATT QRP RIG. IT CONSISTS OF A 6AQ5 AT LOW VOLTAGES. WITH

THIS RIG I'VE WORKED ALL OVER THE GREAT LAKES AREA ON THE NOVICE BAND WITH ONLY ONE CRYSTAL (7175 KC), SO I EXPECT TO BE ABLE TO DO THE SAME ON THE GENERAL BAND OUT OF NOVICE QRL. I WORK ALL BANDS HERE FROM 160 METERS THROUGH 1220 MC. I AM NOW GOING TO LAW SCHOOL IN ADDITION TO MY REGULAR WORK, SO MY TIME IS SOMEWHAT RESTRICTED!

(N.B.: THE QRP NET, AS YOU WILL READ BELOW, IS BEING EXTENDED TO THE 80 METER BAND IN ORDER TO FACILITATE THE LATE OPENINGS TO THE WEST COAST. NET WILL MEET SATURDAY, 0400 GMT, ON 3553 KC., OR CLOSE BY. SEE ANNOUNCEMENT IN NET NEWS-ED.)

DE. . .W4API, CHARLES E. SPITZ, 1420 RANDOLPH ST., ARLINGTON, VA 22204:

THANKS VERY MUCH FOR SENDING THE MILLIWATT AFTER THE P.O. RETURNED IT.

MY OWN INTEREST IN QRP IS NOT THAT OF THE MAJORITY—FOR H.F. DX—BUT RATHER FOR UTILITY IN UHF AND MICROWAVE WORK. SOME OF THE TECHNIQUES USED ON UHF COULD BE VERY WELL ADAPTED TO HF USE, SORT OF A REVERSE ASSIST, HI. WHEN MAKING SOLID STATE CHAINS FOR RECEIVING CONVERTERS, FOR EXAMPLE, I FIND IT SIMPLER TO CRYSTALIZE FOR THE HAM BANDS, AND THEN WHEN SATISFIED WITH THE DEVICE, RECRYSTALIZE AND RETUNE FOR THE DESIRED IF FREQUENCY IN THE CONVERTER.

IN SO DOING, I HAVE OPERATED A LOW COST FOUR TRANSISTOR RIG ON 432 MC AT 9-14 VOLTS D.C. WITH THINGS LIKE 20 DB OVER S-9 A COUPLE OF MILES AWAY. THE ERP OF HIGH-GAIN ANTENNAS (PHYSICALLY SMALL AT UHF FREQUENCIES) HELPS, OF COURSE. USING A 1N914 DIODE TRIPLER (VERY CHEAP SURPLUS UNIT) AND A SMALL PIECE OF COPPER TUBING AS A COAX CAVITY, I CAN GET S-9 SIGNALS A COUPLE OF MILES AWAY IN THE NEXT TOWN ON 1296 MC. I HAVE SINCE HEARD OF A FRENCH STATION WORKING AN ENGLISH STATION ON 2300 MC. USING THE 1N914 DIODE ALSO AS A MULTIPLIER.

ANTENNA AND RECEIVING SET-UPS HAVE TO BE GOOD AT THESE FREQUENCIES, BUT THE POSSIBILITY OF USING UHF QRP FOR RADIO INTERCOMS APPEARS TO BE THERE, AS WELL AS THE USE OF DIODE MULTIPLIERS TO PUT 80-40 METER RIGS ON 15-10 METERS, OR 6 OR 2 METERS.

(N.B. CHARLIE'S POINT IS VERY WELL TAKEN; VHF AND UHF OPERATION IS TO A LARGE EXTENT QRP. FOR EXAMPLE KB1XU HAS WORKED 44 STATES ON 6 METERS WITH 2.75 WATTS ON A.M. DURING OPENINGS, FANTASTIC RESULTS CAN BE ACHIEVED WITH A FEW WATTS. THESE RESULTS HINGE LARGELY UPON THE METHODS ENGINEERED BY VHF'RS AND UHF'RS TO OVERCOME LOSSES IN THEIR SYSTEMS, IN SHORT, SUCCESS ON VHF AND MORESO ON UHF HAS BEEN ACHIEVED THROUGH EFFICIENCY IN EVERY PART OF THE SYSTEMS INVOLVED—BOTH RECEIVING AND TRANSMITTING. EVERY RIG THAT IS WELL-DESIGNED FOR UHF HAS HAD TAKEN INTO CONSIDERATION, AS A NORMAL COURSE OF DESIGN AND CONSTRUCTION, THE MANY METHODS OF OVERCOMING LOSS AND INEFFICIENCY THAT UHF PIONEERS AND EXPERTS HAVE DEVISED OVER THE PAST TWO DECADES. ALL OF THESE METHODS CAN AND SHOULD BE APPLIED TO HF QRP. WE VERY HEARTILY INVITE VHF'RS AND UHF'RS TO WRITE ARTICLES ABOUT THE METHODS OF CONQUERING SYSTEM LOSSES THAT ARE USED ON UHF AND VHF AND THAT CAN BE APPLIED TO HF QRP. IN FACT, WE WISH TO INCLUDE REGULARLY REPORTS IN DETAIL FROM VHF AND UHF OPERATORS OF QRP RIGS. ED.)

DE. . .W9IIL, VAL BUCCICONE, 720 GARFIELD ST. GARY, IND 46404:

I WANT TO PASS ALONG SOME INFORMATION OF INTEREST. THE FOLLOWING STATIONS HAVE BEEN WORKED WHILE THEY WERE RUNNING LOW POWER RECENTLY: W71SP (ARIZ.) 20MTR, 3WATTS A-1, 559; K4FS/M4, 20M, 5W; ZB2BO (GIB-RALTER), 10M, 16W.; W6SE (SAN DIEGO), 80M, 10W, 559; W8AVE (OHIO), 80M, 1W, 559; G310H 10M, 1W, 449; W8NDG (MICH) 40M, 1W, 579. HAVE BEEN BUSY WITH WORK HERE AND HAVEN'T SPENT MUCH TIME WITH QRP.

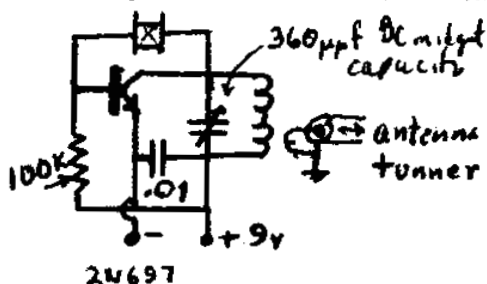
WHAT QRPP I HAVE BEEN DOING HAS BEEN ON 40 METERS. I MUST GET BACK ON 20 METERS AND POSSIBLY 10 METERS. CONDITIONS ON 40M HAVE BEEN VERY BAD HERE THOUGH AND THIS IS ONE REASON FOR INACTIVITY.

(N.B. VAL AND I HAD A HALF-HOUR QSO, 3/27/70, ON 7085 KC 0145GHT WHICH WAS SOLID DESPITE QRM ETC. HE WAS RUNNING 5W. AND I WAS RUNNING 800MW. K8EEG/Ø)

DE. . .W9PNE, BRICE ANDERSON, LANCASTER, ILL 62855:

I RAN ACROSS YOUR SCORE (W8BMCQ) IN A CD PARTY WHILE YOU WERE RUNNING A LOW POWER RIG AND NOTICED THAT YOU MADE A SCORE OF 10,000 POINTS. AS I RECALL, IT WAS LESS THAN 1 WATT INPUT.

I HAVE USED FLEA POWER ON AND OFF FOR YEARS. IN RECENT YEARS, I HAVE OCCASIONALLY PUT A SMALL TRANSISTOR OSCILLATOR ON THE AIR TO SEE WHAT I CAN WORK WITH IT. I'VE MANAGED TO WORK 27 STATES IN ALL CALL AREAS AND VE3 & VE7, WITH LESS THAN 1 WATT INPUT. BEST DX WAS VE7AC ON 80 METERS WITH 540MW. WORKED W1BGD WITH 168MW AND WA2RUE WITH 125MW INPUT. MOSTLY IN CD PARTIES. THE RIG I HAVE USED MOST OF THE TIME CONSISTED OF A 2N697 CRYSTALL OSCILLATOR IN THE SIMPLEST CIRCUIT I COULD GET TO WORK:



I KEYED THE B- LEAD USUALLY, AND THE RIG FOLLOWED A BUG NICELY. THE ENTIRE RIG, WITH A 9 VOLT BATTERY, IS BUILT IN A 'SUCRETES' LOZENGE BOX. THE TANK COIL WAS WOUND ON AN IRON CORE FORM, AND THE TURNS WERE ADJUSTED TO RESONATE AT 3.5 MC AT ABOUT THE 150MMF SETTING OF THE TANK CAPACITOR. THE LINK COIL WAS 3 OR 4 TURNS. THIS CIRCUIT IS ONLY A NOVELTY AS NO PROTECTION IS GIVEN TO THE TRANSISTOR. I'VE POPPED SEVERAL TRANSISTORS

BY LOADING TOO HEAVILY, WHEN THEY STOP OSCILLATING AND DRAW ENORMOUS CURRENT (ED. AT THIS POINT, THEY HAVE ALREADY BLOWN, AND THE HIGH CURRENT IS MERELY THE RESULT OF A SHORT THROUGH THE PERFORATED CENTER ELEMENT OF THE TRANSISTOR.). I HAVE BUILT A 2 STAGE RIG WHICH I HAVE NOT ACTUALLY PUT ON THE AIR YET. HOWEVER, I INTEND TO WHENEVER I CAN FIND THE TIME. THIS RIG WAS DESCRIBED BY W3M00 IN QST.

I FIND FLEA-POWER FASCINATING AND CHALLENGING. MOST OF MY HAMMING IS DONE ON 160 METERS, WITH 80 METERS NEXT. I'VE BEEN VERY INACTIVE RECENTLY, BUT INTEND TO GET ON MORE NOW. FOR ONE THING, I JUST PASSED THE EXTRA-CLASS EXAM AND CAN PUT THE FLEA POWER IN A LESS CROWDED SECTION OF THE BAND. I'VE ONLY USED FLEA POWER A FEW TIMES ON 40 METERS. SEEM TO HAVE BETTER RESULTS ON 80. THE ANTENNA I USED WITH THE ABOVE RIG WAS A 536 FOOT LONGWIRE UP 40 FEET, FED OFF-CENTER. IT WAS RUINED BY STORMS, AND NOW I HAVE AN INVERTED VEE WITH A 50 FOOT APPEX.

DE. . .W0BE, BOB SCHOENING, 10040 BROOKSIDE AVE., BLOOMINGTON, MINN 55431:

MY FIRST QRPP QSO WAS IN 1951 WITH 30MW—12 MILES WITH A POINT-CONTACT TRANSISTOR (ED. I WAS SURPRISED TO FIND OUT THAT TRANSISTOR HAM COMMUNICATION HAD OCCURRED AT THIS EARLY DATE. WHEN WAS THE FIRST AMATEUR USE OF TRANSISTOR IN TWO-WAY CONTACT, EVER?) I DON'T IMAGINE THAT MANY OWNERS OF THE SIGNAL-ONE CX-7 ARE INTERESTED IN QRPP OPERATION; HOWEVER, THE MANUFACTURERS OF THIS GEAR HAVE PROVIDED AN AUTOMATIC ENTRY INTO SUCH RANKS WITH A POWER CONTROL ON THE FRONT PANEL THAT TAKES THE OUTPUT DOWN TO WHAT THEY SUGGEST IS ONE WATT. I HAVE NOT MEASURED THE OUTPUT AT MINIMUM POWER, BUT IT DOES NOT SHOW ON THE FORWARD POWER METER AT MINIMUM SETTING. THE OTHER DAY WHILE SEVERAL LOCAL HAMS WERE IN CONTACT WITH SOME DULUTH STATIONS—NEARLY 200 MILES AIRLINE—ON 75 PHONE, I BACKED THE RIG DOWN TO MINIMUM POWER AND WAS TOLD THAT THE SIGNAL WAS STILL COMPARABLE TO THE OTHER LOCALS' SIGNALS. THIS WAS ON SSB, USING SPEECH PROCESSING AND A GOOD ANTENNA. LIKE MOST OF YOUR READERS, I'VE BUILT AND USED SEVERAL TRANSISTOR RIGS, AND AM THE AUTHOR OF THE ARTICLE ON OUTPUT CIRCUIT DESIGN FOR TRANSISTOR POWER AMPLIFIERS IN JANUARY QO, 1966. THIS ARTICLE GIVES FULL DESIGN INFORMATION FOR THE OUTPUT CIRCUIT USED

BY K40CE ON PAGE 10 OF THE FEBRUARY ISSUE OF THE MILLIWATT, WHICH IS ONE OF MY FAVORITE ARRANGEMENTS FOR LOADING TRANSISTOR FINALS.

DE. . . WØF, YARDLEY BEERS, 740 WILLOWBROOK ROAD, BOULDER, COLO 80302:

FB ON THE QRPP MAGAZINE—JUST RECEIVED IT. AT PRESENT, I HAVE FIVE DIFFERENT QRPP RIGS. THE MOST NOTEWORTHY IS A 3 BAND SSB TRANSISTOR TRANSCIVER THAT RUNS 1 WATT D.C. INPUT. WHILE ON A CAPE COD HOLIDAY ONCE, I WORKED 80 STATIONS IN 8 STATES ON 75 METER SSB IN TWO WEEKS. P.S. PLEASE DON'T ASK ME TO WRITE THE SSB RIG UP FOR THE MILLIWATT. IT IS TOO MESSY. GEORGE GRAMMAR OF QST TOOK ONE LOOK AT IT AND THREW UP HIS HANDS IN HORROR!

DE. . . W8MCO, MIKE CZUHAJEWSKI, ROUTE 3, PAW PAW, MICH 49079:

SAY, I TRIED THIS DAYTIME QRPP BUSINESS A FEW DAYS AGO, WITH MY NEW ONE WATT RIG (ED. COMING IN A FUTURE ISSUE OF THE MILLIWATT). IT'S GREAT! ON 40 METERS, I MADE SEVERAL CONTACTS; NO SWEAT. QRM IS LIGHT, NO LONG SKIP TO BOTHER ABOUT, AND PERHAPS MOST IMPORTANT, SIGNALS ARE RELATIVELY WEAKER THAN AT NIGHT, SO GUYS HAVE THEIR RF GAINS TURNED UP FURTHER, WHICH HELPS THEM HEAR ME! OF ABOUT FIVE CONTACTS MADE, NONE WAS OVER 57, WITH MANY BELOW 55. AND YET I COULD CARRY ON NICE LONG CONTACTS WITH THEM! AMAZING! JUST TRY THIS AT NIGHT, WHEN SIGNALS ARE 90 DB OVER S-9.

I HAVE COME TO REALIZE SOMETHING RECENTLY, THAT SEEMS TO HOLD TRUE HERE. THE DIVIDING LINE BETWEEN QRP AND QRPP FOR ME SEEMS TO BE ABOUT ONE WATT. QRP MEANS FAIRLY LOW POWER, EASY TO MAKE CONTACTS WITH, AND QRPP IS REAL LOW POWER, DIFFICULT TO QSO WITH. WITH ONE OR TWO WATTS, I CAN GET CONTACTS QUITE EASILY, AND YET WHEN I GO BELOW ONE WATT, EVEN AS MUCH AS TO 500 OR 750 MW, I SEEM TO HAVE A GREAT DEAL OF TROUBLE MAKING CONTACTS. THE POWER DIFFERENTIAL BEING WHAT IT IS, I AM INCLINED TO THINK IT IS A GREAT DIFFERENCE IN POWER OUTPUT, ALTHOUGH ALL RIGS USED SEEM TO HAVE ABOUT EQUAL EFFICIENCY. HAVE ANY OF YOU NOTICED THIS?

(N.B.: I THOUGHT EVERYONE KNEW ABOUT THE EASE OF DAYTIME QRPP. SOLID RAGCHEWS ARE THE RULE RATHER THAN THE EXCEPTION. AS FOR QRP/QRPP, REFER TO 'HUNTING FOR LOSSES;' WHAT MIKE HAS OBSERVED IS NOT THE RESULT OF POWER LEVEL, MERELY THE RESULT OF POWER LEVEL GOING BELOW THE TOLERABLE LEVEL AS DETERMINED BY THE LOSSES INCURRED IN HIS TRANSMITTING SYSTEM. THE 3 DB LOSS DOESN'T DESTROY A 2 WATT SIGNAL, BUT ONE CANNOT FOOL AROUND WITH LOSSES WITH A 500 MW SIGNAL, WHICH ITSELF IS ALREADY 4 DB BELOW THE 2 WATT SIGNAL. ED.)

DE. . . K8EEG/Ø, ADE WEISS, MECKLING, SD 57044:

I'VE UNDERRATED MY EFFORTS. I'VE BEEN TELLING GUYS ON THE EAST AND WEST COASTS THAT I'M RUNNING 2 WATTS INPUT. NEVER MEASURED THE ACTUAL AMOUNT OF CURRENT MY RIG HAS BEEN USING TO WORK PJ2VD ON 80 METERS, AND BOTH COAST 80 THROUGH 15. ON 80, IT'S 11.5 VOLTS AT A CINCHY 110-140 MA, WHILE ON 40 IT'S 11.5 VOLTS AT 70MA (TO ALL 5 TRANSISTORS TOTAL!) OR ABOUT 990MW, WHILE ON 20 AND 15 ABOUT 60 MA. I PROBABLY WON'T BE ABLE TO WORK ANYONE NOW, SINCE I'VE DESTROYED MY PSYCHOLOGICAL CONFIDENCE THAT I WAS PUTTING OUT 4 DB MORE SIGNAL THAN I ACTUALLY AM. WOE! KNOWLEDGE CAN BE A DANGEROUS THING!

(N.B. SEE YOUR LOCAL PSYCHIATRIST FOR A RECHARGE OF EGO-STRENGTH, SELF-CONFIDENCE, AND BELIEF IN ETERNAL VERITIES)

NET NEWS

THE QRPP NET HAS BEEN MEETING SATURDAY, 0100 GMT, 7080 KC. THE FOLLOWING IS A REPORT ON CHECK-INS AND QRPP REPORTS, FORMAT: DATE, STATIONS QNI (QRPP STATIONS INCLUDE POWER AND STATE); UNDERLINED STATION RECEIVED RS REPORT FROM STATION LISTED BY SUFFIX.

2/27/70: W8BMCQ (MI 480mw), K6EIL/2 (NY 2w), WA3JFW (EPA 3w), W0JCT (KAN 13w), W4UM (VA), K8EEG/0 (SD), W8BZX (OHIO),
W8BMCQ (480mw) 33 @ EEG/0, 55 @ JCT, 55 @ JFW; WA3JFW (3w) 53 @ MCQ, 33 @ EEG/0, 55 @ JCT, 57 @ BZX; K6EIL/2 (2w) 58 @ BZX, 34 @ MCQ.

3/6/70: W8BMCQ (MI), W8BZX (O), W2BIV (NY 2w), WA7GYQ (WYO 10w)
K8EEG/0 (SD 900mw)
WA7GYQ (13w) 56/57 @ EEG/0, 33 @ MCQ; K8EEG/0 (900mw) 43 @ MCQ, 55 @ GYQ, 45 @ BZX; W2BIV (2w) 55 @ MCQ, 33 @ EEG/0.

3/13/70: W8BMCQ (MI 480mw), W8LVT (O 2w), K6EIL/2 (NY 2w), W2BIV (NY 2w), WA3JFW (EPA 3w), W0JCT (KAN 13w), W9KNX (ILL), K8EEG/0 (SD 900mw),
W0JCT 55 @ EEG/0; W8LVT (2w) 56/57 @ EEG/0, 46 @ JCT, 45 @ MCQ;
W2BIV (2w) 45 @ EEG/0, 34 @ JCT, 33 @ MCQ; K6EIL/2 (2w) 33 @ EEG/0, 53 @ MCQ; K8EEG/0 (900mw) 33 @ MCQ, 45 @ LVT, 56 @ JCT, 34 @ EIL/2;
W8BMCQ (480mw) 33 @ EEG/0;

3/20/70: W8ZPO (MI), W8BZX (O), W4DPR (VA), W2BIV (NY 2w), K6EIL/2 (NY 2w), K8EEG/0 (SD 900mw), K3ZMI/0 (KAN), WA3JFW (EPA 3w).
W2BIV (2w) 55-56 @ EEG/0; WA3JFW 35 @ EEG/0; K6EIL/2 (2w) 44 @ EEG/0; K8EEG/0 (900 mw) 33-34 @ JFW, 45 @ MCQ, 45 @ ZMI/0.

3/27/70: W8BMCQ (MI), W8BZX (O), VE3DQY (ONT), WA3JFW (EPA 3w), W9KNX (ILL), W4VKQ (SD 10w), K8EEG/0 (SD 900mw)
W4VKQ 55 @ MCQ, 56 @ EEG/0; K8EEG/0 (900mw) 53 @ BZX, 44 @ KNX, 44 @ JFW, 55 @ VKQ.

180 METERS SESSION 0400GMT 3553KC: W8BMCQ (MI 480 MW), W4VNE (VA 1WATT), K8EEG/0 (SD 1.2w), W0BEN/7 (WASH 10 W)
W4VNE (1w) 44 @ EEG, 45 @ MCQ; W8BMCQ (480 MW) 33 @ EEG, 44 @ VNE; K8EEG/0 (1.2w) 32 @ MCQ, 44 @ VNE, 45 @ BEN/7; W0BEN/7 (10w) 33 @ VNE, 56 @ EEG/0.

4/3/70: W8BMCQ (MI), K8EEG/0 (SD), WA3JFW (EPA 2w), WA6ABP (CAL 500mw)
WA3JFW (2w) 45 @ EEG/0, 55 @ MCQ; WA6ABP (500 MW) 33-34 @ EEG/0

IT SHOULD BE NOTED FROM THE ABOVE REPORT THAT THE QRP NET IS A VIABLE AND OPERATIONAL EFFORT. QRPP REPORTS ARE CONSISTENT, AND THERE IS INDICATION THAT ANYONE WHO CHECKS IN WILL BE HEARD BY SOMEONE ELSE EVEN UNDER THE WORST QRM CONDITIONS. CERTAIN PATTERNS REGARDING SKIP DISTANCE SEEM TO BE EMERGING, SUCH AS THE FACT THAT K6EIL/2 AND W4UM HAVE NOT BEEN ABLE TO QSO OVER THEIR DISTANCE AND PATH, WHILE BOTH HAVE SUCCEEDED OTHERWISE. ALSO, REFERRING TO K6EIL/2'S REPORT IN OPERATING NEWS, HE WAS ABLE TO CARRY ON A SOLID QSO WITH W9JUO ON NET FREQUENCY WHILE THE NET WAS IN SESSION, AND NEITHER WERE HEARD. WE INVITE MORE CHECK-INS.

NET PROCEDURE: CQ QRP NET QNI 0100-0120GMT; QNI AND QRX UNTIL NET CONTROL ASKS YOU TO MAKE CALLS; CQ QNI COMMENCES AGAIN AT APPROXIMATELY 0145-0155GMT, WHEN CALLS WILL AGAIN BE MADE. NC WILL RELAY A CALL, OR ADVISE ANOTHER STATION THAT YOU ARE CALLING HIM ON QRPP. BE QUICK AND EFFICIENT!

NEW NET SESSION: FOLLOWING THE 40 METER SESSION, THE QRP NET WILL RECONVENE AT 0430 GMT SATURDAY ON 3553 KC OR CLOSE TO IT. SAME PROCEDURE WILL BE FOLLOWED AS ON 40 METERS NET; 20 MIN QNI, 25 MIN. FOR CALLS, 10 MIN QNI. THE REASON FOR THE 80 METER SESSION IS FIRST, MANY HAMS ARE QRPP ONLY ON 80, SECOND, RELIABLE TWO-WAY QRPP QSO'S HAVE BEEN HELD ON 80 BETWEEN WEST COAST AND THE EAST AT APPROXIMATELY THIS TIME. 80 METERS HOLDS UP GOOD FOR QRPP. QRI' FROM FOREIGN BC AND STATESIDE HAMS IS ALMOST NIL ON 80. K8EEG/0 WILL GENERALLY BE NET CONTROL, ALONG WITH W8BMCQ FOR EASTERN STATIONS. TRANSCONTINENTAL QRPP WORK SHOULD BE POSSIBLE.

AT A GLANCE

THE PURPOSE OF THIS SECTION IS TO PROVIDE, AT A GLANCE, DATA ABOUT QRPP ON-THE-AIR ACTIVITIES. IT IS NOT A SCORE COLUMN OR LIST OF RECORD ACHIEVEMENTS. THE SEEMING MAGNIFICENCE OF SOME QSO'S IS COUNTER-BALANCED BY THE KILO-MILES PER WATT RATIO. THE FASCINATION OF QRPP IS THAT, WHILE WORKING ONLY SEVERAL HUNDRED MILES WITH A FEW MILLI-WATTS, ONE ACTUALLY, IN TERMS OF THE NITTY-GRITTY, DOING MORE THAN LONG DX WITH A KW. THE KM/W RATIO IS THE STANDARD OF COMPARISON, EXCEPT THAT IT FAILS TO MAKE ADJUSTMENT FOR DIFFERENT SKIP PHENOMENON ON DIFFERENT BANDS. IN SENDING REPORTS, PLEASE INCLUDE DATE, TIME, STATION WORKED, UR POWER, RST, DISTANCE; ALSO, PLEASE NOTE THE TYPE OF ANTENNA SYSTEM USED, AND ITS HEIGHT ABOVE GROUND. WE BEGIN THIS ISSUE WITH A REPORT ABOUT 160 METER QRPP. WE HOPE TO PROVIDE AS WIDE A HAM BAND COVERAGE AS REPORTS ALLOW. EVERYONE WHO HAS WORKED QRPP CAN AND SHOULD REPORT FOR THIS SECTION. FURTHER, MAKE NOTE OF BAND.

DE. . . K8EEG, ADE WEISS, ATHENS, OHIO 45701. 500MW DOUBLE SIDEBAND, 160M, 1800' LONGWIRE UP 70 FEET. 1968 ENTRIES.

DATE	TIME	STATION WRKED	UR POWER	SIG RPT	DISTANCE	KM/W
11/27	0203Z	K1PBW/8	500MW	59 PLUS 50	1MI	
	0203	W9UCW	500MW	55	365MI	.740
	0208	K9SVL	500MW	55	320	.640
	0445	WA4RGH	500MW	56	245	.490
	0445	W2ITN	500MW	55	435	.870
	0550	W9UCW	500MW	55	365	.740
	0550	K9CQV	500MW	59 P. 10	375	.745
	0550	K9DUA	500MW	59 P 15dB	325	.643
11/29	0208	K2ANR	500MW	57	250	.500
	0345	W2FJ	500MW	57	325	.643
12/6	0110	W2BXU {C.W.}	500MW	569	330	.643
	0120	W5KG {C.W.}	500MW	549	925	1.850
	0134	VE3DU {C.W.}	500MW	559	470	.940

K8EEG/Ø, MECKLING, SD. 80 METERS, 1300' LONGWIRE UP 80 FEET. 1970.
3/20 0530 P.2VD 1.27W 559 1430 1.130

DE. . . K40CE, BOB ROSIER, GREENSBORO, NC. 20 METERS. 4 ELEMENT QUAD UP 38 FEET. 1969 ENTRIES. DISTANCES ROUNDED OUT. '0CE-MINIRIG'

DATE	TIME	STATION	UR POWER	SIG RPT	DISTANCE	KM/W
4/15	0150Z	AP5HQ	7W	569	7000	1.000
3/9	0245	005LX	7W	569	6000	.855
3/22	0353	ZL2AFZ	3.0MW	329	8000	2,680.0 KM/W
5/25	0141	UL7KFE	7W	569	6000	.855
5/11	0311	TA2E	7W	599	5000	.715
4/15	1135	JA2BVL	4W	559	16000	L-P 4.000
7/17	0200	3V8NC	7W	579	4500	.690
4/27	0115	VU2LE	7W	569	6000	.855
4/7	2355	SU7IM	7W	579	6000	.855
4/16	1110	VQ8CPR	7W	599	10000	1.425

DE. . . W2BIV, DR. M.J. BILLINGS, BROOKLYN, NY. 40 METERS. FULL WAVE CENTER FED 40 METER ZEPP WITH OPEN FEEDERS 135' LONG. PM-1 RIG. 1970.

DATE	TIME	STATION	UR POWER	SIG RPT	DISTANCE	KM/W
2/19	2000EST	W8MCO	2W	469	500	.250
2/19	2000	K6EIL/2	2W	469	142	.071
2/19	2000	WA3JVE	2W	579	175	.087
2/19	2340	W8TZZ	2W	569	550	.252
2/20	0815	W2TKG	2W	569	165	.083
2/20	2008	W9CZI	2W	579	830	.415
2/23	0812	VE3GGU	2W	579	320	.160
2/23	0828	W3JMJ	2W	599	95	.004
2/23	1645	WA2JEQ	2W	569	235	.085

DE. . . WØRHI, AL KELLER, ST. PAUL, MINN. 160 METERS.
1/15 0435Z K8EEG/Ø 100MW 449 270 2.700

WE HOPE THAT YOU HAVE ENJOYED THIS ISSUE OF THE MILLIWATT! HELP US IMPROVE IT BY SUBMITTING A REPORT OF YOUR ACTIVITIES, RIG, WAS QRPP STANDING, COMMENTS, AND ARTICLES. THE MILLIWATT IS A QRPP MAGAZINE WRITTEN BY QRPP OPERATORS, AND IT WILL BE ONLY AS GOOD AS YOU FELLOWS MAKE IT! SO, BEFORE PUTTING THIS ISSUE AWAY, WRITE US. IF YOU DON'T KNOW WHAT TO WRITE, THE FOLLOWING QUERY LIST WILL HELP YOU.

NAME-ADDRESS-CALL. HOW LONG HAVE YOU BEEN INTERESTED IN AND USED QRPP? WHAT IS THE CHIEF INTEREST THAT QRPP HOLDS FOR YOU?--THE CHALLENGE AND THRILL OF QRPP QSO'S, EXPERIMENTING WITH TRANSISTORS, DESIGNING AND BUILDING TRANSMITTERS AND ANTENNA SYSTEMS, EMERGENCY/PORTABLE OPERATION, DX QRPP, RAGCHEWING ETC?

WHAT QRPP RIGS HAVE YOU USED IN THE PAST? WHAT KIND OF RIG ARE YOU NOW USING? IF YOU'VE BUILT A QRPP RIG, EITHER TUBE OR TRANSISTOR, CAN YOU SEND US A SCHEMATIC AND PERHAPS A CONSTRUCTION ARTICLE ABOUT IT? WHAT ADVICE WOULD YOU GIVE TO A NEW QRPP'R ABOUT BUILDING A TRANSISTOR TRANSMITTER? ABOUT TUNING IT? HAVE YOU USED METHODS OTHER THAN A QRPP TRANSMITTER FOR OPERATING QRPP, SUCH AS COUPLING A REGULAR VFO TO AN ANTENNA, AND HOW HAVE YOU DONE IT? USED ATTENUATORS TO LIMIT POWER TO QRPP? DO YOU HAVE A DESIGN FOR A QRPP WATTMETER? WHAT PRECAUTIONS HAVE YOU OBSERVED IN GETTING THE MOST EFFICIENCY OUT OF YOUR TRANSMITTER AND ANTENNA SYSTEM?

WHAT TYPES OF ANTENNAS AND WHAT RESULTS WITH THEM HAVE YOU HAD IN QRPP WORK? WHAT WOULD YOU SUGGEST AS A GOOD ANTENNA SYSTEM AND HOW DO YOU EXPLAIN ITS SUCCESSFUL OPERATION? HAVE YOU MADE ANY OBSERVATIONS ON HOW A PARTICULAR ANTENNA SYSTEM WORKS UNDER VARYING CONDITIONS OF SKIP DISTANCE, TIME OF DAY, QSB ETC FROM YOUR ANTENNAS?

WHAT HAVE YOU FOUND TO BE THE BEST TIME OF DAY AND YEAR FOR QRPP OPERATION ON A GIVEN BAND? WHY? IF YOU USED QRPP DURING THE LOW PART OF THE SUNSPOT CYCLE, AND HOW DOES OPERATION DURING SUCH PERIODS COMPARE WITH OTHER POINTS OF THE CYCLE? HOW DOES THE SUNSPOT CYCLE OR SEASON AFFECT QRPP OPERATION ON A GIVEN BAND? HOW CAN A QRPP OPERATOR TAKE ADVANTAGE OF ANTENNA TYPE, SKIP DISTANCES, BAND CONDITIONS, AND PARTICULAR PROPAGATION PHENOMENON?

WHAT HAVE YOUR EXPERIENCES WITH QRPP REVEALED ABOUT THE POSSIBILITY OF DEPENDABLE QRPP OPERATION? HOW DOES QRPP PERFORM DURING A LONG PERIOD OF OPERATION SUCH AS A CONTEST LIKE FD OR SS OR GD? WOULD YOU JOIN IN WITH OTHER QRPP'RS DURING SUCH A CONTEST IN ATTEMPTING TO GATHER A HEAP OF DATA FROM WHICH WE CAN DRAW SOME CONCLUSIONS? HAVE YOU TRIED ANY WAY-OUT TYPE OF QRPP OPERATION, SUCH AS FROM A BALLOON OR A MINESHAFT, AND WHAT HAPPENED? HAVE YOU USED QRPP ON VACATION TRIPS OR OTHER PORTABLE TYPES OF OPERATION, AND WHAT POINTERS CAN YOU GIVE ABOUT ENGAGING IN QRPP OPERATION OF THIS TYPE? GO AHEAD AND TELL US ABOUT IT ALL!!! WE'LL EDIT YOUR REMARKS IF YOU WISH. IT IS IMPORTANT THAT YOU SHARE YOUR QRPP KNOWLEDGE WITH EVERYBODY!!!

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COMING IN FUTURE ISSUES: 1W VFO 7 MC RIG FROM W8BMCQ; ANOTHER POWER SUPPLY, AND A COUPLE OF TRANSISTOR RIGS FROM W8CM; A 7MC 7W RIG FROM W2UUV; ANOTHER 7MC 7W RIG FROM W911L; A 6CL6 VFO RIG FOR 160-40METERS FROM K8EEG/0; A 2W TRANSISTOR RIG FOR 40/20/15 METERS VFO FROM K8EEG; ARTICLES ON PROPAGATION FROM K6E1L/2, ABOUT HOW TO KNOW WHAT TO EXPECT FROM YOUR ANTENNA SYSTEM IN TERMS OF DISTANCE AND TIME OF DAY; OPERATING HINTS; MORE LOG REPORTS FROM 30/4-20/15 METERS; IN SHORT, SOME REAL INTERESTING STUFF. WE NEED A LOT MORE MATERIAL THOUGH TO KEEP UP THE QUALITY. GET BUSY AND WRITE IT UP!

CHECK INTO THE QRP NET ON 7080 kc SAT. 0100; 3553k SAT. 0430.

RETURN POSTAGE GUARANTEED

THE MILLIWATY
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to:

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