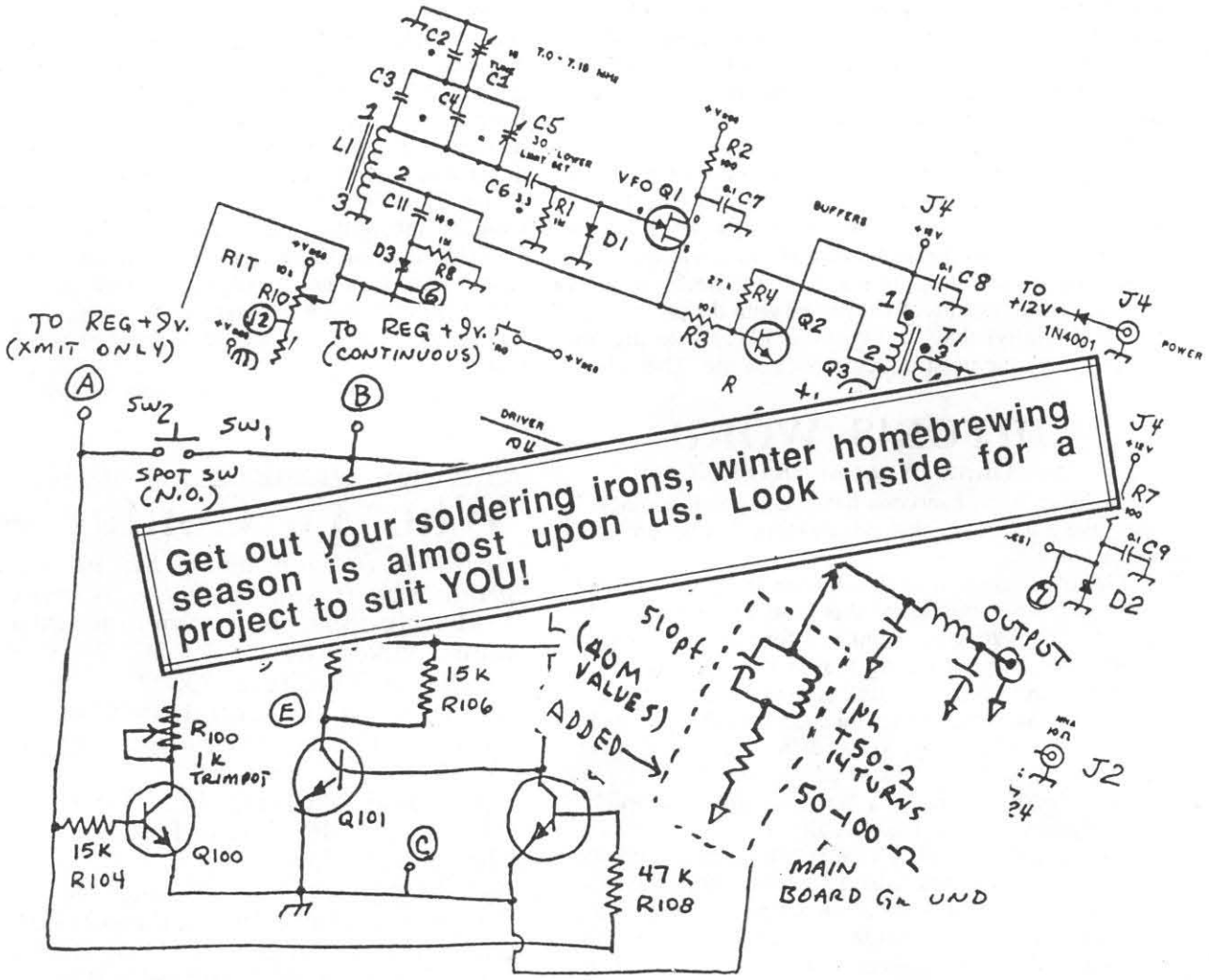
QRP Quarterly

Journal of the QRP Amateur Radio Club, International

October 1990 Volume XXVIII Number 4



President's Word

by Paula Franke, WB9TBU

I hope everyone had an enjoyable and productive summer. The summer season here in Beecher, on the other hand, brings to mind an old Chinese curse: "May you live in interesting times", because there hasn't been a single dull moment.

Those who have managed to get through on my telephone have already heard some of the details. The major happenings include the worst tornado in 25 years (fortunately, this was one storm that did no damage to my own home, but my county was declared a state and federal disaster area), other weather related difficulties particularly as they relate to farming, an unusual number of deaths of friends or members of their families, and my managing editor at work went on vacation for three weeks leaving me to do both her job and mine.

In addition, the site selection process for Chicago's third airport is heating up. As most of you may know, my house is in the middle of one of the proposed sites, a second site is about 5-6 miles directly west and the other three sites are within 25 miles. At the moment, sources that I have who are directly involved with the process tell me (unofficially) that the two most likely sites are the two that have the most direct impact on me. This whole process has overturned our quiet rural community and we have been working very hard this summer to cope with its effects.

Enough of that...on to club business. I hope everyone else had a pleasant summer and a successful Field Day. I haven't heard from many people over the summer, so there isn't a lot to deal with this time around.

New Board Members

There were three positions opening on the board of directors this year. Nominations were solicited in the July issue of The Quarterly and our secretary Luke Dodds W5HKA received three applications for the positions. As a result, I directed Luke to poll the board by telephone to have the nominees elected by acclamation. Luke was unable to contact one board member, the rest were unanimous in their acceptance of the nominees.

Jim Fitton W1FMR, returns to the board. New board members taking their places in January are Rich Arland K7YHA, and Bob Gaye K2LGJ. Our thanks for their services in the past go to outgoing board members John Collins KN1H and Red Reynolds K5VOL. Biographies for our new board members can be found elsewhere in this issue.

Continued on page 14

EDITOR'S WORD

by Chaz Wooten, KD4XX

Hi folks, hope everyone has had a good summer. I don't have a lot to say this time, except that we are running late, again!

I have just gone to work full time; it's put me behind on this issue. So forgive me this time, and I'll try to do better. I would like to say thank you for all the nice letters I've received complimenting me on the last few issues since I took over as editor. But I can't take all the credit, if it wasn't for you, the ones who submit articles for publishing in The Quarterly, we wouldn't have anything to work with. So keep the articles coming in! To those who have sent SASE's asking for a Writer's Guide, you will be getting them soon, if you haven't already.

I stopped by the TEN-TEC booth at the Huntsville Hamfest in August and talked to them about the new Argonaut II. As I didn't have a pen or paper with me at the time I didn't get the name of the gentleman I talked with. But he did fill me in on when it would be out: they are looking to have it on the market sometime between late November to early December. The first two runs are already sold out! The retail price will be around $1,300, but the gentleman told me that the dealers would most likely discount it. One other thing he told me was that if this radio was just a receiver, it would still be worth $1,100, as the receiver is one of the best they make. They also make this radio in a 100 watt version; it will go for $1,600. Now if I can get a loan from the bank.....

Problems, Questions, Comments?

Who To Contact—

PLEASE include an SASE of an appropriate size if you expect a response.

- **Subscriptions, dues, membership problems:** Mike Kilgore, KG5F; 2046 Ash Hill Road; Carrollton, Texas 75007
- **Non-technical articles:** Chaz Wooten, KD4XX; 103 W. 7th St.; Jasper, Tennessee 37347; 615-942-5116
- **Technical articles:** John Devon, KI6DQ; P.O. Box 3236; South Psadena, California 91031; 818-5523
- **QRP Contests:** Red Reynolds, K5VOL; 835 Surryse Road; Lake Zurich, Illinois 60047
- **Nets:** Danny Gingell, K3TKS; 3052 Fairland Road; Silver Spring, Maryland 20904
- **Awards:** Bob Gaye, K2LGJ; 25 Hampton Parkway; Buffalo, New York 14217
- **Club Operations:** Paula Franke, WB9TBU; P.O. Box 873; Beecher, Illinois 60401; 708-946-2198
- **Club information packets** (include $1): Mike Bryce, WB8VGE; 2225 Mayflower, N.W.; Massilon, Ohio 44647

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.

Table of Contents

True RIT for the SPC W7EL Transceiver

by Bill Hickox, K5BDZ
9215 Rowan Ln.
Houston, Texas 77036

(Second of two parts)

The W7EL transceiver is a proven favorite among QRP'ers. It first appeared in an August 1980 QST article by Roy Lewallen, W7EL. Having just built the Small Parts Kit version of the rig, I was excited about everything except the RIT (receive incremental tuning) circuit. The original circuit I consider to be a XIT (transmit incremental tuning) circuit which will only allow offset tuning of the VFO in the transmit mode and not in the receive mode. And in this case, it only tunes on one side of the VFO zero beat.

The modification described in this article will change the original circuit, allowing receive incremental tuning on both sides of VFO zero beat, while maintaining a zero beat transmit frequency, a technique used by most commercial and hobby designs today.

RIT allows one to tune for adjacent signals while keeping the same transmit frequency. It also allows one to follow another drifting signal without playing "leap-frog" down the band. since all my rigs use RIT and I'm too lazy to change my ways, I've modified my transceiver to add the RIT circuit shown.

I am extremely pleased with the results, And I hope you will be too. I found this basic RIT circuit by John Lock, KFØM, which first appeared in Hints and Kinks in QST for January 1981 and later in both editions of the Hot Water Handbook. While

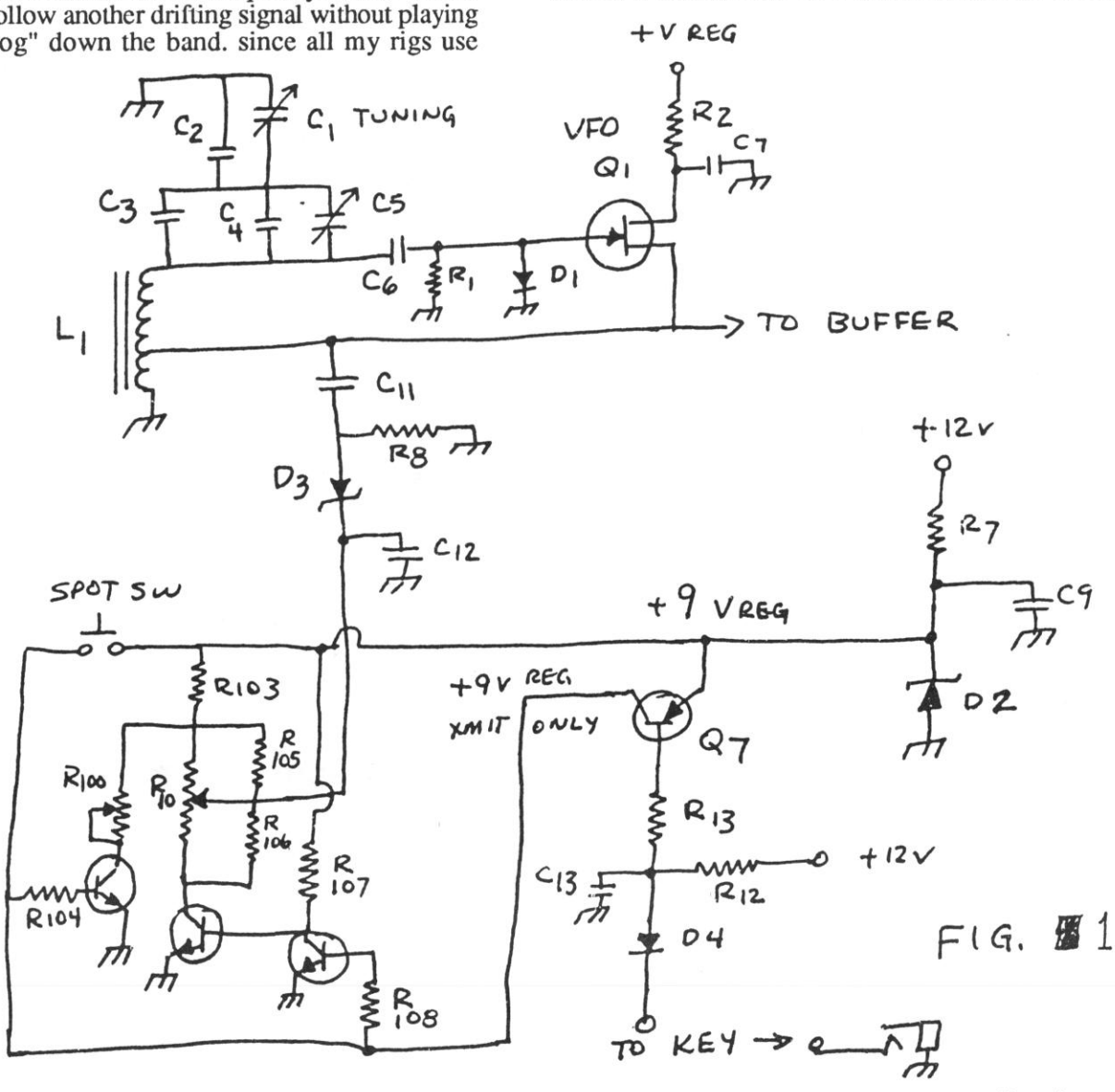


FIG. 1

it was designed as a RIT modification for the HW-8 transceiver, the circuit is very straight forward, and can be used on almost any VFO circuit.

RIT THEORY OF OPERATION

RIT is meant to vary the receive frequency to either side of the main VFO frequency while not changing the main frequency during transmit. To do this properly, three design criteria should be met:

1. RIT is to vary VFO output in the receive mode only.
2. RIT should tune about 3 to 4 KHz either side of main VFO output (zero beat).
3. Transmit frequency must fall in the middle of the RIT tuning range and not be affected by the RIT control setting. Sound simple? It is, if you understand one little secret: The RIT circuit actually functions during both the transmit mode as well as the receive mode. Sure, the RIT control only functions during receive, but the circuit must keep the VFO output in the middle of the RIT tuning range (zero beat) during transmit. Without this feature, your RIT would appear to function properly, say between 7.030 to 7.038 MHz, but the transmit frequency would be off to one side, say around 7.045 MHz, which is out of the RIT range. So, when you add RIT, you are actually adding RIT and XIT.

CIRCUIT DESIGN THEORY OF OPERATION

In this design, a controlled voltage is used to tune the RIT section of the VFO circuit via C11 and D3 (see Fig. 1).The more voltage fed to this point, the more capacitance is allowed to "creep through" into the circuit, changing the frequency of the VFO. In the receive node, the RIT "tuning" voltage is varied by the RIT control pot (R10) on the front panel. While the separate fixed transmit voltage is set by a fix-tuned adjustable mini-pot on the RIT circuit board (R100 in Figs. 1 & 4). The three transistors, Q100, Q101, and Q102, are electronic switches.

In the receive mode, no voltage is applied to the bases of Q100 or Q102, so these transistors are "off," and the XIT is off. Voltage through R107 (15K) is applied to Q101, turning it "on," allowing the RIT control to operate.

In the transmit mode, or when the normally open SPOT switch is closed, voltage is applied to the bases of Q100 and Q102, turning "on" these transistors, and causing the following:

1. Q102 shorts to ground the voltage from R107 that controls Q101. Without that voltage, Q101 turns "off," the RIT pot is no longer in the circuit to ground, and the RIT control is turned of.
2. Q100 turns "on," connecting R100 (1K) to ground and completing the circuit of R100, R105, and R106, thus fixing the transmit frequency.

So there you are. Ten components and 10 minutes of reading, and you're an expert on RIT circuits. How long didit take me? You don't want to know!

THE MODIFICATION

This new RIT modification replaces most of the original XIT circuit as designed. We keep the RIT capacitor (C11) in the VFO, the voltage tuning diode (D3), the 1 meg resistor (R8), 0.01 by-pass capacitor (C12), and the panel mounted RIT pot and the SPOT switch.

The new components are easily mounted on a now board as noted below in item 6. There is plenty of room to mount this additional board within the cabinet, so there is no reason to try to make the new board super-mini if you find it hard to work in tight spaces.

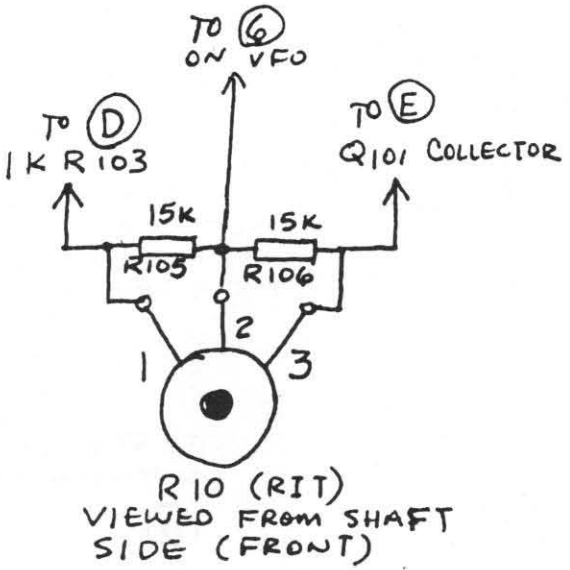


FIG. 2

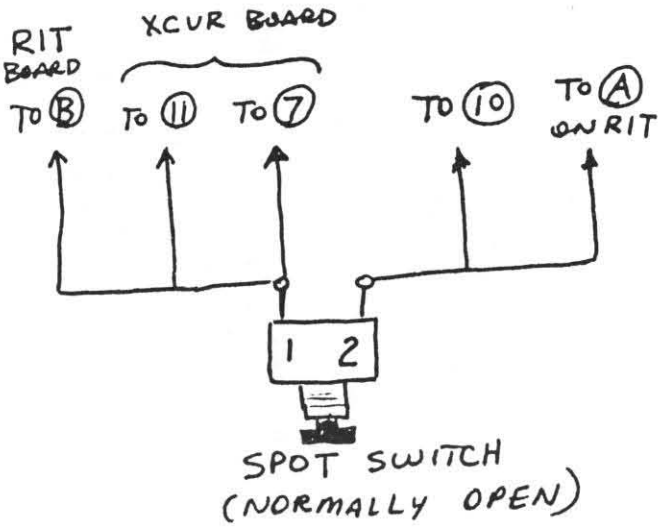


FIG. 3

To modify the SPC transceiver, follow these steps:

1. Remove and discard R9, the 56K resistor. It is replaced by R106.

2. Remove and discard wire form R11 (10K) to RIT pot (R10).

3. Disconnect all wires form RIT pot (R10). (At this time you may wish to replace the adjacent volume control 100K pot, R32, with a similar pot that includes an off/on switch to control the main power.)

4. Disconnect all wires to the SPOT switch.

5. Trim and bend leads on two 15K resistors (R105 and R106) and solder to RIT pot (R10) as shown in Fig. 2.

6. Use a small piece of perf board to mount your remaining RIT components. I mounted mine on a 3/8' x 1" piece of perf board, but that was extremely tight. You may want to try a piece somewhat larger.

7. After mounting the RIT components on the separate board, connect the new RIT board as shown in figs. 2, 3, and 4. Circled numbers refer to the original SPC circuit. Double check all wiring against the modified circuit schematic in fig. 1.

8. Remember to connect the ground wire to the RIT circuit. After testing it, I mounted my RIT circuit board to the outside of the VFO shield, near the top, over the transmitter section.

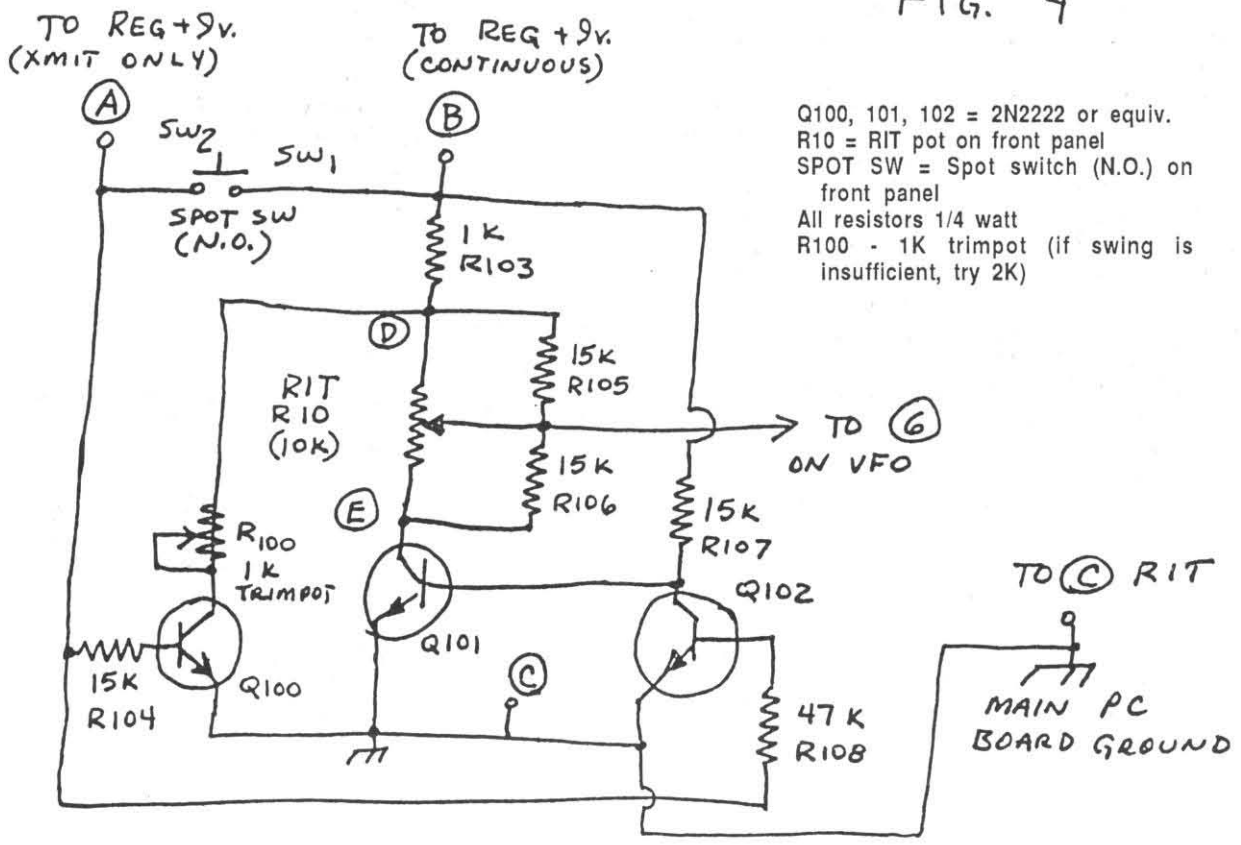
9. Do not run connecting wires over the top of the VFO box. Run them around the outside of the box and dress them so they do not interfere with the shaft screw on the vernier dial. I like to use a one-inch piece of wire, soldering one end to the PC board, and bending the remainder over the loose wires to hold them in place and firm.

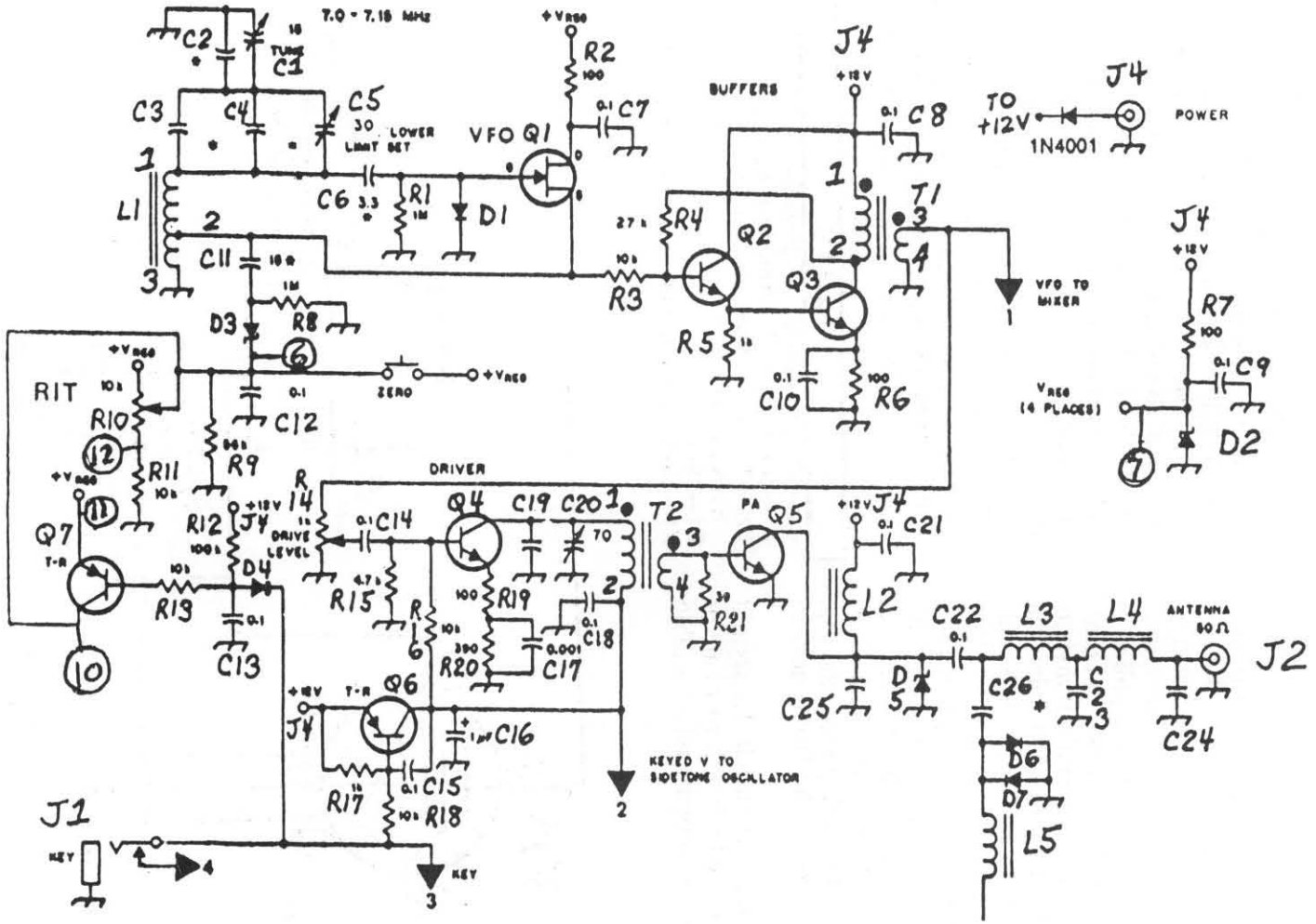
10. To set the XIT frequency in the center of the RIT frequency coverage, find the VFO frequency on a separate receiver (or connect a frequency counter), set the RIT control R10 to midrange 12 o'clock, and using the SPOT switch, adjust the mini-pot R100 until the frequency on receive (SPOT switch out) is the same as the frequency on transmit (SPOT switch in).

Now your RIT should tune approximately 4 kHz. either side of your transmit frequency, and the transmit frequency should be the same as the receive frequency with the RIT control in the 12 o'clock position (center of the pot range).

This completes the modification to include true RIT inyour SPC transceiver. I hope it gives you as much fun asmine has me.

FIG. 4





A PORTION OF THE SMALL PARTS CENTER SCHEMATIC SHOWING RIT CONNECTION POINTS 6, 7, 10, 11 AND 12. FROM FIG. 4

One-Tube 40 Meter Milliwatter

John P. Devon, KI6DQ
P.O. Box 3236
South Pasadena, CA 91031
(818) 441-5523

Adrian Weiss' "History of QRP in the U.S., 1924-1960," inspired me to build a simple, battery-operated 40 meter oscillator-transmitter based on the 3Q5 beam-power tube.

While lacking in DX performance, it made a lone contact to Santa Barbara (about 90 miles) truly memorable! Referring to the schematic, we see an ordinary fundamental-crystal oscillator. I configured the filament for 1.5 volts, supplied by an alkaline flashlight battery. Plate power comes from 12 series-connected nine-volt transistor radio batteries, which yields about 108 volts. The tube is available from Antique Electronic Supply (602-894-9503) for about $3.

Keying is on the negative plate supply lead. If desired, only L1-L2 would need changing for use on any other band. I built mine on a 2.25" X 2.25" X 5" minibox, with the tube and four-prong plug-in coil form protruding from the top. The crystal socket mounts on the front, next to the key jack.

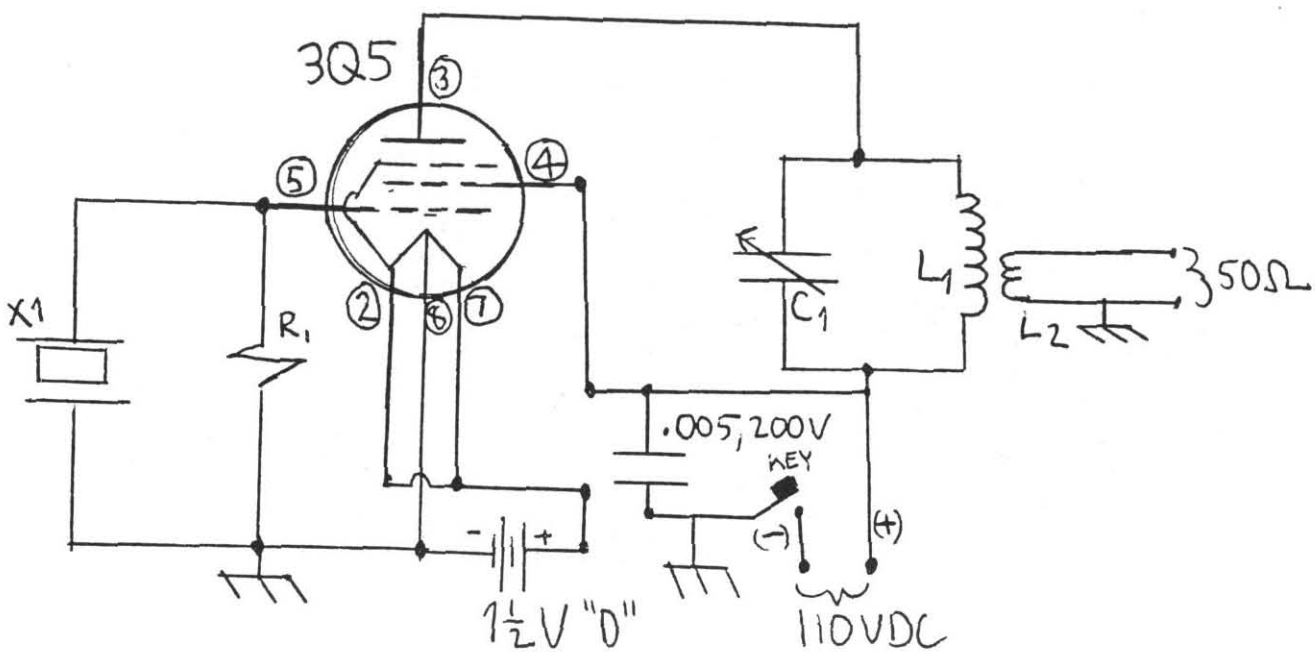
Nothing is critical about the circuit. L1 should be about 5 microhenries, which will resonate at 7.040 with about 100 pf. I recommend a variable be used at C1, for ease of adjustment. Wind L2 over the bottom of L1, and if plug in forms are not available, use a piece of finished wooden dowel.

Tune-up couldn't be easier! Just use an output power meter, plug in your 40 meter fundamental crystal, hit the key, and adjust for maximum power. Since I cannot accurately measure output power that low, I estimate the output at about 200 milliwatts based on a 10% efficiency, and a DC current of 18 milliamps (110 volts x .018 amps x 0.1 = 0.198 watts). Experiment with the turns on L2 for maximum output to a dummy load.

I spent many happy hours calling CQ with the little rig to no avail. When Les, WB6OLL, called CQ and actually heard my answer, I was in Ham Heaven! Most of the contact was repeats and requests; however, QSL's were exchanged. One of these days, I'll fire it up again and try to shake up some real DX with the one-tube milliwatter.

PARTS

C1—140 pf variable or trimmer
L1—17T on 1-1/4" form, spaced 2", #2
L2—6T over bottom end L1 insulated hookup wire
R1—39kΩ, 1/2 W
X1—40M, fundamental crystal (7.040 MHz)



Another Look at the Omega Tuner

Alden Gamage, WA9QMO
501 S. Gladstone Avenue
Aurora, Illinois 60506

(Editor's note: This information refers to the article, "Omega Tuner" which appeared in the April 1990 issue of The QRP Quarterly.)

The circuit for this tuner is not new; a ham buddy gave it to me over 20 years ago. The first tuner was as large as the average breadbox, with circuit and part information pasted inside the cover and later filed away. It was from this information that the Omega was built.

Coil information follows. B & W Miniconductor stock used in the tuner is sold by Radio-Kit. The following data will satisfy the inductances needed for the four coils.

#1.	1-1/4" dia.	8 TPI	3.2 µh	11-1/2 T	Miniductor 3018
#2.	1-3/4" dia.	6 TPI	1.1 µh	3 T	Miniductor 3058
#3.	1-3/4" dia	6 TPI	2.1 µh	5-1/2 T	Miniductor 3058
#4.	1-1/4" dia.	8 TPI	1.6 µh	6 T	Miniductor 3018

Mount inductor #1 inside of #3; mount #4 inside of #2. Locate all coil leads so they are short and direct to their associated parts. Center the outer coil on the length of the inner coil. Cement the coil assemblies together to keep the coils concentric. Small plastic shims will help hold the inner coil concentric with the outer coil (use Duco cement or equivalent).

I learned from Fred Bonavita, W5QJM, that Harvey-Wells built a "Bandmaster Z Match Antenna Coupler" using this same circuit in their tuner. Highly regarded in the 1960's, they still command respect and a princely price when offered on the used market.

In the QRP Quarterly article (April 1990) the output terminals were listed for both high and low impedances. If you have trouble loading, try the other set. Whichever set gives the best results is the one to use. In general, one set is for 80 and 40 meters, and the other set is for the higher frequencies.

Building a tuner from this circuit will give you an excellent little tuner which will do a good job.

QRP ARCI
1990 Net Schedule Net

NET	QRG	NCS	DAY	UTC
TCN*	14.060	W5LXS	SUNDAY	2300
ANCS - NM7M;				
(TCN will be at 2300 UTC year-round)				
SEN **	7030	K3TKS	+WEDNESDAY	0100
ANCS - KH6CP/1;				
(Always 8 P.M. on Tuesday Night EST/EDT)				
GSN	3560	W5TTE	+THURSDAY	0200
ANCS - W5XE				
GLN	3560	KH6CP/1	+THURSDAY	0200
NEN	7040	WA1JXR	SATURDAY	1300
ANCS - K3TKS; (				
Always 8 A.M. on Saturday morning EST/EDT)				
WSN-40	7040	W6RCP	SATURDAY	1700
ANCS - W6SIY - W6JHQ - NJ7M				
WSN-80	3560	W6RCP	+THURSDAY	0400
ANCS - W6SIY - W6JHQ - NJ7M				

(WSN-80 Held in the winter months only)
(Always 8 P.M. on Wednesday night PST)
* On weekends of major contest TCN will meet one hour later.
** If conditions on 7030 kHz are poor, QSY to 3560KHz at 0130 UTC.
(+) Evening of the day before of W/VE.

Please note that 3535 kHz is the Michigan QRP Club Net Frequency at 0200 UTC. (Always 9 P.M. on Tuesday Nights). Net control is K8JRO, Jerry. MI-QRP welcomes all who are interested in QRP to QNI on the net.

Other QRP Nets:

MI-QRP	3535	K8JRO	+WEDNESDAY	0100
VE-QRP	14060	VE6BLY	SUNDAY	1800

Please remember to tell your friends about the QRP Nets. They might decide to join us after seeing how friendly we can be. QRP ARCI Network Manager - Danny Gingell, K3TKS.

LED Battery Warning Light

by Don Callow, VK5AIL

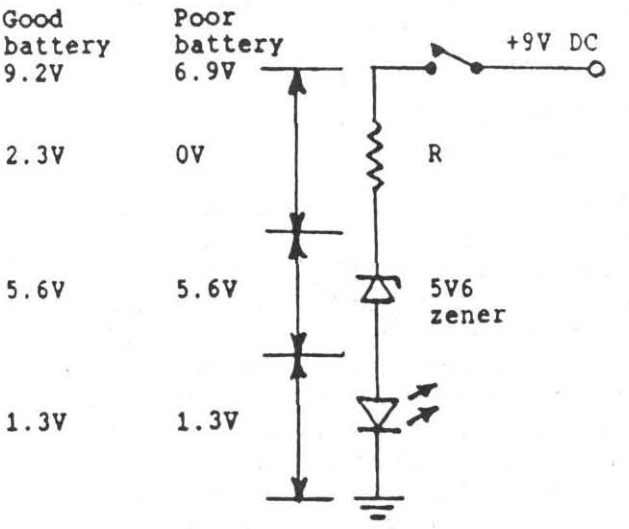
(Reprinted from June 1990 issue of Lo-Key; Journal of The CW Opertaors QRP Club.)

If you are thinking about installing a LED on/off indicator on battery powered gear, why not go further and make it into a warning light for battery low voltage as well! The aim is to make the LED turn off (or be very dim) when the battery voltage drops below a figure you choose. The gear will still operate, but you know you will soon need to replace or recharge the battery.

All it takes is a zener diode. (See the sketch in figure 1.) I used this method after a 'fault' appeared in my "Sudden" receiver. It turned out to be low battery voltage, as I had left it switched on overnight once to twice. But it did fool me into making a start with troubleshooting. Here is one answer to this sort of problem. I will work through my calculations and you can substitute your figures if the voltage or other details are different. Suppose our supply voltage is 9 volts (nominal). The maximum actual voltage might be about 9.2 volts and we will choose 20 mA current through the LED for a nice bright display when the battery is fully charged. (Yes, I know this will gradually flatten the battery, but I use rechargeables!)

The "Sudden" circuit certainly has problems when the battery gets into the 6 to 7 volt range, so let's aim to switch the LED off at 7 volts. In fact there will be a tiny current flow below this voltage, because LED's are not perfect diodes. We know the voltage drop across a LED is around 1.2 to 1.4 volts. Suppose it measured on the diode tester at 1.2 volts. So we need a zener voltage of 7 volts minus 1.3 volts which equals 5.7 volts for the LED to switch off at 7 volts supply voltage. The nearest standard value is a 5V6 zener, which gives a total voltage drop across the zener and LED of 6.9 volts, which is very close to the target.

Now work out the value of the resistance. At 9.2 volts from the battery, the voltage drop across the resistor is 9.2 volts minus 6.9 volts equals 2.3 volts.



from Ohm's law: R = 2.3 /(0.020) = 115 Ohms. The 0.020 is the 20 mA current. The nearest standard value is 120 ohms, which gives a current of 19 mA. From P = I x V we get a maximum power dissipation of 0.019 x 2.3 = 44 mW, which is well within the capability of a 1/4 watt resistor.

Now for some construction hints, if you call installing a LED plus resistor and a zener 'construction' - The (Q)uick (R)ock-bottom (P)rice method is to drill in the front panel a hole the same size as the LED and glue it in (the LED, not the hole). Better still, drill the hole just undersize and use a small rat-tail file to open out and taper the hole to give a push fit. Then slip a piece of heatshrink material over the resistor and zener before soldering them in place between the LED and 'downstream' side of the power switch or other suitable spot.

All this should only take half an hour, but if you are like me you will make it last a whole evening!

QRP Classifieds

For Sale: Icom 735 w/CW filter, Keyer, PS-55 power supply, mobile accessories. Excellent condition. $750. Consider a Century 22 or Argosy on trade. Mike, N4OHB, Rt 2, Box 94, Ft. Payne, Alabama 35967, 205-638-8928

***

Wanted: Argonaut 515. I operate Ten meters a lot with my 505, so you know why I want one. Let me hear from you!!! Chaz Wooten, KD4XX, 103W. 7th Street, Jasper, Tennessee 37347, 615-942-5116.

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

Inexpensive Alternative to FT37-43 Toroids

The very popular FT37-43 sees a lot of use in broadband transformers, RF chokes, etc. According to the January 1990 Amidon price list, it costs 60¢. On the other hand, it also lists the FB43-2401 ferrite bead at a dozen for $3.50, which is a bit under 30¢ each. Both are the same ferrite material, type 43. The outer diameter of the FB is .005" larger, and the inner diameter is .01" greater, both of which are virtually invisible to the naked eye. The height is 50% more, so for all practical purposes the FB43-2401 is a tall FT37-43, with a slightly higher AL factor.

AL, which is based on millihenries per 1,000 turns, is 42O for the toroid and 520 for the bead. To find the inductance in microhenries, square the number of turns and multiply by 0.42 and 0.52 respectively. Fifteen turn coils on the two would be 94.5 and 117 µh.

Unless being used in a tuned circuit, the precise inductance is normally not critical. For use as an RF choke or in a broadband transformer, such as a double balanced mixer or between stages in a QRP rig, the FB43-2401 ferrite bead should make an excellent and inexpensive replacement for the FT37-43. (The bead uses more ferrite material than the toroid, yet Amidon prices it 50% lower. Let's take advantage of them before they wake up and raise the price!) Thanks go to **Danny Gingell, K3TKS** for pointing this one out to me.

Another goodie from Amidon is their tech data booklet for $3.50. It's essentially an overgrown version of their flyers, both in length and size; the flyers contain 23 pages of information, and the booklet has about three times as much. It comes in an 8-1/2x11 format. I highly recommend it for the technical folks.

Kit News from the Small Parts Center

From a recent letter from **Chris Hethorn, KM8X**: "...We are discontinuing the W7EL rig in favor of a superhet transceiver. We will offer the kit for about $110 and it is a much better buy for the money. The receiver is similar to the Micro-20 but has many improvements. All stages are tuned, with a separate VFO and RIT, on board active audio filter, AF muting, and a twin-tee sidetone oscillator, all on a 3.5x4.5 board. The transmitter uses an MC1496P transmit mixer, followed by a doubly tuned bandpass filter, a class A broadband driver, and an MRF472 or MR476 final. My 20 meter version runs at 3.5 W output with a board mounted trimmer resistor to vary the output power. I'm building a 15 meter version and hopefully will have one available for every band.

"I have working models of a stable single band VFO for 3.5, 7, 10 and 10.5 MHz, along with frequency doublers for 7 to 14, and 10.5 to 21 MHz, and a transmitter similar to the one in the superhet. Now all I have to do is find the time to write the instructions!"

Chris should have a new catalog out by the time you read this. For a copy, send a dollar to Small Parts Center, 6818 Meese Drive, Lansing, Michigan 48911.

Recent QRP Articles in the Ham Press You May Have Missed

The July 1990 issue of QST contained "An Experimental Band-Switching Dip Meter" by **Doug DeMaw, W1FB**. It has some similarities to the bandswitching W6HPH dipper in the March 1980 issue of QST, but Doug's unit uses toroid coils to cover the various ranges. Coupling to the outside world is done by a small probe coil at the end of a piece of RG-174 coax. Although I haven't built this yet, and will report on it when I do, I highly recommend reading it.

In the August 1990 issue of QEX, the ARRL Experimenters Exchange, is a six pager by **John Grebenkemper, KI6WX**, "Calibrating Diode Detectors". Those who devoured the explanation of diode behavior in the February 1990 QST article by W7EL will find this one right up their alley. A bit technical, but very interesting information. (QRPers use diode detectors for power measurement of transmitter output as well as various low level QRP circuits.)

Rick Littlefield, K1BQT, presents the QRP-15 CW Transceiver in the September 1990 issue of CQ. This is a 15 meter version of his NE-602 based QRP-20, in the January 1989 Ham Radio, and includes many refinements to the original rig.

Circuit Board Tips

Random thoughts on homemade PCBs, with no claim to originality—

The edges are usually rough and unpleasant

to the touch. I use a file to remove any copper burrs left from the cutting process, then use some 400 grit wet and dry sandpaper, under running water for better performance and to keep things clean, to smooth the edges of the fiberglass. A minute or two of this makes a dramatic difference.

To remove discoloration and shine up the board, I use cleaning paste for copper pots and pans, such as Twinkle, which is available in supermarkets. It works quickly and well. After building the circuit, I spray the board, components and all, with a coat or two of acrylic spray such as Krylon. This protects the copper from future discoloration and keeps it looking nice. Future circuit changes are easy, since the acrylic coating can be easily soldered through—it vaporizes quickly when a soldering iron is applied.

To etch boards, I use an idea stolen from Amidon (and which has no doubt appeared in the ham press already). Years ago, they sold an etching kit which consisted of ferric chloride crystals in a plastic pouch; you added water to make the solution, put in the PCB and massaged it occasionally to keep the solution moving.

I put the board in a heavy duty freezer Zip-loc bag, pour in etchant, close it up and place it in a sink with water as hot as my hands can stand, and massage the bag. This is a quick and clean method, and avoids a lot of fumes as well. It does get a bit nasty when the bag springs a leak, though, so don't reuse them—they're quite cheap. When done, I rinse the bag well then rip it apart so it won't accidentally be used for something edible. Also, to be safe, be sure to use a sink that is never used for food preparation or dish washing.

Better HW-9 Heatsinks

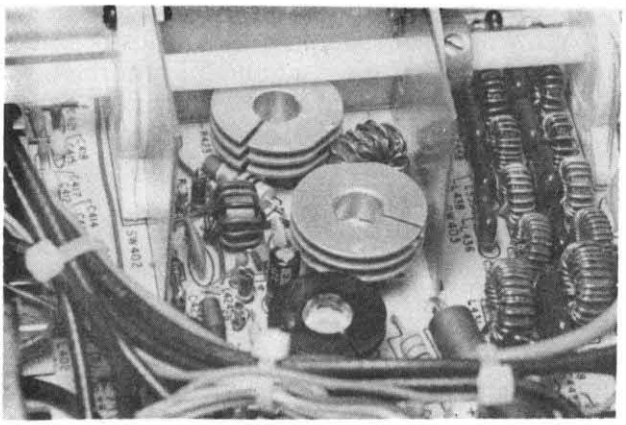
Jack Cleary, WN2Q, of Syracuse, New York sends along this tip—

Attached is a photo of the heatsink mod I made in my HW-9. When I was clearing out the parasitics in the final circuitry I decided the finals (Q405 and Q406) ran a bit hot and looked for some way to run them cooler. The result was removal of the two-fin sinks supplied with the kit and installation of larger three-fin heatsinks. One of the original sinks was moved to Q404, as shown in the photo.

All are coated with heat sink compound. I figure about a 25X improvement in heat dissipation Since I did no tests or measurements, the figure is estimated from the thermal resistance figures shown in the catalog these came from, Phillips Semiconductor Replacement Master Guide ECG212P.

Some mechanical work is required to make these ECG401 heatsinks fit the space. As seen in the picture, I filed down the edges of both sinks to clear coil T403. For sufficient shaft clearance, I also filed a bit off the bottom of one sink and checked rotational clearance before applying heat sink compound. A small tube is available under catalog number EC303. (Radio Shack also carries compound. --WA8MCQ)

Address: Phillips ECG, Inc; Distributor & Special Markets Division; 100 First Avenue; Waltham, MA 02254.



WN2Q's new HW-9 sinks.

W7EL Transmit Voltages for Troubleshooting

Jack Frake, NG1G, mentioned that he was hampered in troubleshooting his W7EL rig by not having information on what voltages to expect in the transmitter. He had sent it to me to work on it; after I had it fixed, I measured voltages at key points in both his and mine and came up with the following: All are RMS voltages seen with an RF probe connected to a 10 megohm input voltmeter, with the rig putting out full power into a 50 ohm dummy load. The voltages shown are for both rigs, and should be representative of most units.

Collector of Q3, buffer amp—3.18/3.37
Collector of Q4, driver—7.3/7.8
Base of Q5, final amp—0.83/0.68
Collector of Q5, final amp—12.4/12.14
J2, output connector—10.4/10.42 (2.16/2.17 watts)

Covering HW-9 Cabinet Scratches

From **Dick McIntyre, K4BNI,** of Basye, Virginia—

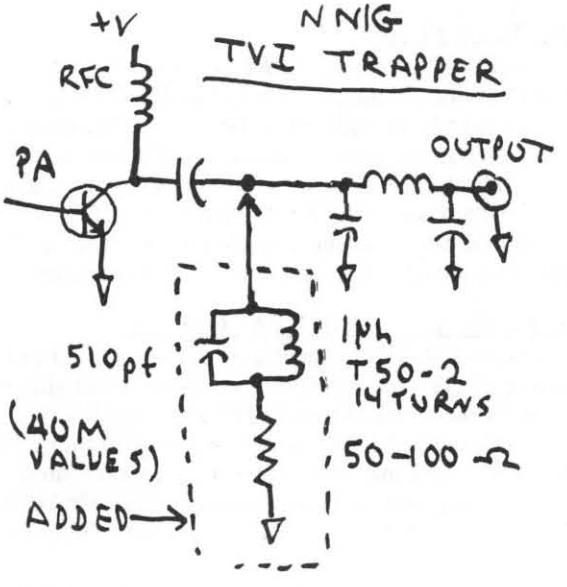
It's been my experience that HW-9 cabinet and panel surfaces scratch easily. Quite by accident I discovered that brown Kiwi Scuff Magic for cleaning up shoes will hide scratches and match the color well. I had several scratches on my front panel above the dial and after application of Scuff Magic I can no longer see them. Several coats applied and rubbed with fingertips is the best approach.

TVI Reduction Circuit and Discussion

The following is an item sent in by **Dave Benson, NN1G,** of Newington, Connecticut, and excerpts from ensuing correspondence.

Dave writes--After trying the usual tricks to eliminate TVI from homebrew transmitters, I came across the circuit shown in the accompanying figure. This one seems to work when other methods fail.

The often-used zener diode from collector to ground does protect the final amp, but helps prevent TVI mainly by shunting the PA collector with capacitance. This subject was addressed in a QST Technical Correspondence letter by **Roy Lewallen, W7EL**, in October 1978, titled "On Solid-State PA Matching Networks," and it also appears in the new ARRL book, QRP Classics.



The parallel coil/capacitor in my circuit are resonant at the fundamental frequency, forming a high impedance which isolates the swamping resistor from the rest of the transmitter. Away from resonance, however, the circuit becomes a low impedance load which snubs out PA ringing. This circuit also works better than using a resistor across the collector choke since it consumes little output power. The values shown on the sketch are for 40 meters, but new values may be substituted for operation on any single band.

If your new homebrew transmitter works great on a dummy load but fails the antenna test, give this circuit a try.

WA8MCQ reply—W7EL said the ringing problem is inherent in any class C transistor amplifier where the input element of the matching network is an inductor or a series LC element (which is again essentially an inductor). The typical 50 ohm bilateral pi low pass filter used in the "normal" QRP rig does not contain an inductance as the input; the left hand capacitor to ground is in effect the capacitor that W7EL is talking about. He said that the input L and the added C should be resonant at Fo, and in the 50 ohm LPF this condition is met, or at least the inductive and capacitive reactances are equal. I suspect that the typical QRP rig using a 50 ohm low pass filter, such as the TwoFer, does not have ringing, due to the filter used.

While your circuit reduces TVI, I don't think it's related to a cure for the ringing phenomenon that Roy described, but more to poor harmonic rejection of the basic low pass filter. In this case your circuit would do well, since it shunts much (not all) harmonic energy away from the output while blocking Fo from the path to ground. Along those lines, it seems like it would be even better to shunt it directly to ground instead of via a 50 to 100 ohm resistor—going into a 50 ohm resistor effectively splits it 50/50 with the filter/load; a reduction of course, but not optimum. On the other hand, I'm not completely comfortable with the idea of the tuned circuit going straight to ground—there seems something intuitively wrong with giving such a low impedance path (read "short") to ground at non-Fo frequencies. It doesn't seem that it would put that much additional stress on the transistor, though, since the harmonic energy is less than the fundamental.

I wouldn't chuck the zener diode just because this circuit is added, since the protection function is quite important in addition to whatever its capacitance does. I had a breadboard rig with a hard-driven 2N3904 feeding a 2SC799 final

putting out almost 4 watts on 40 meters. I was poking around with an RF probe, and deliberately removed the load from the output of the low pass filter. The RF voltage on the collector of the 25C799 shot up to about 54 volts RMS, which translates into 76 volts peak! This was early in the construction stage before the 33 volt zener had been added, and the 25C799, with its collector rating of 40 volts, was quite forgiving—at least this once, anyhow. As always, it's best to leave the zener in an amp, compensating for its capacitance by deducting it from the other capacitors as necessary.

Another cause of TVI might be a poorly built (not poorly designed) pi net, a mistake I made recently. I slapped together a 20 meter low pass filter and checked the insertion loss at 14 MHz—it was about 7 or 8 dB. I followed the cookbook formula for it, but as built the actual cutoff frequency was too low. I had wound the two coils on the proper T50-6 cores, but with the turns bunched up instead of spread out to cover 330 degrees. I peeled a few turns off each one to raise the cutoff frequency. The loss came down to about 1 dB, and I still had good second harmonic attenuation. (Yes, it would have been better to spread the turns than remove some.)

The point here is that a certain number of turns on a core does not necessarily equal a certain inductance. The spacing of turns can affect it, as well as the actual (not nominal) permeability of the core That too can vary.

Speaking of TVI and harmonic reduction, one trick that W1FB has used a few times is to slap a trap on the output of the low pass filter, tuned to the second harmonic, since that's the strongest. It increases the complexity slightly, but he gets some pretty nice looking spectrum analyzer photos off those rigs—harmonics really down in the mud!

Dave replies, The critical idea in Roy's letter was this: In a class C amplifier, the transistor is (ideally) a switch, turned on during the positive-going half of the input waveform. As soon as this half of the cycle is over, the transistor shuts off, leaving energy stored on the collector choke, which has to go somewhere. That "somewhere" is into the front end of the LP filter, or a zener diode capacitance, or you-name-it. The critical idea is that those components are all reactive and will ring at some frequency set by all the circuit values. They ring because there's no damping anywhere during the "off" half cycle. Your suggestion about omitting the damping resistor would probably alter, but not eliminate the ringing.

Roy picked the case that was more prone to VHF oscillation in that the inductive input provides a high-Z input to VHF. The capacitive input (pi section) filter will be prone to the same ringing although probably at a much lower frequency. I'm wondering if this isn't manifested as the low frequency modulation (in the one-MHz ballpark) I've occasionally seen on PAs not yet protected.

Roy establishes rules about the choice of collector choke impedance or parallel capacitance, in effect resonating the network somewhere around the operating frequency. To the extent that the circuit values are well known, his answer is certainly more elegant. My offering is intended as a brute force solution when playing with choke values, etc., doesn't do the job.

The bottom line, from Dave's original letter—"I routinely use the design in transmitters and no longer have to contend with TVI."

THE FINE PRINT—

Thanks to all who have sent in items for the column. As always, your inputs are welcome; we'll either run it here or as a regular article if too long for the column. If you have a technical tidbit, please share it with the other QRPers.

President's Word...

continued from page 1

ARRL Band Plan

As I reported last issue, ARRL Membership Communications Services Manager John Lindholm W1XX said a proposal was to be brought up at the July ARRL Board of Directors meeting regarding formation of a committee to review band allocation and recommendations. In reading the meeting minutes in the September issue of QST I was unable to find any mention of such action. I contact Mr. Lindholm to see if there is any activity on the matter.

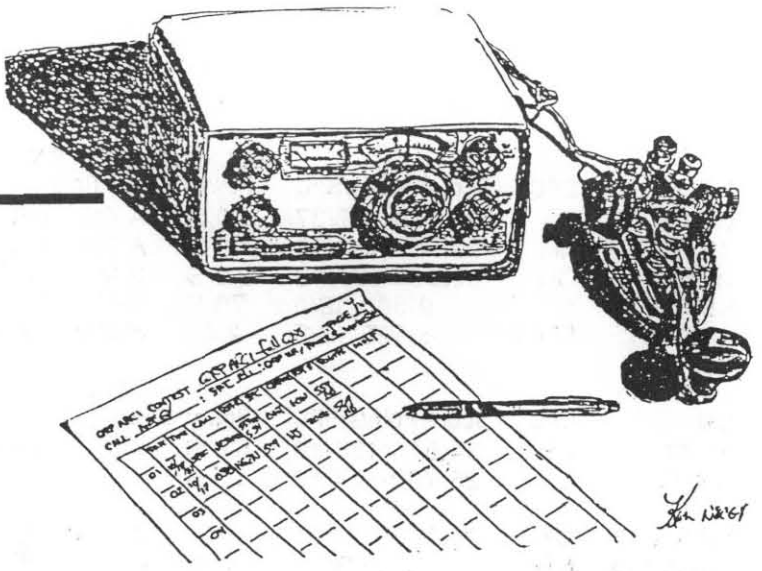
QRP Levels in ARRL VHF Contests

Last issue I also mentioned a comment printed in the June issue of QST regarding the possibility of raising the QRP power level in ARRL VHF contest. I wrote to ARRL Contest Manager Billy Lunt KR1R informing him of the club's (and my own) opposition to such an idea. The reply I received stated my comments would be forwarded to the appropriate person. I've heard nothing further. How about anyone else?

That's about it this time. I'm sure I'm forgetting something, but it's been that kind of summer. My next letter, barring any catastrophe, should be forthcoming mid-November.

Contests

Red Reynolds, K5VOL
835 Surryse
Lake Zurich, Illinois 60047



Upcoming Contests

Fall QSO Party (CW)
1200 UTC October 20 to
2400 UTC October 21, 1990

***

Holiday Spirits Homebrew Sprint (SSB)
December 2, 1990; 2000-2400 UTC

1990 Hootowl Sprint

TOP THREE		
1	N6GA	18,816
2	WX7R	9,800
3	TI2QRP	6,307

SINGLE BAND		
40M	W6SIY	5,300
20M	WD7I	6,272
15M	TI2QRP	6,307

Call	SPC	Score/Points/SPC	Power	Bands/Time	Rig	Antenna
N6GA	CA	18,816/84/16	4.0 S	2/2	HW-9	Yagi
WX7R	OR	9,800/70/10	4.0 S	IC-735	Longwire/Quad	
TI2QRP	C.R.	6,307/53/17	5.0	15M/4	TR-4CW	Vertical
WD7I	AZ	6,272/56/8	5.0 S	20M/4	IC-725	Slope Dipole
WD6SIY	CA	5,300/15/2	.25	40M/1	Tuna Tin-2/ HB CX +Sup RX	Dipole
WA6ARA	CA	3,220/46/5	4.0 S	40M/1	HW-9	Zepp

Only 6 entries!!! The HOOTOWL will run one more year. If interest is not htere, it will be dropped from the contest list. This contest has been plagued with difficulties ever since it was installed (time, date problems, CQ's ridicule). Oh well.

1990 Summer Homebrew Sprint

TOP THREE		
1	W3TS	264,580
2	KZ1L	105,420
3	KN1H	70,080

SINGLE BAND		
40M	W8MVN	60,692
20M	ND9X	6,006
10M	N4OHB	49,949

HI/LO BAND		
HI-B	KA3K	8,288
LO-B	NN1G	25,700

ALL-HOMEBREW

Call	SPC	Score/Points/SPC	Power	Bands/Time	Rig	Antenna
W3TS	PA	264,580/317/37	.90 S	A-6/4	HB Tcvr (S)	Yagi/T/Vee
KN1H	NH	70,080/153/18	.90 S	A-3/4	HB TX/RX (S)	Dipole
W8MVN	OH	60,692/221/18	2.0 S	40M/3	HB Xcvr	Loop
K5VOL	IL	9,560/38/6	.70 S	20M/1	Twofer Xcvr	Longwire
KIØG/M7	ID/UT	5,525/10/5	2.0	20M/2	Twofer	Hustler

MIXED

Call	SPC	Score/Points/SPC	Power	Bands/Time	Rig	Antenna
NC8X	OH	34,976/138/18	5.0 S	A-2/3	Twofer/HW9/R-390	Loop/LW
NN1G	CT	25,700/137/13	4.5 B	L-2/2	HB Xcvr (80)/VXO/ TS-130 (40)	Windom
WD9GLO	OK	24,050/150/21	3.0	A-3/3	HB TX (6K6)/Argo 508	Yagi/Vee
WA8MCQ	MD	6,361/89/7	1.8	40M/2	HB TX/TS-430S	Dipole
WØJRP	MD	3,715/35/5	.20	10M/1	Twofer/TR-4CW	Vertical

COMMERCIAL

Call	SPC	Score/Points/SPC	Power	Bands/Time	Rig	Antenna
KZ1L	MA	105,420/251/30	5.0 S	A-3/4	TenTec	G5RV/2DL
N4OHB	AL	49,959/183/26	5.0	10M/4	IC-735	Quad/Dipole
NT1E	CT	19,050/127/10	.90 B	40M/4	TS-440S	G5RV/Loop
KA3K	PA	8,288/74/16	2.0	H-2/3	TR-7	Quad
ND9X	IL	6,006/52/11	2.0 B	20M/3	HW-8	Dipole
NN9K	IL	5,775/55/10	4.0 B	40M/4	Argo 509	Inv L
WN9H	IN	5,250/75/10	4.0	20M/3	TS-820X	Ground Plane
WA1WPR	ME	3,517/67/5	5.0 B	40M/3	HW-9	Longwire
NØIZZ	MO	2,464/44/8	5.0	20M/1	TS-520	Zepp

Time of operation rounded to nearest hour
B = Battery power; S = Solar power; HB =Homebrew; (S) = Superhet
(H-) = High bands (20-6); (L-) = Low bands (160-40); (A-) = all bands, number used

N4OHB set a new all-time record for 10 meters; KA3K set the all-time record for hi-bands; NN1G set the all-time record for lo-bands; KIØG ran a mobile Twofer entry!

QRP Winter Sports 1990

G-QRP Club Winter Sports 1990 The 1990 Winter Sports will take place from 26th December until 1st of January, using all international QRP CW frequencies (note that in Europe the frequency on 40 meters is 7030 kHz).

The event is an international get-together of QRP operators throughout the world, and all QRP ARCI members are cordially invited to take part. All that is required is to come up on one or more of the QRP frequencies and contact other QRP operators, whether local or DX. As this is a friendship event, one does not have to exchange serial numbers.

Last year QRP operators from over 40 different countries took part, and there were many outstanding two-way QRP contacts including W to G on 3.5 MHz, and ZL to G on 14 MHz. Although not a contest, those taking part are encouraged to send in logs to Gus Taylor, G8PG, Communications Manager, G-QRP Club; 37, Pickerill Road; Greasby, Merseyside L49 3ND, England. The G-QRP Club awards merit certificates for the best logs received.

Book Review: QRP Classics

By Fred Bonavita, W5QJM
P.O. Box 2764
San Antonio, Texas 78299-2764

QRP Classics, edited by Bob Schetgen, KU7G
274 pp. Newington, Conn.
American Radio Relay League Paper, $12

Webster's New World Dictionary defines "classic," among other things, as "...of the highest class; most representative of the excellence of its kind...' If that definition were applied strictly, many of the projects in this first-of-its-kind ARRL publication would not qualify to appear here. The 80 articles, some dating back 15 years, are a curious collection of QRP and QRP-related pieces culled from the pages of QST and/or the ARRL Handbook. The oldest are from 1975, and the most recent appeared early in 1990.

As a result, "QRP Classics" is filled with hits and misses. Luckily, there are more of the former than the latter, and for $12, this is an OK buy. On the plus side is the fact that one has a variety of QRP pieces that the serious homebrewer and experimenter would usually clip and keep. In this instance, they are bound in a single volume. It was interesting to see how many pieces in this book I had clipped over the years and was saving in one of a half-dozen loose-leaf notebooks.

Of particular note are the piece on designing and building simple crystal filters by Wes Hayward, W7ZOI; an assortment of pieces by Doug DeMaw, W1FB, covering virtually the whole of QRP and the 15 years spanned by this book; and the outstanding QRPp power meter by Roy Lewallen, W7EL.

And for those interested in homebrewing but uncertain where components can be found, this book has an updated list of suppliers of parts, including those which published catalogue and the kind of items they offer. That two-page list may be worth the price of the book by itself.

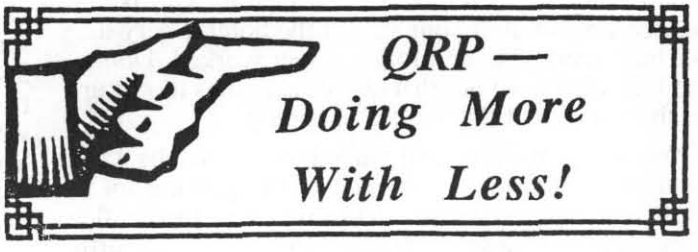
There are negatives in this book, although not enough to earn it a thumbs-down citation. For instance, many articles appear to have been clipped and copied directly from the pages of QST and/or the Handbook, a cheap way of producing a work like this. But as a result, the photographs lack the clarity of the original version in print. Seeing clear, crisp photographs of the innards of QRP rigs -- many of them with high-density component placements -- is a boost to the homebrewer.

Some of the 15-year-old articles call for components which on longer are available, and the editors have made no attempt at recommending replacements. Granted there is ample warning of this face in the preface, but there is no effort to point our which devices may no longer be available. While the technical labs at QST may have the information on what's new and what's not, too many readers will not have access to that and risk being frustrated in their efforts to build a good looking and interesting piece of equipment.

Finally, it's difficult to understand why a collection of "QRP Classics" omits probably THE classic rig of all times: the optimized QRP transceiver designed by Roy Lewallen, W7EL, and appearing in the August 1980 issue of QST. I've lost track of the number of times authors of articles in all Amateur Radio magazines have urged would-be builders to read Roy's piece before undertaking their projects. And there are several versions of that popular transceiver marketed in kit form. If ever there was a classic piece of QRP gear in the strict sense of the word, that is it.

QRP ARCI gets a little publicity from this book: One of the club's awards is prominently displayed on the front cover, although it shows the club's old logo, and the club is mentioned in a front-of-the-book mood piece explaining QRP and the various organizations backing it. But don't expect to find anything else on the cover inside either in the form of an article or an explanation of what's happening in the photograph.

The bottom line: All in all, "QRP Classics" proved an enjoyable read and is a worthwhile addition to a collection of books on QRP construction, theory and design.



South Carolina QRPers Go To Dayton

by Gary D. Foster, WD8OXE
670 Foster Road
Inman, South Carolina 29349

Although this was to be my fourth year at Dayton, this year would be different! We were booked to stay at the Country Inn in Dayton where all the QRPers were staying, plus the hospitality suite on the 11th floor where all the QRP activities would go on. We had always booked at other motels and commuted to the QRP activities. I was looking forward to stepping out of the hotel room, walking down the hall and into the hospitality suite.

My wife Donna, KB4TUY, myself and our friend Jim, KA4LHG left Inman at 7 a.m. on Thursday and worked local hams on our repeater until we went into the tunnel on I-40, just short of the Tennessee line. From there on it was just about a constant QSO on 146.52 simplex with other hams from Florida, Georgia, S.C., N.C., and Alabama, including some discussion on building and QRP for the next eight hours.

We jumped off I-75 at First Avenue, and we were there! Myron Koyle N8DHT had done his job well. The hotel had the list of the QRP'ers rooms.

That evening I visited the hospitality suite and got to meet some old friends, and some new faces and, of course, see some of the nice rigs on display. There were homebrew rigs and a new radio called the MPX-Mini Multi-band Transceiver, a 80-10 meter CW/Phone DSB available in kit form for $179.95, or built for $249.95. There was a lot of operating on different rigs going on and everyone had a good time.

Friday we took a trip to the Air Force Museum, and then went on to the Hamfest at noon. Donna and I hit the commercial booths first, getting all the free goodies that we could before they disappeared with the crowd. Motorola had some very nice free charts, Icom had some calendars and key chains, including many other items.

One of the first booths we went to was TEN-TEC to see the new Argonaut II and spin the dial. The Argo II looked great, and I hope we will see it soon on the market. By 4 p.m. our feet were tired from non-stop walking, pushing and shoving, so we headed back to the Country Inn. When we settled back in the room we started the great ice search, which everyone seemed to be involved in. This is our only complaint about our stay at the hotel. Every ice machine seemed to be broke or over worked. Donna and I decided to sit out that night's activities to rest up for the nextday of flea market shopping.

We got up at 4 a.m. and loaded the car for the day's hamfest shopping. We arrived in the parking lot at 5:30 a.m. and were able to park close to the flea market area fence so we could shuttle back and forth with our flea market goodies without having to carry them all day long. I checked my list over and over for the parts I was looking for, and at 6 a.m. we hit the flea market.

I was mainly looking for parts. So on the first pass thru the flea market I made some notes of the prices on my list, and the flea market space numbers where they were. We were shopping on 2 meter simplex with other members of the group who were acting as spotters for hot bargains. By 11:30 a.m. we were back at the car eating Beanie Weenies, cheese and crackers and resting our feet. I had already made some purchases of known bargains, and was checking my list for the best priced 3904's, 2N2222's, toroid cores, etc.

After about a 30 minute rest we headed back into the flea market and started to do some serious buying. Some of my best buys were some nice 100 µA and 200 µA panel meters for 25¢, and enough double sided P.C. board for 40¢ to last me for two years! By 3 p.m. I had bought everything on my list except for some NE602N's which I could not find. I now had enough parts to last me for another year of QRP building. And in what I think to be the real QRP penny pinching spirit, I had only spent $18.50!

At 3:30 we were at the QRP Forum and enjoyed hearing Paula Franke WB9TBU, George Dobbs G3RJV, Ian Keyser G3ROO, and Michael Bryce WB8VGE talk about QRP to a packed room full of people which, by the way, was the coolest and nicest place anyone could be.

After the forum it was back to the Country Inn to rest up for the night's activities at the hospitality suite. We arrived at the suite at 7:30 p.m., and the room was already packed for the pizza party. When all the eating was over there was a pile of about 20 boxes left over.Boy, could this group eat! My wife, Donna, is from England and we really enjoyed talking to the G-QRP guys and got immediate invitations from Rev. George Dobbs and Ian Kyser to come and see them on our next trip across the pond.

Dick Pascoe, GØPBS and I talked at great length about his first trip here to the U.S. He was surprised at how friendly everyone here was! We also had other common interests including scuba diving. The meeting was held by Paula and the prizes were given away. I won a Kanga Product kit! After we arrived back at the room we decided we had a great time, but we were just hamfested out, so we headed back to South Carolina on Sunday morning. It was a great weekend and I would like to thank Myron for the great room, Lynn Hawkins KA8MUT for a great hospitality room and everyone else involved in making this the greatest QRP weekend ever.

Bandpass Filters Using TOKO Inductors

by Chip Owens, NWØO
1363 Tipperary
Boulder, Colorado 80303

This article shows how to use the TOKO slug-tuned inductors (see July 1990 QRP Quarterly, page 8) to construct two-pole bandpass filters. These filters exhibit an insertion loss of less than 2 dB. The trade-off at higher frequencies is wider bandwidth to limit insertion loss, due to the TOKO's low Q. A typical application might be a receiver pre-selector or an output filter for a VFO or test oscillator.

The TOKO inductors have five pins on the bottom; two are on one side, and three are on the other. Use the outside pins of the side with three pins; check pins with an ohmmeter if in doubt. I usually lay the inductor on its side and solder it directly to the foil. Cleaning the shield can with alcohol first makes it easier to solder.

For the capacitors, I use either silver-mica or small NPO types. Polystyrene capacitors have not been successful. Use a low value trimmer capacitor as needed for small capacitance values.

Alignment is best accomplished with a swept RF source, but is possible at home with a QRP transmitter as a source, and the receiver as an indicator.

Don't try to run much power through these filters as the wire in the inductors is small and could easily vaporize. Use a power level of about one milliwatt, obtainable with a 30 dB attenuator on a one watt QRP transmitter. Additional attenuation will be required ahead of the receiver. An alternative is to use a low-level power meter capable of operating around the Ø dBm (1 mW) level.

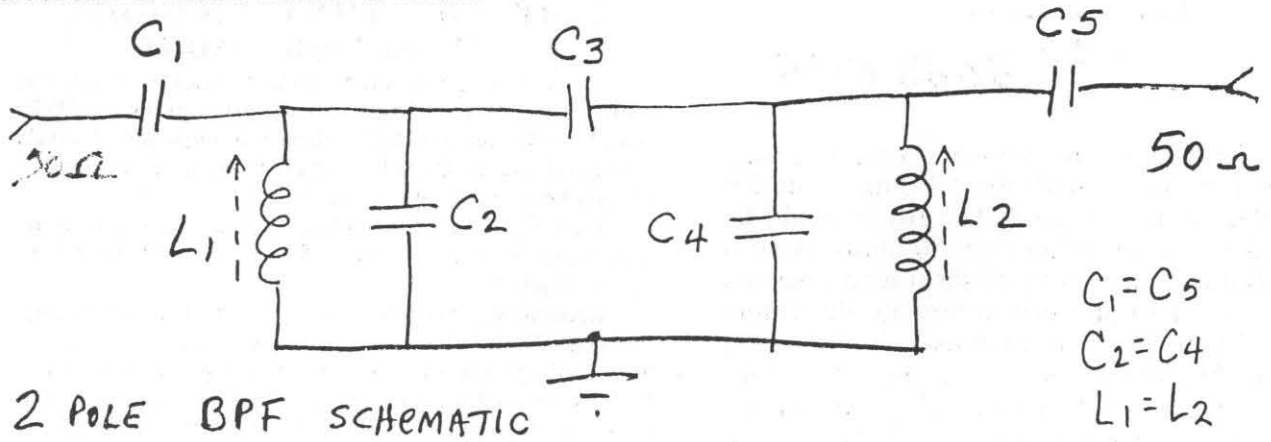
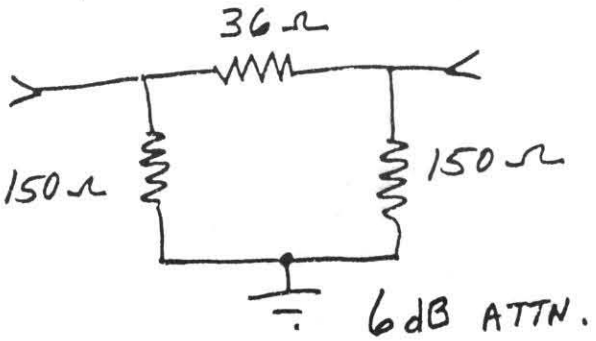
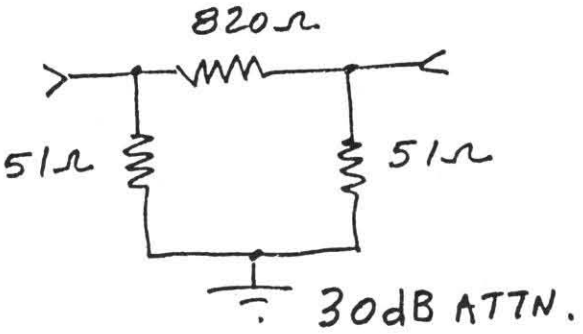


Table 1

BAND	Lower 3dB MHz	Upper 3dB MHz	Center Freq. MHz	C1,C5 pF	C2,C4 pF	C3 pF	L1,L2 µH	Digi-Key Part no.
160M	1.8	2.0	1.897	200	100	22	22	TK1210
80/75M	3.5	4.0	3.742	180	180	33	4.7	TK120
80M	3.5	3.75	3.623	120	270	20	4.7	TK1203
40M	6.97	7.27	7.123	33	68	3.1	4.7	TK1203
30M	9.95	10.3	10.123	18	36	1.4	4.3	TK1203
20M	13.9	14.5	14.197	12	15	0.87	4.3	TK1203
17M	17.6	18.5	18.044	20	56	2.7	1.0	TK1411
15M	20.7	21.7	21.194	15	39	1.88	1.0	TK1411
12M	24.3	25.6	24.942	12	27	1.5	1.0	TK1411
10M	28.0	30.0	28.983	12	18	1.47	1.0	TK1411
6M	50.0	53.0	51.478	6.8	15	1.0	0.4	TK1407



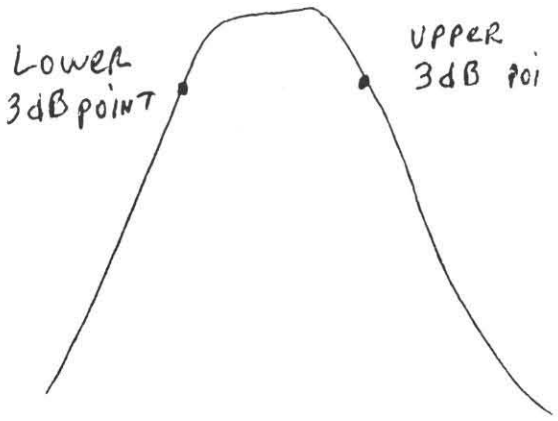


For these filters to perform correctly, they must be terminated with the 50 ohm value for which they were designed. The filters could be designed for values other than 50 ohms. A simple 6 dB attenuator made of short lead resistors could be used to properly terminate the filters during alignment. One attenuator is needed at each end. Alignment consists of adjusting the inductor slugs for equal signal level output at the 3 dB points with a flat response in between (see sketch).

If the response dips more than 1 dB in the passband, reduce the value of the small coupling capacitor. If coupling is reduced too much, the filter response will be too narrow, so adjust the coupling accordingly.

Table 1 shows the component values for each of the current ham bands between 1.8 and 50 MHz. Notice that the bandwidth for the filters at 20 meters and higher becomes wide. Narrower filters could be designed at these frequencies. However, with the Q of these inductors, the insertion loss would exceed 2 dB, limiting their utility.

I have built filters for 160, 40, and 30M using these component values with good results. The TOKO 0.22 µH inductor at 74 MHz also achieved good results. I hope this information will encourage you to try these filters in your next homebrew project!



Dayton 1991 Rooms

by Myron Koyle, N8DHT

Hello All. To identify myself quickly, I am the seemingly "perpetual" manager of reservations for QRP-ARCI for the Dayton Hamvention. I thought that it would be a good idea to say hello and give you an idea of what's already been happening re: Dayton.

First: QRP-ARCI is confirmed again next year in the same hotel as before: Country Suites Inn, 404 West First Street, Dayton.

Second: We have more rooms being held for us than last year. As in previous years, we will have a Hospitality Suite with plenty of room to set-up operating stations. Because of "pre-registration" by this year's attendees and subsequent phone calls, letters, etc.Nearly 40% of the rooms are gone already.

Third: The 1991 cost of the Rooms and the Suites are as follows: Single rooms—$34; Double rooms—$40; Suites—$50. There are 40 rooms total (Note: The suites are a better deal because you pay only a slight increment in rate and can add two to three people).

Fourth: The routine for next year will be the same as in prior years. To make a reservation for a room at the Dayton Hamvention: Send the following ASAP to: Myron Koyle, N8DHT; 1101 Miles Ave. SW; Canton, Ohio 44710; (216) 477-5717.

Information needed:

(1) Names, Addresses, Phone Numbers, Calls of everyone in your party.

(2) If you don't have a roommate, do you want one?

(3) What nights?

(4) Room? Suite?

(5) Smoking? Non-Smoking?

(6) Two BUSINESS SIZE SASE's

(7) A check/money order made out to the Country Suites Inn for one night's lodging.

Board of Director Profiles

In the July issue of The Quarterly, nominations were solicited for three positions on the board of the directors. The current terms of John Collins KN1H, Red Reynolds K5VOL and Jim Fitton W1FMR expire at the end of the year. As of the deadline date, three nominations were received. As there are only three applicants for the three openings, the board of directors has voted to elect the three by acclamation. Jim Fitton W1FMR will continue his seat on the board for another three years beginning January 1991. The two new members taking seats in January are Rich Arland K7YHA and Bob Gaye K2LGJ. Biographies of the three follow:

Jim Fitton W1FMR

Extra Class, licensed since 1954, ex-EI2VLH/QRP.

Jim was a member of the QRP ARCI Board of Directors for three years and served one term each as president and vice-president. He initiated the QRP activity at Dayton which has lead to the current expansion of relationships between QRP-ARCI, M-QRP and the G-QRP clubs.

"I intend to serve in the best interest of all active members," Jim says, "and to help develop and support the type of solid organizational goal setting and planning that has lead to success for all of QRP and especially for QRP ARCI."

Rich Arland K7YHA

Extra Class, first licensed in 1963 as KN7YHA.

Rich has been an active QRPer and has been a member of QRP ARCI since 1965. He served as a member of the board from 1984-87. For the last four years he has written the QRP column in WorldRadio Magazine. Last year he started writing for the Experimenter's Workshop column for Monitoring Times Magazine. His favorite QRP activities are contesting and DXing. At last count Rich has 48 states confirmed for QAS-QRP at the 900 mw level and 88 countries confirmed for QRP DXCC at the 2 watt level.

Rich is a retired USAF Master Sergeant, father of 4, and currently works as a vocational electronics instructor at the State Corrections Institute at Dallas, Pennsylvania. His wife, Patricia, is very supportive of his amateur radio hobby and his daughter, Wendy, is also a licensed ham, KB4UNT.

"My main goal as a QRP ARCI Board Member will be to help rewrite the Club by-laws and streamline the Club operating procedures," Rich says. "The QRP ARCI **must** be a flexible, dynamic organization which can meet the demands of the membership and properly represent our position to the mainstream of amateur radio and the public. In the three years that I have been off the BoD, the Club has remained virtually static. This has to change is the Club is to continue to grow and attract new members into the QRP ranks."

Rich says he will work diligently to bring the QRP ARCI out of the 60's and into the 21st century.

Bob Gaye K2LGJ

Extra Class, first licensed in 1955. Bob is also a member of G-QRP, M-QRP, life member ARRL, IEEE, and Radio Club of America.

Bob is director of Research and Development with STI-CO Industries, Inc., a manufacturer of antennas for the land mobile radio market.

His amateur radio interests include CW DX and contest operation as well as homebrewing. He is active on all HF bands plus 144 and 432 MHz. He has maintained DXCC honor Roll since 1976, and has earned 5 Band DXCC, WAZ, and WAC. His current QRP DX total is 122 worked. Bob's other interests include computers and photography.

Bob's goals for the Club are to help maintain the structure of the club as it grows and evolves.

QRP: Turn It DOWN when you turn it ON

10 Meter Beacons

by K2OLG, updated August 10, 1990

Frequency	Call	Operation	Location	Notes
28.175	VE3TEN	C	Ottawa, Canada	10W, GP
28.191	VE6YF		Edmonton, Alberta	10W
28.195	IY4M	ROBOT	Bologna, Italy	20W, 5/8 GP
28.200	GB3SX	C	Crowborough, England	8W, Dipole
28.201	LU8ED		Argentina	5W
28.202	KE5GY	I	Arlington, Texas	5W, Vertical
28.2025	ZS5VHF		Natal, RSA	5W, GP
28.204	DLØIGI	C	West Germany	100W, Vertical, Dipole
28.205	KA3OEM		Meadville, Pennsylvania	27W, Yagi/west
28.206	KJ4X		Pickens, South Carolina	2W, Vertical
28.2075	W8FKL	C	Venice, Florida	10W, Vertical
28.208	WA1IOB	C	Marlboro, Massachusetts	75W, Vertical
28.209	NX2O	C	Staten Island, New York	10W, GP
28.210	3B8MS	C	Mauritius	GP
28.210	K4KMZ	I	Elizabethtown, Kentucky	20W, Vertical
28.210	KC4DPC	C	Wilmington, North Carolina	4W, Dipole
28.212	EA6RCM		Palma de Mallorca	4W, 5 ele. NNE
28.2125	ZD9GI	C	Gough Island	GP
28.216	GB3RAL	C	Slough, Berkshire, England	20W, GP
28.2175	WB9VMY	C	Calumet, Oklahoma	2W, Dipole
*28.218	W8UR	C	Mackinac Island, Michigan	.5W, Vertical
*28.2185	PT8AA		Rio Branco, Brazil	5W, GP
28.2195	LU4XS		Cape Horn	
28.220	5B4CY	C	Cyprus	26W, GP
28.221	PY2GOB		San Paulo, Brazil	15W Vertical
28.222	W9UXO	C	Near Chicago, Illinois	10W GP
28.2225	HG2BHA	C	Tapolca, Hungary	10W, GP
28.225	N6TWX	I	Grass Valley, California	30W, 3 ele. Yagi
28.225	KW7Y		Washington	4W, OMNI
28.225	PY2AMI	C	Sao Paulo, Brazil	5W, Dipole
28.2275	EA6AU	C	Mallorca, Balearic Islands	10W 5/8 GP
28.230	ZL2MHF	C	Mt.Climie, New Zealand	50W Vertical, Dipole
28.232	W7JPI/AZ	C	Sonoita, Arizona	5W, 3 ele. Yagi NE
28.233	KD4EC	C	Jupiter, Florida	7W, GP
28.235	VP9BA	C	Hamilton, Bermuda	10W, GP
*28.237	NV6A	C	San Diego, California	.5W, Vertical
28.2375	LA5TEN	C	Oslo, Norway	10W, 5/8 GP
28.2405	5Z4ERR	C	Kiambu, Kenya	
28.245	A92C		Bahrain	Dipole NW/SE
28.2455	ZS1CTB	C	Capetown, RSA	20W. 1/4 Vertical
*28.246	N8KHE	C	Mackinaw, Michigan	50mW, Vertical
28.2475	EA2HB	I	Spain	6W, GP
28.248	K1BZ	C	Belfast, Maine	5W, Vertical, Dipole
28.2495	EA3JA		Barcelona, Spain	
28.250	W3SV	C	Elverson, Iowa	10W, Vertical
28.250	KØHTF	C	Des Moines, Iowa	2W, GP
28.250	Z21ANB	C	Bulawayo, Zimbabwe	15W, GP
28.2505	4N3ZHK	C	Mt. Kum, Yugoslavia	1W, Vertical
28.252	WJ7X	C	Seattle, Washington	5W, Ringo
28.252	WB4JHS	I	Florissant, Missouri	7W,Vertical
28.2525	OH2TEN		Finland	
28.255	LU1UG		Gral Pico, Argentina	5W, GP
28.2575	DKØTEN	C	Arbeitgen, West Germany	40W, GP
28.259	WB9FVR	C	Pembroke Pines, Florida	1W, Dipole

28.260	VKSWI	C	Adelaide, SA, Australia	10W, GP
28.262	VK2RSY	C	Sydney, NSW, Australia	25W, GP
28.264	VK6RWA	C	Perth,WA, Australia	
28.266	VK6RTW	C	Albany, WA, Australia	
28.266	KB4UPI	C	Birmingham, Alabama	20W, 1/4 Vertical
28.2685	W9KFO	I	Eaton, Illinois	750 mW, Vertical
28.270	ZS6PW	C	Pretoria, RSA ,	10W, 3 ele. Yagi
28.270	VK4RTL	C	Townsville QLD, Australia	
28.2725	9L1FTN	I	Freetown, Sierra Leone	10W Vertical, Dipole
28.2745	ZS1LA		Stillbay, RSA	20W, 3 ele. Yagi NW
28.275	AL7GQ	C	Denver, Colorado	1W, Loop
28.2755	N6RDX	I	Stockton, California	20W. 3 ele. Yagi
28.277	DFØAAB	C	Kiel, West Germany	10W, GP
28.280	LW8EB		Argentina	5W
28.282	VE1MUF	C	Frederickton, NB, Canada	500mW, Dipole
28.282	VE2HOT	C	Beaconsfield, Quebec	5W, Vertical, Dipole
28.2825	OKØEG	C	Hradec Kralove	10W, Dipole
28.284	VP8ADE	C	Adelaide Island, Near Antartica	8W, V Beam to G Land
28.286	KE2DI		Near Rochester, New York	2W, Vertical, Dipole
28.286	KK4M	C	Las Vegas, Nevada	5W, Vertical
28.287	W8OMV		Near Ashville, North Carolina	5W, GP
28.287	H44SI	C	Solomon Island	15W
28.288	W2NZH	I	Moorestown, New Jersey	3W, GP
28.290	SK5TEN		Sweden	
28.290	VS6TEN	C	Hong Kong	10W, Vertical
28.292	ZD8HF		Ascension Island	
28.2925	LU2FFV		San Jorge, Argentina	5W, GP
28.295	WC3E	I	Cincinnati, Ohio	20W, Ringo
28.297	WA4DJS	I	Ft. Lauderdale, Florida	30W,GP
28.301	KF4MS	C	St. Petersburg, Florida	5W
28.3025	PT7AAC		Fortaleza, Brazil	5W, GP
28.315	ZS6DN	C	Irene, RSA	100W, VERT.
28.888	W6IRT		Hollywood, California	5W, GP Code Practice
28.992	DFØANN		Montzberg, West Germany	20mW, 1 ele. Delta Log

* Revision

New Member / Renewal Data Sheet

Full Name _____ Call_____ QRP Number_____

Address _____

City _____ State or Country_____Postal Code _____

[ ] New Address?
[ ] New Call?
Amount enclosed $_____
**** Please do not send cash! ****

[ ] New Member (U.S. $12.00, DX $14.00)
[ ] Renewal (U.S. $10.00, DX $12.00)

Please make your check or money order payable to: **QRP ARCI.**
Note: Renewals must be received 30 days before publication.

New Member Applications Only:
License Class_____ Age_____
Year 1st Licensed_____
Other Calls Held_____
Rig_____ Ant_____
Bands Most Used_____
Please circle your chief interests:
Ragchewing, DXing, Contests, Traffic, Awards, Homebrew, VHF/UHF, Packet, CW, SSB, RTTY, ATV, Satellite, Other.

	Yes	No	Maybe
Would you like to be an officer/director of club?	[ ]	[ ]	[ ]
Would you help write for the QRP Quarterly?	[ ]	[ ]	[ ]

What subjects_____
What QRP awards/achievements have you won?_____
_____
Why do you run low power? _____

Mail to: **Mike Kilgore, KG5F**
2046 Ash Hill Rd.
Carrollton, TX 75007

QRP Quarterly
P.O. Box 776
Alpine, Texas 79831