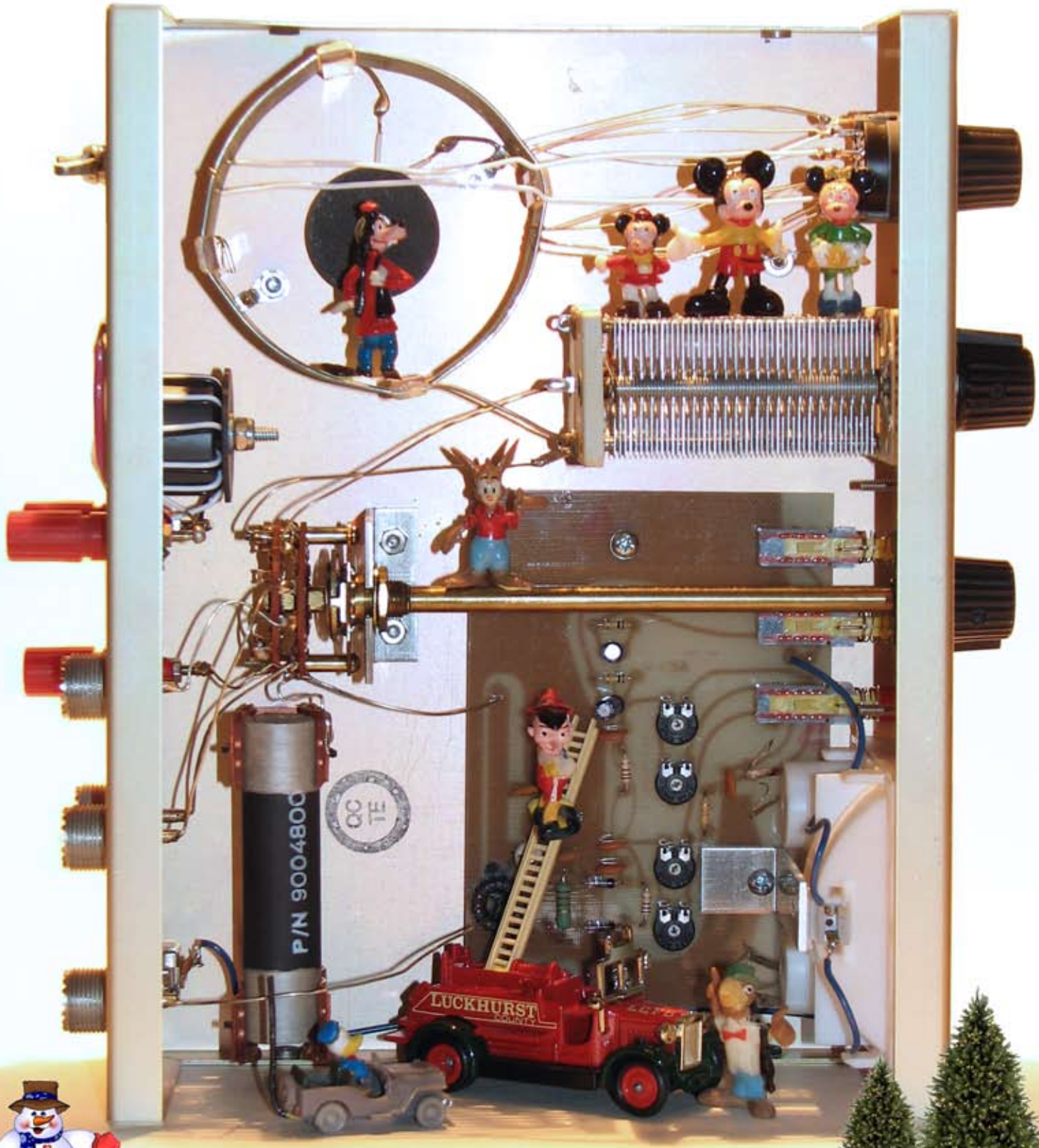
Volume 6, Issue 12, December 2009

K9YA Telegraph



Santa's Little Helpers

Robert F. Heytow Memorial Radio Club

K9YA Telegraph

Robert F. Heytow Memorial Radio Club

Volume 6, Issue 12, December 2009

4SQRP Test Set Kit

4SQRP and Seven Tools for You

Philip Cala-Lazar, K9PL

It took a long time getting here, but it was worth it. Late last year I read about the Four State QRP Group's Test Set kit (http://4sqrp.com/kits/hf_testset/hf_testset.htm), unfortunately it was no longer available. However, if enough pre-orders were received the club would offer a run of 100 kits. I sent in my pre-payment, and over time enough others sent in theirs to get the ball rolling, and about six months later the kit appeared in my mailbox.

Inventorying the kit's supplied parts revealed two resistors were missing; I dispatched an e-mail requesting the errant components and started assembly–it was glitch-free and fast going and completed (less the two resistors) in no more than three hours. The missing resistors arrived in short order: I now had a very neat seven-in-one instrument package designed by Wayne McFee, NB6M:

- Frequency Counter,
- Crystal Oscillator,
- Wideband Noise Generator,
- Audio Oscillator,
- 50-Ohm Dummy Load (rated at 20 watts),
- RF Probe, and
- Time Domain Reflectometer.

"…a useful accessory for all shacks…"

Make no mistake about it; although a QRP club offers the kit, it makes a useful accessory for all shacks, QRP or QRO.

Built according to the kit's construction manual the LCD display mounts directly to the PCB, PCB-mounted wire loops are used to make test lead connections and PCB-mounted two-pin SIP headers and jumpers are used to direct power to the desired test instrument.

I chose to make my version of the 4SQRP Test Set a bit more robust and convenient by eschewing the PCB-mounted display, test loops and headers and mounting it in a NOS Bud enclosure. The basic PCB was the easy part; building the PCB and associated connectors into and onto a box measuring 5" X 4" X 3" was much more time consuming; I had to find room for seven BNC connectors, seven S.P.S.T. subminiature toggle switches, two three-way terminals and a DC jack and fit them around the almost too compact container. This endeavor occupied about two weeks' worth of evenings spent measuring, cutting, drilling and puttering around.

The opening for the LCD display was created by drilling, with a Dremel® drill press, a series of holes outlining the desired dimensions and connecting the holes with an abrasive wheel chucked into the Dremel® rotary tool. The edges were then smoothed with a file. The LCD display board was mounted to the front panel with Scotch® foam

Continued - 4SQRP TEST SET on Page 8

Inside This Issue...

Philip Cala-Lazar, K9PL
Editor

Mike Dinelli, N9BOR
Layout

Dick Sylvan, W9CBT
Staff Cartoonist

Rod Newkirk, VA3ZBB
Contributing Editor

Robert F. Heytow Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

The Old Man and the Paperboy

Part II

Scott B. Laughlin, N7NET

The day the paperboy was to visit Jack's radio room came too quickly. After retrieving the morning paper, he sank into his recliner. As a rule, he first digested the editorial page, and then he scanned the entire newspaper front to back. This morning, however, Millie's remark about how much time had passed since he'd last been on the air was still nagging him. How long it had been? Why was she keeping track?

"Jim will be here this afternoon," Millie called from the kitchen.

"You mean the paperboy?"

"Jack. You've got to start using his name."

Jack grunted and dropped the paper in his lap. Pushing his recliner back, he closed his eyes and tried to recall his last visit to the radio room. Propagation was probably in the ditch that day. It had been for months. As if that wasn't enough, a faulty transformer was creating havoc with the signals, driving the noise floor through the roof. He'd made two formal complaints to the utility company, but to no avail. Perhaps, during his hiatus the problem had been located and corrected.

"Why was she keeping track?"

Jack gazed up the narrow stairway to the radio room door. His shack had once been a portion of the attic. Today, however, he would be sharing his asylum with the paperboy.

Millie's ability for getting her way was phenomenal. And he thought about the sign hanging in a tobacco shop on Van Ness Avenue that read: HISTORIC LOCATION: A MAN WON AN ARGUMENT WITH HIS WIFE ON THIS SPOT ON FEBURARY 3, 1932.

Sighing, Jack remembered that the room needed a going over. Laying the newspaper aside, he pushed himself from his recliner and headed up the stairs. After reaching the landing he pushed the door open and reached inside to flip the light switch. That's when he caught a whiff of Millie's furniture polish. "So this is how she keeps tabs on my radio habits," he muttered. He admired the scores of QSL cards and certificates he'd collected. Directly behind his desk hung a world map on which scores of colored hatpins marked significant locations he'd worked at one time or another—Pitcairn Island, Azores, a North Pole expedition, and a dozen small islands off Japan. A lone pin marked Marion Island, an icy chunk of real estate hugging the Antarctic continent.

The leather protested as he settled into his high backed chair and swung it into position at the desk. His radios were large and occupied much of the desk area. He'd purchased them prior to World War II, months before communications equipment became rationed items. To his right a J-38 was anchored on a heavy brass plate. On a separate table stood an ancient Underwood mill he used for copying high speed CW traffic. At the back of the desk, in custom built shelves, were four telegraph keys that had seen extraordinary service. Had they been capable of telling their stories, each might have startled the world with events of which they'd taken part—the sinking of the Titanic, World War I, the Scopes trial, the 1929 Crash, World War II, sinking of the Bismarck, and the Korean Conflict, not to mention the daily livestock and grain reports, Wall Street, and hundreds, if not thousands of baseball games transmitted to remote studios in Morse code.

After checking the cables and wires, Jack switched on the power and watched the tubes came to life. Their orange glow gave him comfort and he didn't object to the scent of hot dust.

While the radios stabilized he recalled his stint in the army. Drafted at forty-six, he was too old for combat, but as an electrical engineer and amateur radio operator he was a skilled Morse instructor.

The code school where he taught operated around the clock. Students assigned to night classes often fought

Robert F. Heytow Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

sleep. Most of the code drills were prerecorded on 78-RPM records, so he was free to leave his desk and physically shake students awake. However, he soon found an easier way. He could isolate any position he chose and plug his Vibroplex into that circuit. Then he would begin sending the Morse characters that resembled the rhythm of The Old Gray Mare—PE 777 PE7 JA. He couldn't recall ever finishing the first line before the snoozing person was jolted awake and back on the mill copying code.

The sound of the doorbell brought him back to the present. Then he heard Millie's footsteps in the kitchen.

"Remember, you've got to stop calling him the paperboy. His name is Jim." Millie said as she passed the foot of the stairway.

Moments later Jim appeared in the doorway, his eyes bright, his mouth gaping as he took in the radio room

"Wow!" he finally said.

"You still want to become a ham radio operator?" Jack asked.

Before he could answer his mother was at his side. She was a tall, attractive redhead and he saw the boy's clear blue eyes and high cheekbones in her face.

"I'm concerned about what Jim's getting into here, the electricity and all," she said, before introducing herself.

"As you should be," said Jack, swinging his chair around to face her, "but let me assure you there's nothing in this room that's any more dangerous than turning on a table lamp. Everything is properly grounded. However, I shall watch over this boy as though he were my own flesh and blood, Mrs. ahh—."

"I already know code."

"Mrs. Cornwell," she said, and for the first time she seemed to notice her surroundings. "This must be how a War Room looks."

"Well, I don't know about that, but there's been times that I've battled the elements—propagation, noise, and lightning," he said, rising from his chair and motioning Jim to take his place.

"I want you to watch this young man do the most dangerous thing he'll do while he's here."

Reaching past Jim, Jack rotated the receiver dial until he tuned to a familiar voice. Then he adjusted the transmitter frequency, keyed the microphone, and transmitted his call.

"There you are, Jack. We were just talking about you...OVER."

"It was all words of praise, I'm sure. HI HI," he said, laughing. "George, I have some third party traffic, a young man here in my shack wants to become a ham. His name is Jim and he wants to have a word with you. Standby."

Turning to Jim, he said, "When I push this button I'll be keying the microphone. That's when you say 'Hello. My name is Jim. Over. Got that?"

"Got it."

Jim followed the instructions and he smiled at Jack, and then at his mother after he heard George say his name over the radio.

His mother seemed satisfied and followed Millie down the stairway.

"You have to learn Morse code," Jack said, after signing off on the radio.

"I already know code."

"Oh?"

"Yes sir. I learned it from the Secret Code Club. See?" explained Jim, holding his right hand up so Jack could see his ring.

Jack adjusted his glasses and squinted at the ring and watched with interest as Jim opened the top exposing a tiny magnifying glass.

"Where'd you get that?"

"I sent in twenty-five cents and a cereal box top to Battle Creek, Michigan for it."

"And you learned the code from that?"

"Most of it. Some of it."

Jack was stunned. It sounded like hogwash to him, but he tried not to show it. He'd witnessed some pretty wild notions in years past, but this one, in his opinion, took top honors. His first impulse was to terminate the ham radio scheme, but that would never be an option as long as Millie was still breathing. If he tried to back out now she'd hound him to his grave. He was boxed. ■

Robert F. Heytow Memorial Radio Club

www.k9ya.org

telegraph@k9ya.org

Volume 6, Issue 12

Direct Conversion Receivers

Part II

Paul W. Ross, W3FIS

Pixie II (left); Wilderness Radio Norcal 40a (center); and, Wilderness Radio SST for 20-meters (right)

We saw there are some substantial problems with the Pixie II designs and their derivatives. However, for such a simple design, it is quite possible to make some QSOs with a little work and luck. What next?

A step up from this is the "Rockmite" transceiver, currently marketed by Small Wonder Laboratories in New Hampshire. For about the same cost as a Pixie II, the Rockmite transceiver takes things a step further.

The Rock-Mite is a crystal-controlled direct-conversion transceiver. It has an 8-pin PIC micro-controller onboard which controls a T/R offset on key-down. A tap of a push button control switch reverses the offset to yield a second operating frequency, giving you a simple RIT capability. Pushing and holding on the push button activates the speed adjustment routine for the built-in iambic keyer. The Rock-Mite uses two crystals. The first is used in the local oscillator for transmitter and receiver. The second is used as a receiver front-end filter. This crystal significantly reduces the SWBC energy present at the receiver mixer; as a result, unwanted SWBC reception is dramatically reduced over the Pixie II design.

Again, the Pixie II and Rockmite are "single frequency" transceivers, which can be purchased for the 20-, 30-, 40- and 80-meter QRP "watering holes."

Next are the more sophisticated designs from Wilderness Radio and Small Wonder Laboratories. With a simple crystal oscillator, you are "rock bound," as we used to say in the early days of ham radio when I got my Novice ticket in 1957.

A simple way out of this is to move to what is known as a VXO, or variable crystal oscillator. It is possible to "pull" a crystal oscillator quite a number of kHz by placing a small inductance and capacitance in series with the crystal. If the variable capacitance is implemented with a varactor, then tuning is by means of voltage control. This gives us a system, which is much smaller, cheaper, and less complex than using a mechanical variable capacitance. The normal capacitance range of a varactor is fairly small, but we don't need a great deal of change for moving a few kHz in the usual QRP band segments.

If we are going to go to this much trouble, a couple of other features found in the two Wilderness radio implementations are worth mentioning:

QSK break-in capabilities. After a slight lag on "key up," the transceiver returns to receive mode. If you pause between words, then you can easily listen for a returning station.

Multi-pole crystal filters. The receiving bandwidth is controlled by a multi-pole crystal filter made up of selected crystals. The bandwidth is quite suitable for CW operation. Interestingly enough, I have been able to easily recover BPSK-31 signals from both of the Wilderness Radio transceivers.

"…do some serious QRP work!"

AGC – in the case of the SST design, a LED is used for audio rectification, which is then fed back to the initial mixer stage to bias it off for strong signals. This has the nice side effect of flashing the LED in synchronism with the received CW signal.

The Wilderness Radio NorCal 40A has a true VFO, which can be adjusted for a substantial frequency range in the 40-meter band. Modifications have also been made to the circuit for use on other bands, but that involves replacing crystals and winding some of the toroids differently.

The Pixie II runs on a 9-volt battery, which is contained within the case in the accompanying photograph. The two Wilderness Radio units run from an external 12-volt DC source. However, the SST can be configured at build time to run off an internal 9- volt battery, if desired.

Small Wonder Laboratories also market a VXO transceiver similar to the Wilderness Radio SST units.

With some sort of antenna tuner, a hank of wire, battery, and headphones, you are ready to head off to the great outdoors to do some serious QRP work! ■

Robert F. Heytow Memorial Radio Club

www.k9ya.org

telegraph@k9ya.org

Your Help Needed

University Researchers to Study Early Amateur Station Logs

Researchers at the University of Wisconsin and Miami University of Ohio are seeking copies of amateur station logs from 1913-1927 in hopes they may offer insights into the relationship between individuals' work and leisure activities, technology, and their social networks.

"Early hams laid the foundation for the now-ubiquitous use of technology for communications and entertainment," says Steve Johnston, WD8DAS, and director of engineering & operations for Wisconsin Public Radio. "Many operators did not work in a technical field, but pursued the radio hobby for its own sake. This is a true success story about how a pastime can develop into an entirely new commercial and social phenomenon."

Phil Kim, an assistant professor at the University of Wisconsin's school of business, notes that diaries, letters, QSL cards and station logs can contain valuable insights into the link between an individual's occupation, hobbies and friends. During the period sought thousands of early ham radio enthusiasts were licensed by the government to comply with the Radio Act of 1912, and began to more carefully document the new communications era.

"Amateur radio operators during this time period were on the forefront of a new method of communication and social interaction, similar to how social media is evolving today," Kim says. "We notice a lot of similarities between these two groups, even across time."

"We can learn a lot about ourselves and our own interactions from how these pioneers pursued their hobby and expanded their social networks," adds Steve Lippmann, an assistant professor at Miami University of Ohio.

Kim, Lippmann and Johnston are comparing early ham licensing records from the Department of Commerce with detailed information in amateur operators' station logs in an effort to uncover new information about approaches to work and leisure time and the development of social networks.

If you have an old ham station log from the period 1913-1927 you'd like to include in this study, please contact Steve Johnston, WD8DAS, at johnston@wpr.org or 608-262 5584. Thank you. ■

Ham Lingo

DICK SYLVAN, W9CBT

"OLD MAN" (ANY MALE HAM)

Addenda...

Dieter, DL2BQD, writes: *Thanks a lot for the last issue which I read with great interest and joy. May I be allowed to add a tiny appendix to the Pixie II article (*See: *K9YA Telegraph*, November 2009, pp. 2-3). *It's not worth an extra article but I wrote a short text on that Pixie - never ending story which some readers might be interested to read.*

http://www.qrpedia.com/book/200812/workbench-hints-and-more-hints#new

http://www.qrpedia.com/book/200812/pixie-never-ending-story

Perhaps some home constructor will like the "hints and more hints…" and I would like to invite all to send me any other hint for that page. All highly appreciated for the sake of the homebrew community.

5

K9YA Telegraph

Robert F. Heytow Memorial Radio Club

www.k9ya.org

telegraph@k9ya.org

Volume 6, Issue 12

The Straight Key Century Club

Roger Kepner, W6SQQ, SKCC PIO, SKCC #1283C

The Author, W6SQQ, Working QRP CW at a SoCal Campground.

Times are good and getting better for CW enthusiasts. New people are joining our ranks every day, not because they have to in order to get a license, but because they want to experience the essence of our great hobby. I have been licensed for 57 years, and I have no recollection of my first phone contact. But, I remember my first CW contact like it was last week. And, my first out of state QSO late one night brought on shouts of pure joy that woke up the whole house. Those feelings never leave, and that is one of the keenest legacies of the CW mode. Fortunately, there are a number of growing CW specialty clubs around to help us with our pursuit of the CW dream. Arguably, the fastest growing club today is the Straight Key Century Club, or SKCC, and I am proud to tell its story.

"…shouts of pure joy…"

On January 2, 2006, a small group of participants in the just concluded ARRL Straight Key Night, were gathered on a QRZ message board, lamenting the fact that SKN was only once a year. "Why can't we do it more than once a year?" was the question. Tom Peterson, KC9ECI, an Extra Class from Galesville, Wisconsin, replied: "Do it the 1st of each month starting at 00:00Z and going until? Start your own SKCC club; 100 Qs with a straight key in a year gets a certificate. Ah, the heck with it, I'm officially starting the SKCC club. PM me if you want a SKCC number. I'll start compiling a database. De KC9ECI, SKCC-001" And, like that, the SKCC was born. As of June 14, 2009, there were 5,610 members in 3½ years, and Tom just shakes his head in disbelief. Contrary to widely held beliefs inside and outside the ham community, CW, as a viable communications mode, is very much alive and well.

So, what does SKCC have to offer? First, membership is free. There are no fees or dues. Second, Membership is for life. We record call sign changes and silent keys, but your member number remains yours. Thirdly, there are no elected officials. Volunteers from the membership carry out all necessary administrative functions. Now, on to the good stuff:

Awards

SKCC Centurion – Requires a member to work 100 other members, using purely mechanical keying methods.

SKCC Tribune – Requires a Centurion to work 50 other Centurions; keying as above.

Worked All States (WAS) – Requires a member to work other SKCC members in each of the 50 states.

SKCC QRP Award – 2xQRP and 1xQRP awards are available. Award is based on a points per QSO system.

SKCC DX Award – Awards available are DX10, DX25, DX50, etc. Based on contacts with SKCC members in other countries. Standard keying protocol applies.

Young Buck Award – Requires members to exchange ages. Work a 90-year-old member for 1/90 of a point, a 15-year-old member for 1/15 of a point. Award is for 1 point.

Marathon Award – Requires a member to contact 100 other members, with each QSO lasting at least 60 minutes.

Operating Events and Sprints:

Novice Day – Every Friday, 00:00z-24:00z, on 7.114 KHz. (Official SKCC Elmer frequency)

Monthly SKN – First day of each month (z). Get on the air and chat. Non-members welcome to participate.

Straight Key Sprint – 00:00z-02:00z, on the 4th Wednesday of each month. Non-members welcome to participate.

Robert F. Heytow Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

Weekend Sprint-a-thon - 00:00z-23:59z, 2nd Sunday of each month. May focus on certain skills or operating wrinkles for extra fun. Non-members welcome to participate.

DX-TRAVAGANZA – 48-hour DX contest. Work members and non-members worldwide. Both parties must use purely mechanical keying methods.

Elmers

There is a SKCC Elmer manager and 34 volunteer Elmers at this time. Elmers monitor 7.114 MHz, the official SKCC Elmer frequency, to assist those who are new to CW and need help building their CW skill set.

QSL Bureau

All members are encouraged to utilize the services offered by our volunteer QSL Bureau Manager.

Newsletter

An informative monthly newsletter, The SKCC Centurion, is produced by our volunteer editor/publisher, and is available on-line.

Event Calendar

Our event calendar manager creates a monthly calendar, available on-line, that shows all SKCC events as well as various other club events of interest to our members, such as QRP CW Sprints, ARRL and CQ magazine CW events, island activations, lighthouse activations, and others.

Operating Frequencies

(+/- 10 KHz)

1.820 7.055 10.120 21.050 50.090

3.530 7.114 (Elmers) 14.050 24.910 144.070

3.550 7.120 18.080 28.050

Additionally, there is an SKCC DX cluster and an SKCC sked page, as well as an SKCC forum. Our home page is at: www.skccgroup.com, and day to day member chitchat via e-mail is at **skccgroups@yahoo.com**.

Most SKCC members are involved with their local radio clubs, as well as other specialty clubs. In a poll we found that 52% of our members are also FISTS members, a wonderful CW club originating in Europe that has been around, promoting CW, for many years. A large percentage of our membership is actively involved with QRP portable work. The writer is a QRP enthusiast that enjoys working from remote fire lookouts.

Our purpose statement pretty well says it all:

To promote the use of Morse code, particularly using straight keys, bugs, or sideswipers (cootie keys).

"…promote the use of Morse code…"

To help, encourage, and Elmer new CW operators.

To HAVE FUN!

To request an SKCC number, send an email to **number@skccgroup.com** with "SKCC # Request" in the subject line. In the message body include name, call sign, city and state/province, country, and give a brief statement as to why you want to join SKCC. ■

K9YA Field Day Results

Team K9YA managed another Top Ten finish in Field Day 2009. Actually, they placed 8th out of 173 entries in their category (1A).

"Wait until next year," exclaimed Mike Dinelli, N9BOR. "We lost two hours due to a thunderstorm."

As always, K9YA Field Day tested our logistics and operating skills, while introducing amateur radio to Boy Scouts, elected officials and served agencies. Selfishly, it gave us the opportunity to fully immerse ourselves in something we truly enjoy—a perfect balance.

We would like to thank the following members for their contributions to our success: John, AAØBP; Philip, K9PL; Mike, N9BOR; Steve, N9WAT; Art, WB9JKZ; and Dick, W9CBT.

Robert F. Heytow Memorial Radio Club

www.k9ya.org

telegraph@k9ya.org

Volume 6, Issue 12

CONTINUED - 4SQRP TEST SET FROM PAGE 1

mounting tape. Connection from the display's 16-pin terminal to the PCB header was made with ribbon cable salvaged from an old computer. RG-174/U coax was used between the PCB and panel-mounted BNC connectors. For the audio frequency level control knob I used a 14-22-gauge wire nut that nicely fit the pot's shaft. A Brother QL-570 label printer generated the descriptive labeling.

Cabinet Rear

The kit's downloaded 32-page construction manual provides well-written, unambiguous step-by-step instructions for building, smoke testing and using the completed test instruments. Omitted from the manual are some specs including DC input power and the frequency counter's range. In my experience a 12-volt wall wart works FB and measuring HF frequencies 160- through 10-meters is no problem.

The 4SQRP Test Set kit offers seven valuable instruments in a small footprint no matter how you decide to package it–standard or custom built.

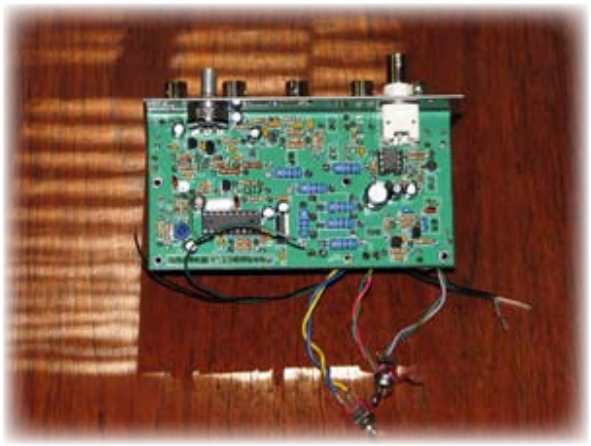
Our Seventh Anniversary

Wow! Our seventh year of publishing the *K9YA Telegraph*, who would have thought we would meet such acceptance and acclamation from the international amateur radio community? That acceptance and acclamation is reinforced month after month by your generous messages of support and the fascinating, informative and well-researched articles you have chosen to share with the *K9YA Telegraph*'s readership.

From the *K9YA Telegraph* staff: Mike, N9BOR; Dick, W9CBT; Rod, VA3ZBB/W9BRD; and myself, K9PL, we wish you and your families a very joyous holiday season.

73 ES HPE CU ON THE AIR

Top View of PCB from Rear



Bottom View of PCB

Call for Articles

Have a story to share? An experience to relate? Some gear to review? A technical tip to dispense? Feeling didactic or pedantic? Write it up, add a couple of appropriate photographs and send them off to the *K9YA Telegraph*. Hams worldwide will thank you, and so will we.

Here's the place to start:

http://www.k9ya.org/write_for_us.htm

Rod Newkirk, VA3ZBB/W9BRD

Rod and Betty Newkirk would like to thank everyone who sent their get well wishes. Rod continues to improve while undergoing rehabilitation following a mini-stroke.

Please join us in our prayers for Rod's rapid recovery and return to his favorite pursuits.

You may send your get well soon wishes to Rod via the *K9YA Telegraph* at: telegraph@k9ya.org

Robert F. Heytow
Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org