QRP Quarterly

Journal of the QRP Amateur Radio Club, International

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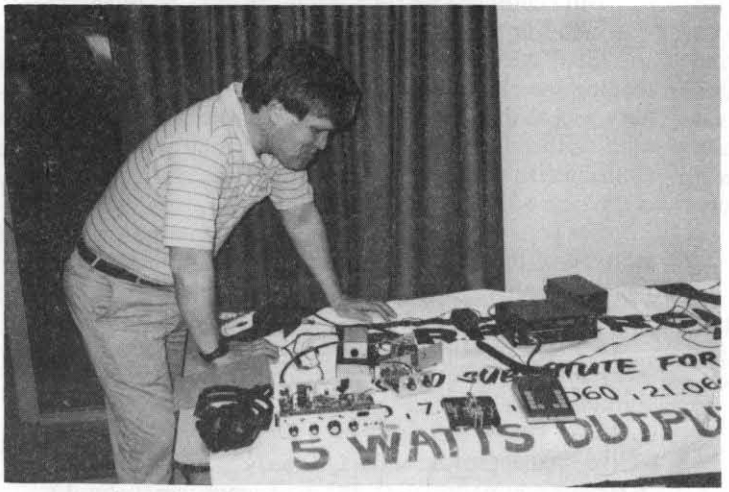

Jack Frake, NG1G looks over part of the show and tell gear at the Dayton Hamvention.

More convention photos on pages 12 & 13!

ORGANIZED CHAOS: The crowd around the QRP information booth at the Dallas convention was impressive and enthusiastic. George Dobbs, G3RJV, in beard, was among those kept busy answering questions, passing out information brochures and selling QRP kits, which were very popular.

Results Spring QRP Contest—page 16

QRP ARCI News

President's Message

Jim Fitton, W1FMR

Hello QRPers:

In case you have not already heard, the Logo issue went through a BOD majority vote, and the "K6JSS" logo is now the official logo of QRP ARCI. This does not mean however, that you have to run out and change QSL cards, award certificates or anything else with the old logo on it. It does mean however that the new logo can now be called the "Official Logo", by those that are concerned, while the other one could be called the "Unofficial Logo", by those that wish to do that. The democratic process unfortunately, while satisfying the will of one group inadvertently provides a source of irritation for another. This logo saga has been very interesting, indeed.

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Club Officers Retiring

All QRP ARCI executive positions and some Board of Director positions are open for re-election this year. You are urged to submit a brief resume of your experience to Bob Brown in order to apply for the particular position that is exciting to you.

Officers that are retiring this year will be:
Paula Franke, WB9TBU—QRP Quarterly Editor.
Bob Brown, NM7M—Secretary/Treasurer
Bill Harding, K4AHK—Membership Chairman
Fred Turpin, K6MDJ—Awards Chairman

QRP ARCI wishes to thank the retiring officers for making the club what it is today, and being the extra-ordinary people that they are. What a pleasure to deal with such high caliber individuals. I know that they will continue to contribute to the QRP movement and the club, because that is the type of person that they are.

For your information, here is a condensed breakdown of the type of things that officers and Board members do, but you can apply for any position on the team.

QRP Quarterly Managing Editor

- Select articles for publication
- Edit technical articles
- Answer letters to the editor
- Give final approval for the Quarterly
- (Having editing/technical/PC experience very helpful)

QRP Quarterly Supporting Editor(s)

- Edit non-technical articles, ads, columns and misc.
- Layout pages of The Quarterly
- Paste up for picture ready copy
- (Having PC experience is very handy)

Continued on page 21

Editor's Word

I know I said the April issue would be my last but, with a little arm twisting and not without some difficulty, here I am with an encore swan song.

So far there haven't been any volunteers knocking down the door to replace me. Perhaps I scared off some hopeful editor's last time. As I said, this job has become too time consuming for one person to handle alone. Please let me assure anyone who may be thinking of taking on the job that things will be much improved for the next editor.

To start off, the new editor will only have to deal with *editorial* functions. Chuck Fitzsimmons, KB8AHS, and I will be able to continue with typesetting and layout, relieving future editors of this time consuming part of the production of The Quarterly. All the editor will have to do is prepare manuscripts for publication, work with the writers and handle correspondence.

Be forewarned, the editor is a popular person and will get a lot of mail. It would be helpful if there were a couple of QRPers who lived close to each other to share the mail handling duties. Preparing manuscripts for publication means proofing the articles for spelling, grammer and accuracy. This doesn't mean you have to build everything written in construction articles to make sure they really work, just double check the figures and theory. To help you out, there are several technically inclined persons (the editorial review board) available to do this sort of checking for you.

I hope this short explanation alleviates any fears anyone may have had about the job. Interested persons are urged to contact me as soon as possible. It is not possible for me to continue as editor after this issue. Once again, thanks to everyone.

73 & 88, Paula Franke, WB9TBU

Nominations Now Open For Board Of Directors

The terms of office expire on Dec. 31, 1989 for four members of the Board of Directors.

Any member of QRP ARCI may place his/her name in nomination for one of these positions on the Board by sending a brief biographical sketch to the QRP ARCI Secretary/Treasurer, Bob Brown, NM7M. The sketch should include a definitive statement of the candidate's goals and interests in QRP. A ballot for these positions will be published in the October issue of The Quarterly and the election will be completed by Dec. 1, 1989.

The Directors whose terms will expire are G. Danny Gingell, K3TKS; Bill Harding, K4AHK; Fred Turpin, K6MDJ; and Terry Young, K4KJP.

Those wishing to have their names placed on the ballot should sent resumes to Bob Brown, NM7M, QRP ARCI Secretary/Treasurer, 504 Channel View Dr., Anacortes, Washington 98221 U.S.A. All biographical sketches must be received no later than Aug. 15, 1989.

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 and 10 watts output PEP.

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Century 21 Power Savings

by Luke Dodds
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When considering battery power, solar power or other portable 12 volt DC systems, the first question is: how much current?

My shack uses solar/battery power *only* for QRP equipment and accessories. Two watts output power is my self-limited maximum. One of my rigs is a Century 21 Digital. I didn't prefer digital but the seller needed the money.

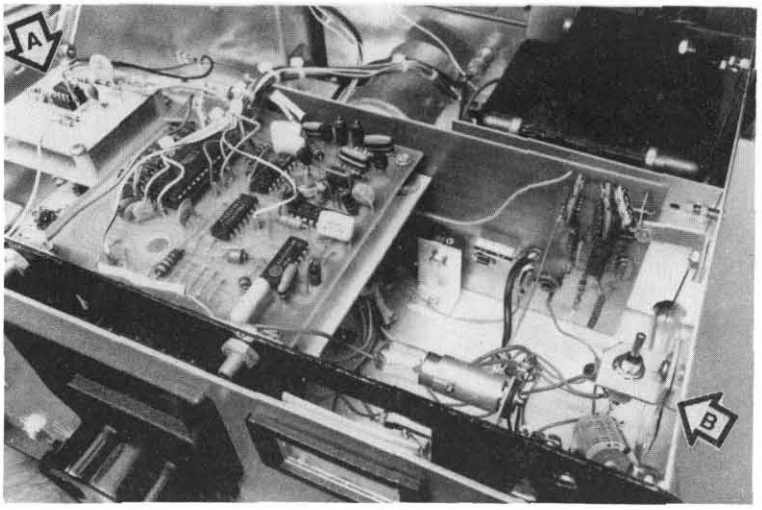
Two high current consumers are the digital board/display and the incandescent meter bulb. Described below, using figures 1 and 2, shows my way to cut off these circuits.

When operating from a DC source (110 volts disconnected) the meter doesn't register. Also, on nets or QRP contests once you have found the gang, the counter is unnecessary. My Century 21 has been modified. The top cover is hinged at the back with trunk latches on each side near the front. I can get at the toggle switch easily and quickly. It is possible to mount a switch on the front panel for this purpose but I decided against it. I have to open the cover anyway to get at the AGC switch.

The solid line in figure 1 shows stock 12 volt wiring using red wire.

1. Cut both wires at A. Leave about 3/8" of the wires above the board tie point. Using your fingernails, strip the insulation off for later soldering to the 3/8" stubs.

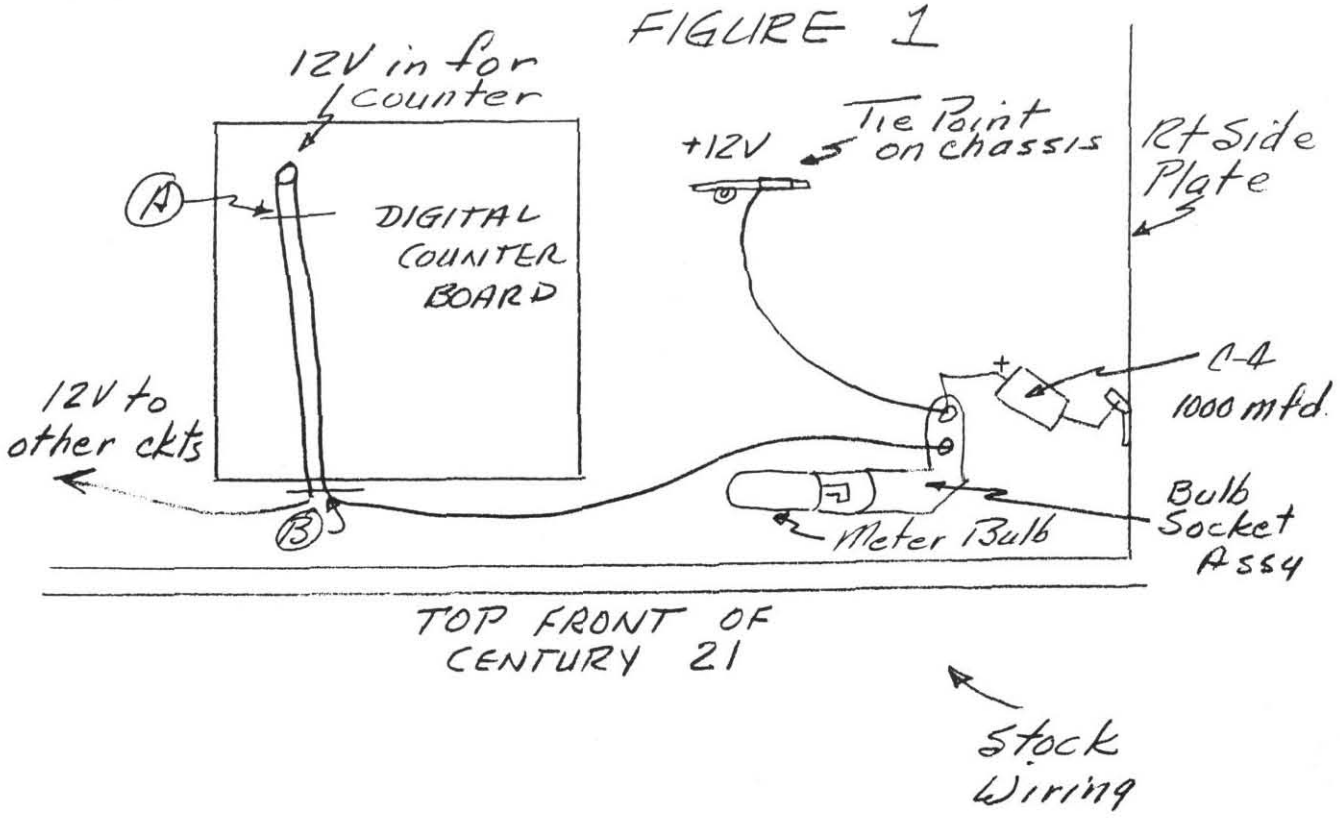
2. Cut the red wire pair at B. Discard the wires that were A to B.



A. AGC Ckt.

B. Switch for on/off bulb and display

FIGURE 1



3. At B, two separate red wires remain hanging. Strip these back 1/4", slip a short piece of small diameter shrink sleeving over one wire. Solder the wires together. Move the sleeving over the exposed joint and shrink it. (I use the heater part of my soldering iron.

4. Remove wires and C4 lead from the solder lug on the bulb socket.

5. Devise an "ELL" bracket with holes for a miniature toggle switch (junk box or Radio Shack) and a 6-32x1/4" screw into the right side plate. Locate the switch fore and aft in a position where the dangling C4 positive lead can reach. Drill the hole.

6. Mount the switch as shown in figure 2. Leave the 6-32 screw slightly loose so it can be swiveled to a handy position for soldering.

7. Proceed to wire per figure 2. After wiring the switch to the 12 volt source (tie point down on chassis), replace C4, then the wire to the bulb socket. Add a wire from the bulb socket to the 3/8 stubs of wire left in the upper left hand corner of the digital display board (Point A). Strip the new wire back 1/4" on both ends. After soldering at the bulb socket end, slip a short piece of shrink sleeving over the wire and let it slip down. Solder the wire to the stubs at the board, put the sleeving in place and shrink it.

Turn the rig on, drive at zero, and operate the new switch so the display/meter light function can be observed.

On my rig the currents observed were:

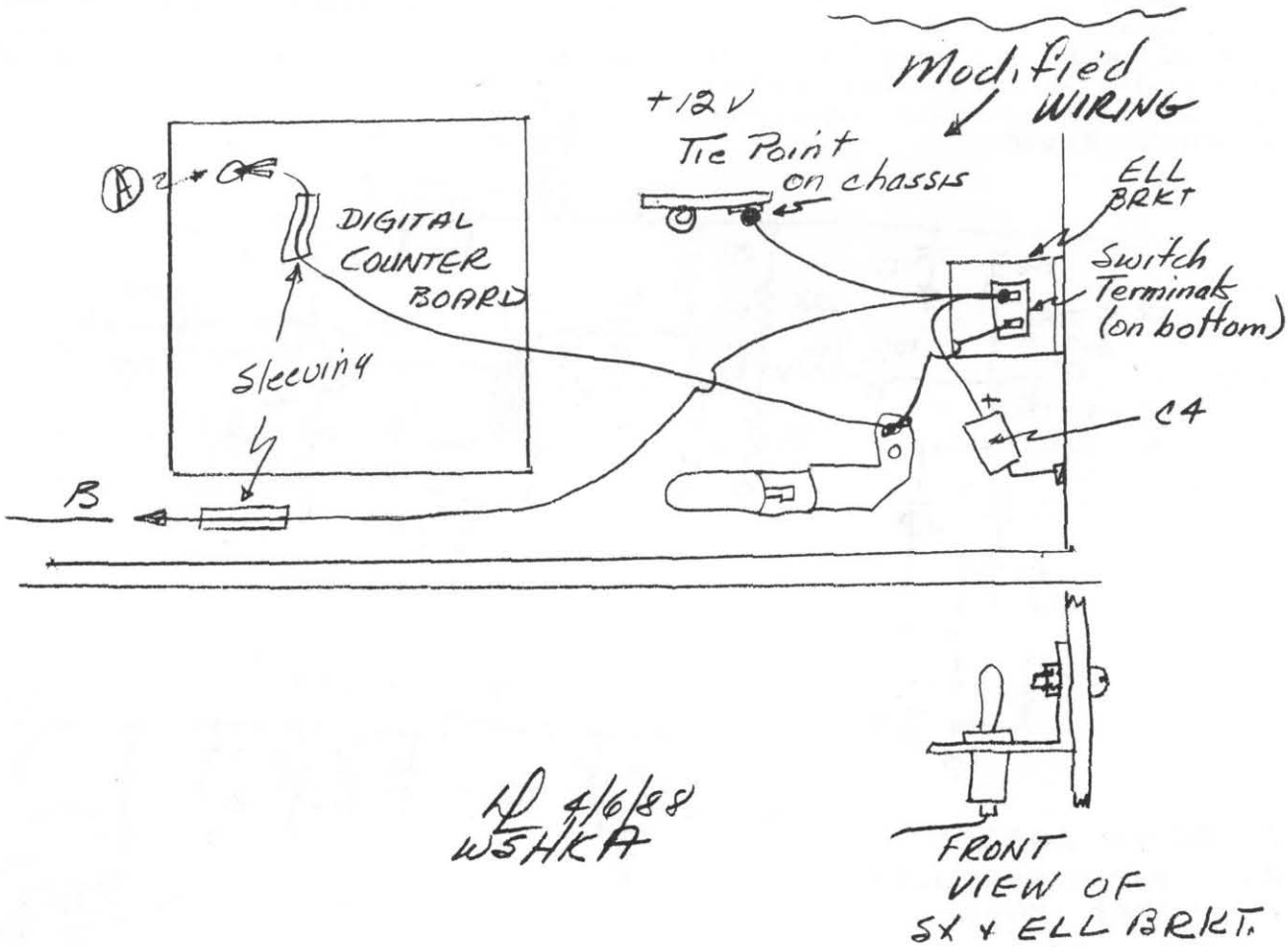
Everything ON, drive at zero, audio at zero (13 volts)	**500 ma**
Turn off the new switch	**200 ma**
Net reduction	**300 ma**

Incidentally, on my rig with the new switch off and audio at zero, I measured:

	Power Out	Total Current
(12.5 volts)	**1 w**	**1.6 a**
	2 w	**1.8 a**
	5 w	**2.5 a**

Be sure to use TenTec recommended circuit breaker in the +12 volt line when using external DC. It is an Airpax product and extremely fast. The $15 cost is cheaper than new finals plus labor.

FIGURE 2



W5HKA 4/6/88

Classic QRP

by Michael Czuhajewski, WA8MCQ
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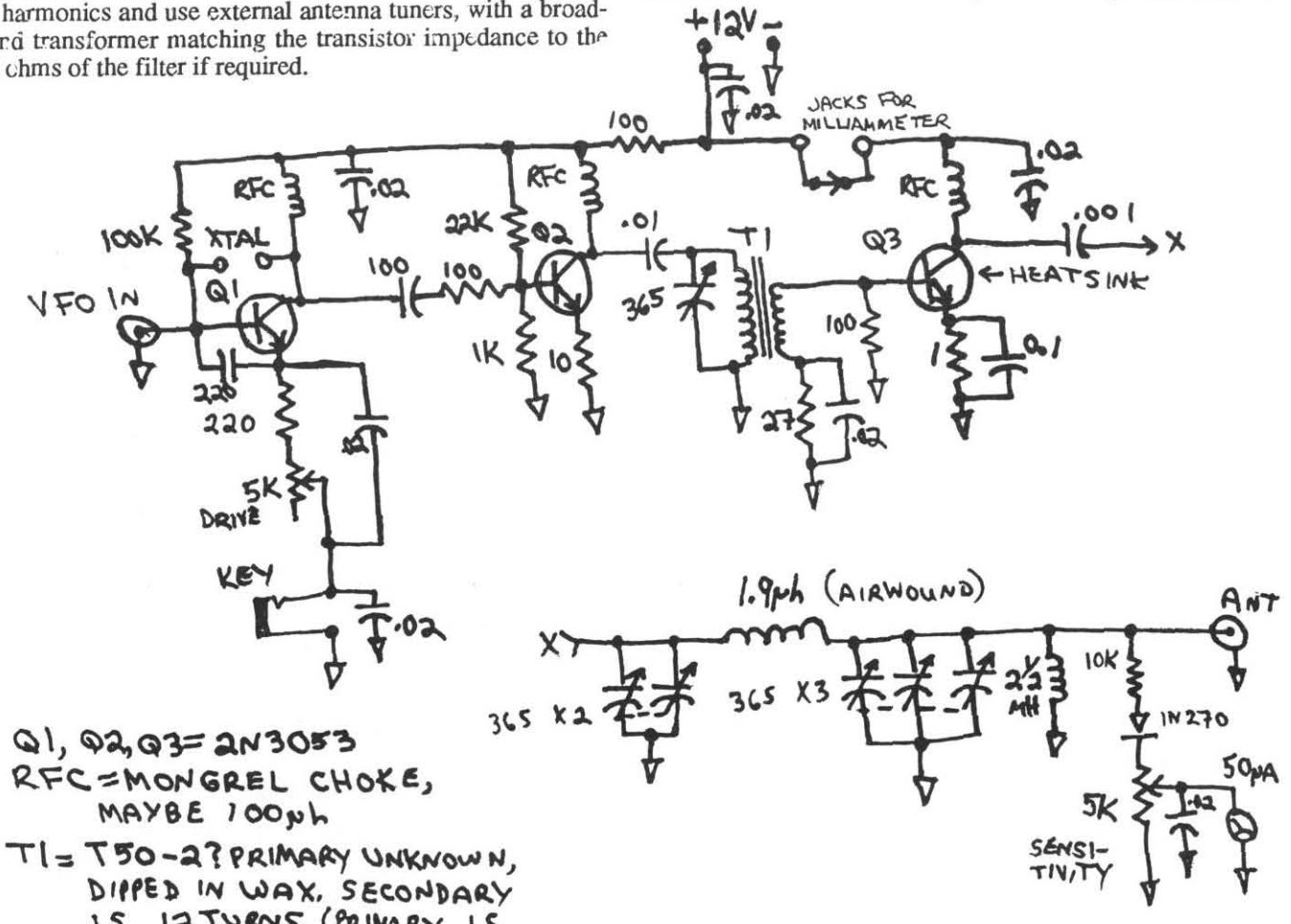
Jessup, Maryland 20794-0232

Heck, everything else is "classic" nowadays, so why not QRP as well? The March 1989 Classic Sprint was a good excuse to fire up some of the vintage QRP gear from my college days, bringing back memories of my low power activities long ago. Back then, the QRP Club had a different emphasis than it does now, to reduce QRM on the air by avoiding use of high power. Members had to sign an oath in blood to never exceed 100 watts input, and those of us interested in flea power were a barely tolerated lunatic fringe. (I was active in the Club and flea power QRP from 1967 until 1970, then I went off the air until 1987.)

This particular QRP transmitter was made as a project for one of my college classes. Actually, the design isn't that much different from what we'd make today, except for the output circuit. Back in the late 60's, transistor rigs tended to use either a tank circuit with a two or three turn link to couple to the antenna, or a pi net with two variable capacitors, like the vacuum tube rigs of the day. Now we simply follow the final transistor with a low pass filter to take care of harmonics and use external antenna tuners, with a broadband transformer matching the transistor impedance to the 50 ohms of the filter if required.

Built in 1970, my rig uses three 2N3053's, a popular QRP transistor in the old days. Some other popular finals were the 2N2102 and the newly introduced 2N4427. The later still sees daily use in thousands of HW-8's. Common for oscillators and drivers, and sometimes low powered finals as well, were the 2N697 and 2N706, which have been supplanted by the 2N2222A. I've included the schematic, though I don't recommend duplicating it. I never did claim to be an engineer; I took bits and pieces from the designs of the day, made a few changes here and there, without always knowing what I was doing, glued them together and somehow it worked. Note the provision for inserting a milliameter to monitor the amplifier current—this was built back in the days when everyone still used power input instead of output. I made one contact in the Sprint with the switch open and nothing plugged into the jacks, disabling power to Q3, and had a measured output of 14 milliwatts.

The receiver, circa 1969, was made from TenTec's first offering, the MR-1 module kit, which could be wired together into a complete QRP transceiver. (It was the basis of their Power Mite series of simple QRP CW rigs.) The four modules were a VFO, MOSFET mixer, high gain audio amplifier and transmitter. Since the latter had a rather low harmonic attenuation and was a prolific TVI generator in the



TV fringe area where I lived, I decided to make just a receiver. Unfortunately, being an early direct design it has the same shortcomings as an unmodified Heath HW-7, such as microphonics, tunable hum and shortwave broadcast feedthrough. Still, it did give me a lot of fun, especially in the 1970 Field Day. For transceive operation, I run the receiver VFO over to the transmitter. It works quite well except that there is no provision for RIT or offset and the transmitter doesn't pull the VFO frequency either. It wasn't quite so much of a problem in 1970, though, since folks then had a greater tendency to use separate receivers and transmitters and fewer razor-sharp filters.

For T/R switching, I had an accessory box similar to W1FB's QRP Omni Box (Doug DeMaw, W1FB, QST, November 1987) with a manual T/R switch, super sensitive SWR meter and dummy load.

I tried a mix of crystal controlled and VFO operation in the Classic Sprint, and with the lack of RIT and offset, both were equally frustrating. I only managed eight contacts in the hour and a half I spent, and even got called a lid by another QRPer! I called CQ CONTEXT twice using the VFO, probably right on top of someone who I couldn't hear due to lack of offset, and got no answers. I called again, tuned off zerobeat a bot and heard someone say "LID." A couple moments later, what sounded like the same signal started calling CQ CONTEST, so I called him and got a good report. (The suspect even replied to my QSL, though he said nothing of the incident!)

I was tempted to fix the problems with the receiver, but finally decided to leave it intact as an example of classic QRP. However, if I ever use it with the transmitter again, I'll add an RIT mod first—being called a LID once was enough. I did make one change to the transmitter by disabling the tunable pi net two minutes before the start of the contest and replaced it with a standard fixed-tuned low pass filter with cutoff a bit above 7 MHz. When I used the rig back home in Michigan, the nearest FCC monitoring station was about 15 miles away, and here in Maryland it's about the same, and I don't want to push my luck!

Using a TS-430S for the vast majority of my QRP activity, it was refreshing to fire up some of my old homebrew gear after all those years. Perhaps in the next Classic Sprint they'll add one more bonus category for being both classic and homebrew!

Band Pass Tuning for the Analog Argosy

by Cornell Drentea, WB3JZO
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Minneapolis, Minnesota 55429

(Editor's note: In an earlier article on enhancing the performance of the TenTec Argosy transceiver, Cornell Drentea offered some first-class modifications to that QRP/QRO rig. In this follow-up article, he details a simple but effective method of band-pass tuning. This is for the analog version only.)

It is possible to add an effective band-pass tuning to the TenTec Argosy. The advantage of this feature is obvious if one tries to improve the signal-to-noise ratio for CW, SSB and RTTY operation.

In a "fancy" transceiver, this function is performed at the intermediate frequencies (IF) throughout a double-mixing scheme (a reason for the double conversion). Modifying the Argosy to such an approach would be impractical at best.

However, introducing an audio band-pass filter, such as the Datong FL3, in the audio output of the rig can give good pass-band tuning results. The exception is that in-band AGC action, which is performed int he earlier audio stages of the rig, can stump weak wanted signals even if they are filtered out by the Datong filter and are not audible in the speaker.

The trick is to find a practical way to insert the audio filter before the last audio stage and the AGC pickup points of the rig so that AGC action is controlled through the pass-band feature. Such as modification would have to be done without changing the printed-circuit board. All previous modifications left the original PC boards intact to help the resale value of the rig.

Such a modification is possible and simple, and it takes advantage of the unused RCA connectors marked SPARES on the rear panel of the rig. It is accomplished by lifting one end of C-43 (the end closest to the right side of the rig). Now lift the white coaxial cable which goes to the audio potentiometer from connector 43 (the contacts closest to the right side of the rig). All are on the IF/AF board 80785.

Stand up C43 (0.1 uF) and connect the open end to the removed coax cable and to a new audio cable going to one RCA connector. Connect the ground shield of the cables together. This will connect via a short, stereo-type audio patch cord to the output of the FL3 or similar audio filter.

One of the remaining RCA connectors on the back panel connects to the input of the FL3 via the other leg of the stereo-type patch cord. From the connector, run another coaxial cable to the remaining pins on connector 43 plug (hot to the inside pin and shield to the outside).

That's all that's needed. No cuts, no mess, and it's the only place the impedance of the FL3 match the rig circuit properly.

The FL3's gain is unity, so there is no loss when the filter is in. By wiring the Datong in this fashion, full AGC action is accomplished within its passband and independent of the audio circuit. All other functions, such as RF gain, remain as before.

The results are worth the effort. The Argosy equipped with an audio pass-band compares favorably with the fancy pass-band tuning of a TS-940.

I can now center my pass-band precisely at 2.210 kHz (halfway between 2.125 and 2.295), reduce the total rig bandwidth to 200 Hz with the help of the FL3 and receive RTTY with a much better probability of intercept (POI) than ever before. Out-of-band signals, no matter how strong, do not impact the rig's AGC anymore.

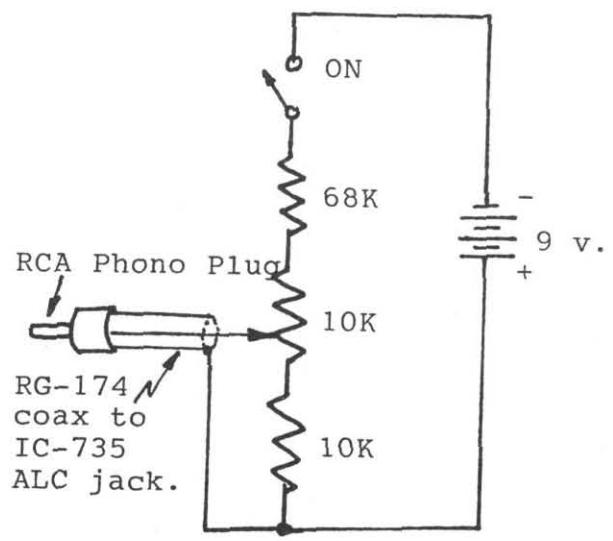
The feature is also useful in effectively eliminating adjacent-channel overlapping (high of low frequencies superimposed on a wanted signal—not to be confused with intermodulation distortion, or IMD) in SSB. No other commercial pass-band audio filters were tested with this modification.

ICOM QRP

Editor's note: Two descriptions of ways to lower power output on several ICOM transceivers appeared recently in separate publications, and they are reprinted here for QRPers who may have missed them. The first appeared in the G-QRP Club's quarterly newsletter, "SPRAT," and is by Mike Michael, W3TS. The second is excerpted from an advertisement ICOM ran in some major Amateur Radio magazines, While the accuracy of these methods is not disputed, in no case does QRP ARCI endorse or warrant either.

By feeding a negative 1 to 4 volts into the ICOM ALC jack, you can turn the RF power down to zero watts. With the circuit shown, my IC-735 can run from 0-5 watts with the front panel power control set at any point (this overrides that control).

My 735 would go down to 6 watts with the front panel control. Now I can go down to 900 mW or less for milliwatting. —Mike Michael, W3TS.



(ICOM's transceivers') front panel RF PWR control puts QRP or QRO selection right at your fingertips. A one-time internal adjustment is required, however, to reset their front panel RF PWR control properly so exactly 5 watts output is produced at a fully counterclockwise position. Please note this change does not alter the control's fully clockwise setting of 100 watts. It simply recalibrates the control so you have instant QRP or QRO selection...

...First, remove any rings or watches when working inside any equipment. Although ICOM transceivers do not employ dangerous vacuum tube-type high voltages, metal objects can unknowingly create shorts in any unit.

Be sure you have plenty of light to see what you are doing and, if necessary, use a pocket magnifier for reading component numbers on circuit boards. Also avoid moving wires or cables that can become pinched after replacing rig covers.

...(The) IC-735 is easily reset for 5 watts minimum output on all modes as follows. Place the IC-735 upside down on a soft towel with its front panel and knobs facing you. Remove the eight (8) screws from the bottom cover and lift it off to expose the main circuit board.

Look in the upper right corner, and you will see four small potentiometers in an "L"-shaped pattern. Locate R-267 near the bottom of that "L". It sets the span of the front panel's RF PWR control. Plug an accurate wattmeter connected to your antenna or dummy load into the IC-735's rear socket, switch the transceiver on and adjust the RF PWR control to minimum.

Select CW operation and key the rig only long enough to read the wattmeter. Power output will typically be 10 watts. Place an insulated screwdriver on R-267 and again key the (rig). While watching the wattmeter, turn R-267 clockwise until the RF output drops to 5 watts. If more than 30 seconds are required for precise adjustment, switch the transceiver back to receive for 30 seconds before repeating (remember its air flow is restricted by the desk and towel).

Rotate the front RF PWR control to maximum, note full output, return to minimum and double-check for 5 watts output, then switch off and reassemble your QRP-ready IC-735.

A similar adjustment procedure applies to ICOM's IC-751 transceiver. In this case, internal potentiometer R-46 is reset so the front panel RF PWR control yields 5 watts at minimum. R-46 is located under the IC-751's top cover and in the center of the main circuit board. It is to the left of the large shiny shield in the board's exact middle.

ICOM's IC-751A and IC-761 do not include internal power adjustments for CW QRP, but reductions from 10 to 5 watts minimum output on SSB simply involve decreasing their RF PWR control to minimum. ICOM's IC-781 is QRP-ready via its front-panel controls. Rotate the RF PWR to minimum, then decrease the DRIVE control until 5 watts is indicated on the wattmeter.

Resetting ICOM's IC-725 for 5 watts minimum output is also a cinch. Set its front RF PWR control to minimum, then adjust R-208's setting until your wattmeter indicates 5 watts. When the IC-725 is upside down and its knobs are facing you, R-208 is located in the main circuit board's top right quadrant (near the UI-7 FM option's area).

Write ICOM or call its service hotline for QRP guidance on other units. Its mailing address is ICOM America, Inc., 2380 - 116th Ave. NE, Bellevue, Washington 98004. The hotline number is 1-206-454-7619.

The first image transmitted on experimental television in the 1920's was a cartoon cat.

Reviving a Dead HW-8

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Jessup, Maryland 20794-0232

I picked up an HW-8 at a very good price because it was inoperative on all bands. The problem was that the heterodyne crystals were mistuned and thus dead. Everything worked fine after aligning them, but a few difficulties cropped up along the way.

The four crystals are tuned by coils L17, 18, 19, and 21, which are located in aluminum shields, two coils per can. The design is such that the business end of the tuning tool must be passed through the top slug to turn the bottom one. Since I didn't have the proper tool, with a cut-away shaft, I had to remove the top slugs to tune the bottom ones, then reinstall and tune them as well. Although the coils don't have to be tuned very often, it's a real pooper, as WB8VGE would say, to have to tune two when only one really needs it. Also, the stress of removing and replacing the top slugs increases the chance of them breaking. (More on this later.) To get around the problem, I drilled holes in the circuit board underneath the coil cans, so the bottom slugs can be reached directly from the underside without removing the top ones.

First, remove both coil cans from the circuit board to prevent damage when the holes are drilled. To position the drill accurately, I drew lines between the existing holes in a "*" pattern to hit dead center. I used a 1/8" drill bit, although any similar size is OK as long as it allows the tuning tool to pass. Unfortunately, there are a total of three circuit traces which run through the center of the coil footprints, carrying voltages for some of the bandswitching diodes. They will be severed when the holes are drilled. Continuity is then restored with pieces of wire soldered onto them, routed to avoid the holes.

Although the alignment instructions for the HW-8 say to insure the bottom cover is in place before doing any adjustments, it didn't seem to have any significant effect on the heterodyne oscillators. I adjusted all four tuned circuits with the cover off, to allow access to the bottom holes, and noted the power output. I replaced the cover and still had full power. However, if you prefer, you can drill holes in the bottom cover as well to allow adjustment with it in place. (To align the holes, place the cover on the HW-8 before putting the coils back on the circuit board, and stick a pen or scribe through the center holes to mark the locations on the cover before drilling.)

The cores in these coil forms are smaller than the others in the HW-8 and more fragile, especially with old age. A problem that occurred during tuning up the rig was the core for the 15 meter coil cracking after I turned it a bit and it could not be moved any more. The basic, inviolable law of the universe that says any failure will be at the worst possible time and/or in the most inconvenient possible manner has a corollary stating that when a coil slug freezes in place for the rest of eternity it will be nowhere near resonance. I tried various methods of removing the fractured core from the form, but none worked. I considered throwing away the entire form, replacing it with one scrounged from my considerable supply of old TV circuit boards and winding the appropriate number of turns on it for both coils. I would probably have been able to find cores with the proper permeability in the TVs too, but I eventually discarded this idea. (As an experiment, I tried removing over two dozen cores, of the small size used in the HW-8, from coils in the TV boards, and over half of them fractured as well!) Next, I considered using toroids (-6 material) and trimmer capacitors mounted on a vertical scrap of circuit board material to get rid of the coil form entirely. It would not have been necessary to trim and fit it inside the aluminum can, since toroids are self-shielding, but mounting the board could be a problem.

Although either of these two methods would have solved the problem, what I finally did was remove the 24 pf mica capacitor across the coil, C123, and replace it with a small 6-35 pf ceramic trimmer. It tuned nicely in the middle of its range with the core stuck where it was. Depending on the location of the core, and thus the inductance of the coil, it might have been necessary to add a small fixed capacitor in parallel with it. A larger trimmer could also be used, but physical size would be a limiting factor. The same technique of adding trimmers can be used with the coils for the other bands as well, although the mica capacitors are larger so a fixed capacitor of some value would have to be used along with the trimmer to tune them. The exact value would have to be determined experimentally, since the inductance of the coil could vary widely depending on where the core froze in place.

To make room for my particular trimmer to fit flush against the board, I found it necessary to remove the 100K resistor located right next to C123. I relocated it to the foil side of the board, and clearance between it and the cover was more than adequate. Another thing to keep in mind is that both sides of the trimmer are above ground, so you must be careful not to allow it to touch anything.

Hopefully, not too many HW-8 owners will find themselves stuck with the dilemma of having an unadjustable core, but for those who do this is a good alternative to trying to find the exact replacement part.

Dual QRP Special Event Stations in Missouri

The Kansas City QRP Association, operating NR0R, in conjunction with the St. Louis QRP Society, operating N0ZZ, will celebrate QRP in the state of Missouri with dual special event stations from their respective cities on September 9 and 10, from 10 a.m.-6 p.m. Central Time (1500-2300 Z).

Work both stations and receive a special certificate. Use QRP to work both stations and receive a bonus QRP endorsement.

For certificate, send a large SASE and QSL for each contact, stating log information and power used to: Mark Campbell, NR0R, 6205 E. 140th Place, Grandview, Missouri 64030-3834.

Suggested frequencies are, of course, the normal QRP frequencies.

HW-9 Fixes

Larry East, W1HUE
119-7 Buckland St.
Plantsville, CT 06479

The two short articles on the HW-9 modifications in the July 1988 QRP Quarterly were of particular interest since I have been using one of these rigs for the past two years or so. I replaced the audio filter op-amp in my HW-9 with a TL084 as suggested in the article by KRØU, but could not see that it made much difference; perhaps a sharper (or younger?) pair of ears are required to appreciate any improvement. However, it was certainly a simple mod (just pop the old IC out of the socket and plug the new one in), so it was at least worth the effort to see what would happen.

The first modification that I made to my HW-9 (I began thinking about it before the kit was even completed) was the addition of an on-board 100 kHz calibration oscillator and keyer using a Curtis keyer chip. I will gladly supply the circuit I used to anyone sending me an SASE; it was also published in the "Technical Correspondence" column of the October 1988 issue of QST. (The QST article neglected to identify U1; it is a 4011 CMOS NAND gate from Radio Shack.)

Here are some other "problem fixes" and simple modifications that other HW-9 owners might find useful:

Transmitter instability on 10, 12 and/or 15 meters

Some, but not all, HW-9's exhibit stability problems to some degree on the high bands. The output meter on my rig would slam hard-right at power levels above 3 watts on 15 meters, and some observation of the 10 meter output on a scope showed evidence of instability under some power level and loading conditions. Heath is aware of the problem, and will supply a 2N5770 upon request to replace Q402. This will probably cure the problem, but it will also reduce the transmitter output on the high bands (in this case, to about 1 watt on 10 meters!).

After trying a number of things, I found that replacing Q402 with a 2N4401 cured the instability problem in my rig without any decrease in 10 meter output. So, if you are experiencing stability problems, try replacing Q402 with a 2N4401. Since the circuit appears to be quite sensitive to transistor parameters, you might have to try more than one. In real stubborn cases, try also changing C434 to a slightly smaller value; or better yet, replace C434 with a 51 or 68 pF fixed cap in parallel with a small 5-50 pF trimmer cap and "tune" it for best stability and reasonable 10 meter output.

Transmitter frequency offset adjustments

The unduly large value of R131 (100k) makes adjustment of the VFO "transmitter return" (actually, transmit/receive frequency offset) very touchy. The situation can be improved by shunting R131 (the adjusting pot) with a 20k fixed resister. This can be done without removing the circuit board by (carefully) soldering the resister across the outer "legs" of the pot next to the circuit board.

Another suggestion: this adjustment should be done using a frequency counter instead of a voltmeter as described in the manual. Place the probe of the frequency counter at TP102, and adjust R131 for the same (as close as possible) frequency reading on receive and transmit. Note: if that "rare DX" station is using a sharp IF filter and is too lazy to use his RIT, an error of 200 Hz or so in this adjustment could mean a lost "new one"!

Also check the BFO for proper receive/transmit offset: it should be between 700 and 800 Hz. On my rig, it is about 550 Hz, and I had to reduce C206 to 68 pF (requiring removing the oscillator board), add 10 pF in parallel with C205 and readjust L135 to get it within range. The resulting BFO frequency was 8.83153 MHz on receive and 8.83075 MHz on transmit for a difference of 780 Hz—an almost perfect match to the measured peak response of the narrow audio filter at 770 Hz (Heath claims 700 Hz) and better centering within one of the peaks of the IF filter passband. (The filter is rather "lumpy" as well as not very sharp...)

Keying line pull-up

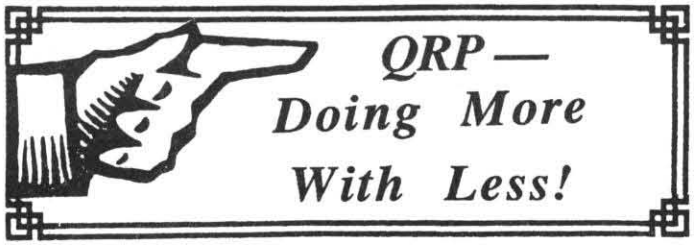
The keying line has a fairly slow return to +12V which can result in heavy "weighting" if a keyer is used. This is easily fixed by adding a 1k pull-up resistor between the keying line and +12V. I made this mod as part of my keyer addition, but it can be easily made by adding the resistor between the key jack and any convenient point of +12V on the oscillator board.

Increased audio output

Need a little more audio output? Simple—just decrease the size of R373. Anything in the range of 200 to 300 ohms should work just fine (if you are really deaf, try 100 ohms). With a little luck, you might be able to shunt the original R373 (1k) with another resistor without removing the circuit board.

My rig had an annoying oscillation in the audio amplifier (before any change was made to the amplifier gain) during keying when the volume control was near its maximum level. This was easily cured by placing a 1k resister in series with the wiper of R3 (the volume control) and the collector of Q303 (place the resistor at the control). This will also reduce (but not eliminate) the annoying "clicks" and "thumps" when Q303 switches on and off during keying. It also helps if the "mute delay" is not set too short. (The "thump suppressor" published in QST a while back should completely eliminate noises due to the switching of Q303, but at somewhat more effort.)

Now, if I can just find an inexpensive 8.33 MHz CW filter at a flea market and figure out how to (easily) reduce the HW-9's warm up drift, I will have an almost perfect QRP rig!



How Smart is your Dummy Load?

by Luke Dodds, W5HKA
2852 Oak Forest
Grapevine, Texas 76051

Homebrew dummy loads most often fall into two configurations:

1. The Double Hoop Variety
   (a) Two rings of Heavy copper wire are made (~3 or 4 inches in diameter).
   (b) With the two rings held side by side, carbon composition resistors are soldered from one ring to the other.
   (c) All around the ring the attached resistors parallel to achieve 50 ohms and for QRP-respectable wattage.
2. The Sandwich Variety
   Two metal plates (or blank pc board) are pierced then resistors soldered from plate to plate. These parallel resistors between the plates solve out to near 50 ohms.

An example of a load similar to my "hoop variety" is in the July 1985 issue of The Quarterly, page 18. An example of the "sandwich" can be found in the RF Power Bridge article in QST, August 1983, page 30, figure 10.

Experience building several of both varieties of dummy loads has been interesting. The double loop variety always turns out inductive, caused by the many wires. The actual value of the inductive reactance becomes significant only at 15 and 10 meters. Its value compared to 50 ohms at lower bands is zilch.

The sandwich variety always shows capacitive reactance—two metal surfaces are facing each other and the capacitive reactance becomes significant on the higher HF bands.

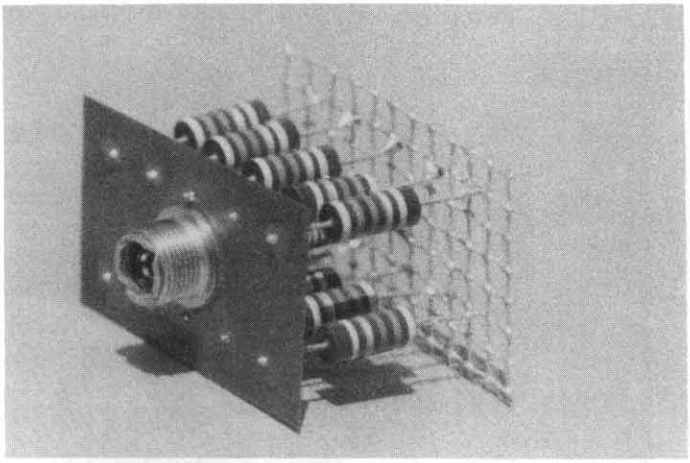
Since there is no way to homebrew a dummy load without wires, I decided to try to minimize the capacitive reactance of the "sandwich" configuration. As a result, I finally made one using solid copper at the connector end of the resistor and hardware cloth at the other end. The accompanying photograph shows how it ended up.

Using the HP4815A RF Vector Impedance meter, I got the following data:

MHz	Z	Angle
2.0	50	0
4.0	50	0
7.0	50	0
14.0	50	0
21.0	50	0
28.0	51	-3°

At least here is a pretty clean 50 ohm load. Again, bear in mind the capacity is there all the time but its value doesn't become a large enough vector to show on the meter until 28 MHz.

Therefore, in the final analysis the hardware cloth load exhibits minimal frequency dependent behavior. I doubt if using hardware cloth at both ends of the resistors would achieve much better results. Certainly it would be necessary to use the more accurate digital variety of HP Vector Z meter to try to measure the characteristics. Also, the digital variety is embedded in buss controlled hardware and not readily available before work or at lunch.



IMPROVED W5HKA DUMMY LOAD

Application of this or any other "clean" dummy load is varied. Because of the inherent I^2R losses resulting from undesirable SWR, QRP types prefer to keep close to 1:1. I began to "walk" up through the cables, switches, etc. between an HW9 and the antenna feedline. Using the Welz automatic model 825 SWR/wattmeter, I found the following:

- "Clean" dummy load at transmitter (after Welz sensor) the SWR is 1.05:1 @ 28.2 MHz.
- Add 2 feet of RG58U between transmitter and "clean" load. SWR=1.05:1
- Put the Drake TV3000LP filter in the same line. SWR=1.5:1
- Replace the TV3000LP with a small "Drake" (hecho in Mexico) LP filter. SWR=1.4
- Connect the "clean" load to the far side of a switch box and SWR=1.9

The various conditions of mismatch were startling to say the least. The Drake TV3000LP was a real surprise. Changes made to clean up the various mismatch problems can be checked at each step using the "clean" dummy load. It's probably best to just throw out the fancy switch boxes and manually connect BNC connectors where needed.

Other bits of interesting behavior discovered are:

- **Drake TV3000LP complete data:**

MHz	SWR
28.2	1.5
21	1.15
14	1.05

- **SWR into an MFJ Model 260, 300 watt D.L.**

MHz	SWR
28.2	1.6
21	1.35
14	1.05

The various data above are at best crude by test engineering standards. However, ideas to use or principles of good practice are also served.

The "Smart Dummy Load" is a handy tool for ferreting out problems and, as these data show, clean things up at the more obvious 28 MHz and lower frequencies will be in great shape.

(P.S. How may of you other old guys remember neutralizing a Class C final at 28 Mc?)

QRP IN DAYTON

All Dayton photos by John Solony, WA3SRE

Dayton conventioners (l. to r.) Bill Hickox, K5BDZ, Buck Switzer, N8CQA and Wayne Watson, WB8ZWW try to decide the best way to steal Ray Murray's, AI2S, seat in the Dayton suite.

Paula Franke, WB9TBU, (left) and Randy Rand, AA2U, (seated next to her) field questions about photos of their recent QRP DXpeditions: Paula's to the American Virgin Islands and Randy's to Israel.

Ray Murray, AI2S, has a go at the Dayton QRP station.

Jack Frake, NG1G, gathers a crowd as he makes a contact during the Dayton Hamvention.

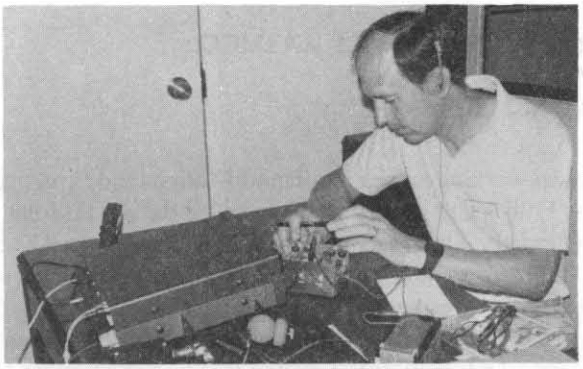
Lowell Corbin, KD8FR, new president of the Michigan QRP Club, enjoys late night conversation in the Dayton QRP suite.

Just what is the Illinois QRP contingent (L. to r.) Jim Jones K9PNG, Paula Franke, WB9TBU, and Red Reynolds, K5VOL, cooking up at Dayton?

DOWN SOUTH IN DALLAS

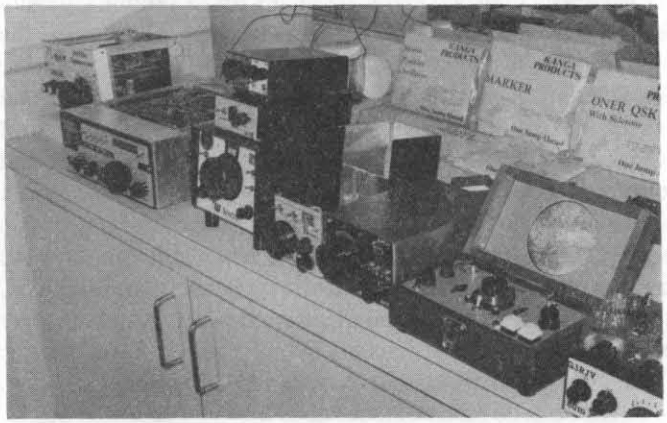
All Dallas photos are by Mike Kilgore, KG5F

IT REALLY WORKS! Ian Keyser, G3ROO, left, points out the finer features of the Oner transmitter to a dubious-looking ham.



CAM THE HAM: Cam Hartford, N6GA, a member of the QRP ARCI board, gives a try on 40 meters during the convention. Sunspot activity made the going rough. He operated a battery-powered version of the W7EL QRP transceiver developed by the Small Parts Center.

NEWLY MINTED TEXANS: The three technical forum speakers at the QRP functions in Dallas were honored by certificates from the governor of Texas. Made honorary admirals in the Texas Navy were George Dobbs, G3RJV, left, and Adrian Weiss, W0RSP, second from right, while Ian Keyser, G3ROO, was made an honorary Texas citizen. Passing out the certificates was Fred Bonavita, W5QJM.



A FINE LINE-UP: G-QRP Club members displayed a fine collection of homebrewed equipment, including assorted transceivers, transmitters and receivers.

HIGH-LEVEL HUDDLE: Discussing the finer points of a QRP transceiver are George Dobbs, G3RJV, left, and Adrian Weiss, W0RSP, in a head-to-head session in the hospitality suite.

SEPARATE CHECKS, PLEASE: Some of the QRP gang swapped war stories at lunch during the convention. From left: Fred Bonavita, W5QJM; Ed deBuvitz, W5TTE; Ade Weiss, W0RSP, looking over Ed's head; Jake Jacobs, XE2IM; Bill Harding, K4AHK; Mike Kilgore, KG5F, looking over his shoulder; and Watts Hill, a friend of Bill's who is on his way to getting his license.

Quick and Dirty DC Receiver Audio Stage

Michael A. Czuhajewski, WA8MCQ
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Jessup, MD 20794-0232

I was working on a series of modifications and experiments with my HW-7, and shortly after I installed the KN1H front end (ORP Quarterly, October 1987) the CA3035 audio amp IC died on me. I didn't want to go to all the bother of tracking down a replacement for it, especially since I plan on eventually installing a completely new audio section (per the K7OWJ article in the ORP Quarterly, July 1986). I started thinking about other electronic items in the house that had high gain audio amps, for an emergency replacement.

The phono input on the stereo downstairs was one candidate, but would obviously be impractical. Then I thought about all the portable tape recorders scattered around the house. I knew they have both high and low level inputs for recording, typically labelled "RADIO" and "MIC". I ran the signal from the the output of the KN1H circuit into the MIC input, but results were disappointing. I put the unit into the the RECORD mode and plugged into the monitor output to listen, but the volume control had no effect, the audio output level wasn't really adequate and the recording AGC had an extremely long recovery time. Then I tried running the signal directly to the playback head connection on the recorder circuit board—Bingo! When going through the playback circuits the volume control is active and there is no AGC action. Best of all, the audio output was much better, and can drive people out of the room if cranked up high enough. I used a piece of shielded wire to avoid noise pickup, RG-174 coax in this case.

The cassette recorder that I used was a 13 year old Hitachi, a fairly well-designed and well-constructed unit. Presumably most other portable cassette recorders would work as well, although one possible limitation would be the noise level of the amplifier. Some of the inexpensive units may have an unacceptably high background hiss. The Hitachi has virtually none. I can hear a slight noise increase when I plug the HW-7 into the amp, and a further increase when I connect an antenna. You may need to try a couple different recorders before you find one quiet enough to be used with a direct conversion receiver.

I modified mine by first disconnecting the leads to the motor, since it must be placed in the PLAY mode to turn the amp on. Then I rewired the RADIO jack to go directly to the playback head, so I can disconnect the HW-7 when necessary. To be safe, I put a 0.1 mF capacitor in series with it in case I accidentally plug in something which doesn't have its own DC blocking capacitor. I didn't bother to remove the head from the circuit since the amp worked quite well as it was. The resistance was about 100 ohms and doesn't seem to load down the audio much. To find the head connection on the recorder, look near the play/record switch on the circuit board. It is usually a long slide switch with quite a few contacts. The head will normally be connected to it by a small shielded cable. To confirm that you have found the right point, hold a small screwdriver by the shaft, put the recorder in PLAY and touch the connection with it—you'll hear noise in the speaker.

A recorder naturally has a wide frequency response. However, both the stock HW-7 and the KN1H mod provide passive audio filtering after the mixer, so it's no problem. (As mentioned in the K7OWJ article, another benefit of filtering before the first audio stage is elimination of AM detection in the amp.) It should also be possible to break the circuit path somewhere in the amplifier, where the signal is at an appropriate level, to insert an outboard audio filter.

Unfortunately, not all portable recorders, including this one, run from 12 volts so I couldn't use the supply that runs the HW-7. I use the integral AC power supply, and as long as I keep it a couple feet away from the HW-7 there isn't any hum picked up from the power transformer. (The audio transformer in the KN1H circuit makes it very susceptible to nearby magnetic fields.) You could also run it from the internal batteries. Another possibility would be to use a three-terminal regulator to drop the 12 volt source down to what the recorder needs. Using a common supply could possibly lead to ground loop and hum problems, though.

After a couple weeks of playing with the HW-7 I realized I had forgotten about the sidetone, since all my experiments so far had been confined to the receiver. I keyed up the rig into a dummy load and found that the amp put out a lot of thumps along with a bit of sidetone leaking through; adequate to monitor my sending, but far from optimum. In the HW-7 the sidetone is fed into the volume control, where the signal level is much higher than that out of the mixer. If I were going to make this amp a permanent setup, I'd try knocking the sidetone signal down to the proper level by using a large resistive voltage divider or a very small capacitor and feeding it into the amp along with the received audio. Another possibility would be to run a second audio line from the HW-7 to the amp, taking the full strength sidetone straight into the volume control.

Another use of the recorder is as an external speaker-amplifier for a DC receiver. I have another one in the shack which also has a CA3035 audio amp like the HW-7. I fed the headphone output, through a 1 megohm potentiometer, into the recorder volume control with good results, using the pot as an additional volume control. Without it, the receiver output was too high and I couldn't get a good volume range with the recorder control.

Portable recorders are widely available, and most QRPers probably have an extra one around that could be put to service in the shack. Even discarded ones can often be used. My experience from dumpster-diving has been that a radio or recorder in the trash frequently has a good audio section. Having a large external box beside the rig isn't always appealing for a permanent installation, and certainly leaves something to be desired for portable operation. However, as a temporary repair measure or for experimental use, a modified recorder makes a very quick, handy and LOUD audio section for direct conversion receivers.

QRP/QRO for the HW-7

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Jessup, MD 20794-0232

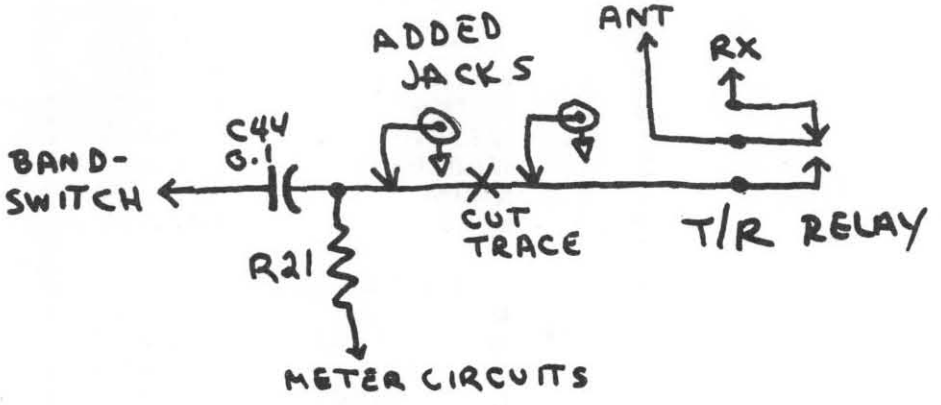
It can be fun to use an attenuator on the output of a QRP rig to try milliwatting, and some people like to run an outboard amplifier at times. The problem in doing these with the HW-7 is that there is no access to the transmit signal before it gets to the antenna jack, by way of the T-R relay, and anything done to it must be accomplished externally. You could use an attenuator in the antenna lead, but it has to be switched out every time you go from transmit to receive, or put up with the attenuation on received signals. On the other hand, when using an amplifier you need some way to bypass receive signals around it. While you could use an external relay to do these things, the best solution would be to insert the devices between the transmitter and internal antenna relay.

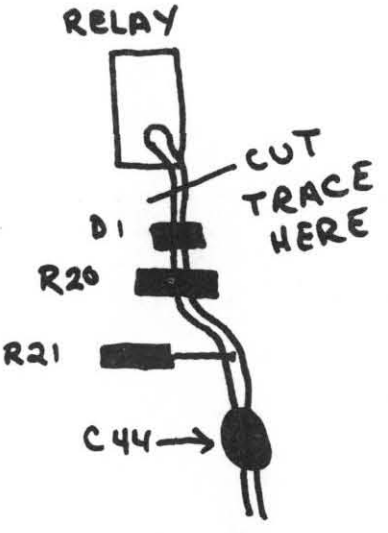
To do this, I broke the connection and installed a pair of BNC connectors as shown in the diagram. For normal operation, I place a jumper cable between them, which I can easily remove to insert my attenuators. If I should ever feel the need to add a small amplifier, it's just as easy. I don't know the current rating of the existing relay but it looks like it should certainly be more than adequate to handle the typical 5 or 10 watt amplifier. While I used BNC connectors, you could also use UHF or phono plugs, depending on your preferences. I used RG-174 miniature coax to connect them to the circuit board.

I also replaced the relay in my HW-7, although it had nothing to do with the possibility of adding an amplifier later. I used a DPDT, 12 volt coil DIP relay obtained from KM8X's Small Parts Center. It's quieter, has more than enough current capacity (2 amps) and best of all gives me an extra set of T-R contacts. Although I don't have anything definite in mind yet, some future modification will make good use of them. This type of relay is similar to those used by Kenwood for RF switching in some of their transceivers and antenna tuners at the 100 watt output level.

I installed the relay in the area vacated by the old one, which required some butchering of the circuit board. It would be much easier to put the relay on a scrap of perf board and mount it on the side or rear wall, but I wanted to keep those areas open for future mods.

Not only have these changes improved my HW-7, they'll also give me what every QRPer really wants, down deep in his heart—a place in the next edition of the Hotwater Handbook!





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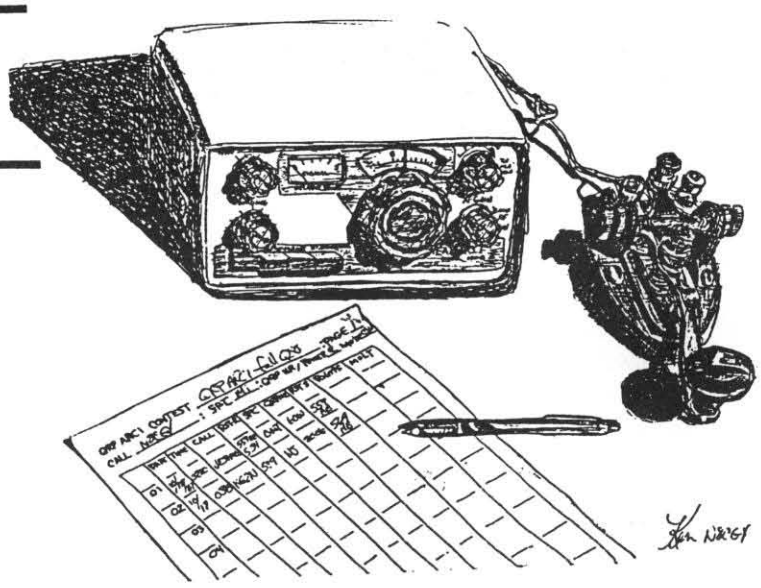
Contests

Red Reynolds, K5VOL
835 Surryse
Lake Zurich, Illinois 60047



Upcoming Contests

***

Summer Homebrew Sprint
July 9, 2000-2400 UTC

***

Summer Daze Sprint
Aug. 13, 2000-2400 UTC

***

Fall QSO Party
Oct. 21 (1200 UTC)-Oct. 22 (2400 UTC)

***

Holiday Spirits Homebrew Sprint
Dec. 10, 2000-2400 UTC

***

QRP ARCI Spring QSO Party Results

CALL	SCORE/POINTS/SPC	POWER	BANDS /TIME	RIG	ANTENNA
ALABAMA					
N4OHB	113,305/ 327/ 33	4.0 B	3 / 4	IC-735	Dipole
W4DGH	24,864/ 148/ 16	2.5 B	2 / 7	Argosy-2	Yagi
ARIZONA					
WD7I	61,152/ 182/ 32	5.0 B	4 / 6	Century-22	Inv 'L' Dipole
CALIFORNIA					
W6SGJ	103,572/ 411/ 36	5.0	15M/ 8	TS-930S	Yagi
W8QZA	24,402/ 166/ 21	5.0	20M/11	AT-1/51J4	Dipole
COLORADO					
W1XE	1,601,124/1167/ 98	4.0 S	7 /24	IC-740/IC-551	Vert/Dp/Yagi
KROU	308,637/ 639/ 69	4.5	7 /24	IC-745/FT-726	Vert/Yagi
K9AY	91,560/ 327/ 40	5.0	3 / 7	IC-745	Gnd Pl/Yagi
CONNECTICUT					
W1AW OPR-KH6CP/1	1,823,440/1052/ 86	.87 S	5 /24	Argo 515/HB	Loop/Dp/Yagi
NN1G	214,058/ 396/ 51	4.0 B	5 / 7	HW-9	Windom
W1KKF	145,336/ 358/ 28	3.0 S	40M/ 8	W7EL/m	G5RV
FLORIDA					
K4KJP	136,080/ 243/ 40	2.0 S	3 / 5	Argo 509	Yagi
KA4LKH	99,000/ 275/ 24	.90 B	15M/ 6	TS-440S	Dipole
GEORGIA					
AB4LX	14,816/ 83/ 17	3.5 B	4 / 1	Drake Twins	Loop
ILLINOIS					
WD9IWP	686,960/ 554/ 62	.95 S	4 /18	IC-735	Inv Vee/Dp/Vt
W9PNE	436,170/ 434/ 67	.75 B	5 /14	Argo 515	Sloper/Yagi
NF9X	189,000/ 315/ 40	.80 B	5 /18	TS-130V	Vertical
K5VOL	177,632/ 416/ 61	2.0	4 / 7	Argo 509/HW8	Longwire
W9ZSJ	114,800/ 205/ 28	1.0 S	3 / 4	---	---
ND9X	78,498/ 267/ 28	2.5 B	20M/ 4	HW-8	Vertical
K9VON	4,704/ 56/ 12	5.0	40M/ -	---	---
INDIANA					
KA9JKK	103,740/ 273/ 38	.90	5 /12	Argosy	Loop/M Quad
KANSAS					
WOOE	10,080/ 90/ 16	5.0	3 / 3	R4B/T4XB	Dipole/Yagi
MARYLAND					
K3TKS	890,175/ 715/ 83	1.0 B	5 /19	Argo 509	Loop/Vert
WD8OYG	215,250/ 615/ 50	5.0	5 /17	TS-820	Dipole/Vert
KX3U	204,792/ 552/ 53	3.9	5 /14	TS-140S	Vert/Dp/Wire
KC3MX	17,920/ 256/ 35	5.0	3 / 8	TS-680S	Dipole
WA8MCQ	12,019/ 101/ 17	4.0	4 / 4	TS-430S	Dipole

Top Ten

1.	AA2U	2,934,800
2.	W1AW (KH6CP)	1,823,440
3.	W1XE	1,601,124
4.	W3TS	1,493,340
5.	KN1H	943,400
6.	K3TKS	890,175
7.	WD9IWP	686,960
8.	WA0ZPT	610,522
9.	NA9M	449,190
10.	N8CQA	447,552

Single Band

80 M	WD2H	109,080
40 M	W1KKF	145,336
20 M	ND9X	78,498
15 M	W6SGJ	103,572

MASSACHUSETTS						
WB1GJI	248,117/ 454/ 51	5.0 B	4 /24	HB RX/TX/Argo	Windom	
NQ1F	35,881/ 173/ 17	3.0 B	20M/ 5	HB QRP-20	Dipole/Vert	
N1FSS	7,007/ 91/ 11	3.0	3 /--	HW-7	Dipole	
MICHIGAN						
N8CQA	447,552/ 576/ 74	4.0 B	5 /15	HW-9	Random/Square	
WG8R	142,800/ 425/ 48	3.0	3 / 8	Argo 509	Zepp	
K7JBQ	52,528/ 268/ 28	5.0	20M/ 7	FT-757-6X	Loop	
KD8FR	37,170/ 177/ 30	5.0	4 / 3	Century-22	Loop	
MINNESOTA						
WONGB	46,170/ 171/ 27	.90	5 / 5	TS-440S	Vert/Yagi	
WAORPI	28,980/ 138/ 20	5.0 B	2 / 2	HW-9	G5RV	
MISSISSIPPI						
KA5KAB	62,370/ 330/ 27	2.5	2 /15	HW-8	Dipole	
MISSOURI						
WCOW	124,320/ 320/ 37	5.0 B	3 / 4	TS-440S	Yagi	
NOEIC	59,360/ 265/ 32	4.0	4 /12	HW-9	Loop	
WNOF	24,864/ 148/ 16	1.7 B	20M/10	HW-8	Dipole	

NEW HAMPSHIRE								
KN1H	943,400/	690/	68	.90	S	6 /18	Argosy/m	G5RV
W1FMR	262,521/	463/	54	5.0	B	4 /11	Argosy	Longwire
N1CUU	103,845/	345/	43	5.0		4 /15	HW-9	G5RV
NEW JERSEY								
AA2U	2,934,800/	1276/	115	.95	S	6 /24	IC-730/FT-736	Loop/Dp/Yagi
WB2CZB	225,480/	416/	53	.95		6 /13	2-FER X/IC-575	G5RV/Yagi
K2JT	156,156/	338/	44	3.0	B	5 / 3	Argo 515	Dipole
K2QJ	122,584/	398/	44	5.0		5 / 7	TS-930S	Vert/Yagi
W2JEK	41,140/	187/	22	.90		4 / 4	Argo 505	Hertz/Dp/Gp
K2HPV	25,564/	166/	22	5.0		3 / 3	IC-735	Dipole/Yagi
WA2GTJ	9,506/	97/	14	2.0		3 / 1	Argo 509	Random/Vee/Yag
NEW MEXICO								
W5TTE	431,040/	449/	48	.9	S	5 /21	Argo 505	Vert/Button Bm
NEW YORK								
WB2QAP	374,738/	754/	71	5.0		4 /21	Argo 509	Inv Vee/Yagi
W2QYA	333,900/	420/	53	.90	B	4 /22	HW-8	Longwire
N2ARP	135,050/	365/	37	.90		3 /11	2B/TX4B	Zepp
WD2H	109,080/	303/	24	.90	B	80M/ 9	Corsair 2	Loop
W2FB	99,960/	340/	42	4.0		5 / 7	HW-9/TS-430	Vert/Loop/Yagi
W2PFS	71,800/	359/	20	1.0		40M/ 9	Argo 509	Loop
NOEID	61,985/	235/	35	5.0		4 / 6	---	---
WN2Q	1,920/	32/	6	1.0		20M/ 2	HW-9	Vertical/Loop
OHIO								
NN8B	57,240/	159/	18	.90	S	40M/ 3	Argosy	G5RV
NC8X	42,425/	175/	22	1.5	B	40M/14	2-FER XCVR	Longwire
K8UPR	11,130/	106/	15	4.0		2 / 3	HW-9	Vertical
OREGON								
W6RCP	122,430/	330/	53	5.0		5 /12	Argo 515	Loop/Vert
W7AVV	14,994/	119/	18	2.0		4 / 4	HW-8	Vertical
WX7R	11,844/	94/	18	4.0		4 / 7	IC-735	V Beam/Zepp
PENNSYLVANIA								
W3TS	1,493,340/	923/	79	.90	S	7 /15	HB Sup XCVR	Vee/'T'/Yagi
NM3K	5,400/	54/	10	1.0		40M/ 1	Omni	Longwire
WA3SRE	2,064/	128/	16	4.0		80M/ 3	Argo 515	Vertical
RHODE ISLAND								
KA9HAO	223,720/	329/	34	.85	S	4 /12	Argo 515	Loop
SOUTH DAKOTA								
WA0ZPT	610,522/	740/	76	4.0	B	4 /24	HB XCVR's (2-FER tx)	G5RV/Loop/Vert
TENNESSEE								
KV4B	224,775/	405/	37	.90	B	2 /11	Argosy	Inv Vee/Yagi
WO5K	67,760/	242/	28	1.0		3 / 4	Century 21	Vertical
NU4B	33,901/	167/	29	4.0		4 / 3	HW-9	Vert/Yagi
TEXAS								
WG5G	415,996/	716/	83	5.0		3 /15	TS-130V	Quad
WA8YWK	273,466/	492/	51	3.0	B	2 /10	HB RX/TX	Vertical
K5HDX	94,668/	322/	42	1.5		3 /22	HW-8	Dipole
N5MVK	5,621/	73/	11	5.0		2 / 1	HW-9	Dipole
VIRGINIA								
KA5NLY	177,261/	367/	46	5.0	B	5 /20	Argo 515	Longwire
N3OS	91,376/	456/	28	2.3		40M/ 2	HB tx/SB-301	Loop/W.Yagi
WN2V	24,990/	170/	21	4.0		3 / 3	Omni-D	Vertical
N3OS	12,080/	120/	12	3.1		80M/ 2	HB tx/SB-301	Dipole
N4QYK	6,628/	67/	8	3.0	B	2 / 2	HW-8	Dipole/Vert
WASHINGTON								
KF7MD	331,964/	577/	76	5.0		5 /24	HB Sup XCVR	Loop/Log Per
NOAX	55,755/	177/	30	5.0	B	3 / 3	Argosy-525	Quad
KV7X	32,775/	115/	19	1.0	B	40M/ 4	IC-730	Loop
NM7M	29,988/	153/	28	5.0		3 / 2	Corsair	Dipole/Yagi
WM7P	3,465/	55/	9	2.0		2 / 1	HW-8	Vertical
WISCONSIN								
NA9M	449,190/	620/	69	2.0	B	5 /20	Argo 509	Vert/Yagi
KA9VAX	44,660/	203/	22	.90		20M/ 5	Argosy 1	Inv Vee
WYOMING								
WF8X	18,326/	154/	17	5.0		2 / 4	TS-430S	G5RV
BRITISH COLUMBIA								
VE7CA	40,275/	173/	25	4.0		2 / 4	HB DC XCVR	Loop/Log Per
QUEBEC								
VE2BLX	28,352/	139/	16	5.0	B	40M/ 8	MAVTI-40/m	Longwire
SASKATCHEWAN								
VE5BA	302,505/	469/	43	.90	B	3 /15	IC-735	Yagi
ENGLAND								
G4EBO	35,126/	193/	26	3.0		2 / 4	Century 22	Dipole/ZL-Spec

All Time Leaders

*** CW — QSO Parties ***

Band	Call	Score	
ALL	N4BP	3,587,220	Fall 88
160	N8CGY	1,260	Fall 87
80	WK8G	136,800	Fall 88
40	W1KKF	145,336	Spring 89
20	NF0R	170,100	Spring 88
15	W5SGJ	103,572	Spring 89
6	------	0	

*** CW — Sprints ***

Band	Call	Score	
ALL	W3TS	452,380	Holiday Spirits 88
160	------	0	
80	W8KYD	2,940	Holiday Spirits 88
40	W1KKF	78,206	Holiday Spirits 88
20	W4FRL	60,960	Summer Homebrew 88
15	------	0	
10	TI2QRP	7,600	Holiday Spirits 88
6	------	0	

*** SSB ***

Band	Call	Score	
ALL	W8WVR	179,580	Summer Daze 88
160	------	0	
80	------	0	
40	------	0	
20	WB5KYK	32,039	Winter Fireside 89
15	KA6HGT	48,720	Winter Fireside 89
10	WA6IET	107,184	Winter Fireside 89
6	------	0	

*** TEAM ***

Colorado QRP Team 3,545,087 Fall 1988
(KR0U, K9AY, W0KEA, W1XE)

The QRP Candy Store is a clearing house for all member and ARCI sponsored products such as T-shirts, ball caps, hat pins, stickers, stationery and more. Promote QRP in your area! Send your ideas, suggestions and an SASE to Bob Spidell W6SKQ, 45020 N. Camolin Ave., Lancaster, California 93534, for store flyer.

Idea Exchange

by Mike Michael, W3TS
P.O. Box 593 Church Lane
Halifax, Pennsylvania 17032-0593

LOW COST COILS

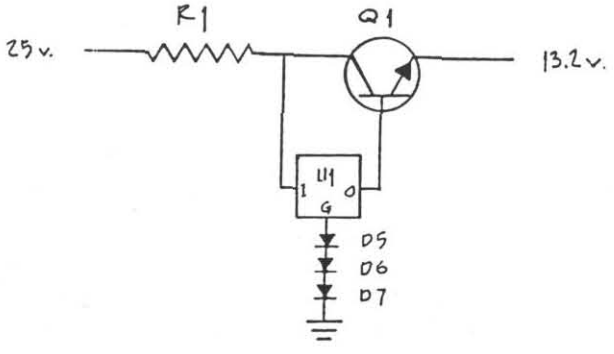
As the cost of Home Brewing keeps going up I keep looking for low cost ways to build my gear. I have been buying old CB sets at Ham Fests and yard sales. The newer sets have very good QRPER parts in them and I have been giving from 25¢ to $1 for them. The "10K" style coils are very useful. The cost of the Amidon cores keep going up and so I have been using these "10K" coils in quit a few of my home brew rigs. You can rewind them with out to much trouble if you use about #32 wire. To pull them apart, just pull a bit on the pins, first on one side then on the other and soon the core will be free from the can. I use an "AL" value of 135 and have had good results using Amidons formula that is used with toroids.

HEATH PSA-9 POWER SUPPLY MODIFICATION

Mark Miller K5DP writes with a hint if you loose your regulator:

The PSA-9 is the matching accessory power supply for the HW-9 transceiver. Voltage regulation is accomplished by a low current 12 volt regulator IC (U1) and a pass transistor (Q1). The regulator in my supply failed, taking with it a 1 ohm, 2 watt limiting resistor (R1). In looking for a replacement, I discovered the 7812 regulator IC (Radio Shack cat. no. 276-1771). With its 1 amp capacity and internal overload protection, I was able to replace not only the original regulator, but also the pass transistor and limiting resistor with a single component. Since the original pass transistor and the new 7812 regulator are both housed in T0-220 cases I reused the transistor socket with only minor rewiring. I retained the diodes D5, D6, and D7 which maintain the regulator ground at 1.8 volts and increases the output voltage to 13.8.

The 7812 is available from Radio Shack at $1.19 each. Pin connections are shown on the package. Radio Shack also has a 5 volt regulator which could be included in this (or most other) supplies to provide a small, inexpensive, dual voltage supply.



ORIGINAL REGULATOR CIRCUIT
HEATH PSA-9
(PARTIAL SCHEMATIC)

FIGURE 1

VFO CAPACITORS

Mike Czuhajewski WA8MCQ writes with an idea for low cost VFO capacitors that already have a vfo "box" and dial drive attached.

KD4YD's Hints & Kinks item in the October 1987 QST about UHF tuners is worth reviving here for the QRP community. Many of them have small but sturdy three-section capacitors, with double bearing shafts, and integral gear reduction drives, usually 4:1. Although they have click-stops, you can easily defeat that by removing a ball bearing. You can keep the dial from the TV set, cover the channel numbers and recalibrate it.

Carefully rip out the extraneous components, tie all three stators together, and you have a capacitor built like a tank. A word of caution—be careful around the stators. They are usually mounted by soldering onto a thin metal coating bonded onto ceramic shafts. I've had some of these joints break, necessitating resoldering the stators, and it's a bit tricky doing it so the rotors don't short against them. Also, even if the joint doesn't break, be careful when you solder your wires on so you don't melt the mount.

You may see one or more unencapsulated disc capacitors with one face soldered to the case. You might be tempted to use these as part of your circuit or as tie-points, but I wouldn't recommend it, even if the capacitance is perfect for you. Although they *could* be NPOs, I have no idea what their temperature coefficients might be, and they could sabotage your attempts at making a stable VFO.

It's best not to buy surplus tuners from a catalog, since there is no guarantee any given one will be usable for this purpose. You may have to go through several tuners to find a good one, since many older designs aren't really suitable. I have nine in my collection, but have passed over at least that many for various reasons. For instance, I've seen some where the stator and associated inductor are one continuous piece of metal and could not be separated. While it makes a great UHF tuned circuit, that inch-long line from the capacitor to ground is a dead short at HF! I've had the best luck with solid state TVs made in the '70s or later. Also, it goes without saying that mechanical tuners are required—if you see a junk TV with electronic tuning, strip it for parts but forget about using the tuner.

How about capacitance? Although they are small, when all three sections are tied together the typical range between minimum and maximum is around 20 pf. Depending on the VFO design, this can be perfect to cover an entire band. In fact, most of the 40 meter VFOs I built use "normal" capacitors of about that value. However, a drawback with the tuners is the shape of the plates. The UHF TV band covers something like a 2:1 ratio, and the plates are cut for straight-line frequency, not straight-line capacitance. When used in a circuit covering a small range, such as an HF ham band, the coverage will be compressed at one end. The drawing below shows the resulting dial calibration when I put one into my test-bed VFO. The normal tuning capacitor, of about the same value, had straight-line capacitance plates (semicircular) and produced relatively linear calibration. (See note below.)

Size can be a problem if extreme miniaturization is one of your goals. Typical bulk is about the same as a large pack of cigarettes, with a 2-1/2 inch shaft extending out of it. (These days, it might be better to compare it with something else, since that's no longer a universal point of reference! And since I don't smoke, it's only an estimate anyhow.)

Despite the drawbacks, if you come across a free one in a junked TV, a UHF tuner can bc great fun to play with. And for the truly dedicated, hard boiled, grass-roots scrounger/ homebrewer, it's much more rewarding than using a store bought capacitor and drive.

VFO dial calibration with
UHF tuner capacitor

7	7	7	7	7
0	0	0	0	1
0	2	5	7	0
0	5	0	5	0

Note Recommended reading:

- October 1984 QST, p. 27, "Shapes of Variable Capacitor Plates"
- May 1985 QST, p. 47, Technical Correspondence, "Straight-line Frequency, Anyone?"

CAPACITORS CAPACITORS CAPACITORS

Mike WA8MCQ says take a look in the hamfest junk barrels.

A good source for small variable capacitors is old commercial FM rigs of the boat anchor variety. These used to be in great demand by hams for conversion to two meters, long ago before the manufacturers started making rigs for the ham market. They still appear sometimes at hamfests, but don't always sell very well. In fact, I've picked up at least a half dozen from various places at no cost. (One of the benefits of hanging around at the end of hamfests comes from dumpster diving, to get some of the goodies that folks can't sell and don't want to take home.)

I've stripped down both old General Electric tube type rigs and some RCA transistorized ones. I haven't done any of the relatively new and expensive Motorolas, but both the GE and RCAs yielded a lot of good variables of various types. In addition to ceramic trimmers, they have screwdriver-adjustable air variables of the APC type. The ones in the final amplifiers might run to 50 pf or more, and the low level stages have a lot of really neat miniature ones, in the 15-25 pf range. Some are APC's, some are PCB-mounted, others are mounted with nuts and have shafts. The diameters on those are an oddball size, less than 1/4 inch, but you can drill out the hole in a knob designed for a 1/8 inch shaft and get a good fit

Hint: don't overlook the shielded cans in the rigs—some of them have been known to contain air variables as well as transformers and coils. Open them all up to be safe.

You probably won't want to pay very much for any of these old rigs, but if you can get them for nothing or close to it, many are a gold mine of small variable caps. And to think I used to pay money for those parts at hamfests!

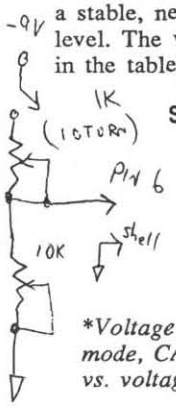
ALC QRP CONTROLLER REVISITED

Mike WA8MCQ is busy builder and always has something going, this time he adds some ideas to the QRP controller.

The Kenwood SSB QRPer

Ever since I got back into ham radio a couple of years ago, I've been 99.99% QRP CW. My TS-430S is great for that—just crank the carrier knob down and the degree of control from 5 watts to a few hundred milliwatts is surprisingly good. It really leaves a lot to be desired on SSB though since the carrier control has no effect. The only way to cut power there is with the microphone gain and the usable QRP range on it covers about one degree of rotation! Don't give up hope though, as the TS-430S is quite capable of QRP SSB operation.

The W3TS Idea Exchange in the April 1986 issue of The Quarterly had an item on going QRP SSB with the ICOM IC-735, and the same principle works beautifully with the TS-430S and probably the other solid state Kenwoods as well. The key is pin 6 of the REMOTE connector on the rear, which is intended as an ALC input from a (gasp!) linear amplifier. A negative voltage cuts down the power output and, with proper adjustment, the voltage will take the rig down into the QRP region very nicely. All you need to do is apply a stable, negative voltage and adjust it for the desired power level. The voltage range for QRP is rather narrow, as shown in the table, but this is not a serious problem.



Sample power outputs with various ALC voltages*

ALC voltage	Power output
7.30 or less	100 w
7.54	50 w
7.69	20 w
7.83	10 w
7.95	5 w
8.18 or more	<2 w

**Voltage is negative with respect to ground. Rig in CW mode, CARRIER control fully clockwise. Values of power vs. voltage vary somewhat over a period of time.*

I tried a variable power supply for proof of concept, and it worked quite well, although the adjustment was critical due to the wide voltage range. The best way to go is to use a 9 volt battery and a divider network. This way you don't tie up a power supply, can have a very small device, and the adjustment range can be spread out. I used a ten-turn pot in the center, varying the end resistors to get the output voltage in the ballpark. (You can use a regular pot and still get god results, but the adjustment won't be as smooth.) I based the design on the value of the ten-turn pot in my junk box, but you can use any values you want. The important thing is to get the proper voltage level.

I designed for a nominal 9 volt battery, as simulated by setting the power supply to that level. Everything worked well until I plugged in an actual battery, which turned out to be 10 volts and threw my carefully designed adjustment range out of whack—the lowest voltage was too high and the power wouldn't go over a few hundred milliwatts. I replaced one resistor with a pot as a coarse adjustment to compensate for variations in battery voltage. I later eliminated another resistor and ended up with the circuit shown. This way, the ALC input can go all the way up to the full battery voltage, which is important if it's starting to get weak. Paragraph 6-8 of the operator manual says the input is nominally -8 to -10 volts, so a 9 volt battery won't cause any damage.

I used a a switch to conserve power, though the drain isn't much over 1 ma. (I tried measuring the current drawn by the ALC input circuit with my Fluke 77 digital voltmeter and it read 0.01 ma, which is the same reading I got with the test leads shorted together, so the only significant current drain is from the resistors in the box.

To use, apply the voltage to the ALC connector. (Another mistake I made—the local store was out of 7 pin DIN plugs and only had the 8 pin models which look almost the same except for an extra pin in the center. Unfortunately, after you get home and break off the center pin to make it fit, you find that two pins are in slightly different positions between the two plugs. I finally made it fit by removing more pins, filing a notch in the plastic body of the connector and turning it 180° in the metal shell. Next time I'll listen when they recommend that I wait a couple of days and get the right part!)

(continued on page 22)

Members' News

Fred Bonavita W5QJM
P.O. Box 420321
Houston, Texas 77242-0321

TOP-BANDERS: **Dave Humphries, VE3DN,** of Kemptville, Ont., says he finds operating QRP on 160 meters can be pretty lonely, and he encourages more activity on the band.

"I am now involved with homebrew QRP VFO on 160m, running first 100 mW (worked 13 states) and then up to 1 watt," Dave says. "Not much activity on QRP 160, although it is a band for QRP as many of the CW operators on 160 are really set up to copy weak signals."

Dave would like to hear form any of you who are on 160 or would like to get on the Top Band.

MORE QRP IN KP2: For those who missed the QRP expedition staged last summer to the U.S. Virgin Islands (KP2), there's another chance coming up early in August.

Listen for **W5QJM/KP2/QRP** from around Aug. 9 and for the next five or six days. I expect to be especially active the weekend of Aug. 12 and 13 from the island of St. Croix, barring any mishaps.

Operation will be CW only and on 40, 30, 20, 15 and 10 meters as conditions warrant and permit. Operation will be the recognized QRP frequencies, plus or minus 5 kHz for QRM. Special attention will be paid to 30 meters (10.110 MHz) for those needing a new country on that band. QSLs via W5QJM to the address above; my Callbook listing is out of date.

LATEST ELECTION RETURNS: Congrats are in order for the newly elected presidents of two QRP groups:

Max Brunger, VK5OS, of Lockleys, South Australia, is the new president of the CW operators QRP Club from Down Under, taking over from **Len O'Donnell, VK5ZF.**

In his first message to the membership in Lo-Key, the club's quarterly newsletter, Max makes an interesting observation: "Of the letters received from new or prospective members, 78% have mentioned their participation in building as being a major part of their enjoyment, and all of them sought information about organized CW QRP."

Max also says their is fresh interest in the new 18 MHz band for QRP. Information about the Aussies' club can be had from **Kevin Zietz, VK5AKZ,** 41 Tobruk Ave., St. Mary's S.A. 5042, Australia.

And the new president of the Michigan QRP Club is **Lowell Corbin, KD8FR,** of Lansing. He succeeds **Jerry Totten, K8JRO.**

From Jessup, Md., comes word from **Mike Czuhajewski, WA8MCQ,** who reports good results on his first efforts on 30 meters. With his TS-430S cranked down fist to 4 W out and then to 103 mW out, Mike worked WA1OIH in Connecticut for an average of 2,524 miles per watt.

"A few minutes later, I answered W8AVB's CQ, by which time my power had drifted down to 33 mW," Mike says. "I made it easily into Toledo for 11,969 miles per watt."

He next worked W1BNS in South Carolina, who had been listening to them, and since his power out had dropped to 22 mW by then, that QSO was good for 20,454 miles per watt. "That's the way to start out on a new band!" Mike says.

Mike went on to say he wound up his first year back in QRP by jumping into the CQ Sweepstakes with 4 watts out. When the smoke cleared, he not only had landed the last two states he needed to qualify for WAS/QRP, but managed to work all 50 and missed only VE8 for a clean sweep.

If that wasn't enough, Mike also "slapped on every attenuator I could find in the house to cut my power to 6.72 microvolts out on 10 meters for some tests with a nearby ham." Just hours earlier and running 12 mW out on 10 meters, Mike logged KP4TIN for 129,666 miles per watt.

Danny Gingell, K3TKS

Dick Hayman, K3DML

THE MARYLAND GANG has been a busy bunch, carrying the QRP message to others. **Dick Hayman, K3DML; Danny Gingell, K3TKS,** our nets manager; and **Mike Czuhajewski, WA8MCQ,** recently mounted a presentation for the Washington, D.C. area Maryland Apple Dumpling Radio Amateur Society, better known as MADRAS, a technically oriented small group.

Danny opened with a demonstration of a QRP CW keyboard—the one described in the December 1988 issue of QST—with a homebrew Twofer transmitter built in. Mike discussed technical aspects of homebrew gear and the Heath HW-7/8/9 series of QRP transceivers. Dick capped things with an explanation of QRP from an operator's perspective: the difficulties, rewards and thrills of low-power operating.

Says Mike, "Although no one pledged to sell their amplifiers to feed the poor or house the homeless, the presentation was well received, and everyone seemed to enjoy the introduction to this 'new' facet of ham radio."

MORE MILLIWATTING: Veteran QRPer **Brice Anderson, W9PNE,** reports from Lancaster, Ill., jumping into the ARRL CW DX Contest to see what he could do while running 50 mW input to his TenTec Argonaut 515. "I can't measure the output accurately, but it's below 25 mW and probably less than 20 mW," Brice says.

After a slow start trying to break through the pileups, Brice found conditions better by the afternoon. When he checked his log later, he found he had worked five continents in 112 minutes, but it took another 80 minutes to round out his mW/WAC.

Next day, he was back at it and qualified for WAC in 1 hour, 56 minutes at 25mW. Brice's antenna is an 8-year-old TH5DX at 52 feet and fed through 225 feet of RG-213U.

"Several years ago, I worked all 50 states with 50 mW output," the 70-year-old ham says. "I'm now trying with 25 mW output and have worked 38 states. Many have been worked on 40 meters with my sloping dipole and some on 3.5 MHz.

DON"T FORGET VHF: QRPers **Dave Benson, NN1G,** and **Zach Lau, KH6CP/1,** dusted off their gear and hit a hilltop near their Newington, Ct., homes for the ARRL VHF QSO Party last year.

"Limited to the contents of our knapsacks and hand-carried yagi antennas, we puffed our way up and enjoyed contacts from Southern New Jersey to Maine," Dave says. "Aside from the benefits of fresh air, this is a great way to wave the QRP banner."

"QRP portables now have their own top ten contest summary, and given the modest amount of activity in this category, your chances of competing successfully are excellent. QRPers with VHF capabilities, especially in the densely populated Northeast and West Coast areas, are urged to give VHF hill-topping a try," he says.

For the record, Dave used an IC-502 and dipole on 6 meters and an IC-202 and 4-element yagi on 2 meters, while Zach had an IC-202 and dipole on 2 meters, an IC-702 and dipole on 432 MHz and a homebrew transmitter and loop yagi on 903 MHz.

From Coon Rapids, Iowa, **Randy Shirbroun, WA0VBW,** throws his support to the calls for a QRP certificate for those who have worked all zones. (Creation of such a certificate was among the items the club's board of directors was to have considered at its June meeting; the results will be reported later—ed.)

"There's no doubt in my mind that it is much tougher than QRP-DXCC or even QRP-DXCC-200," says Randy, who boasts a QRP DXCC total of 34 worked and 231 confirmed. "I've used QRP exclusively since 1980 with an Argonaut 509 at 2-3 Watts output. It's truly a fantastic little radio, and I hope TenTec decides to produce another QRP rig."

Among Randy's credits: a 20-minute WAC during the recent ARRL CW DX Contest and a "clean sweep" in last November's ARRL Sweepstakes.

Meanwhile, the man who started all the talk about a QRP certificate for working all zones, **Peter Elmendorf, WE2P,** checks in again this quarter from his home in Kingston, N.Y., with word he bagged QRP/WAC in 8 minutes on the second night of the ARRL DX Contest in February!

He qualified for the award a day earlier in 16 minutes and decided to see if he could better his time. Both were with 4 watts out.

"What does all this show?" he asks. "First, RF is wonderful stuff; second, sunspots are a QRPer's best friend; third, a fancier rig can help make up for a not-so-fancy operator."

Two final notes: Because of the repetitious nature of some items in recent members' news columns about fast-track QRP/WAC qualifiers, the batch above will be the last we will print for a while. We still are interested in hearing from all members and readers about their QRP exploits, but we fell the time has come to get on with other activities.

We encourage everyone to continue submitting items for this column, which is one of the widest-read sections of The QRP Quarterly. We will print items about fast-track WAC or other awards from time to time, however.

Second, out best wished go to QRPer **Bob Spidell, W6SKQ,** of Lancaster, Calif., who is well on the way to recovering from a hart attack. Bob is one of the forces behind the QRP Candy Store and a long-time supporter of the club and its activities.

That's it for this session. Send your articles and items to the above address, and remember we can use black-and-white photos of QRP activities and operators.

President's Message

continued from page 2

QRP ARCI Secretary/Treasurer

- Distribute mailings to officers and board of directors
- Maintain QRP ARCI bank account, budget and financial records
- (Having a PC/label program is very handy)

QRP ARCI Membership Chairman

- Receive membership applications
- Assign membership numbers
- Forward mailing labels quarterly, to The Quarterly printer
- (Currently on Apple/Mac computer)

QRP ARCI Awards Chairman

- Issue club awards
- Keep club award records
- Submit "Awards" column for The Quarterly
- (A computer comes with the job)

QRP ARCI Board of Directors.

- Vote on important club issues
- Elect club officers
- (No experience needed, but as you can see with the logo issue above, this is a very powerful position)

BOD members are elected by the general membership, and officers are elected by the BOD.

Are you a possibility thinker ? Success is never a single small accomplishment, but a never ending process of going through good times and bad, pleasure and pain, ups and downs, ins and outs. If you have an idea or dream that comes to you out of the blue, pick up that dream and run with it. Dreams and ideas are so wispy that they rapidly*fade away unless acted upon as soon as they occur. If you can see a possibility, be sure to start to make it into your own special reality. It is important to write down your idea before it drifts away.

If you think that you would like to be part of the success of QRP ARCI, quickly write down your own thought, so that it does not slip away - then go for it !

000

Take a QRP rig along with you on vacation, and we will be looking for your (/QRPvac) signal on the nets. Also be sure to send B&W photos of your portable setup to Fred Bonavita, so that we all may enjoy your adventures.

Have a great summer and a long, safe vacation.

Dallas/Dayton Deals!

Since many members were unable to attend the QRP activities at either the Dayton Hamvention or the ARRL National Convention in Dallas earlier this year, your club has acquired a limited number of kits which were sold at those events.

These kits are on a first-come, first-served basis and are limited to club members. One type of each kit may be ordered, but not mote than one of each. For example, a member may purchase a Sudden receiver, a crystal marker and an iambic keyer.

Checks should be made payable to Fred Bonavita and sent to him at P.O. Box 420321, Houston, Texas 77242-0321. In case items have been sold out, items still available will be shipped with a refund of the unused portion of the check.

Items available are:

ONER TRANSCEIVER: This popular kit, prepared by the G-QRP Club, includes four kits in one: Oner transmitter, Oner receiver, VFO and a t/r relay and sidetone board. Complete with instructions but less output filter and transmitter. $45, postpaid.

SUDDEN RECEIVER: Designed by Rev. George Dobbs, G3RJV, this direct-conversion receiver is a simplified version of the Neophyte receiver. Kits available for 20 or 40 meters only, although instructions tell how to put one on 160, 80 or 30 meters. Less main tuning capacitor (20 pF). $25, postpaid.

IAMBIC KEYER: A very compact, fully iambic operation keyer with dot-dash memories, low power consumption, negative or positive keying and on-board speed control. $20, postpaid.

VFO: Originally designed to run the Oner transmitter, this VFO is useful in its own right. Highly stable. Compact. Builder has option of 160, 80 or 40 meters or 5 MHz. Less coil and tuning capacitor. $15, postpaid.

CRYSTAL CALIBRATOR: Very stable, compact unit with outputs on 10 or 1 MHz or 100 or 10 kHz. Uses 10 MHz crystal. $15, ppd.

ONER TRANSMITTER: The stand-alone transmitter section from the Oner Transceiver above. One cubic inch of power! $7, ppd.

SUDDEN RECEIVER PC BOARDS: A limited number of pc boards for the Sudden receiver. No other parts. See "Sprat" for April 1989 for complete details of receiver. $2, postpaid.

PASSIVE AUDIO FILTERS: These well-known CW filters were designed by Ed Wetherhold, W3NQN, and were featured on the cover of the December 1988 issue of "QEX." This kit includes an 88 mH inductor stack, a set of matched capacitors, a set of input/output transformers and complete instructions. $12, ppd.

Idea Exchange.....

(continued from page 19)

With a dummy load, key up the rig in CW, with the CARRIER control fully clockwise. Adjust the QRPer to get the desired power output level. You ca then use the carrier control to go even lower, spreading the QRP range over the full 300°. Switching over to SSB and talking, with the microphone gain at a normal setting, the power is about the same as it was in CW, at least on my TS-430. (The ALC meter won't kick up much, though).

Important note: In the TS-430S, the CARRIER control has no effect on SSB. If you set the power level to 5 watts CW, then crank CARRIER down to 2 watts, you'll still get 5 watts on SSB, not 2. Always adjust for the desired power with CARRIER fully CW.

I can't guarantee that the SSB and CW power will match exactly. Also, I can't make any guarantees about using this with any of the other Kenwoods. I did try it on one TS-140S and it worked well in both CW and SSB, but the settings of the pot were quite a bit different for the two modes.

On word of caution about using this device. Make sure all connections are good and tight. If the voltage should disappear from the ALC input pin for any reason, the output power will rise instantly to the full 100 watts CW, or 200 watts PEP on SSB. Normally this is nothing to be overly concerned about but if you happen to have the rig connected to a QRP wattmeter at the time, you have a very good chance of damaging it. I blew out a 1N277 in my peak-reading diode detector wattmeter this way, the 12th one I've lost in a year and a half for similar reasons. Don't make the mistake I did of trusting a loose 9 volt battery connector; you might want to consider taping it securely onto the battery or even soldering it.

I much prefer CW and doubt that I'll get hooked on QRP SSB, but at least I can try to get a few 1000 miles per watt awards on a different mode. This little device will come in handy when I'm trying to sell someone on QRP. They usually complain that they prefer SSB but can't cut their power in that mode. Now they'll have to come up with some other excuse.

THANKS TO ALL WHO CONTRIBUTE! Please keep the ideas coming. Being interested in QRP and portable operation, I am also interested in

any suitcase or spy-type radios. I am also interested in military HF manpack sets too.I have a small collection of units and I am always on the look out for additions to my collection. So, if any of the readers have info, schematics, manuals, sets for sale or loan, I would like to hear from them.

Well that's it for this time. 73 es GL, W3TS

Correction

There was an error in Mike Czuhajewski's article "E^2/R Explained" on page 20 of the April 1989 issue of The Quarterly.

The second sentence of the second paragraph should read "Power in a sine wave is $Erms^2/R$ where Erms is the effective value of the signal." Mike points out that the erroneous /2R of the formula that appeared in the April issue applies only when the voltage is peak, not rms.

We regret the error.

The QRP Candy Store

Operated for QRP ARCI by Bob Spidell, W6SKQ 45020 N. Camolin Ave., Lancaster, CA. 93534

The QRP Candy Store is a clearing house for all member or ARCI sponsored, QRP related products. Promote QRP in your area; send your ideas, suggestions and a sase to Bob Spidell, W6SKQ for store flyer.
LOGO: T-Shirts, Ball Caps, Hat Pins, Stickers, Stationary & more.

Propagation Toolkit

by Bob Brown NM7M
Now Available on MSDOS disk
Manual and disk $11 ppd in U.S.
$6.50 each if sold separately
available at The QRP Candy Store
c/o Bob Spidell W6SKQ
45020 N. Camolin Ave.
Lancaster, California 93534
make checks payable to Bob Spidell

Please make check payable to Bob Spidell.

NEW PRODUCT AVAILABLE

Mark Boucher, WB3ELL, has started to advertise a 20 meter AM conversion kit for a Radio Shack TRC-218, Model 21-1638A CB handheld to 14286 kHz, the 20 meter SPAM frequency. Mark is selling the kits for $79.95 each and the portables go for about $50.

Mark tells us he is selling these as a way of starting up his own amateur radio design and kit manufacturing business. "It is a lot easier for me to convert an existing radio than to design one from scratch," says Mark. "I am not especially pushing AM, but these should sell, as they are different, simple, inexpensive and they work." For the future, Mark plans a very simple 40 meter DSB and 160 FM transceivers.

Contact him at 4813 Lexington Ave., Erie, Pennsylvania 16509 or call 814-864-2125.

New Member/ Renewl Data Sheet

Call_____ Age_____
Recommended by:_____
License Class_____
Other Calls Held_____
Bands Most Used_____
Please circle your interests and elaborate if desired on a separate sheet. Thanks!
Ragchewing, DXing, Contests, Traffic, Awards, Homebrew, Experimenting, CW, SSB, RTTY, ATV, Packet, VHF/UHF, Satellite, Other

Do you plan to participate in club activities? Y/N
Would you like to be a club officer/director? Y/N
Do you have access to duplicating equipment? Y/N
Are you interested in our awards program? Y/N
Have you applied for any of the club awards? Y/N
Are you in favor of QRP calling frequencies? Y/N
Are you in favor of member QSO parties? Y/N
Would you help write for the Quarterly? Y/N
What subjects?
What QRP awards/achievements have you won?
Why do you run low power?

[ ] Renewal (U.S. $10, DX $12) [ ] New Address
[ ] New Member (U.S. $12, DX $14) [ ]New Call

Name_____Address_____

City_____State/Country_____Postal Code_____

Amount Enclosed_____QRP ARCI #_____Callsign_____
Please make your check or money order payable to:
QRP Amateur Radio Club, International
Please Do Not Send Cash

Mail to: Bill Harding, K4AHK
10923 Carters Oak Way
Burke, Virginia 22015 USA

QRP #_____Inc Rec_____Apl Rec_____
List File_____MCert_____Rep Cpy_____

QRP ARCI
Spring/Summer Net Schedule

Net	QRG	NCS	Day	UTC
TCN*	14060	W5LXS	Sunday	2300
		ANCS-NM7M		
SEB**	7030	K3TKS	+Wednesday	0001
		ANCS-KH6CP/1		
GSN	3560	W5LXS	+Thursday	0100
		ANCS-W5XE		
GLN	3560	K2JT	+Thursday	0100
		ANCS-KH6CP/1		
NEN	7040	WA1JXR	Saturday	1200
		ANCS-W1FMR/K3TKS		
WSN	7040	W6RCP	Saturday	1600
		ANCS-W6JHQ/W6SIY/NJ7M/NM7M		

* On weekends of major contests, TCN will meet one hour later.
** If conditions on 7030kHz are poor, QSY to 3535kHz at 0030Z.
+ Evening of the day before for W/VE

Other QRP Nets

MI-QRP	535	K8JRO	+Wednesday	0100
VE-QRP	14060	VE6BLY	Sunday	1800

Every Sunday QSO Party

UTC	CW	SSB	Novice
1400-1600	14.060	14.285	
1600-1700	21.060	21.385	21.110
1700-1800	28.060	28.885	28.110
1800-1900	7.040	7.285	7.110
1900-2000	14.060	14.285	
2000-2100	21.060	21.385	21.110
2100-2200	28.060	28.885	28.110
2200-2300	7.040	7.285	7.110
2300-0000	14.060	14.285	
0000-0100	7.040	7.285	7.110
0100-0300	3.560	3.985	3.710

Upcoming Contests

Summer Homebrew Sprint
July 9, 2000-2400 UTC

Summer Daze Sprint
Aug. 13, 2000-2400 UTC

Fall QSO Party
Oct. 21 (1200 UTC)-Oct. 22 (2400 UTC)

***

Holiday Spirits Homebrew Sprint
Dec. 10, 2000-2400 UTC

QRP Quarterly
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Alpine, Texas 79831

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