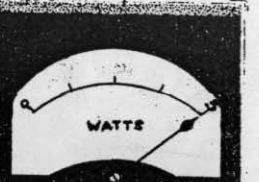
Power Measurement p. 5

QRP QUARTERLY



Journal of the QRP Amateur Radio Club International, April 1983, Vol 21, Number 2

HOT!!! SPRING QSO PARTY!!!

1983 QRP ARCI Spring QSO Party

by Fred Bonavita, W5QJM
QRP ARCI Publicity Chmn

DATES: 1200 UTC Saturday, April 23, 1983 to 2400 UTC Sunday, April 24, 1983. Participants may operate a maximum of 24 hours

Exchanges: Members give RS(T), state/province/country and QRP ARCI membership number. Non-Members give RS(T), state/province/country and power output.

Stations may be worked once per band mode for QSO multimplier credits. For example, the same station may be worked on 40 Meter CW and SSB for credit. Each member contact counts 5 (five) points, regardless of location. Each non-member U. S. or Canadian contact counts 2 (two) points. Non-Member stations other than W/VE count 4 (four) points.

Multipliers: (All power is OUTPUT)

2 - 4 to 5 Watts CW/8 to 10 W. PEP

4 - 3 to 4 Watts CW/6 to 8 W. PEP

6 - 2 to 3 Watts CW/4 to 6 W. PEP

8 - 1 to 2 Watts CW/2 to 4 W. PEP

10 - Less than 1 watt CW/Less than 2 watts PEP

More than 5 watts CW or 10 Watts PEP will be counted as check logs only.

Bonus Multipliers: If 100% natural power (solar, wind, etc.) with no storage, X 2. If 100% battery power, X 1.5.

Scoring: QSO points (total of all bands) times total number of states/provinces/ countries (a s/p/c may be worked on more than one band) times power multiplier times bonus multiplier (if any) equals claimed score. Send a large S.A.S.E. or IRCs (International Reply Coupons) to contest chairman for scoring summary sheet in advance of contest.

Suggested Frequencies:

CW: 1810, 3560, 7040, 14060, 21060, 28060, and 50360 KHz.

SSB: 1810, 3985, 7285, 14285, 21385, 28885, and 50385 KHz.

Novices & Technicians: 3710, 7110, 21110, and 28110 KHz.

No 30 Meter (10.1 MHz) contacts will be counted.

Calling Method: CQ CQ QRP DE (Call sign) or,

CQ QRP CONTEST DE etc.

Awards: Certificates to highest-scoring station in each state/province/country with two or more entries. All entries are automatically considered for Triple Crowns of QRP Award.

Logs: Suggest use of separate log sheets for each band for ease of scoring. Send full log data plus separate worksheet showing details and time(s) off the air. No log copies will be returned. All entrants desiring results and scores please include a large S. A. S. E. with one ounce of U. S. postage or IRCs. It is a condition of entry that the decision of the QRP ARCI contest chairman is final in case of dispute.

Deadline: Logs must be received by May 21, 1983; logs received after that date or missing information will be used as check logs.

Send all material to:

QRP ARCI Contest Chairman
William W. Dickerson, WA2JOC
230 Mill Street
Danville, Pennsylvania 17821 U.S.A.

**********WILL WE CU THERE?**********

Have you checked your subscription expiration date shown on your mailing label? The Quarter and Year that your QRP Quarterly subscription expires follows your membership number on the label. Take pity on the volunteer workers who produce your QRP Quarterly and RENEW EARLY!!!

*********STOP, LOOK, & LISTEN*********

Please note the correct starting time for the TCN is 0001 UTC, not 0100 UTC as previously noted*

**********NEVER GOODBYE**********
JUST BCNUL

QRP Quarterly is the official journal of the QRP Amateur Radio Club, International, Inc and ispublished four times a year: January, April, July, and October. The QRP ARCI is a non-profit organization dedicated to increasing world-wide enjoyment of QRP operation and experimentation (QRP, as defined by the club, is 5 watts output CW, 10 watts output PEP). Members agree to voluntarily limit their transmitter power to 50 watts output CW, 100 watts PEP, except for public service work, where higher power may be necessary. Current club membership is 5309, QRP Quarterly circulation is 711.

Initial membership fee of $6.00 ($7.00 for DX applicants) covers lifetime membership plus first four issues of the QRP Quarterly. Membership information is available from the secretary/treasurer (see roster below). Subscription renewals are $5.00 ($6.00 for DX Subscribers) for four issues. Expiration notice appears in red (rubber stamp) on the mailingcover of final issue. Expiration date also appears on mailing label, following QRP number: i.e. 4174-4/81 means member 4174's subscription expires with October issue, 1981 (or fourth quarter, 1981). Renewals must be received by secretary/treasurer by the 15th day of the month prior to month of publication for continuous service. Otherwise, renewal begins with the next issue. Send renewal notices, changes in call, or address changes to the secretary/treasurer (see roster below). PLEASE MAKE ALL CHECKS OR MONEY ORDERS PAYABLE TO: QRP Amateur Radio Club International, Inc. PLEASE DO NOT SEND CASH. New members will receive first issue following receipt of their application provided it is received at least 15 days prior to month of publication. Otherwise, their subscription begins with the next issue. Please include QRP # and Call on checks and M.O.s.

Letters to the editor are welcome. Not every letter can be published, and the editor reserves the right to edit letters to conform to space limitations. Those desiring a responsefrom the editor, officers, and Directors should enclose a SASE with their letter. Construction projects or articles of general interest are always welcome. Manuscripts should be typed, double spaced, and all circuit diagrams should be clear and include all parts values. The editor and club are not responsible for testing projects that appear in this publication. Pictures should be sharp, distinct, and Black & White. Size should be approximately 2" by 3", or a size that can be trimmed to one column size. Any requests for returned materials MUST be accompanied by return postage and envelope. Please include name, call, address, and phone number on all manuscripts and mailed to the editor.

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a peak inside

The Editor's Soapbox
by Terry M. Gregg, KA5EXI
QRP Quarterly Editor

We have one slot open for the Board of Directors (BOD). Please be sure to read the nominees' backgrounds on page 19 and vote for your choice. The layout is such that cutting out the ballot on page 20, if one desires, will only make one forfeit the nominee background on the reverse side. A facsimile can be used in lieu of the original.

If you haven't had (or taken) the chance to, please be sure to read the headline page regarding the April QSO Party. Note the dates and times on your calendar; put a note on your rig. We'll be trying to get up on 40 or 15, conditions permitting. Go for those awards!!! Be sure to get yourself credit for Ade Weiss' Milliwatt Trophy. His address is listed elsewhere this issue.

(Continued on Page 19)

The President Speaks
by Ed Popp, K5BOT
QRP ARCI President

The first part for the Triple Crowns of QRP, for this year, are now open. It is time for the Spring QSO Party. Thisyear, both modes CW and SSB will be used in the contest. As for myself, I plan to be active in both.

I am planning operations in both modes for about 20 minutes each. The remaining 20 minutes will be in the Novice/Tech frequencies.

I received a couple of comments about the last QSO Party from those who operate in the Novice/Tech bands. They heard no-one! I did operate in those bands also and even after calling CQ, nothing.

I have asked all Officers and Directors to spend a little time in the Novice/Tech bands so that our members that operate in these bands can get more contacts. I also ask each of you to spend a little time on those bands especially after a frequency has been bled of all its contacts. It beats calling CQ and hearing only those that you have already worked.

If you contact a station in the General portion of the band (CW), working him in the Novice/Tech band does not count...same mode, gang.

Now if you feel that you did pretty good in the Spring QSO Party, put yourself to the test with Field Day on the last weekend of June. Mark your entry QRP. It doesn't matter how many rigs you enter under, just that all are QRP.

The single transmitter, with many guys and gals, seems to be the most fun. It is a campout for us, so the kids have fun too. But let me warn you, it will test your skill.

I know of two groups that will be out in the field this year with only homebrew gear. Now that is a test. How about you?

And don't forget to send your entry in for Ade Weiss' "Milliwatt FD Trophy". Two contests for the work of one.

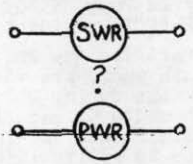
Down here, Southwest, we have a third award, the "Texas Travelling Trophy" to shoot for. Only problem down here is that we have to face some groups later in the "what happened to you" bit. And please remember that the 30 Meter band is NOT a contest band.

Let's give a hearty welcome to Gary Beam, WA9WZV, our new Vice President. Gary is very active in TCN and is also the WQF representative for QRP ARCI and a Director. If you would like to meet Gary, check into the TCN.

You may recall that 10.106 MHz was suggested as a calling frequency for 30

(Continued on Page 19)

Letters From The Readers:



Dear Terry,

My XYL and I confess! We're the ones having the HW-8 with 1.28 Watts output, as mentioned by Luke Dodds, W5HKA, in his Letter to the Editor. Luke was the XYL's last QSO in the recent QRP Contest.

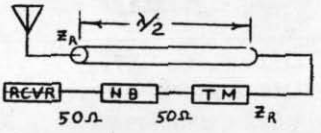
Our power output was measured using an 0-400 milliwatt power meter and an attenuator, both 50 ohms impedance; thus, 1.28 watts corresponds to 320 milliwatts after 6 db of attenuation. The power meter was manufactured by M. C. Jones and the attenuator by Kay Electronics. Both devices were left over from my days of telemetering scientific data from high altitude balloon flights. The calibration of the power meter (and a spare) was checked in a standards laboratory just before my retirement.

Incidentally, we calibrate the output of the HW-8 on each of the bands for B+ voltages (key down) ranging from 10V to 14V. On a field trip, this enables us to check the power output at the time of a fantastic DX QSO by simply measuring the supply voltage from our tired, aging battery.

On the subject of QRP power and antenna measurements, we find a noise bridge, such as the one sold by Palomar Engineers, of great value. The dial calibration, as purchased, is not accurate and has to be established independently using a number of resistors, having values known to a precision of a few percent.

Another item most helpful is a piece of RG-58/U coax, just one-half wavelength long at the average operating frequency (e.g., 21.1 MHz for 15 Meters). Of course, the half-wavelength is based on the velocity factor of the cable (o.66 for polyethylene and 0.79 for foamed polyethylene). When connected to the balun of a dipole or inverted V, the input impedance Z_s at the end of the line in the shack is the same as the impedance Z_R at the feedpoint of the antenna. The input impedance Z_s is then measured using the noise bridge. This enables one to find the SWR on the feed line of impedance Z_o, i.e., Z_s/Z_o or Z_o/Z_s if Z_s is essentially resistive. The power loss due to SWR on the line may then be minimized by replacing the first half-wavelength coax by another half-wavelength coax having an impedance closer to that of the antenna. For example this would involve using RG-59/U if the antenna feed point impedance of a dipole were closer to 75 ohms than 50 ohms.

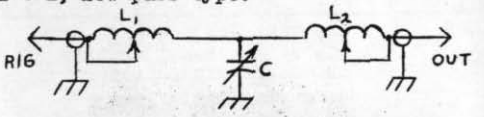
Now, at QRP the antenna can be well matched to the output impedance of the rig by using a transmatch and the noise bridge, now set at the output impedance of the rig (50 ohms):



Thus, simply by varying the transmatch controls until a noise null is established, the impedances are matched. That does it ! CAUTION: If one uses a transceiver in the receiver-mode, by all means YANK out the key plug before starting to carry out this step; otherwise, one risks frying the noise bridge with an accidental dot or dash.

All of the above can be done easily on a QRP field trip, thus giving a means of getting the most out of all those precious milliwatts!

Speaking of transmatches, we like the L-C-L, low-pass type:



For L_1 and L_2, we use about 6 microhenries (24 turns, 1" dia and 2" long), with multiple taps to a ceramic rotary switch, and C is 325 pf. This transmatch handles the impedance encountered with the usual dipoles and inverted V's, at home and on field trips.

Another technique for determining the power output involves measuring the RMS voltage across a calibrated load resistor by means of an HF scope (with an internal precision calibration).

We hope this information is helpful.

73, Robert, N7DGZ &
Mary Lou Brown, N7DHA
504 Channel View Drive
Anacortes, Wa 98221

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From W9SCH...

I was particularly interested in Luke Dodds', W5HKA letter in January 1983 of QRP Quarterly. In response to this, may I report that an "SWR-Bridge" is neither necessary nor desirable for measuring QRP-level RF output in my opinion. What is most effective here, I've found, is a simple "Dummy-Load" equipped with an RF Voltmeter. There are such things available on the market but these are precision instruments at princely prices, totally unnecessary for amateur use.

Simple QRP RF output meters of this sort have been frequently described in the Quarterly, Sprat, and other QRP magazines. In the full face of being considered redundant, I describe the one I use below:

This is just a simple "Peak-Reading" RF Voltmeter calibrated to read average sinusoidal AC power (Real Working Watts). This meter theoretically reads up to 7.3 watts - plenty for QRP work

If you wish to plot a calibration curve for this thing, use the equation:

Meter reading, I_{dc}, Milliamps = $\sqrt{\frac{P \text{ watts}}{2.7}}$, or use the table below:

RF Watts	I_{dc}, ma
0.0	0.00
0.1	0.12
0.3	0.20
0.5	0.26
1.0	0.37
3.0	0.64
5.0	0.83
7.4 (Max)	1.00

A derivation of the above formula is:

$$P_{av} = \frac{E^2}{2R}, \quad E = \sqrt{2RP}$$

$$E = 10.\sqrt{P}$$

$$I_m = \frac{E \times 1000}{27000} = \frac{10\sqrt{P} \times 1000}{27000}$$

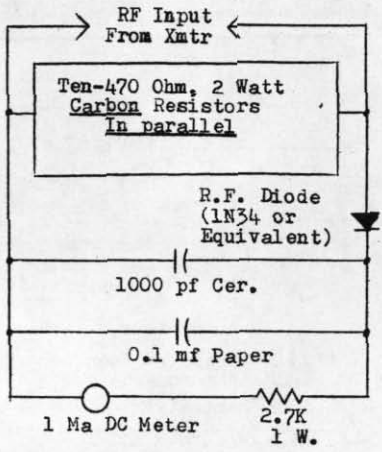
$$I_{ma} = \frac{\sqrt{P}}{2.7} \qquad \text{Q.E.D.}$$

If you plot this upon two-cycle logarithmic graph paper, you should get a nice straight line, easy to read., or mark the power readings directly on the meter dial.

To use this thing, just connect your transmitter to the input terminals and tune it up to the usual operating power unput. The meter will then indicate the power output. This should be very close to that power supplied to your antenna or tuner.

This is not a precision instrument, your old physics professor would sniff his nose at it (or would he?). But it is amply precise, probably plus or minus 20% or better, for amateur work. This is within one decibel, a difference undetectable by ear. Mechanical details of construction are up to you but keep the leads as short as you can.

What is the cost of this instrument? Probably about that of a medium-priced meal at the local restaurant for you and the XYL, -- or less if you have a good junk box.



Every earnest QRPer should have one of these, or its equivalent, in his shack. If you haven't one, build one today..... 73, C.F. Rockey, W9SCH

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Dear Terry,

Re January 1983 QRP Quarterly QRP-SWR meter.

I use an MFJ 832 QRP SWR Meter. It has two ranges - Ø-2 watts and Ø-20 watts. It works well and I calibrated it against a Bird 43 wattmeter on the 20 watt range and find it acceptable. The only fault I can find with the 832 is its size. Harris Adelman, K6IB

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(I) have been off the air since May, which was when we moved from a ranch to our present location. Seems like there is always too much to do to get to putting my antennas up again, but at least I have three poles up, so far, and am just finishing a water tower, which I made higher and larger than is usual with the idea that my 6 meter antenna can go on it and maybe even a radio shack, which I would like to make like an airport tower, but think maybe that is too frivolous. I have separate yagis for 2, 10, 15 and 20 Meters besides the 6 meter job, so you can see there will be a lot of work.

Now is the rainy season, when everything becomes humid and full of mildew or mold, like the piece of apple pie I just pulled out to steal a bite from.

Hope this QTH is as good as the last one, propogation-wise. We are 88 feet from the high water mark of the south shore of the Amazon River, which at this point, at the mouth of it, looks like an ocean. We are also located on an island. 73, Fred Coates PY8ZLC, K4LC

(Continued on Page 16)

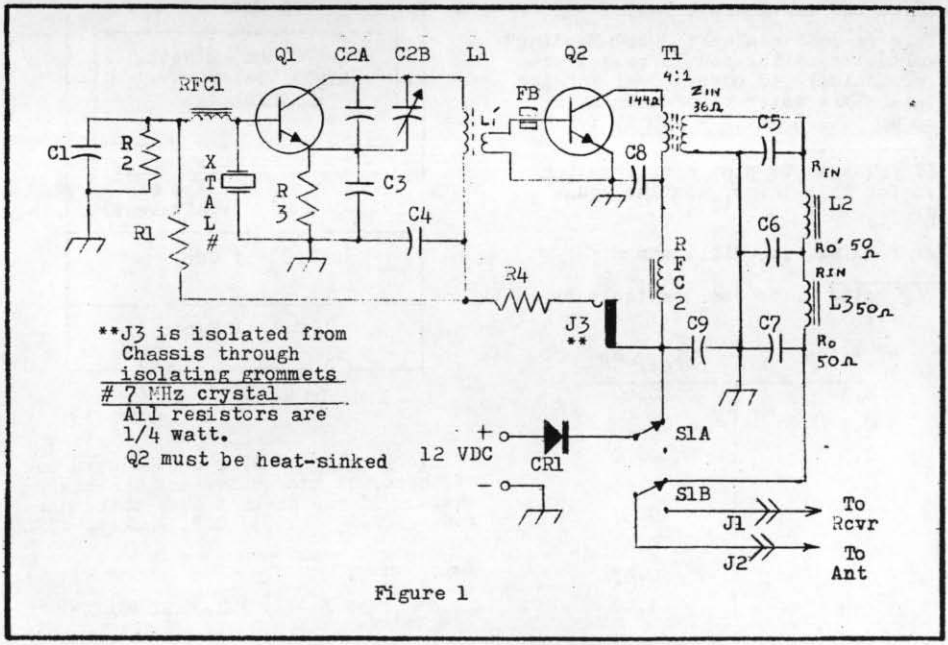

Figure 1

A 40 Mtr Xmtr

by Antoine F. Galindo, AC6G
10941 Allen Dr.
Garden Grove, Ca. 92740

There are two facets of ham radio I enjoy the most, building my own and running QRP. I build several low-power rigs that appeared in different QSTs or other magazines. Despite the good results I got with those little inexpensive rigs, I felt I was missing part of the fun, using somebody else's ideas. In the past QST published a series of good articles, "Learning to work with semiconductors " (April, May, July, August, September, October 1975) that would help any hams with some elementary algebra knowledge, to design their own.

So, leaving the soldering iron to cool off for a while, I switched to the slide rule and decided that my next rig would be something different: a crystal controlled two-stage solid-state running not more than half-watt output on 40 Meters. I decided to use a 2N2222 for the oscillator and a 2N2219 for the power amplifier. Referring to the article in QST (1) I began the design for the oscillator. I read the instructions step-by-step and came with what follows (See figure 1). All computations are slide rule accurate or rounded off.

The B plus or Vcc is 12 VDC and I chose that the oscillator will run about 80 mws (P.oe).

Small signal input power of the oscillator:

P.ie - P.oe X 1.4 or 80 mws X 1.4 equals 112 Mws.

Collector Current. Ic equals W/Vcc:
-Ic equals 0.112/12 equals 9.35 ma.

Operating point of Q1. Q point is 9.35 ma., 12 VDC.

Collector signal current of Q1, Ic equals Ic X 1.7.
Ic equals 9.35 ma X 1.7 equals 16 ma.

R.F. Output voltage of Q1. Eo equals 2 P.oe/Ic.
Eo equals $\frac{2 \times 8 \times 10^{-2}}{1.6 \times 10_{-2}}$ equals 10 V.

Collector Impedance of Q1 equals Z1 equals $2\ P.oe/Ic^2$

$Z1_{Q1}$ equals $\frac{2 \times 8 \times 10^{-2}}{(1.6 \times 10^{-2})^2}$ equals 625 ohms

The reactance of the tank coil XL_1 is obtained by -

XL_1 equals $(Eo^2/2P.oe) \times 0.1$

XL_1 equals $(10^2/2X8X10^{-2}) X0.1$ equals 62.5 ohms, rounded off to 63.

(Continued Next Page)

The transmitter being designed for the 40 Meter band, I use the figure of 7.1 Mhz for finding the values of L_1, L_2, and L_3.

L_1 equals $XL_1/2X(Pi)XF$

L_1 equals 63/2X3.14X7.1 equals 1.4 μh.

Instructions to use toroids for tank circuit design were found in a very interesting article in Ham Radio (2). L_1, L_2, and L_3 use an Amidon T37-2 toroid. The formula to find the number of turns of wire for a given inductance is: N equals K$\sqrt{L}$ where N is the number of turns; K is the coefficient of toroid material (15.09667411 for T37-2); $\sqrt{L}$ is the square root of inductance in μh.

The number of turns for L_1 will be

N equals 15.10X$\sqrt{1.4}$ equals 18 turns of enamelled #24 wire on a T37-2 toroid.

To sustain oscillation, the positive feedback voltage Vfb is 25 percent of Eo.

Vfb equals 0.25 X 10 equals 2.5 Volts.

The bias across R_3 is equal to 2 Vfb which gives 2X2.5 equals 5 volts.

From this we get the value of R_3,

R_3 equals E/Ic -

R_3 equals $5/9.35X10^{-3}$ equals 534 ohms (value used is 510 ohms).

Drop across R_3 is $510X9.35X10^{-3}$ equals 4.76 volts.

Base resistor R2 is given by R2 equals R3X3

R2 equals 5.0X3 equals 1530 ohms (Value used is 1500 ohms)

Base-Emitter Junction Voltage is Vfb/2 equals 2.5/2 is 1.25 volts.

The base bias is obtained by subtracting the voltage at the emitter junction from the voltage developed across the emitter resistor R3: 4.76 - 1.25 equals 3.51 v.

Voltage across base resistor R1 is Vcc - Vr3 equals 12 - 3.51 equals 8.5 volts (rounded off).

Current taken by R2:

IR2 is Base Bias Voltage/R2

IR2 is 3.51/1500 equals 2.34 ma.

Total current taken by R2 will be:

IR2 plus Emitter base junction (ballpark figure of .5 ma)

$IR2_t$ is 2.34 plus 0.5 equals 2.84 ma.

So R1 will have a value of 8.5/2.84X 10^{-3} equals 3,000 ohms

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The values of C2 and C3 were found by using the formula:

C_t equals $1/4(pi^2LF^2)$ equals -

$1/4(3.14^2X7.1^2X10^{12}X1.4X10^{-6})$ equals 360 pf.

C2 is approximately Ct(Vfb plus Eo/Eo

$3.6X10^{-10}$(2.5 plus 10)/10 is 450 pf.

C3 is C2X3: 450pfX3 equals 1350 pf. (value used is 1300 pf)

XC_1, XC_4 equals 5 ohms.

C1, C4 equals 1/2PiFXc equals 1/2X3.14X7.1X10

XC_1, XC_4 equal 5 ohms.

C1, C4 equal 1/2FXc equals

$1/2X3.14X7.1X10^6X5$ equals 0.0045 μfd (value used is 0.005)

$Xrfc_1$ equals 2,000 ohms

rfc_1 is approximately equal to -

$Xrfc_1/2PiF$ equals $2K/2X3.14X7.1X10^6$ equals 45 μh (minimum)

- - - - - - - -

Now for the power amplifier. I followed the instructions from QST (3). As mentioned earlier, the final will have a power output of 500 mw. The collector impedance of Q2 is given by:

ZQ1 equals $Vcc^2/2Poe$.

$12^2/2X0.5$ equals 144 ohms.

I decided to use a step-down matching transformer T_1 with a 4:1 ratio, which would bring down the collector impedance of Q1 from 144 to 36 ohms and design a broadband half-wave harmonic filter that will match the 36 ohms from the secondary of T_1 to the 50 ohm load represented by the antenna.

T_{1Pri} reactance must be equal from 5 to 10 times the collector impedance of Q2. I chose a value of 7 (ZQ2)(7) equals 144X7 equals 1008 ohms. 8 turns of #24 enamelled wire on a FB 2401-43 Amidon bead gives roughly this value (not critical). The collector impedance of Q2 must be stepped down from 144 to 36 ohms. The secondary turn ratio is equal to the square root of the impedance ratio to be matched:

AQ2 (144)/Zin (or Rin) (36) equals 4;

$\sqrt{4}$ equals 2;

T_{1Sec} equals $T_{1Pri}/2$ equals 8/2 equals 4 turns.

T_{1Pri} equals 8 turns, T_{1Sec} equals 4 turns.

Both windings cover the entire toroid in the same direction.

We will refer to the following formulae for finding the values of the half-wave harmonic filter:

Rin' is 36 ohm Ro' is 50 ohm

Rin is 50 ohm Ro is 50 ohm

XC6a is Ro'/Q equals 50/1 equals 50 ohm

(Continued on page 8)

(Continued from Page 7)

XC6b is $1/2\pi FX_{c6}$ equals

$1/2X3.14X7.1X10^6X50$ equals 450 pf.

C6 equals C6a plus C6b equals 450 plus 450 pf equals 900 pf.

XC5 equals:

$$Rin'\sqrt{\frac{Ro'/Rin'}{(Q^2+1)-(Ro'/Rin')}}$$

$$36\sqrt{\frac{50/36}{2-(50/36)}}$$ equals 55 ohms

C5 equals $1/2\pi FX_{c5}$

$1/2X3.14X7.1X10^6X55$

equals 410 pf.

XL2 equals $\frac{QRo' + (Rin'Ro'/XC5)}{Q2+1}$

$\frac{50+(36X50/55)}{2}$ equals 41 ohms

L2 equals XL2/2πF

$41/2X3.14X7.1X10^6$

equals 0.92 μh

XC7 equals:

$$Rin\sqrt{\frac{Ro/Rin}{(Q^2+1)-(Ro/Rin)}}$$

$$50\sqrt{\frac{50/50}{2-1}}$$ equals 50 ohms

C7 equals $1/2\pi FX_{C7}$

$1/2X3.14X7.1X10^6X50$ equals 450 pf

XL3 equals

$\frac{Qro + (RinRo/X_{C7})}{Q^2+1}$ equals

$\frac{1X50+(50X50/50)}{1+1}$ equals 50 ohms

L3 equals XL3/2πF

$50/2X3.14X7.1X10^6$ equals 1.12 μh.

As mentioned earlier, two T37-2 toroids were selected for L2 and L3, and from the formula N equals $K\sqrt{L}$, we find out we need for L2:

N equals $15.1\sqrt{0.92}$ or 14.4 turns. Rounded off to 14 turns of #24.

For L3: N equals $15.1\sqrt{1.12}$ or 16 Turns.

For RFC1 and RFC2 I wound some turns of #24 enamelled wire on a 2401-43 Amidon ferrite bead until I got the right value of inductance as shown on an L/C bridge; the easiest way when you don't know the formula.

\- - - - - -

Well, after the design was completed, I built the rig on a 2X4 inch piece of aluminum, using the point to point soldering method. The last connection still warm, I put the rig under test using a 50 ohm 1 watt carbon resistor as a load at the antenna connector, adjusted C2 for maximum output and good keying while monitoring on the old HBR-16.

Checking the output with an R.F. Probe connected to the VTVM gave me a reading of 5 v. RMS resulting in a power output of: P equals E^2/R or $5^2/50$, or ½ watt.

Finally I put the rig on the air and my first CQ was promptly answered by W6NBG in San Francisco, about 500 miles away who gave me a 5-8-9 RST; second call was answered by W7CV in Boulder City near Las Vegas (Nev) about 250 miles away with 5-6-9. The best DX so far has been VE4AAQ in Manitoba with 5-5-9. I never tell the other "OM", for at least two transmissions what I am running and, until I get my signal report. I feel it is the only sure way I can get an honest RST. My antenna is a random wire of about 60 feet, using an antenna tuner. Its height is only ten feet above the roof of my mobile home and approximately twenty feet above ground. I use the shell of the trailer for ground in conjunction with an 8 foot rod driven into the ground. Being my first attempt in design I understand that this rig couldn't be perfect and could be improved by more experienced amateurs. A W6 friend of mine wanting to try QRP built the same rig and was thrilled when he made a contact with Texas.

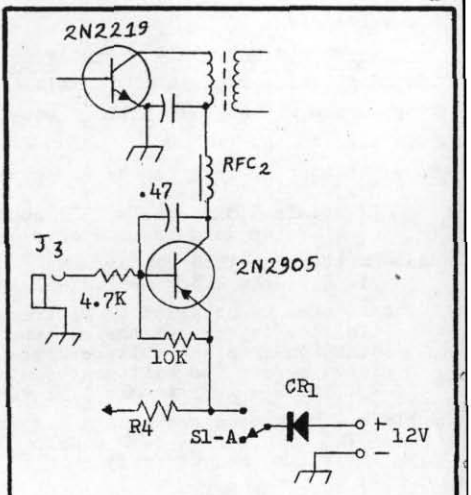


Figure 2

If one desires to use a keyer or keep J3 grounded he may incorporate a switching transistor (Circuit found on "Solid State Design for the Radio Amateur", ARRL).

Endnotes:

[1] QST, April, '75, Pg 21.

[2] Ham Radio, February, '72.

[3] QST, July, '75, Pg 30.

(Parts List Page 18)

CALL	DATE	BASIC	ENDORS. - MILES/WATT - NOTES	POWER	MODE	BAND
			- DXCC -			
N8CQA	1-29-83	57C		5.0	MIX	MIX
WD6EKR	2-21-83	58C	ONE MODE, ONE BAND, MOBILE	4.0	SSB	15m
KA3CRC	2-28-83	59C	ONE BAND	3.0	MIX	10m
			- W.A.C. -			
JH1KRC	12-27-82	431C	ONE BAND	1.0	MIX	20m
WD6EKR	2-21-83	432C	ONE MODE, ONE BAND, MOBILE	4.0	SSB	15m
NØBYC	2-28-83	433C	ONE BAND	5.0	MIX	10m
			- W.A.S. -			
KA9JKK	12-27-82	191C	50 STATE SEAL - NOVICE	5.0	CW	MIX
W5HKA	1-24-83	198C	50 STATES	5.0	CW	MIX
N5EM	1-24-83	197C	30 STATE SEAL	2.0	CW	30m
KE6VY	1-24-83	199C	20 STATES	2.0	CW	MIX
KB9KX	1-29-83	200C	20 STATES	5.0	CW	MIX
NØBYC	2-28-83	179C	40 STATE SEAL, 2-WAY QRP	5.0	MIX	MIX
NØBYC	2-28-83	180C	30 STATE SEAL	5.0	MIX	80m
NØBYC	2-28-83	201C	20 STATES	5.0	CW	30m
KA7KLH	2-28-83	202C	20 STATES	2.0	CW	MIX
N5CNH	2-28-83	203C	20 STATES	MIX	MIX	MIX
WD4SMH	2-28-83	204C	30 STATES	2.0	CW	MIX
KA6UTU	2-28-83	205C	20 STATES, NOVICE	2.0	CW	15m
			- QRP-25 -			
W5HKA	12-27-82	952	BASIC & "50" SEAL #509			
W2JEK	2-21-83	953	BASIC			
			- 1000-MILE-PER-WATT -			
N7DHA	12-27-82	789	TO W3QWW 1,021 M/W	2.1	CW 624	40m 132
WA2BTG	12-27-82	790	TO OZ1GCC 1,857 M/W	2.0	CW 625	10m 134
JH1KRC	12-27-82	791	TO EA6HI 6,570 M/W	1.0	SSB 118	20m 192
JH1KRC	12-27-82	792	TO LU1EWL 11,417 M/W	1.0	CW 626	20m 193
KA7MNZ	1-24-83	793	TO VK4NPK (NOVICE) 1,589 M/W	5.0	CW 627	15m 277
VE6ER	1-24-83	794	TO VKØKS 5,723 M/W	2.0	SSB 119	20m 194
N4BP	1-24-83	795	TO 3B8CF 194,800 M/W	.05	CW 628	20m 195
W5HKA	1-24-83	796	TO N7DHA (2-WAY QRP) 1,362 M/W	1.25	CW 629	20m 196
WB5YVG	1-29-83	797	TO KZ5OJN 1,773 M/W	1.0	CW 630	15m 278
KA2KMU	1-29-83	798	TO N6EZC 1,269 M/W	2.0	CW 631	20m 197
W3UCS	1-29-83	799	TO VK5DP 10,356 M/W	1.0	CW 632	20m 198
WB7OJV	1-29-83	800	TO WB9WOM (2-WAY QRP) 1,681 M/W	1.0	CW 633	20m 199
KB9KX	1-29-83	801	TO KE6WH 1,713 M/W	1.0	CW 634	15m 279
WBØBEK	1-29-83	802	TO W6VD (1st 30m) 1,764 M/W	.90	CW 635	30m #1
JR3ELR/Ø	1-29-83	803	TO JH7YZN/7 1,110 M/W	.20	SSB 120	2m 10
SM6HQK	1-29-83	804	TO JAØDAI 2,038 M/W	2.5	SSB 121	15m 280
K4TWJ	1-29-83	805	TO YJ8IR 1,916 M/W	4.0	SSB 122	10m 135
KB3ND	2-21-83	806	TO ZL3AGI 3,582 M/W	2.5	CW 636	20m 200
WD6EKR	2-21-83	807	TO ZS5SP (MOBILE) 2,698 M/W	4.0	SSB 123	15m 281
WD6EKR	2-21-83	808	TO F9YZ (2-WAY QRP) 1,409 M/W	4.0	SSB 124	15m 282
N6HY	2-21-83	809	TO KD5OB 21,597,015 M/W (DISTANCE CHAMP FOR THIS QTR.)	67uW	CW 637	10m 136
KD5OB	2-21-83	810	FROM N6HY 21,597,015 M/W	67uW	CW 638	10m 137
W2JEK	2-21-83	811	TO UA9NN 2,761 M/W	2.0	CW 639	20m 201
W2JEK	2-21-83	812	TO YU4GYZ 2,229 M/W	2.0	CW 640	40m 133
WD4SMH	2-28-83	813	TO KA6IYE 1,155 M/W	2.0	CW 641	15m 283
KA6UTU	2-28-83	814	TO KH6OU (NOVICE) 1,291 M/W	2.0	CW 642	15m 284
KA1CZF	2-28-83	815	TO CT3BZ 1,550 M/W	2.0	CW 643	80m 31
			- NET -			
			NONE ISSUED			

Club Awards Update

by Bill Harding, K4AHK
QRP ARCI Awards Manager

21.5 Million Miles Per Watt

On January, '83, all records for KM/W were broken with a micro-power QSO from California to Oklahoma that yielded 21,597,015 miles per watt. Taking advantage of a peak in ten meter propogation, Dan Lewis, N6HY and Charles Ebert, KD5OB, managed a CW contact while Dan was running 67 microwatts output.

Dan was using an Argonaut 505 into an attenuator and measured power output with an R.F. Voltmeter. His antenna was an obvious aid. Dan fed open wire line to an East-West V-Beam having legs about 115 feet long.

(Continued on Page 20)

CQ QRP TCN

by Gary Beam, WA9QZV/4
QRP ARCI Vice-President

QRP TCN is the Transcontinental QRP Net that meets each Sunday evening at 0001 UTC (Monday) on 14.060 MHz. It is an informal gathering of club members and QRP enthusiasts designed to meet one another, ask and/or answer questions about club activities, and provide QSOs to fulfill requirements needed by QRP award hunters. Regular check-in stations span the country from coast to coast, from Lake Michigan to the Gulf, and even an occasional DX QTH.

The way to find QRP TCN is to listen for the Net Control Station (NCS) who calls CQ QRP TCN during the first ten minutes of scheduled net time. When he asks for QNIs (Net Check-Ins), just give him a call. Don't despair, more than one QNI attempt may be needed because of QRM, and in case the NCS cannot copy your QNI attempt, other check ins are always around to help out by relaying (QSP?) your call. Once the NCS has acknowledged all QNI requests, he will begin the net by listing all the stations (QNS) that have checked in, introduce himself by name/QTH/ QRP #, and then pass it to the next station on the list. After this introductory round of QSOs, and a quick CQ TCN by the NCS for late arrivals, each QNI station gets a chance for questions, comments, or QSO requests. Eventually, the net must come to an end, so the NCS will QNF (Net is Free) for the night.

Lately, TCN has turned into a "Business meeting" among club officers and directors. Regular check-ins include K5BOT (the Prez), K4AHK (Awards Mgr), WD4LOO (Sec-Tres), W5QJM (Publicity), W6RCP (B.O.D.) and myself. But these guys want to meet and hear from you the club members, so let's get together on TCN.

73 and hope CU on TCN/Gary WA9WZV/4

********DON'T FORGET--QNZ NCS*********

ICOM 730 PERFORMANCE REPORT

by Tom Fleming, WA4N (Ex-K4HMD)
1634 Baywinds Lane
Sarasota, F. 33581

I just read the letter from Mike Kilgore, KG5F, in the January 1983 Quarterly. I would like to add some comments regarding the "new QRP rigs" from ICOM - the 730 and 740. I have the 730, and have been using it as my primary rig for about six months. Mike is correct about it being easy to hold maximum output to 50 watts by flipping a slide switch under the cover. Your readers should be aware that the top cover has to be removed to access this switch. When this is done, the minimum output then becomes about one watt. The user can then obtain any output between 1 and 50 watts by monitoring output with a power meter and adjusting the front panel "RF Power" control. I find this somewhat inconvenient since I like to keep my power output near five watts for most operating, and switch easily back and forth between 5 and 50 watts.

To solve this, the minimum power can be adjusted by removing the top cover and adjusting R149 (See page 23 of the manual for its location). R149 is called "Transmit 10W Adjust" in the manual. All you have to do is hold your CW key down and adjust this control while monitoring output on a power meter. After this is done, you will have 5 watts at the minimum setting of the RF Power control, and 50 watts at the maximum setting. Getting the correct power level is now merely a matter of rotating this control, and I do not have tomonitor output with a power meter unless I want some intermediate setting. Incidentally, if you use 14 MHz for this adjustment, then power on all other bands will be at 5 watts or slightly less.

I find this rig to be an excellent performer in spite of the lack of QSK. I would suggest that any readers who decide to go for the ICOM rigs consider an alternate power supply. The ones from ICOM leave a great deal to be desired. I use an Astron RS-35 which will handle the full power of the 730. If you use the 50W maximum, you might be able to use the lower cost RS-20. An advantage of these supplies is that they can be used to power accessories such as filters or power meters as well as the rig.

As Mike points out, the 730 will cover the new bands, but as received from ICOM, transmit is disabled on the three new bands. To enable transmit, you must cut a small green wire on the RF unit. The location of this wire is shown in Figure 7.2 on page 23. This procedure is not described elsewhere in the manual.

I hope this information will be helpful to other QRPers. I will be happy to sched any reader who would like to discuss this further on either SSB or CW. 73, Tom, WA4N

********QRP: AROUND THE WORLD AROUND THE CLOCK**********

Time At A Glance

Ever wonder what the time is during a QSO with your hands tied up to look at the trusty watch? Try a "Stick-On" clock. Prices range from bargain $2 on up and "supposedly"last a year. At that price, perhaps more than one could be afforded. Simply slap one on the front of the rig and leave it. Except in the dark, the time will be available at a glance. Simply set it for UTC and leave it. Try it...

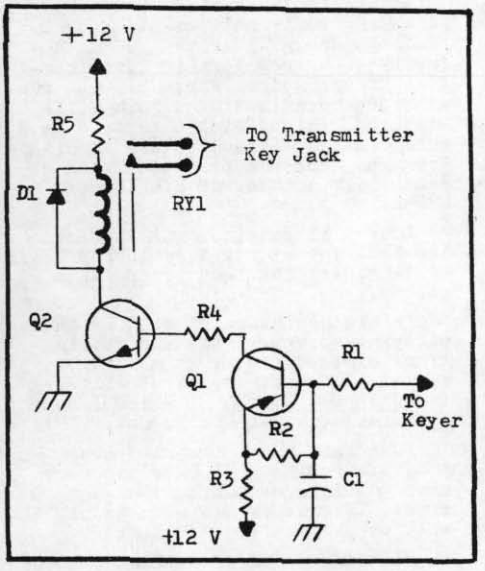
TICK-TOCK--QRP-AROUND THE CLOCK*

Keyer Interface

by Michael Bryce, WB8VGE

How many keyers do you have laying around in the shack? Well if you're like me, that may add up to quite a few. With the popularity of the low power CMOS chips many keyers now use transistor switching. This is fine and many transmitters will work with this. However, my Ten-Tec Argonaut does not like the Heath uMatic Keyer. The transistor switching will make the receiver pop and the agc to pump. The older Argonaut did the same thing with some of the other keyers that I had here. Both rigs require that the key line sees a low-impedance line.

Well, to get by this and not wanting to get inside of the Heath Keyer, I came up with this simple circuit. It will allow the keying of most any type of rig and will not call for modifications of either the transmitter or the keyer being used at the time.



Let's take a look at Figure 1. This is super simple. Just two transistor switches and all the pops and noise are gone. To start off with, Q1 is normally off. When the base of Q1 is pulled low by the output of whatever keyer is used at the time (to ground) it will turn on. This will apply base voltage to Q2. Q2 turns on and the relay is pulled in, keying the transmitteron. *Diode D1 is there so* the back EMF from the relay will not damage Q2. Resistor R5 limits the current for our 5 volt relay. Capacitor C1 takes some of the noise off the key line should there be some.

The only bad thing about this circuit is that it will increase the current from the power supply. This is a small price to pay for better operating.

Construction may start with most any form. I used a small printed circuit board. I will make a small amount available for those who send a SASE and a buck.(2225 Mayflower NW, Massillon, OH 44646). The resistors may be either half or quarter-watt. You can use just about any type of transistor as long as they are NPN and PNP types. Just be sure that the one you use for Q2 will handle the current of the relay coil.

The relay used here came from Radio Shack. It is listed as having a 5 volt coil. I have not had any trouble with the unit running it at the 12 volt level with the current limiting resistor. You may use just about any type of relay as long as it is the reed type. Also watch the coil current again if you change both Q2 and the relay type.

With the circuit board I made up the unit is plugged in the back of the Argonaut and the power is taken off the Aux jack. The output of the keyer is plugged into the interface and off we go to 40 WPM.

Of course, you don't have to have an Argonaut to use this interface. I use several here when making a transmission. If something should go wrong and apply full power on the key line--puff there goes a $100 keyer down the tubes (where were the transistors,Mike? Ed.). This way now the interface will take the smoke and not the expensive keyer.

Maybe you just got a new piece of gear and you find it uses "grid-block" keying. You could rewire the keyer or change a transistor inside but wait, just use the keyer interface instead. If it is grid-block, just watch the voltage rating of the contacts. If there are two sets of contacts you may consider doubling up the contacts to get a bigger rating.

At any rate this little project should come in handy. With the cold winter months ahead it makes a great weekend project. So let the snow fall and get out the soldering iron and have at it.

73, Mike, WB8VGE/QRP

PARTS LIST

R1,4 - 1.8K	C1 - 0.01
R2 - 10K	Q1 - 2N2907
R3,5 - 100	Q2 - 2N2222

RY1 - Reed Type, 5 Volt Coil

********TUNE-UP? DUMMY-LOAD UP********

Due to unforseen problems, the results of the Fall QSO Party will not be presented this issue. Our Contest Chairman, WA2JOC, apologizes for this omission and passes along that it, and April's QSO Party results will be featured in the next *QRP Quarterly*.

73, Bill, WA2JOC

*****HAVE YOU TRIED 160 LATELY?*****

-QRP Handbook
by Ade Weiss, WØRSP

New ears has just rolled by and I figured that I better report on my progress with the long-promised QRP handbook. The end is in sight--finally! It will be published in 1983. As things look, it will be in 8 X 11 format and about 350-400 pages (price as yet is undecided, but expect around $12.95 price tag.)

Here's a look at the book so far:

Ch. 1. An autobiographical essay of my own QRP philosophy developing through my experiences with QRP.

Ch. 2. "Early Days: A History of QRP 1924-1926." A detailed account of the development of shortwaves and the pivotal role played by QRP operators in that effort. (Ch. 2. contains technical background for understanding this chapter)

Ch. 4. "Getting Started: Types of QRP operation and the Attitude for Success in QRP." Up-front advice for beginners--decisions about rigs, antennas, bands, expectations, clubs, contests and awards.

Ch. 5. Getting on the Air QRP-Style." Standards in selecting used QRO gear, conversion for QRP operation, useful test equipment, construction items, etc.

Ch. 6. "R.F. Power Concepts and QRP." An introduction to basic AC and RF power concepts, theory of operation and construction projects for RF power measuring devices. Introduction to trouble-shooting tips for solid-state circuits.

Ch. 7. "The Ionosphere and HF Radio Propogation." Deals with the ionospheric medium responsible for radio propogation.

Ch. 8. "Propogation of H.F. Radio Waves in Real Ionospheres." Explores propogation in specific detail in applying the factors of Ch. 7. to a mathematical analysis of wave behavior in 6 model ionospheres reconstructed from vertical incidence ionograms. (I've been doing research, writing, and computer programming over a year to come up with a picture of propogation that conforms to the known scientific realities.

Ch. 9. "Propogation and QRP Operating Techniques." Applies theory covered in 7 & 8 to QRP operating practices and tactics for special types of operating such as DX, awards, contests and the like.

Ch. 10. "QRP and Antenna Practices." "Down and dirty" details about antenna efficiency and operational characteristics relevant to successful QRP operation.

Ch. 11. "A Beginner's QRP Station." Construction details for a 20 Meter VFO controlled QRP transceiver.

The Appendix includes reprints of test reports on the Argonaut 509, 515 and the Heath HW-8. Space permitting, a Great Circle Bearing, Distance and Path Coordinates BASIC program.

Well, gang, that is what the "QRP & Operation Handbook is turning out like. 73 for now and BCNUL.

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Ed. Ade is sponsoring the QRP DXCC program. If you would like the credit you get in the Fall and Spring QSO contests to be good for another award, send a SASE to: Ade Weiss (K8EEG/WØRSP), 83 Suburban Estates, Vermillion, SD 57069 USA for a copy of the rules.

*****DO YOU TRUST YOUR GROUND?*******

W1FB Retires
by Fred Bonavita, W5QJM

Doug DeMaw, W1FB, technical department manager for the ARRL and well-known author and QRP enthusiast, will retire at the end of May.

In letters to friends, Doug says he is taking early retirement after 18 years at the ARRL to return to the family's 40 acre farm in lower central Michigan from which he will run an independent business, Oak Hills Research. His decision to take an early retirement and return to his Michigan home was prompted by the death last October of his father, W8PMK.

Doug will continue working for the ARRL for at least another 3 years, editing, writing and producing a column.

In his business, "I will be developing some products and publications aimed directly at the QRP market." One of the first will be the W1FB QRP Handbook, which I hope to release in July or August."

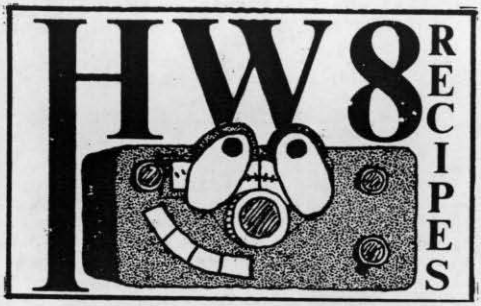
Doug said he will market some QRP products adding: "I have two very slick ones in development at this time. If this proves successful, I will expand the product line.

"Ifeel the QRP enthusiast has gone too long without recognition from the manufacturers, so perhaps I can perform a needed service to our low-power colleagues," he continued.

After 18 years of fighting deadlines, political pressures from outside the ARRL, dealing with irritated hams and working long hours, I'm ready, at age 56, to start living the good life. I'm anxious to get back to the hunting, fishing and camping I have missed since moving to the East Coast".

(Ed. Doug will still be heard from, so he hasn't planned on making a complete disappearance.)

**********QRM? - TRY QRS**********



30 Meter on the HW-8
by John McNeil, WA2KSM
168 Lexington Road
Shirley, NY 11967

Did you kmow the international QRP calling and listening frequency on the new 30 Meter band is 10.106 MHz?

Do you feel left out? Do you have a Heath HW-8 sitting there on the shelf gathering dust? Interested in a simple conversion that requires only a half dozen capacitors and one crystal to get the rig on 30 meters for less than 10 dollars? Read on...

First thing you will need is a crystal for 18.895 MHz, which I obtained from Jan Crystals[1]. This is the new heterodyne frequency that must be mixed with the VFO output (8.654-8.895 MHz) to produce 10 MHz.

Second--and perhaps a little painful--you must decide which of the HW-8's existing bands will be sacrificed for 30 Meters. I elected to give up 20 Meters.

Two reasons dictated this: since the heterodyne oscillator and other circuits have to be retuned for the new band, it is easier to add capacitance in the existing 20 Meter circuits on the foil side of the board than by decreasing capacitance in the existing 40 Meter circuits. Perhaps more important, the 20 Meter low-pass output filter, as is, falls within the range needed for harmonic reduction for 10 MHz.

To accomplish the frequency change, do the following: Replace crystal Y3 (22.895 MHz) with the 18.895 MHz crystal. Parallel C121 with an additional 47 pf silver mica capacitor on the foil side of the circuit board. Peak L19 as instructed in the tune-up procedure of the HW-8 manual. Parallel C68 of the mixer amplifier with an additional 100 pf silver mica capacitor also on the foil side. Peak L15.

In the RF Amplifier section, parallel C22 and C7 with an additional 37 and 68 pf silver mica capacitor respectively. When you adjust C7, a definite signal peak will be heard in your headphones. If you find that this occurs when C7 is fully meshed, add capacitance until you have a nice tuming adjustment. Also, with C22 adjusted for maximum signal, the preselector variable capacitor, C301, will peak about half half way out. If not, add a little more capacitance until C22 has a good peak and adjustment range. Again, C301 should peak about half way out. C104 on the final amplifier section must be paralled with an additional 10 pf silver mica capacitor on the foil side of the PC board. Adjust C103 for maximum output. This concludes all changes to the "8".

I would like to thank W2OQI, WB2YDS, and W2JFP for their critical evaluation of my signal during on-the-air testing. Also, a special thanks goes to "Wally", W6BHM of Oroville, CA., who answered my CQ and gave me a 559 report while I was running 500 milliwatts output into my inverted Vee Zepp. Now let's hear all those "8's" on 10.106 MHz!!!

[1]Jan Crystals, 2400 Crystal Drive, P.O. Box 06017, Ft. Myers, FL 33906

Order 18.895 MHz Crystal, plus/minus .005% tolerance, HC6/U holder, 30 pf. - - - - - -

NOTE: John points out that the output on 10.1 was checked with a spectrum analyzer and the second harmonic was 35 db down from f (Carrier Frequency). This is in specification as pointed out in the HW-8 Manual.

*******QRP ARCI--SPREAD THE WORD*******

Notes from G4BUE - G-QRP-Club...

Late Spring QRP SSB Activity Weekend:

7/8 May 1983

Time	Freq	Time	Freq
0900-1000	14285	1500-1730	21285/ 28885
1000-1100	21285/ 28885	1730-2000	14285
1100-1200	7090	2000-2100	7090
1200-1300	3690	2100-2200	3690
1300-1400	14285	2200-2300	14285
1400-1500	3690		

World QRP Federation (WQF) QRP CW Activity Weekend:

10/11 September 1983

Look for general QRP QSOs on: 3560, 7030, 10106, 14060, 21060, and 28060 KHz.

******QRP: AROUND THE WORLD DAILY*****

New, updated member lists will be available for mailing at the end of April 1983 and not sooner. Cost will be $1.00 or appropriate postage on S.A.S.E. (#10) to cover 4 ounces. Contact WD4LOO for orders.

*********QRP: AROUND THE CORNER**********
AROUND THE WORLD

Net Report
by Red Reynolds, K5VOL
QRP ARCI Nets Manager

New 25 QNI Award winners are:

WD4LOO	TCN-20	Cert
K6RJM	SWN-40	Cert

Thank you for your support to the respective nets to both of these qualifiers.

The Saturday GLN-40 has been placed on the inactive list due to no activity. It seems that the GLN area can support only one net. Plans are in the mill for a new net serving the Northeast Area. A volunteer for NM has been located. Watch for the announcement soon, through the net system.

Our Awards Manager indicated a number of 25 QNI qualifiers have not applied for their certificates and stickers. They are as follows:

GLN-40

N8CDP	Cert
W8SFK	Cert
KE8P	Cert
K3TKS	Sticker

GLN-80

K9PNG	Cert

SWN-40

WB6JUR	Cert
WB6PUM	Cert
K6RJM	Cert (New)

GSN-40

WA4OOD	Cert
KB5CS	Cert

NEN-40

WB2IVX	Cert

TCN-20

WB4LOO	Cert (New)

TCSN-20

K8IF	Sticker
WD4LOO	Sticker
K5BOT	Sticker

These awards are very attractive, fellas, and they represent an accomplishment considering what QRM and QRN do withlow power nets!

Current nets are (UTC and Days):

Time	Day	Freq	Net	NCS
0001	Mon	14060	TCN	WA9WZV/4
0100	Wed	7030	SEN	WD4LOO/ WA9WZV/4
0200	Thur	7040[1] 3560[2]	GLN	K5VOL
0200	Thur	7040[1] 3560[2]	GSN	K5BOT
0200	Thur	7040	CCN	KC7IG
0400	Thur	3710[2]	SWNN	KC6JII
1200	Sat	7040[1]	NEN	WB2IVX
1300	Sat	7040[2]	NEN	WB2IVX
1600	Sat	7040	SWN	W6RCP
1600	Sat	7110[1]	SWNN	KG6JII

[1]Net frequency during Daylight Time.

[2]Net frequency during Standard Time.

Please note that CCN is still active, that net has really picked up in the last few months. Nothing has been heard from the Novice nets. We may lose that one if it gets another quarter without any activity. 73, Red, K5VOL

********** WHY NOT QNI? BUILD UP FOR AWARDS **********

From The Secretary's Blotter
by Edwin R. Lappi, WD4LOO
QRP ARCI Sect/Treas

I would like to remind all members once again that if you do not include your call and QRP number on your checks or on the renewal notice or facsimile when you send in renewals, your renewals may well be delayed possibly causing you to miss an issue. The reason for this is that memberships are keyed on QRP number and call. In fact, ifyou forget to give one of these items, it is best to forget the call just so long as you give your QRP number.

It is with great pleasure that I welcome into the club Jack Swiney, VK6JS, President of VK-CW-QRP Club and General Secretary of the WQF. It is simply great to have such a dedicated QRPer as a new member. On behalf of the membership, welcome Jack, and good QRPing.

For those members attending the Dayton Hamvention I will be there also on Friday afternoon and Saturday morning. I will be monitoring on two meters (147.525 Simplex) if any of you want to have an eyeball QSO with your club secretary. Hope to meet some members there and chat for a bit.

Elsewhere in this Quarterly you will find a ballot for the remaining seat on the Board of Directors. This seat is opening up with the retirement of WA3ZBJ. Please read the profiles of the candidates and vote for your choice. Try to get the ballots into me no later than June 1, 1983.

Last but not least it is with a great deal of pleasure that I can report that the club finances are in good shape and from all indications will continue to be so with your continued support. 73, Ed, WD4LOO

*******QRP-HOW LOW CAN YOU GO?********

The Post Office is moving to a new 9 digit Zip Code system (note Editor's address). If your local branch has made this move, please make this notation on your renewal form, or notify the Secretary/Treasurer ASAP.

**********NEW QTH?-TELL US**********

Upcoming:

Mark Oman, WAØRBR, has advised we can put in a "Fun-..." series of articles. They were printed in 73 magazine over several issues. As soon as we can contact them for official permission, they will come out in the QRP Quarterly, starting with the next issue. Mark also states he has boards available for these articles. Be looking for these soon...

***QRP ARCI: WORKING THE WORLD DAILY**

WQF Report

by Gary Beam, WA9WZV/4
WQF Representative

A suggestion has been hade on behalf of QRP ARCI to the WQF Secretary that an international QRP frequency be adopted for the new 30 Meter band. European QRPers have unofficially settled on 10.106 MHz while US QRPers have been heard on 10.120 MHz. If you have a definite preference on a 30 Meter QRP frequency, please let me know so that we can keep WQF appraised of our activities.

The international mails have been very sluggish so little new information on WQF is known right now. Hopefully more information will be available before long. So for now, 73 and keep those international QRP frequencies busy.

30 METERS--WILL U BE THERE SOON?

Christmas-Tree Bulbs as R.F. Indicators

by C.F. Rockey, W9SCH

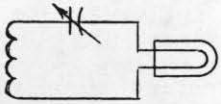
If you build or test QRP transmitters but do not command a benchful of test equipment, small lamp bulbs can be very useful. Old-Timers have known this for many years, but the younger set may not be aware of these cheap and handy "test instruments". May we enlighten you...?

The small bulbs sold for replacement in the popular multilamp strings are inexpensive and readily available everywhere. We recommend the 2.5 - 3.5 volt size, sold for replacement in 35 to 100 light strings, as probably the most useful for QRP testing.

I have approximately measured the properties of one of these bulbs and provide this information in the included table.

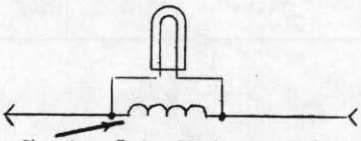
What can a QRPer do with one of these handy "Ten-cent Testers?" Since such a lamp bulb is practically a pure resistance, it could well serve as a "dummy load" and output estimator for a milliwat-level transmitter. Connected to a loop of wire, it can be loosely coupled to an R.F.-carrying tank circuit; it becomes a very handy tuning indicator since it consumes very little power - just tune for the brightest glow (this once-popular device was often called a "Soup-Loop" by Old-Timers, who could barely "keep shack"without one).

A variable capacitor and an appropriate coil, all in series with one of these bulbs, makes a very handy absorption-frequency meter, easily calibrated with a variable frequency oscillator and a general-coverage receiver. With it you can make sure that your transmitter is operating upon the band you hope it is and not upon some image frequency or harmonic. Hold the coil near the output tank circuit and resonance therewith is indicated by the brightest glow.

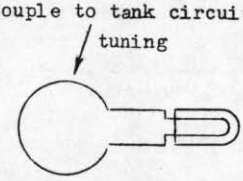


Absorption Frequency Meter

One of these bulbs, shunted with a few inches of wire, forms a "poor-man's thermoammeter." Connect it in series with your antenna and tune for the most light. Then you know that the "soup-is-up-the-stack" and not merely circulating around within the tuning system (the much-touted SWR-Bridge can be a nasty liar sometimes. Although the SWR may be near the cherished one-to-one value, the power may mostly be used in heating a coil or even a bad connection). Ingenious hams may readily think of other uses for these bulbs.



"Poor-Man's Thermoammeter"; connect in series with antenna (or feeder) for positive tuning.



"Soup-Loop"

Measured Properties of 2.5 - 3.5 Volt Christmas Tree Bulb (for use on 35 to 100 light sets).

Volts	Ma.	Mw (Power)	Remarks
0.5	50	25	Barely Glows
0.7	60	42	Dim Glow
1.4	80	112	
1.8	90	162	Normal
2.2	100	220	Glow
4.0	120	480	Very
5.8	170	940	Bright
(Burnout at about 200 Ma)			

They're much less (and fragile) than meters and, for amateur purposes, almost as handy. Try and see...

*******TUNE-UPS--WHAT DO YOU USE?******

Chips Found Floating
Down Silicon Slough
by Roy H. Trumbull
833 Balra Dr
El Cerrito, CA 94530
(de "Electronic Design")

The state of the Art is changing rapidly. In fact I ran into him in New Mexico last month. Seems he had just gotten back from China where he had just seen their latest computer. It was really fantastic, but they still have a problem with noise from the beads. I asked Art to clue me in on the latest devices coming out of research and these are the ones he told me about:

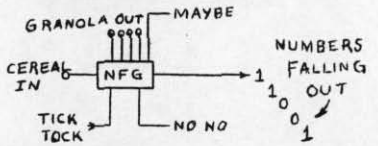
DON'T GATE

The Don't Gate:
You don't get no output no matter what's at the inputs. It is believed that the don't gate was the breakthrough that made the LSI write only memory possible.

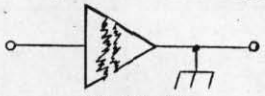
NED

The Noise Emitting Diode (NED):
When connected across a 1000 volt supply it makes a loud noise (once). The NED was discovered by Igor Pravaganda whom you'll recall worked many years trying to filter AC with electrolytics. He'll always be remembered as the father of the confetti generator.

SHIFTLESS REGISTER



Shiftless Register:
Must be used with 3 speed forward clutch gate. Shifts at 15, 25 and 35 bits per second. Double clutching with logic 2s is not suggested.

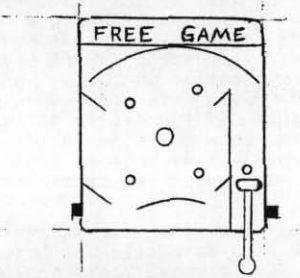


IN-OP AMP

Inoperational Amplifier (In-Op Amp):
Linear cousin of the DON'T gate. Provides no cutput for any input at a slew rate of 0 volts per microsecond. Mil. Spec version available at 100 times the cost of OLM version.

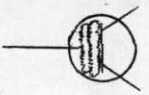
J(UN)K FLIPFLOP

J(UN)K Flip Flop:
Doesn't change state when clocked regardless of input states. Changes state only when cola machine down the hall makes change.



EXCESS 3 TO INSUFFICIENT 4 CARRY FORWARD FUDGER

Excess 3 to Insufficient 4 Carry Forward Fudger:
Used to enter Murphy factor and get the programmer off the hook.



MOSS

Moss:
Highly experimental material. Very rare at present since only source is from under grizzly bear toenails. Turns green when facing north while on wood substrate.

Fuzz Locked Loop:
Great if you want to avoid radar speed traps. (So experimental, no release of schematic available to date, Ed.)

********HAVE YOU A "SNIGLET"?**********

Any Mechanical Elmers...?

I just received your info and application for ARCI. I mailed my membership in today, my name is Bill Rudd, call K5JQO. I moved to Las Vegas 4 years ago. I have always been a low-power operator. Have had call since 1957. Age is 42.

The reason I am writing is that I am going blind from a rare disease that is hereditary and I can do no detailed work anymore.

Would you know anyone who would like to build me a 40 meter CW XCVR like I saw in the brocure sent me. I can pay for all parts and expenses. I appreciate your help. Sincerely,

Bill Rudd, K5JQO
P.O. Box 983
Las Vegas, NV 89101

Ed: Any takers for Bill?

**********QRO--DO YOU ABUSE IT?********

The following is a current list of officers and board members for the QRP Amateur Radio Club International in alphabetic order:

Frederick W. Bonavita, W5QJM
(BOD & Publicity Chairman)
Box 12072 Capital Station
Austin, TX 78711 U. S. A.

Harry E. Blomquist, K6JSS
(BOD & Founder)
12340 Ted Avenue
Saratoga, CA 95070 U. S. A.

Richard A. Crowell, W4WQW
(Legal Officer)
803 Oak Plaza Rd.
Kingston, TN 37763 U. S. A.

Gary Beam, WA9WZV/4
(Vice-President)
P.O. Box 1117
De Leon Springs, FL 32028 U. S. A.

William Dickerson, WA2JOC
(BOD & Contest Chairman)
230 Mill Street
Danville, PA 17821 U. S. A.

Terry M. Gregg, KA5EXI
(QRP Quarterly Editor)
P.O. Box 725
Grand Forks, ND 58206-0725 U. S. A.

William Harding, K4AHK
(Awards Chairman & BOD)
10923 Carters Oak Way
Burke, VA 22015 U. S. A.

James Holmes, W6RCP
(BOD)
136 Reed Way
Santa Cruz, CA 95060 U. S. A.

Don McBride, WA3ZBJ
(BOD Until Mar '83)
155 Autumn Drive
Trafford, PA 15085 U. S. A.

Edmund A. Popp, K5BOT
(President, QRP ARCI)
2212 Deadwood Drive
Austin, TX 78744 U. S. A.

Christopher J. Page, G4BUE
(BOD)
'Alamosa', The Paddocks
Upper Beeding, Steyning
West Sussex, BN4 3JW
England

Robert W. Reynolds, K5VOL
(BOD & Nets Coordinator)
835 Surryse Road
Lake Zurich, IL 60047 U. S. A.

Peter N. Spotts, N1ABS
(BOD)
140 Warren Street
Needham, MA U. S. A.

Ellicott Valentine, N4JO
4495 Bashavia Wayside
Pfafftown, NC 27040 U. S. A.

William G. Welsh, W6DDB
(BOD)
2814 Empire Avenue
Burbank, CA 91504 U. S. A.

Edwin R. Lappi, WD4LOO
(Sect/Treas. & BOD)
203 Lynn Drive
Carrboro, NC 27510 U. S. A.

Make the following new members welcome when you work them on nets or in club contests.

W5YSN, Frank L. Jamison,Sr., LA
KA5ESG, Theodore G. Vaky, TX
W3KGN, Walter B. Lane, PA
N9CLQ, James L. Fiedler, IL
WA8RLV, Ralph A. Tafel, MI
KCØPP, Keith R. Arns, MO
WB6CKH, Thomas V. Davis, CA
W4XD, Joseph F. Moomaw,Jr., VA
KJ2O, Americo J. Defilippo, NJ
WD9DNX, Alfred Adamski, IL
KT7E, Kenneth M. Uthus, WA
WB7OJV, Darrell R. Buxton, WA
JG1RYQ, Akira Yamada, Japan
KH6UN, David M. Mitchell, HI
N6GTI, William R. Young, CA
KA8QMR, Richard Prosper, MI
KAØORS, Glyn Frank-Jones, MO
N2BAL, James B. Shannon, NY
KA4QVK, Jonathan A. Titus, VA
W9NT, Gurnee K. Bridgman, OH
WB3JJK, Thomas Crede, PA
WB1ALZ, John V. Bellantoni, MA
W9WOC, Frank E. Rossner, IL
KCØEB, Kenneth E. Erickson, CO
N9CIB, Ray Grundy, IL
W2HLG, Edward F. Bremer, NJ
WB6AJV, Robert Maller, CA
WA8HQO, Ross E. Weston, OH
WB2BWL, Samuel J. De Donatis, NJ
VE4WI, Craig L. Winchar, Canada
KA7PAE, Michael F. Bower, AZ
WA5UIL, Tom Wheeler,Jr., TX
WD9IWP, Thomas A. Verachtert, IL
KA4UMC, Edward J. Wright,Sr., FL
WA9FBM, Anthony J. Schlude, WI
N7NV, John Seginski, NV
WD4SMH, Franklin P. Strough, VA
KH6OK, Bernard K. Diffen, HI
KM9E, Richard E. Viehe, IN
N6HMO, Randy Miltier, CA
VE3MOH, Kenneth Gamble, Canada
WB5TOE, Cal Waterbury, TX
K7RSF, Leo J. Cunningham, WA
W9DIU, Paul H. Davis,Jr., IN
KI3J, John Christopher, PA
WA1WLU, Joseph W. Sullivan,Jr., MA
W6XO, John W. Herdeg, CA
N5ONH, Hermann Haertel, TX
WD8BIX, William A. French, OH
KA1WA, Benjamin J. Zigun, CT
VK6JS, Jack Swiney, W. Aust.
KA4RAI, Henry W. Casiday, NC
AK3X, Peter Moury, MD
KA1GDG, Bradford M. Wilson, MA
VE3NSM, Salvatore Scopacasa, Canada
N9AIS, Robert E. Kenyon, IN
WA4W, James N. Winn, AL
N8AAN, Nick Stanich, OH
KA1KGY, Bradford T. Fligor, MA
**********WELCOME ABOARD**********

Please note on your mailing label your expiration code. The first digit indicates the quarter, not month, your subscription expires. i.e. 4/83 is the last issue of 1983 (October), not April 1983. Further details on renewals are covered on page 2.

******COLLECT NUMBERS-COLLECT AWARDS****

"A 40 Mtr Xmtr"
Parts List

C1,4,8 - .005
C2A - 270 pf
C2B - 40-470 pf
C3 - 1300 pf
C5 - 400 pf
C6 - 900 pf
C7 - 450 pf
C9 - 0.1

R1 - 3K
R2 - 1.5K
R3 - 510
R4 - 100

J1,2 - Female RCA Phono plugs or SO-239

Q1 - 2N2222. P_t = 500 mws. F_t = 250 MHz, V_{cco} = 30 V. I_c = 800 mas. wb 8 pf

Q2 - 2N2219. P_t = 800 mws. F_t = 300 MHz. V_{cco} = 30 V. I_c = 800 mas. wb 8 pf.

RFC1 - (45 uh minimum)-Ten turns of #24 Enamelled wire on FB 2401-43 Amidon Ferrite Bead

RFC2 - (10 to 20 uh)-5 turns as RFC1

L1 - 18 turns #24 enamelled wire on T37-2 Amidon Toroid

L1' - 3 turns on cold side of L1 - both windings in same direction.

L2 - 14 turns #24 enamelled wire as L1

L3 - 16 turns, same as above.

T1 - Primary - 8 turns #24 enamelled wire on FB 2401-43 Bead
Secondary - 4 turns #24 E.W. over primary.
Both windings in same direction to cover entire bead.

S1 - Two poles Two position Rotary switch.

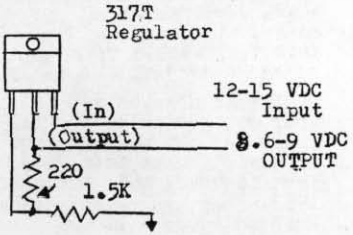
C2 - Any combination that will adjust the total capacitance between 400 and 500 pf.

CR1 - Any silicone diode rated at 50 V. 1 Amp.

********HOW LOW CAN YOU GO?**********

Construction Project
by Bill Botko, WB6WYX
from Feb, '83
Lockheed Employee's
Recreation Club"

Bill says this is a very easy regulated power suply to use an IC2-A in the car or from a 12 Volt DC power supply. It mounts easily in the ICOM BP-4 battery case. Bill says the Radio Shack inst. on the 317 call out the wrong pins.



**********QRP--SPREAD THE WORD*******

OOPS!!!....Here's one on us...

Reference April 1982 QRP Quarterly, (Remember, the one not dated?), page 10. It has been brought to my attention on the diagram that a diode was not labeled. The diode in question is on the collector side of Q2 on the schematic drawing. This diode should be labeled D4 to correspond to the text. Then D3 and D4 should be labeled D5 and D6.

The diode across the relay should be the 1N4001 as annotated in the Parts List on page 14. Renumber this as you wish on the diagram and accordingly in the text.

Good luck...

- - - - - -

Keeping with the tradition,...

January, 1983,"Mavti 40...".

Figure 1... Parts List:

R1 - 10K Pot
R2 - 34 K
R3 - 3.16 K
R4 - 97.6 K
R5 - 23.7 K
R6 - 2.21 K
R7 - 68.1 K
R8 - 2.7
R9 - 10
R10- 470
} Ohms

L1 - 100 uh

C1 - .01
C2,3,4,5 - .015
C6 - 1 uf, 25 V.
C7 - 6.8 uf
C8 - 0.1
C9 - 100uf, 12 V
C10 - ;0 uf, 10 V.

IC 1 - LM340
IC 2 - LM380

RY1 - 0490-0430
12 V @ 8.5 ma, 1K

Figure 2...

① 12 Volts Power to Driver

② 12 Volts Power to Rcvr

③ S2B - See Mavti-40 Schematic

**********REMEMBER WHEN**********

Dear Terry,

I would like to arrange some type o get-together for QRP club members in the St. Louis area. Anyone interested should drop me a card or give me a cal My address and phone number are:

Charles Bright, KAØFDL
4115 Buckley Ridge Ct.
St. Louis, MO 63125
Phone: 314-544-5584

- - - - -

Dear Terry...

During the ARRL National Convention at Cedar Rapids last July, I subscribed for their service (Name intentionally omitted here) (both US and foreign calls). Since that time, I've written numerous letters of inquiry to them without receiving either an answer or my letters back.

Jerry Shepherd,
AI9W
310 Alpine Lane
Hoffman Est., Il
60194

(Ed. We cannot print the name of the company here, but if anyone was there and also suspect same, SASE to Jerry.)

Board of Directors (BOD)
Candidate Profiles

James M. Lyons, VE2KN, #5005

I am a junior college chemistry teacher who has been an active ham for 33 years having also held the calls GM3GUJ and VE2DGS. I have operated QRP for much of my ham life. Initially this was by necessity, as QRO gear was hard to come by in my early days but, more recently, it has been by interest and conviction.

My radio experience ranges from homebrewing AM, CW, and SSB gear through RTTY and OSCAR 7B operation to my present interest in simple solid state rigs as described by Hayward and DeMaw.

As a Board Director, I would hope to promote the international aspects of the QRP ARCI and, as an ex-GM I might perhaps encourage and approach to QRP based on miles, or countries, worked per dollar invested in equipment.

**********C Q Q R P**********

When was the last time you looked at ur license? Do you know what yo xpiration date is? Next time you pull the switch, take a look. Don't go QRT on us!!!
****

"...Editor"
(Continued from Page 3)

Articles are coming in fairly well. I'm getting inputs from regulars, and new "faces". We always welcome new material, but be sure to read page two regarding pics and returned material. I want to see this Quarterly e-x-p-a-n-d with diversified material. Technical articles, humor, letters to Editor, requests from other hams for help, advice, etc. The expansion must be done in multiples of four pages to maximize our space.

Have you listened to your fist lately? Think it's good? Record it and play it back at a later date (Is that me???). Think of the other person listening.

Soon the U.S. Postal Service will be using the 9-digit system of zip codes. If you get yours, please be sure to pass it along to the Sec/Treas. Annotate the renewal form or postcard, including at least your call and QRP number.

Later we'll be including material on USSR "robot" stations. One reader has re ed hearing, and working them, with int ting results. As I get this, it will be passed on. Be keeping your eyes peeled for a "Perk-O-Mitter" next issue. Space precluded inclusion here, but the next copy will have a 10 Mw/Cup Coffee Percolator/Transmitter. A different approach to rig packaging.

Robert Spidell, W6SKQ, #3135

Age 45, Licensed since 1954, Extra Class, QRP ARCI member since 1969, member of S.O.W.P., Employer - FAA - Air Traffic Control Specialist at Lancaster Flight Service Station, CA.

My interest in QRP began around 1968 while residing in Virginia with limited resources, i.e., BC-348, windon antenna and a 30 watt transmitter. Eventually started experimenting with different antennas and built 3 homebrew transmitters withpower ranges of 180 mw to 2 watts input. Never went back to 30 watts after my homebrewing projects worked. To further my interests in QRP, I joined QRP ARCI in 1969 to be part of a unique group of dedicated hams. Since the early 60's to present innovative designs of both commercial gear and homebrew gear have resulted in super sensitive receivers and imaginative designs of antennas enable us to "work the world".

I feel that with over 5,000 members of our club on the rolls that we should strive for international friendship and support goals for increased activity for QRP ARCI and the World QRP Federation. I am also a proponent for alternate energy sources to a degree where all of us can afford this technical advancement.

********MEMBERSHIP RENEWALS**********
GO TO SECT/TREAS

That's a wrap for now. Good luck in the QSO Party (both CW & SSB) & GO GET 'EM.

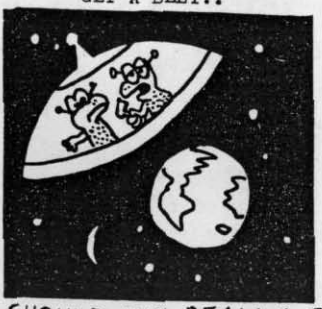
73, Mike (Ed.), KA5EXI
*********NEED HELP? LET US KNOW******

(Continued from Page 3)

Meter. At times, this frequency has been pretty busy and some have been using 10.120 MHz. We are reaching a point where we need to determine a QRP calling frequency. If you haven't already checked out these frequencies, please do so or your favorite and be ready to vote when the question is called.

CU on the bands. 73, Ed, K5BOT

**********GOT A TOWER?**********
GET A BELT!!



SHOULD WE REALLY TELL HIM OUR QTH?

****

The ballot below is for the remaining seat on the Board of Directors which is opening up with the retirement of WA3ZBJ. Please read the profiles on the reverse side and vote for your choice. Try to return the ballot to the Secretary/Treasurer so as to arrive no later than June 1, 1983 at the following address:

Edwin R. Lappi, WD4LOO
Secretary/Treasurer, QRP ARCI
203 Lynn Drive
Carrboro, NC 27510 U. S. A.

OFFICIAL BALLOT FOR BOARD OF DIRECTOR

Vote For One Only:

James M. Lyons, VE2KN, QRP #5005 ☐

Robert "Bob" Spidell, W6SKQ, QRP #3135 ☐

Name _____ Call _____ QRP No. _____

**********PLEASE DETACH HERE AND MAIL ASAP**********

Replacement Program
for Board in Argosy
from SW/QRPer, Jan-Feb 83

Ten-Tec Inc, has begun a program to replace faulty AF/IF boards in its popular Argosy QRP/QRO transceiver in the early models. So far there is no cost for the program other than return postage or UPS shipping charges on the original board.

Some owners have complained of a "popping" noise when a strong signal hits, especially on SSB. One source says an inquiry to Ten-Tec produced an offer to replace the board (No. 80785) at no cost, provided the owner swapped them and returned the original.

If you have an Argosy exhibiting this problem, drop a line to Garland Jacobs, Ten-Tec Inc., Industrial Park, Sevierville, TN 37862, giving him the serial number of your rig and a description of the problem. He'll need the serial number since Ten-Tec corrected the problem in later production numbers. This is typical of the fine service Ten-Tec provides on its gear. (W5QJM)

— — — — — —

Late Note:
Regards Argosy Board Replacement Program - be sure to contact that company and find out who you talk to or hear from. If there are any problems, be sure to let W5QJM, Fred Bonivata, know. There have been differing responses to inquiries.
(From SW/QRPer, Mar-Apr 1983)

QRP ARCI: WORKING THE WORLD DAILY**

_____ (Continued from Page 9)

As with many of you who have written to me about very low power work, Dan spent a large effort in assuring accurate measurement of power output. If anyone finds an inexpensive and still accurate method of measuring microwatts at the antenna, I would appreciate a line from you.

ALL Mobile DXCC-QRP

Walt Del Conte - WD6EKR - received DXCC-QRP certificate # 58C for One Mode, One Band and special endorsement All Mobile for 15 Meter SSB. Nice Work!!!

Zero Net Awards

During the past quarter, not a single certificate was issued for the QRP-NET award. There have been only sixteen certificates mailed since the program began. Come on, you hams - GET ACTIVE! Check into one of the QRP nets and earn some pretty wallpaper!!

Remember that a copy of the Awards Rules is available free for a S.A.S.E. My address is inside the front cover of the Quarterly.

Look for me in the April contest. I still need a few more states for my 2-way QRP WAS. Good luck and happy QRPing! 73, Bill, K4AI

********HEAR THEM?-GO GET THEM!*******

A response to QRP ARCI ad in World Radio came from John Ruckert, WA6ZPN. John teaches braille. He is NCS for a QRS CW net for his students. The net meets on 7105 Khz every Saturday and Sunday 1900Z. They CQ around the net frequency for about an hour before net time. John would like to have us drop in for QSO. He said they are interested in learning operator techniques used by QRP operators. I have QNC this info to QRP SWN-40.

Jim Holmes, W6RCP