IOWA QRP JOURNAL

NEWSLETTER OF THE IOWA QRP CLUB

Welcome to the Spring 2000 issue of the Iowa QRP Journal. The spring-like weather has come early this year and seems to be toying with us rotating between cold and hot. Propagation has been kind to the QRP'er with many openings worldwide. There have been many Dxpeditions and contests that have provided opportunities for snagging that new country operating QRP. During the ARRL CW contest earlier I managed to work 50 countries and WAC using my NorCal NC20 and Fractal Wing Loop (indoor shortened loop) while operating casually. I'm sure there are others who fared better than myself and we would love to hear about your operating successes in this newsletter.

The second leg of the Milliwatt Triple Crown (sponsored by the Knightlites, Ft. Smith QRP Club, and the Iowa QRP Club) was held in mid April. The Ft. Smith gang ran the second leg of the contest. The event was fun and I am amazed at how well milliwatt power levels work! Murphy and conditions prevented me from operating 2 of the three days, but I did manage 8 contacts in two hours running 500 milliwatts into the Fractal Wing Loop (again using an NC20 with the power level reduced). The Iowa QRP Club call was used (KQ0RP/c). I snagged VA (25mw), SC (100mw), NC (4w), OH (50mw), MD (500mw), KY (100mw), AL (5w), and TX (5w). The next leg will be this summer and I hope the date will be finalized within the next few weeks. Give milliwatting a try and become part of the fun.

June is fast approaching and plans are in the works for the Sioux City Hamboree to be a QRP event. There will be forums from Ade (W0RSP), Mike (N0MF), Larry (WB0RMT), and others. We will again sponsor a building event Friday evening (again testing the hotel for an eviction). We have several kit choices and the final choice and announcement will be made within the next few weeks. As soon as all the details for the Hamboree are finalized they will be announced to all. Mark your calendars for the June 2 and June 3, 2000 and plan to attend.

The IAQRP outreach program for school related clubs is still operational. The goal is to provide kits to school clubs (or individuals) to promote the hobby, generate interest in building, and promoting the good word of QRP. As you may recall from the last newsletter, the St. Louis Audio Amp boards (boards donated by the St. Louis QRP Society and again our thanks to Dave Gauding NF0R and the St. Louis gang for their help) along with all board mounted parts (various donations from Jeff Woods W0ODS and other IA QRP members) were distributed to Waco Middle School club as well as several hamfests. The club has several Tick 3 chips donated by Embedded Research that will be used for this program (thanks much to Gary N2JGU and Brad WB8YGG). The club will gather the remaining board parts and distribute keyer kits to the school clubs (until our supply of chips is exhausted).

The last newsletter issued a challenge for receiver designs to be used not only for the outreach program but as a club project as well. Larry WB0RMT has answered the call with his CSS receiver (part of his transceiver project). A schematic has been distributed to several volunteers who are building the kit (to debug my CAD mistakes

hi). This receiver will be used as a building project for the club and later in the outreach program.

Now is the time to volunteer for hosting a meeting. All we need is a place to gather. Past meetings have been held at restaurants, libraries, Red Cross, and hamfests. By spreading the meetings out across the state, everyone gets a chance to attend at least one. If you are interested please let me know as soon as you can.

This spring has been bad (time wise) for me as my oldest son graduates from highschool in May plus my work schedule has changed. Mike (N0MF) probably has a pool going to see if I actually will build my K2 before the end of this year (hi). After graduation I should be able to get back into QRP mode (hi). My apologies to you all for dropping the ball on any spring meetings.

Our first hamfest of the season will be Des Moines on April 29, 2000. We will have a display table and I hope to see you there. If you are able to attend, please bring a show and tell item for the table. Your homebrew/kit masterpieces are what attract interest to the table and gives us a chance to spread the good word about low power operating. I hope to see you in Des Moines!

72, de John NU0V
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Member Profile: Matthew Balvanz
By Matthew Balvanz KC0AYG

"Name here is Matthew and I'm running QRP with a..." and so starts another QSO here at the shack of KC0AYG. I've been a ham for 3 years now and enjoyed every minute of it! Whether I'm running QRP on 40 meters or packet on VHF, there's always something fun to do.

I got started in QRP right away. I've always been one to take up a challenge, no matter how hard. So the original plan was to homebrew a station from scratch. Little did I realize how much I had to know before I could build everything. At the age of 15 I didn't know much about electronics and had zero experience soldering. I had a Radio Shack receiver and figured I could use that, but I couldn't decide what to do for a transmitter. I discovered after a few weeks some plans for a crystal controlled, half-watt, one transistor CW transmitter, and I started work on that. Of course it didn't work right away and it took me weeks to figure out I read a resistor wrong, but it was a learning experience!

After a few months of no contacts with the few CQs that I worked up the courage to do, my interest started to fade and I decided that I should find something with a few more features and more frequencies. So after some hunting I came across a used HF rig and added that to my station. Boy was I excited! A real HF radio! It was a 100-watt rig, but I knew how to change the settings to bring it down to 5 watts. It was perfect!

After working up enough courage to call CQ again I finally had my first QSO on QRP 10 meter CW. After that I was hooked! I worked people off and on when I had time, but I was getting busier with school and work. So, when I heard about the QRP-L novice foxhunts I signed up right away.

An addition to our house was conveniently scheduled for the same time as my hunts, so all the antennas had to come down. Now what to do? A radio doesn't do a bit of good without an antenna! Luckily I had helped a friend setup an HF station at his house recently (Chris, K0CNN, ex KC0DBO) and he let me use his setup. I wasn't

used to the transceiver and had no idea how to use half the features. He has a Yaesu FT-847 with DSP built in; it was probably a good thing too!

The night of the first hunt came. I tuned up the rig, adjusted the tuner to get the SWR down to the minimum. Once everything was in place, I called CQ. I didn't expect a response right away, even with the frequency posted on QRP-L. After one call I had no less then two stations calling me! I was so surprised that I didn't get either call out of it and had to send QRZ? Once again two stations came back, but this time I managed to pull part of a call out of the noise. After working those two stations, one of which was in Canada, I kept busy for the next two hours working station after station at about 6 wpm. I did a total of four hunts and had a blast during each one. I've doubled the number of QSL cards on the wall from the foxhunts, and I'd encourage everyone to try them. They're a great time!

My interests lately have turned to digital modes, but QRP nonetheless! I have a packet station running 5 watts out and have started doing PSK31 on 10 meters. I've also experimented with RTTY, SSTV, FELD-HELL and MT63. Most of my QSOs have been QRP and I've amazed myself how well some of the modes work. On PSK31 I think I worked more DX then US stations. I've worked people in South America, Europe and even one in Japan with just 5 watts, sometimes less.

I haven't given up on home brewing either. I've built several projects, Tick keyers, a RIT kit for and SW-40, a CW audio filter and a lot more. In fact I'm trying right now to build a laser transceiver to use with a computer interface for high-speed networking!

In the mean time, I hope to hear you out on the bands!

72, de Matthew KC0AYG

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Rebirth of a Six-Meter AM Transceiver

By Walt Holling N9MZP

For many years I have enjoyed restoring and working with boat anchor-type radios. In addition, I am active in a Quad Cities area 6-meter AM group. The group conducts a 6-meter net that operates every Tuesday night at 2000 hours CST on 50.4 MHz, sponsored by WC9M from Moline, IL. The objectives of the net are to promote 6M AM activity and to restore older 6M boat anchor radio equipment (see Website http://home.revealed.net/WC9M).

I have restored a Gonset Comm III, Ameco TX62, Swan 250C, Heathkit Senca, Knight TR106, and have constructed several 6M converters and preamps. A solid state version of the old tube type 6M AM rig is a unique concept that revives AM in a fun approach. This was a great project for 6M AM enthusiasts in order to experience the joy of building and working a back-to-the-future VHF project.

Background: Amateur radio and AM operation brings back many happy memories for me. When I was in grade school. I began teaching myself radio design. From the junk piles of several neighborhood radio/TV repair shops, I retrieved some of the older tube radios that had shortwave bands. After getting several of them to work, I would attach a piece of hookup wire for the antenna and listen to the AM Ham operators on 80 meters.

Although I did not become a ham operator until later in life, I always thought this was something I wanted to do. I enjoyed hearing the resonant AM voice quality signals

coming from the warm, glowing tubes of the radios I had fixed.

When I was in the sixth grade, one of my friends challenged me to build a transmitter to talk to one of the older SW BC receivers that was in his house about a 1/4 mile away. I did some research at the library and revisited the radio/TV trash bins and was able to collect enough parts to homebrew my first AM transmitter. It was not very efficient, but it did work and my friend was able to faintly hear my voice over his radio.

That was my first experience with homebrewing radios and one that I will always remember. Although my interest shifted away from radio for many years, this was a lasting experience. Now with the returning interest in AM, especially 6-meter AM, this project became timely, fun, and useful.

Fig 1: 6M AM Transceiver With Cover Removed

General: The 6-meter solid state AM transceiver is designed to tune the 50-54 MHz band. The single-conversion superhet receiver features exceptional sensitivity, image rejection, signal-to-noise ratio and stability. The receiver is ideally suited for listening to AM communications with a bandwidth of about 15 kHz. The transmitter is crystal controlled with a final input power of about 5 watts. The original design is from Rich Littlefield, K1BQT, and was presented in the Communications Quarterly 1993 entitled, "Build the Nor'easter 6-meter AM Transceiver." This design is very closely related to the old tube VHF-AM rigs, which includes a tunable receiver, adjustable squelch, AGC, transmit crystal controlled transmitter, spot switch, and PTT switching. A PDF copy of the article from Communications Quarterly can be viewed at my web site URL http://www.geneseo.net/~hollingw/images/6m_am.pdf.

Circuit Description: The receiver is a superhetrodyned AM unit built around four ICs: (1) NE602 double-balanced mixer, (2) MC1350 IF amplifier with AGC, (3) LM324 quad op-amp for AF preamp, AGC drive, and comparitor-driven squelch, and (4) LM386 final audio amplifier. In operation, an AM signal from the antenna is coupled to a two-section bandpass filter to reject out-of-band signals and then coupled to the VHF low-noise transistor for pre-amplification. Signals are then fed through the input of the NE602 that serves as an active double-balanced mixer and also as the local oscillator.

The oscillator is varactor-tuned for a VFO of 39.3 MHz which is 10.7 MHz lower than the incoming frequency. The signal is then filtered selectively with a narrow passband using cascaded crystal 4-pole filters that yield a 15 kHz bandwidth. The output of the filters is amplified by the MC1350 IF amplifier which, as configured, also offers automatic gain control (ACG). The AM signal is demodulated by a diode and the audio is fed in sequence through the four sections

of the quad op-amp. This op-amp also contains a squelch circuit to help eliminate unwanted background noise. The overall design and squelch control is designed such that the background noise is quite low. The final AF output stage is a LM386 and is set up for minimum gain of 20x.

The transmitter uses a third overtone 50.4 MHz crystal to operate the 2N2222A oscillator. A 2N5109 is used as the transmitter's diver to amplify the signal to the 2N2166 RF power amp. Modulation is supplied from a 4-watt audio preamp/power amp IC Phillips-TDA1015. The modulation audio IC is coupled to the RF power amp by the modulation transformer to supply the AM modulation. Then a 3-section low-pass L-network provides the filtering to reduce the spurs and harmonics of the transmitter.

Construction: The double-sided printed circuit board was obtained from Far Circuits. Caution is required because the board isn't plated through. All grounded connections must be soldered on top of the board to ensure continuity. Because the circuit board layout, parts list, and schematic of the original article do not match, a new parts layout and suggested assembly instructions were developed by myself and Dave Kamp KC0AHZ. Copies are available upon request via my email address.

Parts and Assembly: Most parts are readily available popular homebrewing components. However, the toroid cores for the L network coils could not be located, so a different value was found and the proper number of turns was recalculated for the correct inductance. The modulation transformer Uniden TF-177 also could not be found. I substituted a TF-068 from a broken CB transceiver. Another approach is a Mouser 42TU048 audio matching transformer. The modulation taps will have to be adjusted depending on the transformer used. I recommend utilizing a monolithic capacitors for the .1 UF disc because of the size factor when mounting the components. Also be sure that the two 68 pf capacitors are good NPO types to eliminate thermal drifting for the receiver. The varactor diode MV2104 could only be located in a surface mount configuration. This makes mounting a little tricky, but it will work. The RF power amp needs to be mounted on an insulated heatsink. The RS #270-214 modem case does provide a nice fitting enclosure to make the rig relatively compact.

Fig 2: Partial Assembly Testing Receiver Section

Alignment and Adjustment: Aligning the receiver starts by adjusting the local oscillator coil to 39.3 MHz with a frequency counter. Next, peak the IF transformer with an RF signal generator set to 10.7 MHz. Then adjust the two variable capacitors in the receiver's two-section bandpass filter for maximum signal using an rf signal generator

with an AM modulated signal set within the 50 MHz receiving range.

The transmitter is adjusted starting with the main oscillator by pressing the spot switch and peaking the trimmer capacitor for maximum value on an oscilloscope. Next, adjust the transmitter driver's trimmer capacitor for maximum signal. To adjust the RF power amp, connect a dummy load to the antenna connection through an RF wattmeter. Then depress the PTT switch on the microphone and adjust the driver and power amp trimmers for maximum output. Next, supply a modulation signal to view the modulation pattern on an oscilloscope and adjust for maximum peak-to-peak voltage. It may be necessary to adjust the modulation transformer taps to achieve 100% modulation or to avoid driving the modulator into saturation.

Operation: Utilize a high impedance microphone with this transceiver to achieve near-broadcast quality audio. I have received the best audio reports from this rig of all be 6-meter AM transmitters that I have tried. The local 6-meter AM net usually has at least 17 check-ins. Everyone has stated that this is my best AM signal. The receiver has good bandwidth for receiving the crystal-controlled signals that could be several KC apart. The sensitivity seems to equal my ICOM 6-meter transceiver and will detect a .3 uV carrier. This radio has been used every week on the local 6-meter AM net since December. Also, after the local net one evening, a sporadic-E opening allowed me to use the transceiver in QSOs with the New Hampshire and New York areas. This shows that 6-meter AM is alive and has made a comeback.

This project has been fun and will also provide enjoyment in the upcoming 6-meter openings this spring and summer. This modern version of the 6-meter AM transceiver will provide better performance and enjoyment in 6-meter AM activity. Six-meter AM can allow better ragchewing than the customary "hit and run" QSOs that are common on this band with ssb.

Four other local 6-meter AM enthusiasts are also building this rig, thereby providing the opportunity to have more fun and to get more hams interested in building projects. This project combines ham radio homebrewing and learning with nostalgia in a way that is pleasurable to both the operator and listener.

(Editors note: Far Circuits has offered a group discount on the Nor'easter board set. If you are interested please contact NU0V.)

72, de Walt N9MZP
hollingw@geneseo.net

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ArkieCon 2000 or 2 days in Arkansas
By Darrel Swenson KBØAWB

ArkieCon... here I come! I left Omaha Friday morning. After a brief stop for a couple of breakfast burritos in Council Bluffs, I headed south down I-29. With the exception of a small stretch of winding 2-lane road from Neosho, MO to Arkansas, the road was all 4 lane interstate type, with a 70-mph speed limit. (OK officer... 65-mph in Iowa.)

Friday evening I joined the rest of the QRPers for supper at the Rib Eye Restaurant. We sat around and talked for an hour or so after dinner. I discovered that Jay Bromley, W5JAY, and Kelsey ("Hanging Judge") Mikel, KK5KU both work for the same 'southern' phone company I work for in Omaha. Kelsey and I swapped notes (and lies!)

I took advantage of the hour before the QRP forums Saturday morning to scout the flea market for bargains. I saw several nice HF rigs for sale, some nicely restored tube equipment, and lots of individual components for sale. I didn't find anything I had on my 'shopping list', but I was being pretty picky. I counted at least 15 tables stacked with trays of components.

Photo 1: Doug Hendricks KI6DS

The QRP forums started at 9:00 am. First up was "Mr. NorCal," Doug Hendricks, KI6DS. Doug's presentation was a "Complete Ham Radio Station For Under $50.00." He started with the new SMK-1 kit coming soon from NorCal ($30 + $4 S&H), showed off the NJ-QRP enclosure for the SMK-1 ($10 including S&H.) He then demonstrated how to make a "NorCal Doublet" from a piece of 4-conductor ribbon cable. With some measuring help from Jim Duffy ("Dr. Megacycle") Doug had a complete 40M dipole in less than 10 minutes. He then passed out plans for a small QRP 'Z' match tuner that can be built for less than $10. Doug completed his station by introducing the Ft. Smith QRP club's latest kit, a combination Iambic Paddle and TiCK keyer (that includes the TiCK chip.) The new kit sells for $10. (plus $2 S&H) I don't remember the exact math... but the entire station came out to $50.00.

Doug admitted it was a pretty basic station, and probably not a great choice for beginners, but it did work. For someone just starting in QRP he suggested a combination of Small Wonder Lab's SW40+ (Dave Benson, NN1G), an Elmer 101 book from Paul Harden, the tuner, keyer and a 40M dipole. That combo would still be less than $100.

During his talk Doug also updated us on several NorCal related topics:
The Winter QRPp should ship in the next couple of weeks. Doug's wife and doctors ordered him to stay away from QRP for 3 months following his heart surgery. He thanked Paul Harden for stepping in and taking care of the winter issue of QRPp in his absence.
He said NorCal has probably done their last "through the hole" kit. The SMK-1 and the 10M kit later this year will be the start of many surface mount kits. "Through the hole" parts are getting too hard to find, especially in the low priced, large quantities needed for kits. He said it took months to round up all the parts for the NorCal20. He was able to find all the parts for the SMK-1 in a single day.
Doug also passed around a couple of Manhattan style construction SST rigs for 10 and 15 meters, built by IA-QRP's own Mike Fitzgibbon, NØMF! We can look forward to Mike's construction article for the rigs, to be published in QRPp this summer.

The second QRP Forum was Paul Harden, NA5N and "Propagation." Paul is an excellent speaker and

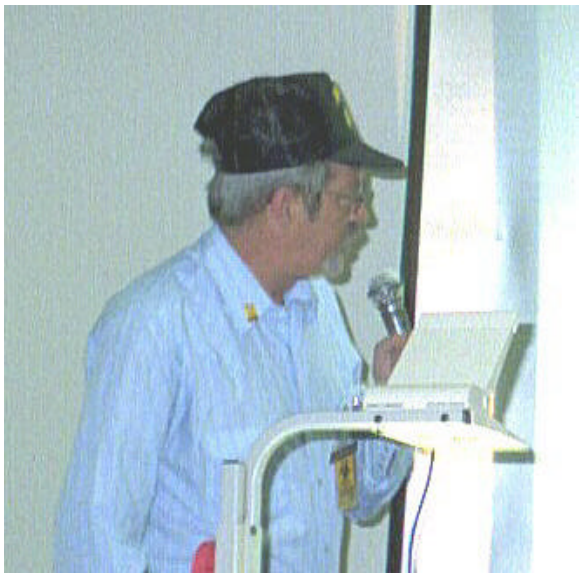

Photo 2: Paul Harden NA5N

has a way of presenting a complicated subject in terms even I could understand. He discussed the major "solar event" that occurred on Thursday night (4/6/00) and it's impact on propagation. He says these "solar events" have a one/two punch. The first X-ray pulse is immediate, arriving at the earth in about 8 minutes. The second arrives on the "solar wind" about two days later. I can't do Paul's presentation justice here. If you ever get a chance to hear it, don't miss it. He mentioned a couple of neat web sites to check out: www.dxlc.com and www.sec.noaa.gov/today.

The third presentation was by Dave Gauding, NFØR of St. Louis antenna fame. His presentation titled "Pretty Good Indoor and Portable Antennas" described several good antennas that people living in apartments or with covenant restrictions could use to get on the air. My favorites were the "Aluminum Cloud" antenna and a compact delta loop antenna I believe he called the "St. Louis Loop." He is also a big fan of used computer "twin-ax" as a balanced feedline.

At noon we broke for an hour lunch. I took advantage of the flea market, purchasing another VE3DNL Marker Generator and one of the new Ft. Smith QRP Group Iambic Paddle/TiCK Keyer Kits. I also picked up a used key and a set of paddles with a gold plated base, hand crafted by Dennis Foster, KK5PY. I also purchased an autographed copy of Paul Hardens Data Book.

Photo 3: Dave Gauding NF0R

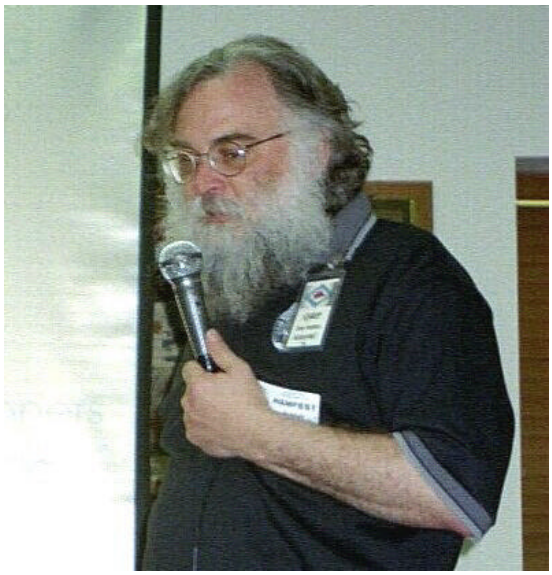

Photo 4: Jim Duffy KK6MC

The first speaker of the afternoon was Jim Duffy, KK6MC ("Dr. Megacycle!") on "Antenna Miscellany..." Jim had an interesting presentation of a wide variety of antenna topics, from baluns, to tuners, to pulleys and insulators. Jim suggested checking out the local building supply store for antenna parts. He says we should keep record of our antenna designs in our logbook, including a sketch, dimensions, and a record of SWR/impedance for each frequency.

The next forum was by Glen Leinweber, VE3DNL. Glen designed the marker generator that the Ft. Smith QRP Group kitted to raise money for ArkieCon.

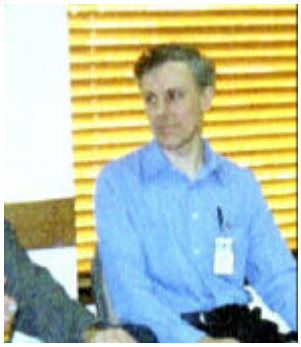

Photo 5: Glen Leinweber VE3DNL

Glen discussed "Efficiency in QRP Radio." He had several ideas for reducing power consumption of battery operated radios including: connecting the headphones in series instead of parallel, using a fuse instead of a series diode for polarity protection, using a tuner to maximize transmitter efficiency, and using acoustically tuned speakers.

Glen also had a very interesting presentation on some designs for class E power amplifiers with 90% efficiency. These designs are a work in progress and I'm sure we can expect to hear more about them in the future.

The last presentation was to have been about "Manhattan Style Construction" by Dr. Chuck Adams, K7QO. Chuck had angioplasty surgery a couple of weeks ago and was unable to attend. Paul Harden filled in with presentation on "Regenerative Receivers." Paul

Photo 6: Tom and Sharon Stibolt

took us step by step through each stage in his regenerative receiver design, explaining how it worked and why he designed it the way he did. Very informative and easy to understand.

WOW... it was four o'clock and the forums are over. Time for the drawing for the grand prize, a K2 kit. I almost fell over when the prize was won by someone from Nebraska (and it wasn't me!) Congratulations to Sharon Stibolt, WAØAYI of Lincoln, NE. Sharon is the wife of IA-QRP member Tom Stibolt, WØTJ. When I talked to Sharon later that evening she said Tom was being VERY NICE and was trying to renegotiate the driving duties for the trip home. He was willing to drive longer if she would read the manual (out loud!)

What a great day... but it wasn't over. The Ft. Smith QRP Group hosted a FREE barbecue and test drive session later that night. (First time I ever went to a ham forum with a bar on the side of the room!) I spent the evening talking to several of the Ft. Smith QRP members. I also got to discuss antennas with the two antenna presenters: Dave Gauding and Jim Duffy. I have several new ideas to try in my backyard antenna farm.
Later that evening after the barbecue broke up I walked into the

hotel and found Doug Hendricks sitting in the lobby. Glen Leinweber and I stayed up talking to Doug until well after midnight. Doug is a high school sophomore geography and science teacher, and the basketball coach! What a thrill to talk to those two.

Photo 8: Rig Test Drive Session

Sunday morning I had breakfast with several of the group. Paul Harden and I had an interesting conversation about old AM radio stations that we had worked at. Paul actually loaded up the broadcast station antenna (after it went off the air) to work the Novice Roundup one year!

Well... it was time to head back to Omaha. What a great time... I was sorry to see it end.

A 1060-mile round trip. 8 hours of driving each way. Was it worth it? You bet it was... worth every bump in the road!

Jay... if you are taking pre-registrations... sign me up for next year.

72, de Darrel KB0AWB
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A Simple Counterpoise
By Tom McGuire NO9S

Many of us have a great, stealthy counterpoise that we may be unaware of. Chain link fences can be an effective counterpoise for verticals, slopers and other ground referenced antennas. First check for continuity using an ohmmeter. Simply check continuity from point a to b, b to c, c to d, etc. If you find an "open" in your fence make a jumper out of spare fence link or wire, being sure to clean any oxidation from the points of contact. For safety's sake and to drain static noise from the fence it's a good idea to ground the fence using a copper plated ground rod and a low gauge wire or braid.

Oftentimes you may ground mount your vertical directly to a support post with gratifying results. Another existing counterpoise I have used to great effect (at several locations) is steel or aluminum house siding. Again, check for continuity. Opens can be made continuous by drilling a self taping metal screw through offending portions of siding. You may attach the braid of coax feeding a sloper directly to the siding, optimally at the same spot the siding is grounded to earth. At NO9S I have house mounted an SGC-231 counterpoising the 60' random wire against the siding with pleasing results on all amateur bands. Since feedpoint voltages can be high even at QRP operating levels, if you elect to use this scheme be sure to mount the antenna coupler out of reach of children, pets and nosy neighbors. If you have any questions I can be reached at <radioman@qconline.com>.

72, de Tom NO9S
radioman@qconline.com

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Hamboree 22 Is Coming!
By Jerry Huldeen WB0T

Hi Gang-

Here is info regarding our State QRP convention with Hamboree 22 and

MidWest and Dakota Division.

Dates are: June 2 & 3, 2000, at the Marina Inn, 4th and B Streets, South Sioux City, NE. A complete Convention with 150+ table flea market.

Friday Registration:
Begins at 12:00 Noon, Flea Market Set up, 10:00 a.m.
Programming begins at 2:15 p.m.

Saturday Registration Begins at 7:30 a.m. Flea Market Setup,
6:30 a.m. Doors open at 8:00 a.m.

VE testing Saturday at 1:00 p.m. Prize Drawings every
hour on the hour.

2 Main Prizes, $100 Cash, must be present to win. Dual Band Mobile, Paid admission & Ham License required to win. Coffee & Sandwich Bar Friday Night get acquainted dinner & building projects, very informal for QRP'rs

Saturday Noon QRP Luncheon Saturday Night Banquet & Prizes.

RV Camping 2 blocks from Marina Inn.

Call to make your reservations for Motel. These are negotiated prices. Ask for the "Hamboree 22" price when making your reservations.

Marina Inn - Phone (800) 798-7980
1 to 4 people, One/Two beds - $54
TraveLodge Phone (402) 494-3046
1 person - 1 bed -$35
2 people - 1 bed - $39
2 people - 2 beds-$43
The TravLodge is walking distance of the Marina Inn and is at 400 Dakota AV.

Admission is $6 per person. To pre-register, send check payable to Hamboree 22. Mail to LeRoy Baldwin, W0OFY 645 Mentzer Rd. Robins, IA 52328-9703

For Flea Market info or other info contact W0OFY at LGBW0OFY@aol.com

Call in Freq. is 146.91 - offset if you need directions. I will furnish written driving directions later. Additional lodging is available if you prefer. Let me know if you wish it.

Speakers for the QRP group are Ade Weiss W0RSP, Mike Fitzgibbon N0MF, a panel headed by John Burnley NU0V and others. If you would like to present, send me info ASAP.

Friday evening building session and order from the menu, if you wish.

More questions? Let me know.
Hope to see you at the convention. It should be an exciting time.

72, de Jerry WB0T
WB0T@aol.com
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Tuna Tin 2 Kit Review
By Steve Sellemeyer WB0QQT

(Editors note: This FB photo provided by Jerry W0PWE)

After reading about the Tuna Tin 2 in the March issue of QST and on

other websites, I decided to order the kit version from the New Jersey QRP Club. I can still remember the 1976 issue of QST featuring it on the front cover but at that time I had no interest in QRP operations.

The kit arrived on a Saturday and I had to work the whole weekend. Seems like when a new toy comes along other things take precedence!!!!! I'm sure you know the feeling! After supper Saturday night and feeling somewhat tired, I decided to at least open the padded manila envelope and see what it contained. Thirty minutes later, I had the contents checked off the inventory and instruction sheets (which were very straightforward and easy to understand). I'm also one of those guys who like to be neat and organized. And when it comes to kit building, I think it pays off when you start melting the solder. My method is to stick all the parts into a strip of styrofoam using the leads, then write on small adhesive labels the value, part location, quantity etc. I'm sure we all have some form of doing this in our own way. Knobs, switches, pots etc. go into compartments of an egg carton and are labeled the same way. Been doing this since my Heathkit building days over 20 years ago.

Sunday work came and went, and so did Sunday evening. When I work a weekend Sunday evening is generally "downtime".....pizza, tv and just plain relaxation.

Monday was my day off so after a few errands and "honey-do's" it was time to turn the styrofoam strip of parts into something more useful. As per step 2 of the instructions, the building of the enclosure was next. Everything went well with drilling holes, installing phono jacks, preliminary wiring etc. I also drilled the hole in the pc board at this time for the key jack J1 rather than wait until later. Component installation using the instructions was quite simple but I do double check values using a multimeter and eyeballs just prior to installing on the board. . Winding the 2 toroids was no problem (I had prior experience from a previous kit). Ask me sometime about the Ten-Tec 1340 kit toroids and how much practice I got before getting them right!!!!!

After the board was finished, all the preliminary wiring from the jacks and switch on the can were soldered to the board.
Now for the "smoke test"..... I decided it was coffee time and to review what I had just accomplished. All solder joints looked good and everything was in it's proper place. MOST important step I always say as I have limited knowledge as to how this all works. I hooked up the dummy load and WM-2 wattmeter and set the knob for 1 watt. Next came the key and power cord followed by setting the TT-2 switch to transmit. On came the 12vdc.....NO SMOKE!!! Alls well so far!

Using the Grundig YB-400 as a test receiver set to 7.040 mc I proceeded to put the key down. A nice clear, solid tone was detected. And again.....no smoke. A quick glance at the wattmeter showed between 300 and 400 milliwatts. Good! I then sent a series of V's and listened for chirps or abnormalities and again all was well. Letting my breath out, I say to myself: I have a winner!!! Time for another short break.

As of this writing I haven't had it on the air yet but hope to do so soon. I feel confident this little rig can do the job and do it well. And for those who may ask..... A good club project? A good beginners kit? I strongly think so! This kit is well suited to anyones building ability and I certainly recommend it.

I do want to thank the New Jersey QRP Club for kitting this and all those involved clear back to it's design. I know these folks have put forth a lot of time and effort to make kits such as these available to the rest of us. I hope that someday I may have the opportunity to do something to return the favor.

72, de Steve WB0QQT
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Iowa QRP Club Winter Meeting
By John Burnley NU0V

The Iowa QRP Club held a meeting Saturday February 26, 2000 in Sioux City, IA. It was great seeing all of the Sioux City gang plus all those who made the long drive. There was a lot of good QRP fellowship plus the judging for the building contest was held. Many thanks to Paul Sipes KB0JIT for volunteering to take on the impossible task of deciding how to rank all of the great entries. Congratulations to the following people for submitting winning entries:

Scratch Built:

1st place (tie):

Walt Holling N9MZP Tuna Tin 2
Mike Fitzgibbon N0MF 2N2/40

2nd place (tie):

Larry Stambaugh WB0RMT Receiver
Mike Fitzgibbon N0MF SST-10

Kit built:

1st place (tie):

Larry Stambaugh WB0RMT NorCal NC20
Darrel Swensen KB0AWB SST-40

2nd place:
Walt Holling N9MZP DSW-30

Photo 1: Paul Sipes KB0JIT performing the impossible task of rating the entries.

As you can see it was a good thing that I brought some extra prizes (hi). There were many works of art here folks and I know Paul had a hard time choosing. I would like to thank the following people for submitting entries into the building contest: Larry Stambaugh WB0RMT, Alex Stambaugh KC0EBK, Darrel Swensen KB0AWB, Walt Holling N9MZP (Walt came all the way from Illinois with a stop-over in Omaha; now there is a true QRP'er), Mike Fitzgibbon N0MF, Ade Weiss W0RSP, and John Burnley NU0V. Everyone who submitted an entry was awarded a Tick 3 keyer chip with a data sheet. The chips were donated by Embedded Research and our thanks to Gary and Brad.

Photo 2: Mike Fitzgibbon N0MF

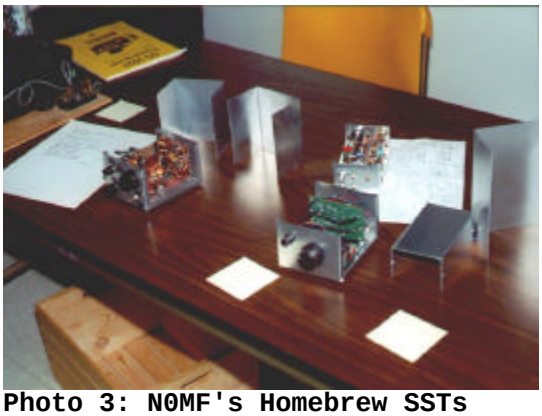

Photo 3: N0MF's Homebrew SSTs

Here is a sample of the goodies on display in Sioux City (not all were entered into the building contest). Walt N9MZP brought his scratch built Tuna Tin 2, SWL DSW-30, tuner, Nor'easter 6 meter am transceiver (see article in this issue), 6 meter tuner, SWL Mark 2 (autographed by Dave Benson himself), Tick 4 keyer, power meter, and dummy load.

Photo 4: Ade Weiss W0RSP

Darrel KB0AWB brought his Wilderness SST (40 meter) and Ft. Smith VE3DNL marker generator. Alex KC0EBK brought a spider web coil xtal set, junk box REGEN (that he built with his father), and a film can xtal set. Larry WB0RMT brought his DSW-20, NC20 (you should see his finishing job on this one; it is a beauty), Ten Tec tuner, and his prototype Altoids CSS (Curiously Strong Superhet) Receiver project (Larry built this punch pad aka Manhattan style with the board fitted into an altoids tin; a real FB job!). Mike N0MF brought his 2N2/40, two 10 meter punch pad (Manhattan style) SSTs (Mike has put SST's on 40, 15 and 10 meters), and a binural receiver project. Ade W0RSP brought his AZscQRPions LED SWR indicator built into one of the Altoids 'tiny' tins, linear loaded antenna, KC-1 keyer and counter, his 'Altoids-1' transceiver (MRX receiver packaged with a homebrew transmitter in an Altoids tin, plus a set of home brew paddles. Ward N0EFW brought an SGC-2020. John

Photo 5: Alex Stambaugh KC0EBK

NU0V brought a homebrew antenna / rig switch (see article this issue), NorCal 38 Special, NJQRP FB40, Ten Tec 6 meter receiving converter, Emtech ZM-1 tuner with AZscQRPion LED SWR indicator, Knightsmite, Pixie II, and Super Tick keyer. What a great show!

Plus the club had the following information on display: NorCal QRPp(s), ARCI QRP Quarterly(s), G-QRP Sprat(s), CW Operators Club Low Key(s), St. Louis QRP Society Peanut Whistle(s), JARL QRP Club Newsletter, NJQRP QRP Homebrewer, 'Joy Of QRP' and 'History of QRP in the US' by Adrian Weiss (W0RSP), and Paul Hardens Data Book for Homebrewers and QRPers. We also had some vendor information (but not much) left over from the hamfest season. Catalogs from Hands Electronics, Milestone

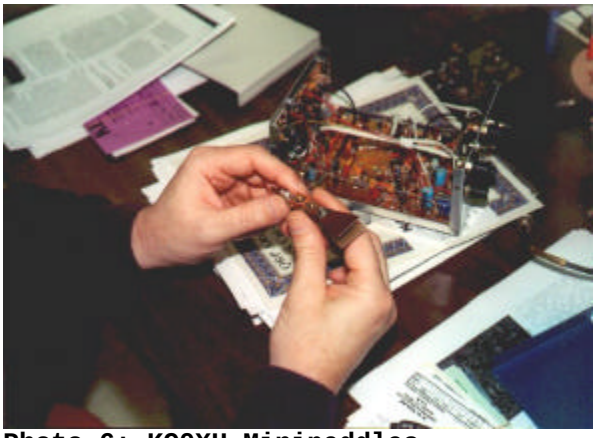

Photo 6: KC0XU Minipaddles

Technologies, Ten Tec, SWL, and Kanga US were available as well.

As the meeting wound down Ade W0RSP, Jerry WB0T, Mike N0MF, Paul KB0JIT, and myself had a good old fashioned rag chew about propagation. Ade had some very good insight and hints that he shared with us. I only wish that I didn't have that 3 1/2 hour drive back to the Des Moines area so we could have spent some more time with that discussion. (I took his advice and rewarded myself with a CE0 Easter Island at 07:00 UTC; thanks much Ade!).

Photo 7: Walt Holling N9MZP

The ride home was made a lot easier by Mike N0MF. He and I chattered (about QRP of course) for an hour on two meter simplex down Interstate 29. He invited me to stop over to see his shack so I couldn't pass that up. Talk about builders Mecca! You would not

Photo 8: Larry Stambaugh WB0RMT entries.

You would not believe all of the FB projects he has built (we won't even go into the parts inventory)!

This was a great kickoff for 2000 and my thanks to Jerry WB0T who made all the arrangements. This is going to be a great year for QRP and I'm getting really excited about the projects and gatherings (forums) that I am hearing about from the different clubs. You know its really hard not to get up on a soap box when you are talking about QRP!

72, John NU0V
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Eastern Nebraska / Western Iowa QRP And Kit Builders Net

Announcing the formation of the the Eastern Nebraska/Western Iowa QRP kit builders net. The net is a recent start up initiated by Steve WB0QQT out of Lincoln, NE and meets every Tuesday night at 8:00 pm (local) on 145.115 (-).

The idea was to get together like minded QRP'ers and builders to discuss projects and get help (if needed) on any project you might be having trouble with. A great idea Steve!

Review of the Small Wonder Labs DSW-30

By Walt Holling N9MZP

Most of my CW practice was accomplished on my first QRP HF radio-the NN1G Mark II 40 Meter transceiver. I truly enjoyed my experience with this radio, so it was only fitting to build the DSW-30 when I decided to try a portable 30 Meter QRP transceiver. After constructing this radio, I realized that this design sets the standard for simple, low-cost integrated digital monoband QRP transceivers.

Background: I had been following the early releases of the DSW-40 from NN1G Dave Benson. Then, at the 1999 West Liberty, IA hamfest, I was able to display the Mark II and meet John Burnley for the first time. John told me about the special on the DSW series radio being offered by Small Wonder Labs through the Iowa QRP Club. Since the DSW-30 version had just been released, the time and price were right for me to order it from Small Wonder Labs at the discounted price.

Features: For those who are not familiar with the Small Wonder Labs DSW Series radio, I have briefly listed its features below. More detail can be found at the website: http://www.smallwonderlabs.com.

Transceiver: DSW-30
Manufacturer: Small Wonder Labs
Output Power: 2.5 W nom. At 13.8v
Sidetone: 800Hz, fixed
SFDR: >60dB over frequency
IF Filter BW: ~500Hz
Tuning: Encoder tuned with RIT
Display: Audio Freq. Annunciation
Iambic Keyer: 5-50 WPM
RX Current: about 32 ma
Freq. Coverage: 10.1 - 10.15 MHz
Board Size: 7cm x 11cm

Construction: This kit was easy to build, taking about 6 hours to

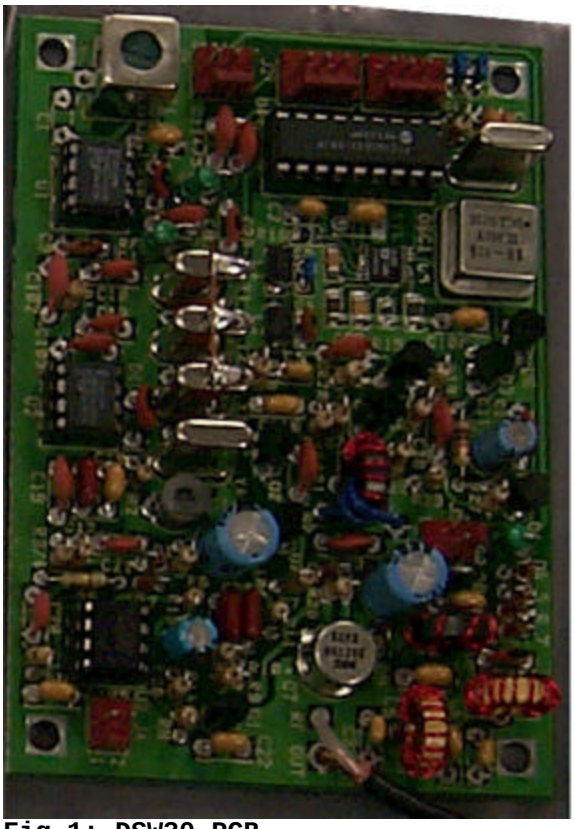

Fig 1: DSW30 PCB

complete with no special tools or test equipment. However, I needed a magnifying glass so that I could read the small component markings. (At least I don't think my age was a factor!) A few surface mount components are included, but they already come mounted and tested. The manual is very well organized and divided into sections, allowing a number of places to take a break during assembly. There are only 4 toroids to wind and they are easy. I highly recommend buying the enclosure-it is a blue-anodized clamshell-style case that measures 4.25" x 4.25" x 1.3".

This enclosure has all the legends engraved on both the front and back, truly a finely crafted case that is well worth the price. The DSW-30 in this enclosure is very compact and fits nicely, which one must see to appreciate. Final alignment takes about 5 minutes and does not require test equipment or a receiver. The BFO pitch is set by

comparing it to the sidetone frequency using a built-in CAL mode. Also, the receiver peak is adjusted by ear for maximum received signal.

Fig 2: DSW30 Enclosure

Operation: On power-up, the DSW starts in the coarse tuning mode of 200 HZ at a frequency of 10.110 MHz. The shaft encoder has 30 detents per revolution for tuning which gives a 6 kHz per turn of the tuning knob. This means that after power-up to move to 10.111 would be 5 dedent steps of the tuning knob; also, one complete revolution would set the radio to 10.116 MHz. If you are not sure of the setting, just briefly depress the tuning control and a 3-digit kHz Morse code audio will be sent at the same rate of the keyer speed setting. For example, 10.112 MHz would send 112 to you in Morse code.

For fine-tuning, push the tuning control and hold until a Bee-Boop is heard. This will set the tuning to the 50Hz/step rate. The RIT switch allows tuning the receiver frequency by 50 Hz/step without affecting the transmit frequency. The iambic keyer is controlled by depressing the keyer pushbutton and setting to the correct function, speed, reverse, tune, and straight key. The paddle will increase/decrease or set the functions. Depressing and releasing the keyer control switch results in an audio Morse sequence of characters representing one for each mode. The keyer initializes at 15 WPM on startup.

Testing: It takes a little time to get used to not having a display, but for the dollar there is no better QRP rig today. Not having a visual display can be a benefit when using the radio in the field or other low-light operating conditions.

I finished constructing the PCB in October, but the case delivery was backlogged and was not received until November. My first contact was with WA2DKG from NY with a 599 signal report. I followed up the next night by contacting KY and MS with 559 signals. The next week I had just turned on the DSW-30 rig and answered a CQ from Maine KE1LG who bought a DSW-30 but had not yet put it together. I sent him an e-mail to encourage him, and he plans to get started soon.

Just after my QSO with KE1LG, I received a call from KK6I in Ramona, CA. Band conditions were not good, but I was able to work both East and West Coasts within 10 minutes on 2 watts. The next day, I worked W4NTI in Anniston, AL who was using his DSW-30 in a marine mobile on the Tennessee River. I have been hearing a lot of DSW-30 radios lately and have made several contacts with KB9RPG who also was using a DSW-30.

Summary: The DSW-30 is best described as a hot rig in a cool blue case. An excellent QRP radio at a QRP price. This is a very nice piece of design work by Dave Benson and I enjoyed the results. The DSW series are well packaged and come with a very friendly manual. I recommend it for beginning builders. Also, it would make an excellent starting radio for a QRP enthusiast or for a club project.

The D in DSW stands for digital, it uses Direct Digital Synthesis (DDS) for tuning. All the digital functions of the DSW are done in the software of the CMOS PIC 16C622. This includes the process of the shaft encoder to interface to the DDS, RIT, Keyer, and the

Morse frequency audio readout. These features are unique in this price range for QRP rigs.

I especially enjoyed the QSK of this radio and think it was one of the nicest QSKs I have worked. The DSW series is available in the 160, 80, 40, 30, and 20 meter bands. In addition, the DSW power supply voltage can be between 8 and 15 VDC, making battery operation very flexible. This is one of the best QRP rigs for the dollar on the market today, and I highly recommend it if this type of radio fits your needs.

72, de Walt N9MZP
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The Sloping Vee Antenna Revisited
By Fred Spinner W0FMS

(Editors note: here are some follow-up comments from Fred about the Sloping Vee antenna featured in Jeff Woods W0ODS article in the Winter 1999-2000 issue of the Iowa QRP Journal.)

This antenna could be the only useable antenna on 160m for a small city yard; it is a good
low noise AM BCB and LF antenna.

The best version I built used RF transformer cores from Collins surplus-- And the packs of Allen Bradley 2W carbon comps I got-- Had to make a big terminator-- I think my current antenna has a "continuous" power rating of 200W per terminator. I have about 60 feet of wire on each side going from my (2nd story) eve of my house to my fence at either side. I have run 500+W on the 4017 KHz MARS frequency on this antenna with no ill effects. The antenna a V configuration that goes to the back fence with about a 60 degree V in the dipole, and about a 45 degree slope. In this configuration there is some directivity to the south (away from the house to the fence). Also this "slope", and the fact the antenna is shorter than the minimum "ideal" that Jeff states in his article, lowered the impedance of the system a bit, and I believe I have 450 ohm terminators at each end, and a different ratio on the transformer core. Still the antenna is less than 2:1 up to about 60 MHz.

Due to the type of core material, above 14 MHz, there is some reduction in signal strength in my antenna. Jeff's as presented in his article doesn't seem to suffer from this effect-- but mine is a hair better on 160m than his. So I inadvertently did a trade off in efficiency on the low end for the high. However, I compensate for this by having a trap vertical on the lot, and between the two antennas good HF coverage is available to me in a very small backyard.

My most successful termination was when I used a piece of perfboard as a form to drill holes in two pieces of "hobby" copper flashing. Each load then had two large heatsinks, and I suspect that is part of the reason I can get away with so much power into the antenna. Also it should be noted that of the 500W I ran at 75m, that most of the power is RADIATED by this antenna. The fact I haven't popped the terminators at QRO is proof that most of the power in this antenna is going elsewhere than heat.
Because of that, Jeff's statement of "1/2 of the output power per terminator", although good engineering practice, is quite conservative. In reality, the envelope can be pushed quite farther than that with this design.

I suspect, but have not had adequate time to prove that losses in typical loading coil matches could exceed those lost in the broadband antenna. It is a beautifully simple design-- and is

super for Field Day, JOTA, etc. I have a spare just for those events. It also might be the only way some of us can get on 80m and 160m.

The antenna is consistently down about 1/2 - 1 'S' unit from tuned antennas on bands where the wire is of sufficient length, compared to resonance, or longer, and in most cases is "very low noise". This is a good compromise in many cases.

For example, on 160m, I'll probably only get 10-15% efficiency out of it. But, as they say in the old country, 100W radiated might be great, but 10W is better than now being able to use the band at all.

72, de Fred W0FMS
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The Milliwatt Triple Crown: 2nd Leg
By John Burnley NU0V

A big pat on the back for the Ft. Smith gang in the second leg of the Milliwatt Triple Crown. A fun event and surprises everywhere on how little power is sometimes needed.

Murphy really nailed me on Friday and I could not operate the IA Club station KQ0RP. However the second day provided much enjoyment. I made a mistake and started out on 20 meters and now wish I chose 40. When I switched later the conditions were not good on 40 (for all signals). 20 meters provided several good contacts. I snagged VA (25mw), SC (100mw), NC (4w), OH (50mw), MD (500mw), KY (100mw), AL (5w), and TX (5w). The Iowa QRP Club call was used KQ0RP/c running 500mw into my Fractal Wing Loop (experimental shortened indoor loop in attic over my garage).

Conditions were horrid here the last night as well although I listened around for about the entire time.

A very fun event indeed and thanks again to the Ft. Smith group.

72, John NU0V

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Cutting PC Board Stock

Editors note: The following suggestions were made in response to a question posted to the Iowa QRP Email list (IAQRP-L). Here is the original post to the list:

Hi gang, I'm looking for suggestions on the best/easiest way to cut PC boards from larger pieces of stock. My previous attempts failed miserably. Thanks in advance.

72, John NU0V

From Jeff Woods W0ODS

Two suggestions:

1) For small boards/pieces, I use a decent pair of scissors. Works on boards
up to about 5 inches, then gets ragged.

2) For the larger jobs- the ubiquitous office paper cutter. Hold it steady
and play "French Revolution." I sneak into the copy room here after hours and
do all my delicate work here. Hee Hee.

-Jeff

From Ron Keener WA0MWW

John,
I've been through that same search on the qrp-l reflector and to the best of my ability what I found out is summarized below.

Hacksaws with carbide tipped blades. Some kind of aviation snips. Dremel tools used as a

router. Metal shears. If you're going to do a lot of cutting, Harbor Freight has some fairly inexpensive ones, but for that average homebrewer it's expensive. I can't think of their web address now, but most of the search engines can help you. Score the copper plating and break it over the edge of a table with a good whack. Use a band saw with a carbide tipped blade. A power sander to straighten and smooth the edges.

The glass boards dull most any cutting tools real fast so if you can get a carbide blade I guess it really pays.

I have about decided to get me a small table saw and use an abrasive blade like they do for cutting metal. One of these days soon I'm going to Burlington and see what Lowes have along that line. I hope that will do the trick.

Good luck with your projects.

Ron, wa0mww

From Jack Kovar K0VAR

John,

I have a Sears Craftsman Bandsaw with a 1/5 hp electic motor.
It has up to a 8 inch mouth.
I would think it would work very nice and its for sale too!

From Todd N0NCL

Two methods that work well.....

Treat pieces as if they are cheese, then slice into bite sized pieces.

See web site: http://www.ilovecheese.com

Pay dearly to have someone else do it.....(I don't have the equipment necessary)

72/73 Todd N0NCL

From Steve Sellemeyer WB0QQT

I've never tried it before but I would be thinking of my bandsaw or scrollsaw. May have to give it a try just to see what happens. I havevcut 1/8" plexiglass at a slow speed on the bandsaw and it worked pretty good. Scrollsaw had tendencies to chip the edges.

Steve/WB0QQT

From Cla Cadmus KA0GKC

Here are several techniques I've used over the years and they all work well.

Use a large tin snips. The edge will be a little ragged, so cut it about a 1/64 inch wide and use a block of wood wrapped with 120 grit sandpaper to reduce to size. This technique works well for making the pieces for PCB enclosures as well. One tool I find indispensable is a 12" caliper for getting the fit just right. With a little practise it becomes quite easy to size PCB pieces to within a few thousanths.

If you can find a large paper cutter, this works very quickly on thinner PCB.

I also have cut PCB on a table saw with a carbide tipped blade, this works very well too and seems to leave a better edge. Safety glasses for sure.

Probably the best power tool in a good bandsaw with a coarse metal cutting blade. Wood blades are to coarse and fine metal cutting blades cut to slow and can burn the edges.

I have a free standing belt sander that I use for sanding the edges now. But this actually can be harder to use if you're not careful. It's very easy to sand away to much, unevenly or get the

board to hot and burn the fiberglass.

Drilling holes is also something I differ in technique then most. I don't like the carbide bits that the board houses use. They break much to easy. I use regular highspeed steel twist bits. Best technique is to use a drill
press at a medium to slow speed. Mount the board on a block of wood with
tape. When you drill a hole make sure you don't move the board sideways at all or "snap". Here's why I don't like carbides they will break every time, at least twist bits have a small tolerance to side movement. Let the drill do the work, light downward pressure is all that's needed. Always drill with the copper side up on single sided boards. If the hole on the other side looks like it "busted" through, you used to much pressure. Use a larger drill, twisting it between your fingers, to deburr the holes. Again light pressure.

Don't have a drill press? Use a hand drill, not a power drill. I don't recommend using a Dremel tool either. They spin to fast. Going to fast is what wears the drill bits out.

Hope this helps,
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73 de KA0GKC Claton Cadmus

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SMK-1 Number 40
By Darrel Swenson KB0AWB

I received my SMK-1 kit in the mail Monday (4/24/00.) I started assembling it right after work. It took me about 2 1/2 hours, (not counting interruptions,) to assemble the kit.

I thought the kit went together amazingly well. The surface mount parts were not as difficult to work with as I remembered them.

Assembly

The parts are packaged in compartmentalized plastic bags. Each bag contained 20 different parts values. I used an exacto knife, to slit each compartment in order as I assembled the board.
I didn't use any special equipment to assemble the SMK-1. I used my regular 40-watt Weller iron with a 1/16" pointed chisel tip. I run the iron through a regular incessant light dimmer (to give me some control over tip temperature.)

I tried several techniques for soldering the chip caps and resistors. The one that was suggested in the SMK-1 manual seemed to work the best. I tinned one of the pads, then holding the chip component in place with a pair of tweezers in my left hand; I just re-heated the pad until the solder flowed. Then I soldered the other end. I just used an ordinary pair of bathroom tweezers. (That's where I "borrowed" these anyway!)

I did find it worked best to only touch the iron to the pad, not the component or the solder. It also helped a lot to clean the soldering iron on a wet sponge between EACH joint.

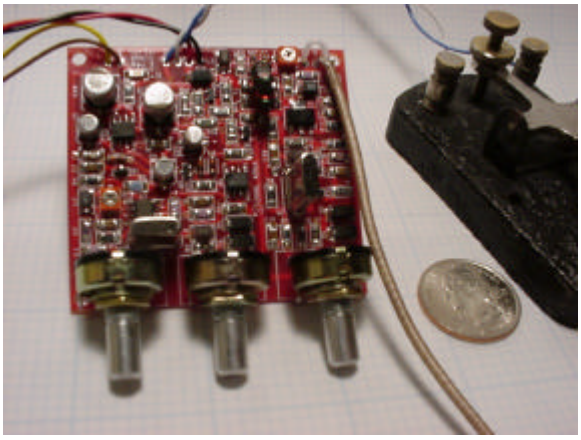

Photo 1: SMK-1 assembled.

Surface Mount Parts

Most of the caps do not have a part number stamped on the part, so you only want to open one compartment at a time. I couldn't tell which side was up, so I just mounted them.

The resistors and most of the remaining parts do have a part number of some kind. The resistors use a three-digit code: two value digits plus a multiplier digit. 100 = 10 ohms, 561 = 560 ohms, 223 = 22K. The code is very similar to the 'through the hole' resistor color code, just no colors! The semiconductors all had at least part of the part number stamped on the top. The ICs use a beveled edge to identify the side with pin 1.

Assembly Notes

The manual doesn't mention this but a good time to clean the flux of the board is between the steps at the bottom of page 4 and the start of the electrolytic capacitor installation at the top of page 5. It is much harder to remove the flux after the larger components are mounted.

There is only one toroid to wind, a bifilar output transformer. The one suggestion I would have for the feedback box would be to make the toroid a 'through the hole' part. I had a lot of trouble getting the toroid mounted securely close to the board.

I found 3 typos in the manual, all minor, and easy to figure out:

1. Item 5 on the parts list is listed as capacitor C24. That should be C2, C16, C26 - 470pF. (C24 is the 390pF in Item 4.)
2. The parts layout for bag 2 on page 4 shows 2 of item 18 - MMBF2222AL, there are three, Q2, Q4, & Q5. My kit had the correct number of parts, just the bag layout diagram is wrong.
3. The bag layout also shows Item 42 as a SA602AD. The parts list and schematic show a SA612AD. My kit shipped with the SA612AD.

Some other hints

With my big butter fingers I had more trouble getting the parts out of the LITTLE plastic chip carriers, than I did soldering them! I finally worked out a technique using the exacto knife to remove the plastic covering from one side and dropping the parts out on a sheet of white paper.

I also found it much easier to work with a light close on each side of the work area (less shadows.) If one of the chips moves and it not flush with the board, press down on the top with the tweezers and then rapidly alternate ends with the soldering iron until it pops down. If you get more solder than you want, one of the solder bulbs works great. (Just make sure the other end of the component is soldered solid before you suck!)

Smoke Test

Gave it the smoke test Tuesday night - it passed! Everything worked the first time. (It's been a while since that has happened!)

I'm getting 7.038.4 to 7.039.6 on TX and 7.036.1 to 7.039.6 on RX. The transmitter is putting out .275w (measured on IFR1200.) TX looks clean on the spectrum analyzer (must be that crystal thing.)

The RX hears a lot of signals, almost too many! With the attenuator wide open it gets a little BCI. I have never been around an MRX-40 receiver, so am not sure what to expect. There aren't many components in there! It seems to work. I've been playing with an A/B switch and my Yaesu 757GXII. I think the SMK-1 RX is

hearing every thing I am hearing on the Yaesu (plus a BC station!) Considering the complexity of the design I think it is doing very well.

Final Impression

I like the Surface Mount layout a lot better than I thought I would when Doug Hendricks first suggested this a couple of months ago. I can see several advantages:
No plated through holes to worry about.
No component leads to clip off. (Once I got the hang of it... I was installing the surface mount components as fast for faster than I could the leaded versions.)
Less flux to clean up.
No holes to drill when making boards at home.
Lower component cost, better availability.

I'm looking forward to the 10M rig latter this summer.

72... Darrel... KB0AWB...
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Upcoming Operating Events
By Mark Milburn KQ0I

Here are some QRP operating events that will be coming up. Turn your power down and join in...they are fun events and the people you meet will be some of the best hams on the air.

Don't forget the Midwest/Dakota Divison Convention
June 2-3 in South Sioux City, NE!

This convention has become a favorite of QRPers in Iowa and surrounding states. Plan to attend the QRP Luncheon and the QRP programs as well as the great flea market and dealer tables.

QRP To The Field 2000 -- Water World

Date: Saturday, April 29, 2000
Time: 1500 to 2400 UTC (pick any 6 hours)

Bands: 40-20-15-10 meters, in the vicinity of the QRP calling frequencies, please be courteous to others.

Mode: CW only
Power out (QRP only): 5 watts or less

The theme for this year is to get outside and get as close as possible to a water location! Sorry...bathtubs, toilets, sinks, leaky plumbing, water ottles and the like don't count. Just about everyone has a nearby location that involves some kind of lake, pond, river, canal, ditch, whatever! If you can't get away to be near the water, then set up out in your back yard or on the back porch and be a field station. The whole idea of QRP to the Field is to get outside and operate! So pack a lunch and get out there.

Let's have some fun! A note of seriousness here. Please keep your personal safety in mind, especially Marine Mobile stations. Don't attempt to go out on the water before the fog has cleared, and please don't stay out on the water after dark. We want to have everybody around for next year too. So use a little common sense and please obey the laws governing your location.

Select any 6-hour operating period that works for you. If you need to split it up into two or three hour intervals to accomodate other plans, then do so. Jump in there when you can, but only work a total of 6 hours.

Categories: Marine Mobile (MM) - must submit photograph of operating position! Whether you're on a ship, canoe, kayak, raft, innertube or what have you....if you are afloat then you're marine mobile.

DO NOT sign /MM after your callsign, it will be part of the exchange.

Ocean (OC) - must submit photograph of operating position! This category also includes the Great Lakes and the gulf, cuz those babies are huge!

Other water (WT) - inland lakes, rivers, streams, park ponds, ditches, canals, etc.

Field station (FD) - any station that is outdoors and not using commercial power or fixed antennas.

Home station (HO) - any station that is operating from an indoor or home location.

Exchange: RST + SPC + Category identifier (two letters)

Example: 559 NM WT

Scoring:
25 pts - for each MM station worked per band
20 pts - for each OC station worked per band
15 pts - for each WT station worked per band
10 pts - for each FD station worked per band
5 pts - for each HO station worked per band

SPCs: count once per band

Location Multipliers: MM = x5
OC = x4
WT = x3
FD = x2
HO = x1

Final Score: Total pts x Total SPC x Location = Final score

A summary sheet is available at the Norcal web site:

http://www.fix.net/~jparker/norcal.htm

Deadline: Send complete logs and summary sheets by June 1, 2000
Summary sheets must include a description of location and equipment used; also include photographs where indicated above. Pictures must show your station location and the water in the same field of view. Your log should include a minimum of time (in UTC), callsign of station worked, complete exchange received, RST sent (if not a static exchange). Incomplete submissions will be used as check logs.

Email submission (except MM & OC stations): send complete logs and summary sheets in ASCII text format only to:

n0qt@arrl.net

Please send text format only, all other forms will be rejected so no html, word processor documents or attachments please.

Snail mail (including MM & OC stations): send complete logs and summary sheets and photos to:

Jan Medley N0QT
QRPTTF 2000
P.O. Box 1768
Socorro NM 87801

Florida QSO Party
1600Z Apr 29 to 0159Z Apr 30 and 1200Z-2159Z Apr 30

Twenty Hours total time, 40, 20, 15 and 10 meters.

Classes: Single op, mobile (single op, or multiop), Novice/Tech(mixed mode, phone only, CW only), Multi-single and multi-multi(mixed mode only; max 1 signal per band)

Three power classes: QRP (less than 5 watts), Low Power (less than 150 watts), and High Power (over 150 watts)

Exchange: signal report and SPC (DX send entity), Florida stations send county.

Work stations once per band and mode.

Work Florida mobile stations again as they change county.

Count 1 pt per phone qso, 2pts per CW qso.

Multipliers: for Florida stations, 50 states; Canadian areas (MAR, NL, VE2-VE8, YT); DX countries (except W, VE, KH6, KL7) All others count Florida counties (67). Count multipliers once per mode.

Power Multiplier: QRP = x3, low power = x 2, high power = x1

final score: QSO points x total multipliers x Power multiplier.

Logs must be postmarked by May 30. Send to Florida QRO Party,
c/o Ron Wetjen, WD4AHZ, 5362 Castleman Dr., Sarasota, FL 34232
fqp@qsl.net
http://www.qsl.net/fqp/

Ontario QSO Party

1800Z Apr 29 to 1800Z Apr 30
Phone and CW, 160, 80, 40, 20, 15 and 10 meters plus all VHF/UHF bands(no repeaters qsos and keep 146.52 clear)

Classes: Single op low power (less than 150 watts on HF and less than 50 watts on VHF/UHF); single op high power; single op, single band; mobile; HF QRP (less than 5 watts); VHG/UHF FM QRP (less than 5 watts; multiop (CW, SSB or mixed mode)

Exchange signal report, SPC. Ontario stations exchange signal report and county/district/regional municipality. Work Ontario stations only - Ontario stations work everyone.

Work mobile and portable stations again as they change county/district/regional municipalities.

Work stations once per band.

Score - 1 pt/qso, 10 pts (each band) for working VE3ODX and VA3RAC.

Multipliers are Ontario county/district/regional municipalities (for Ontario stations; county/district/regional municipalities, and state/province/DXCC countries)

Final score is total qso points x total multipliers (max 48)

Awards.

Send logs by May 31 to:
Ontario DX Association
Box 161 Stn A,
Willowdale, Ontario M2N 5S8 Canada

ve3sre@rac.ca
http://www.odxa.on.ca/oqrprules.html

Adventure Radio Society Spartan Sprint

May 1, 2000
June 5, 2000
July 3, 2000
August 7, 2000
September 4, 2000
October 2, 2000
November 6, 2000
December 4, 2000

1. Start at 9:00 PM EDT, 8:00 CDT, 7:00 MDT and 6:00 PDT. Finish at 11:00 PM EDT, 10:00 CDT, 9:00 MDT and 8:00 PDT.

2. The frequencies will be 3560 kHz+/-, 7040 kHz+/- and 14060 kHz+/-.
(You may operate one, two or three bands--your choice.)

3. Exchange RST, SPC (state, province or country) and power output.

4. If you choose to call CQ, use the format "CQ SP," or "CQ SP TEST."

5. You can take credit for working the same station on a second band.

After the contest, we invite you to use our autolog, which is part of the ARS Sojourner. Just go to www.natworld.com/ars and follow the link for "Direct access to autologs". Or you can speed things up by going directly to the Spartan Sprint autolog page at www.natworld.com/ars/ss_log.html.

If you don't have access to the web, send Russ Carpenter, AA7QU, an e-mail with your total QSOs and the total weight of your station (i.e. the combined weight of all transmitters, receivers, keys, keyers and batteries used during the Sprint). You may also include your comments from the soapbox. Russ' email address is russ@natworld.com.

We publish results for each Spartan Sprint on the Thursday following the Sprint. This may be the world's quickest contest reporting! Please send us your log as soon as possible, but in no event later than Wednesday afternoon.

Connecticut QSO Party

2000Z May 6 to 2000Z May 7 with a rest period from 0400Z-1200Z.
Phone, CW, and RTTY
Work stations once per band and mode, mobiles as they cross county lines. No repeater QSOs

Classes: Single op, fixed/mobile; Novice; QRP (< 5 watts); multi-single, multi-multi and CT clubs.

Exchange: RS(T), SPC. CT stations send county.

Score: 1 pt/phone or RTTY QSO, 2 pts/CW QSO, and 5 pts for W1AW or W1QI QSO.

Final score is QSO points x CT counties. CT stations use CT counties/SPC plus 1 multiplier for DX.

Awards.

Send logs by Jun 3 to CARA, POB 3441, Danbury, CT 06813-3441.
http://www.danbury.org/cara/

CQ-M International DX Contest

2100Z May 13 to 2100Z May 14
CW, Phone, SSTV 160, 80, 40, 20, 15, 10 meters plus satellites.
Categories: singleop-single band CW, SSB, Mixed mode or satellites. single-op, multi-band CW, SSB, mixed mode or QRP (mixed mode < 5watts you must send /QRP), Multi-single(multi-band, mixed mode) SWL or WW II veteran (multiband, mixed mode); SSTV (single or multiop, multiband, SSTV only)

Change bands only once every 10 minutes.

Work stations once per band, regardless of mode.

Exchange RST and serial no.

Scoring 1 pt/QSO with own P-150-C country, 2 pts/QSO with another P-150-C country, 3 pts/QSO with another continent. Each country in the P-150-C award country list counts as a multiplier only once per band.

Final score is the sum of all QSO points, times sum of all multipliers.

Awards.

Send logs by July 1 to
CQ-M Contest Committee
Krenkel Central Radio Club of Russia
Box 88

Moscow
123459 Russia

cqm@mail.ru
http://www.mai.ru/~crc/cq-m/cqmain_e.htm

FISTS CW Club Spring Sprint

1700-2100Z May 13, CW only.
Work stations once per band, 80, 40, 20, 15 and 10 meters.

Exchange: Name, SPC, Fists number (power out if non-member)
Score 5 pts/QSO with FISTS members, 2 pts/QSO with non-members.

Final score equals QSO points times SPC (each time worked on DX countries)

QRP and QRO categories.

Send paper logs only within 30 days to
Alan Tanner,
3787 Trebein Rd.
Fairborn, OH 45342
htt://www.fists.org

QRP ARCI Hootowl Sprint
May 28, 2000
8 PM to Midnight Local Time

Memorial Day CW Sprint
2300Z May 29 to 0300 May 30, CW only 160, 80, 40, 20, 15, 10 and 6 meters.

Classes: < 250 mW; 250mW to 1 W; 1 W to 5 W; and over 5 watts.

Exchange RST, SPC, Michigan QRP Club member number (power output if non-member)

Work stations once per band.

Score 5 pts/QSO with MI QRP members, 4 pts/QSO with non-members outside W/VE, and 2 pts/QSO with W/VE non-members.

Multiply QSO points by SPC per band.

Multiply total time 1.25 if using home-brew receiver or transmitter.

Awards.

Send logs to
L. T. Switzer N8CQA
654 Georgia Ave.
Marysville MI 48040-1243
n8cqa@tir.com
www.tir.com/~k8dd/rules97.htm

QRP TAC Sprint
June 3, 2000
1800Z - 2359Z, CW only

Exchange call, RST, Name, State and TAC (telephone area code). To receive a sample log try htt://www.n3epa.org

2000 Summer Homebrew Sprint

July 9, 2000
2000Z-2400Z CW HF only

Flight Of The Bumblebees

Adventure Radio Society takes great pleasure in announcing the 2000 Flight of the Bumblebees, to be held on the last Sunday of July (July 30, 2000). As usual, we will hold a drawing for the first 25 people who sign up as Bees. Two lucky people will receive one-year subscriptions to Backpacker Magazine.

This announcement is being send to ARS members only. On Friday, April 21, we will announce the event on the QRP-L.

There are five different ways to be honored for your accomplishments as a Bee:

- Highest number of points in the Bee category
- Highest number of points in the home-based category
- Most interesting equipment,
- Most outrageous venture, and
- Most beautiful site.

We won't put a limit on the total number of Bees this year, but we would really appreciate hearing from you right away, so can put together a Bee Roster and build momentum.

To become a Bee, just send Russ Carpenter, AA7QU, an email at russ@natworld.com. Please indicate your interest in Beedom and your intended operating site.

This is a four hour event during the last Sunday of July, running from 10:00 PDT/11:00 MDT/12:00 CDT/1:00 EDT to 2:00 PDT/3:00 MDT/4:00 CDT/5:00 EDT. Thus, the hours of operation accommodate all four time zones. No matter where you live, there is time to for the Bumblebees to travel to their sites, set up their stations, operate the contest, and travel back to their cars.

Both home-based and portable operations are encouraged. Participants who want to operate in the Bumblebee category apply to Adventure Radio Society for Bumblebee status. ARS assigns each Bumblebee a Bee number. Bumblebees agree to walk, bike or boat to their sites. The distance traveled to the site is at the Bumblebee's discretion. Bumblebees add "/BB" to their calls.

Group operation is welcome in the Flight of the Bumblebees. You may Operate under a single call and report a single score, or under multiple calls and report multiple scores. In any event, you are limited to operating a single transmitter at a time.

Maximum power is five watts. We operate CW on 40, 20, 15 and 10 meters, on the standard QRP frequencies. We want this to be a national contest, so we encourage long-range contacts by giving double points for 20, 15 and 10 meters. 40 meter contacts will receive one point. The same station can be worked on different bands for additional QSO points and multipliers.

If you are a Bumblebee, your exchange is RST, state/province/country, and your Bumblebee number. If you are homebased, your exchange is RST, state/province/country, and your power.

Contacts with Bumblebees generate a 3X multiplier. So your score equals QSO points times (number of Bumblebees times three). Here is an example. If you make 20 contacts on 40 meters and 30 contacts on the higher bands, and make a total of 25 Bumblebee contacts, your score is (20+60) X (25 X 3), or 6,000.

Separate but equal commendations are awarded to the high scores for the home-based and Bumblebee participants. We will also commend Bumblebees in the following new categories:

- Most interesting equipment,
- Most outrageous venture, and
- Most beautiful site.

Participants are strongly encouraged to use our automated contest reporting system, which is found in the ARS Sojourner. Participants may submit paper logs, with a two week deadline. Results are posted during the third week of August in The ARS Sojourner, the QRP-L Internet Group, and by direct email to ARS members.

If you choose to use a paper log, please include at least the following:

- Your full name and callsign;
- Your status (Bumblebee, or homebased).
- Date of the event;
- Total number of completed QSOs with Bumblebees, and
- Total number of completed QSOs with all other stations.

You may also want to add soapbox information, such as the equipment used, your operating location, interesting contacts, successes and challenges.

You are encouraged to submit stories and photographs of your Bumblebee adventure for publication in The ARS Sojourner. See Advice for Contributors, www.natworld.com/ars/pages/pageone_material/advice.html.

Russ Carpenter, AA7QU, is the Contest Manager. Mail paper logs to him at 47227 Goodpasture Road, Vida, OR 97488. You can reach Russ in the following ways:

- By mail, at the foregoing address
- By phone, at (541) 896-026
- By email, at russ@natworld.com

QRP ARCI Summer Daze SSB Sprint
August 6, 2000
2000Z - 2400Z

QRP ARCI Fall QSO Party

1200Z October 21 to 2400Z October 22

QRP ARCI Holiday Spirits Homebrew Sprint
December 3, 2000
2000Z-2400Z

Enjoy....

72, de Mark KQ0I
kq0i@juno.com

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A Simple Antenna And Rig Switch

By John Burnley NU0V

A very positive benefit from my experiences with QRP is the collection of fine rigs that I have been gathering. Before becoming involved with low power operations, my only building experience was with antennas. The QRP community has been enhanced with the development of the various high quality (and low cost) kits that are available now. My dilemma with covenants does not afford me the opportunity to have an elaborate antenna farm (or visible) so most of my hamming utilizes one or two antennas going through a tuner to make the transmitter more happy (although not always the most efficient).

Manually changing antennas from rig to rig (especially during contests) and readjusting the tuner for every band frankly is a bit of a pain. It occurred to me that the solution was to build a coax switch (or move to an acreage but the XYL vetoed that idea).

There have been several good antenna switches over the years including the Heathkit HD-1234 and several models from B & W. I currently have the Heath model (which works great), but I still must change the coax from rig to rig (plus one of my antennas is fed with twin lead enabling more efficient multiband use). I decided to build a switch that not only accommodated antennas but rig choices as well.

One consideration for building an antenna switch is how to handle the 'out of circuit' antennas. Ideally you want those grounded but DO NOT RELY on this method alone for static and lightening protection. This should be incorporated into your overall plan but do not naively believe that this alone is all the precaution(s) that you must take.

Several months ago I ran across a website from Cole-Instrument at: http://www.cole-switches.com/ . It was very informative about different types of switches and the appropriate terminology. But I could not find any info on a switch that would ground the unused connections. A phone call to Cole-Instrument followed and I spoke with Mark Keeler. He confirmed

that there was nothing on the website about that type of switch, but he told me what I was searching for was a multi-deck switch with at least one deck that was bridging. He also noted that there is sometimes confusion between the term bridging and shorting.

Shorting and non-shorting refer to the state of the contacts being switched (from and to). Shorting (as the name implies) refers to a make before break contact during switching. In other words, while switching physical contact is made between the from and to contacts before the latter is disengaged. The opposite is break before make which is termed non-shorting. Here the from is disengaged before the to contact is placed in circuit.

Bridging is another concept where all positions except the in circuit contact are connected together. The in circuit position is open. This is the type of switch that was used in the Heathkit and some of the B & W switches. Mark graciously provided me a sample and I began my experimentation.

Before we continue, lets review some of the terms associated with switches. These definitions were taken from the Cole Instrument website.

Common - The common is one of the switches terminals, and is the terminal that is always part of the switch circuit regardless of position. The common connects to the different circuits via the individual stator terminals as the shaft rotates from position to position (also called the pole).

Decks - Multi-deck switches have sections, each performing a separate function, that are axially stacked around a common actuating shaft.

Rotor - A device inside the rotary switch, permanently affixed to the shaft, that houses the moveable contact that closes circuits through the stator terminals as it moves from position to position by normal shaft rotation.

Stator - The fixed portion of a rotary switch containing the terminals completing the circuit with the moveable contact.

The sample switches I used were both multi-deck (with one deck bridging on one switch).

The first major decision was whether to use all the positions on the switches or just use a few. After reviewing the number of positions available, the decision was made to use just a few (not enough room for all those connectors hi).

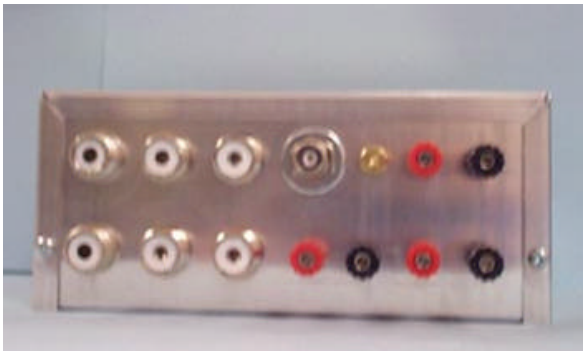

Photo 1: Rear panel of the switch box.

The layout of the rear panel (where the SO-239 and terminal connectors reside) is really up to the builder (and will vary depending on your needs). My project used the top row for antennas and the bottom row for rigs. There is one balanced antenna input along with 1 BNC and three SO-239s. The bottom row (rigs) contains 3 SO239s and 2 balanced outputs. A ground connection is also provided on the top row.

The first step was designing the front panel. A line was drawn to divide the panel in half

(horizontal). Two vertical lines were then drawn to mark the exact points for the holes for the switches. The back panel was a bit more detailed. First two lines were drawn 1'' from the top and bottom (horizontal). Then a vertical line was drawn every 1'' (for the first four connectors) and every 1/2 inch after that for the balanced and ground connections.

The first line connected to the antenna switch was the ground connection. It was attached to the common terminal on the 'bridging' deck. Remember the bridging concept is the opposite on how a switch normally works. Here the selected position is out of circuit while the other positions are connected to the common. Next a wire was connected to all 4 decks of position 1. Position 1 on the project is ground (the switch is placed in this position when I am away from the shack).

Next the first SO-239 connector's center conductor was connected to deck 2 position 2. A small piece of wire was used to connect deck 2 position 2 to deck 1 position 2. This was attached to ensure that when the switch was in another position then the SO-239 center conductor would be connected to ground. When the switch is in position 2 then deck 1 (the bridging deck) would be open and deck two would complete the circuit (without being shorted to ground). The same methodology was used for the remaining SO-239s and the BNC connector. The common for deck 2 is used to connect the antenna switch to the rig switch.

Installing the connections for the balanced line was a bit more complex. So far the following positions have been used:

1. Grounded for non-use.
2. SO-239 #1
3. SO-239 #2
4. SO-239 #3
5. BNC

Twin lead was used to connect the balanced terminals. One section was attached to the common on deck 3 while the other section was connected to the common on deck 4. A small piece of wire was connected between decks 3 and 4 in positions 1 through 5. A small loop of wire was connected to positions 1-5 on deck 6. This allows grounding of decks 3 and 4 when positions 1 through 5 are selected (a pseudo bridging effect). A small piece of wire was connected from position 6 deck 3 to position 6 or decks 1 and 2. This allows for the connection to deck 2 common when the balanced line is selected (from deck 3) while grounding it when unused (the bridging of deck 1). Deck 4 position 6 is connected to the rig switch deck 2 common.

The rig switch was more straight forward to connect. Remember the center conductor from the SO-239s, BNC, and one twin lead conductor are connected via the common from deck 2. The other twin lead conductor is connected via deck 4 position 6 to the rig switch common deck 2.

The connections on the rig switch were made as follows:

- Deck 1 position 1 to rig SO-239 #1.
- Deck 1 position 2 to rig SO-239 #2.
- Deck 1 position 3 to rig SO-239 #3.
- Deck 1 position 4 to rig balanced terminal 1(a).
- Deck 2 position 4 to rig balanced terminal 1(b).
- Deck 1 position 5 to rig balanced terminal 2(a).
- Deck 2 position 5 to rig balanced terminal 2(b).
- Remaining positions unused.

I know the explanation can be confusing but when connected via this method it really does work!

Some labels were added to document which antennas and rigs occupied which positions and the project was complete! Now switching between antennas and rigs is a breeze!

72, de John NU0V
burnleyia@home.com

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The Iowa QRP Club was formed to promote amateur radio low power operations, to hone operating skills, improve building skills, and introduce the hobby to perspective new amateurs.

Membership is limited to current Iowans, former Iowans, those with strong Iowa ties, border states (border counties), and in some cases by invitation. To join, email a request to:

IowaQRPClub@juno.com

or surface mail to:

John Burnley NU0V
8204 Sutton Drive
Urbandale, IA 50322

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