K9YA Telegraph

Robert F. Heytow Memorial Radio Club

Volume 8, Issue 7, July 2011

NEScaf

New England QRP Club's Hot Kit

Philip Cala-Lazar, K9PL

I'd been considering purchasing the New England QRP Club's NEScaf kit for quite a while to complement my QRP rigs. Unfortunately, my timing was off, the kit, a hot commodity, quickly sells out. Finally, the first week of February 2011, kits were again available and I ordered with the due alacrity born of those who have waited too long in the past. Facilitated by check and via USPS, the kit arrived in my mailbox in a fortnight. Running a parts inventory it was good news right off the bat, no missing parts!

Rather than reinvent the wheel, here's the kit's description from the New England QRP Club's Web site.

*The NEScaf is a **s**witched **capacitor a**udio **f**ilter (acronym SCAF) built around a "building-block" type filter chip. The NEScaf will take the audio from any source (rig) and filter it to suit your listening… which is called a bandpass filter. The filter has two controls:*

1. The center frequency control allows the user to raise or lower the received frequency (the CW note) in the bandpass filter. The pitch can be set to a default value anywhere between 450-1,000 Hz range.

2. The bandwidth control will vary the width of the received CW pitch from about 90 Hz to about 1,500 Hz.

As good as the QRP kits I've built and reviewed in the *K9YA Telegraph* are for casual rag chewing, their performance during contests and operating events sometimes falls short. Sensitive receivers yes, but their selectivity often needs enhancement. And, to my ears at least, more audio output would definitely help. My Ft. Tuthill 80 was hearing what sounded like every participant over several kilohertz during a recent NAQCC weekday sprint. Problem was I needed to separate them; that's where the NEScaf comes in.

The 2" x 2" NEScaf PCB despite its compact dimensions is well populated with through-the-hole components, no surface mount devices here. No problems were encountered during the three hours or so it took to build. For my build I included the three IC sockets (two 8-pin and one 20-pin) that are "highly recommended" in the construction manual.

"highly recommended."

I included a minor modification posted to the club's mailing list by an op who noticed distortion when "…switch(ing) the input from one rig or another." According to this mod, tantalum capacitor C17's polarity should be installed reversed from that indicated in the text and on the schematic, i.e., the positive (+) lead should point toward the filter IC. In addition, it is suggested to install a "…150 ohm resistor (or even smaller) at the input to assure that the external source is at zero bias…" The instruction manual I built from, last revised April 2010 does not include this modification. I suggest checking the mailing list noted above for the modification note and

CONTINUED - RADIOMAN 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

A Bicycle Mobile Adventure

Part IV

Scott B. Laughlin, N7NET

Summary of Part III

Wiley and Alice, after leaving the truck stop at Mile Post 103 on Interstate 10, followed the old Wickenburg Stage Road to the Vulture Mountain Summit. The summit, a few miles short of Wickenburg, provided three primitive campsites that were free to the traveler.

They made their camp in a depression a few yards beyond the campsites because being out of sight from the road provided added security.

During the wee hours of the night a car arrived at the summit. An argument developed, apparently over a previous drug deal, and a man was executed.

The following morning, numb with guilt from what they'd witnessed, they continued their trek to Wickenburg, stopping at Mel's diner to mentally sort things out. There they met a couple, Bruce and Carmen, who were also touring on bicycles. After a brief discussion they joined forces.

> *"We call him McBark"*

Part IV

"Wow. You're taking a dog along?" said Carmen as they departed the diner. What's his name?" she added, scratching him behind one ear.

"We call him McBark," said Alice, stowed his leash and then coaxing him into his box.

"Ah, a CB." said Bruce as they prepared to head out.

When they began their first bicycle mobile trip, hearing their radio referred to as a CB annoyed Wiley. However, it had occurred so frequently he'd become desensitized. It no longer mattered. But since the four of them were going to spend some time together he decided to clarify the difference right off the bat.

"It's a ham radio, two-meters. I also have a 20-meter rig for communicating greater distances." Wiley watched Bruce's eyes scan the bike for some evidence, and then added. "The radio is in a pannier. The antenna is a ham stick, separated in two parts and lashed to the top bar."

"Oh? What kind of distance?"

"On a good day with low power I can often fetch a ham a thousand miles away." Bruce seemed skeptical of the claim, but that didn't matter either. He was in no mood for a show and tell. Instead, he and Alice headed out.

On the northern edge of town they found a supermarket. Wiley and Bruce stayed with the bikes while Alice and Carmen shopped for rations.

"Alice is my navigator, my communications officer, and weapons officer when we encounter a mean dog. Her bout with cancer has left her weak. I want her to set the pace."

"That's okay with me. I'm certain Carmen won't object."

After their supplies were stowed they turned west on US 93. At Congress they headed north on 89 toward Prescott.

"We should let the kids know that we're okay," Alice said over his shoulder.

The bicycle built-for-two always gave him comfort. Not only could they communicate in a normal tone, but Alice could slack off when she needed to without falling behind. However, not every couple shared that outlook.

In 1885 J. and Elizabeth Penell, Philadelphia newlyweds, pedaled out from London's Tabard's Tavern on a Covington Tandem Tricycle. Their honeymoon would be spent following the same course that Chaucer's Canterbury Tales group had followed 500 years earlier. It was a tough assignment and Elizabeth was apparently not in condition for such a challenge. On upgrades freight wagons and teams of draft horses often passed them. Somewhere in the course J. accused Elizabeth of back-pedaling, making the trip more difficult than he thought it

Robert F. Heytow Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

should be. Wiley smiled, recalling the familiar adage: Wherever a relation is headed it will arrive there more quickly on a tandem.

"Sending an email to the kids crossed my mind back at the cafe, but we were too early for using a library computer. Maybe there's something ahead?" And he heard her unfolding a map.

"I don't think so. Prescott is the next town large enough for a library. Maybe we'll find a pay phone."

"Maybe, but in the spirit of amateur radio I'd rather send Kelly a message through the NTS. The Maritime Net will start soon. I'll try it when we stop for lunch somewhere.

"We have company approaching from the rear," he added as they pedaled through Yarnell. A moment later a lone cyclist in shorts and tee shirt was beside them.

"Hi. I'm Paul. Mind if I join you?" He was tall, probably in his late twenties. His dark tan indicated he spent a great deal of time out-of-doors.

"Of course we don't mind. Glad to have you along. Where's home?"

"Yarnell. I was getting ready to water the flowers when you came through town, so I grabbed the bike. Where are you headed?"

"Prescott is the immediate destination, but Oregon is our objective," explained Alice.

"Wow! That's ambitious."

By this time Bruce and Carmen had joined them and they filled the northbound lane. Wiley went through the introductions.

"What's a young man do for a living around here?" asked Carmen.

"I'm a Deputy for Yavapai County. You?"

"Wiley and Alice are retired Air Force. Carmen is a working journalist researching for a book. And me? I'm an attorney."

PULL OVER, blasted a bullhorn from behind.

Wiley glanced in his mirror and saw an Arizona State Trooper with the overhead lights flashing. A moment later he heard the door slap shut.

"Staying as far to the right as possible is not only the law, it is for your own safety," shouted the trooper, keeping the cadence of his stride by slapping his ticket book against his thigh. He was a big man, graying around the temples. "You should be familiar with the rules of the road."

Wiley noticed the recognition between these two officers. He recalled rumors of competition between law enforcement agencies. The rumor was evidently true. He sensed hostility between them even though nothing was said aloud. The trooper belabored his point. After issuing a verbal warning, he returned to his car and sped off toward Prescott.

The bicycle procession continued. Paul was silent for several minutes. At last he came abreast of Wiley. "Have you ever been this way before?" he asked.

"I think this is a first time for all of us on bikes. Why?"

"Then you don't know about the hill?"

"Hill?" echoed Wiley, thinking about Alice and wishing not to compromise her recovery.

"Yeah, it's between here and Prescott. Five miles of steep switchbacks, maybe that's no big deal to you long-distance cyclists."

"Hills are always a concern for us."

"PULL OVER, blasted a bullhorn…"

There's a detour through Skull Valley that will take you around back of the hill. It's my favorite route into Prescott even if it is a little further."

"What do you think, Alice?"

"Let's do the hill."

"You sure?"

"Absolutely."

"You heard her. How far are you going, Paul?"

"All the way to Prescott. Let's head into the store and I'll call my wife," said Paul, nodding his head, indicating a small market on the left.

They came to a halt at a sun-bleached picnic table. While everyone else was inside getting drinks and makings for sandwiches Wiley set up the 20-meter rig. By the time he was ready the Maritime Net was under way. The current NCS was in Fort Meyers, Florida with his beam pointed south calling for emergency or priority traffic, deployed service personnel or maritime traffic in the Caribbean. Several minutes passed while he rotated his antenna more westerly toward the Gulf of Mexico and finally he

Continued - Bicycle Mobile on Page 7

Robert F. Heytow Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

Stealth & Less Than Optimal Antennas

Now You See It, Now You Don't...

Paul W. Ross, W3FIS

Can You Spot the Antenna?

This article was prompted by some questions on one of the Yahoo news groups about "stealth" and "short" antennas, which I had attempted to answer, so here goes…

In an ideal world, we all have acres of property; nifty towers; neighbors far, far away; and an indulgent spouse who lets us spend money like water on ham radio gear, let alone lets you work that rare DX until 3:00 in the morning without complaint! Fat chance, not in this lifetime…

The reality that most of us face is:

- Deed restrictions concerning outside antennas. Nothing you can see, nada…
- Low power QRP issues, due to cost and not getting to know your neighbors when you key up the "full gallon."
- Issues of "domestic tranquility," meaning no loud noises or the like. It gets the dog upset…
- Often a lack of a dedicated space for the "ham shack." You may be condemned to a broom closet or space in the spare bedroom.

"'stealth' and 'short' antennas"

How do we work around this? I suspect that what I encountered is what the vast majority of ham radio operators faces. I ran into pretty much this situation when we moved into a house in a "deed restricted" development. At that time, I had been out of ham radio for a number of years, and only by accident got back in it again. But, here we were, with no "outside antennas."

Fortunately, there is a nice attic over the garage, and I can access it through a door in a spare bedroom. Guess where the "ham shack," home office, and hide-away was going to go? So, what did I do for an antenna system? Your mileage will vary, of course, but this was my solution.

1. The VHF/UHF problem was easily solved by a J-pole in the attic. I made it up out of the usual copper plumbing fittings, making it a point to put a threaded fitting on the bottom. This allowed me to screw a mounting plate to the attic floor, and allow easy removal for any work I might need to do on it. The local hardware store is your friend.

2. The feed line was simply RG-58 coaxial cable, fed through the wall into the spare bedroom using an "old work" box and a blank plate from the local hardware store. I fitted it with two bulkhead fittings, as one would be used later for the HF antenna. The J-pole was placed at the far end of the attic away from the shack. This was to attempt to get the RF in the shack under

Stealth Antenna Exiting Second Story Window

Stealth Antenna Ending at Foundation

Robert F. Heytow Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

control. I also fitted the cable with a ferrite choke to attempt to tame unbalanced currents on the coax. I can still get the "touch switch" china cabinet to light up. The XYL is very tolerant…

So far, so good: an adapter, a few odd fittings, and my HT was set up to work as a base station. It is quite remarkable what you can do with five watts, a decent antenna, and a good selection of local 2-meter and 70-cm repeaters within reasonable distances.

The bug really bit, so I now had to get into HF again. I had a very old (1957) "Tech" class license, so with a little help from my friends, I "grandfathered" into a General class ticket. I love QRP, so a couple of nice kits were acquired, and eventually a Yaesu FT-817ND. Kill multiple birds with one stone–VHF/UHF and HF. What do we do about an antenna?

Well, the deed restrictions raised their ugly head again. A check with the tape measure suggested I had 24 feet to work with using the full length of the attic. If I "dogleg" it around at the far end, I can get 34 feet. I am going to have to end-feed this monster. A borrowed antenna analyzer showed that the impedance was all over the place. What to do? I need an antenna tuner that will beat the beast into submission. A little reading– Google is your friend again–suggested that I could likely get a decent match with a "T" type tuner if I kept my wits about me, and tuned it with a minimum amount of inductance. A badly mistuned "T" tuner will dissipate all the power in the inductor! You have one too many variables at hand. Pick an inductance value, tune for minimum SWR, and then see if you can get a match with a lower yet value of inductance.

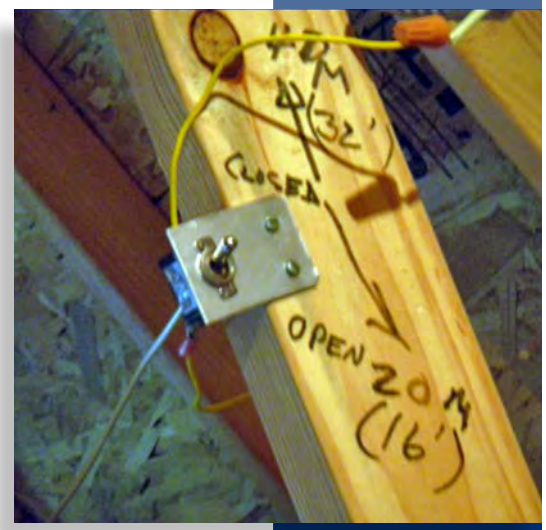
"What do we do about an antenna?"

An antenna tuner "fools" the transmitter into thinking it is seeing the desired 50-ohm resistive load. Matching a complex (resistance plus reactance) impedance is a matter of doing two things:

Detail of Balun Mounted to Roof Truss

1. Remove the reactive component by presenting the complex conjugate impedance to the antenna–if it is capacitive (likely in my case, as my antenna is going to be "short"), then you need an inductance.

2. We also have to convert what real component of the antenna impedance is seen to a value equal to 50 ohms, which the transmitter wants to see. We are going to have some loss in that tuner–live with it. Remember, we cannot have our nice dipole or trap antenna for the lower bands in the space I have, except for 15- and 10-meters. Also, I wanted to be able to work primarily the 40-, 30-, and 20-meter bands.



Attic Antenna Mounted to Roof Truss

3. That nice piece of coaxial cable for the VHF/UHF stuff is going to work as a counterpoise of sorts for me. Remember, I am on the second floor. The distance from the rig to the near end of the attic antenna is about ten feet. The house siding is vinyl, and there are only the nails in the roof to worry about.

4. I also put a toggle switch in the antenna at about the sixteen-foot position. With this (just walk through the door to the attic), I can shorten the antenna if needed for the higher bands, like 15- and 10-meters.

5. OK, "good to go." In the meantime, I have gotten into digital modes—remember the comment about domestic tranquility and not getting the dog upset…

More recently, I decided to do myself a favor, and invested in a LDG Z-817 auto tuner for the FT-817ND. I find myself hopping from band to band over the afternoon and evening with the digital modes. Consulting note cards and throwing tuner switches gets a bit "old" after a while.

The tuner gave me a slightly rude awakening! I now found that I was having distinct problems tuning 40- and 80-meters. A little investigation showed that the auto tuner was an "L" design. This is nice,

CONTINUED - STEALTH ON PAGE 7

Robert F. Heytow Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

Doing the Dishes to DX

Charlie Cotterman, KA8OQF

Magnavox D2935 Receiver

Heading out the door going to work (this would have been in the mid-80s or so), I saw a box lying behind the porch wall—apparently the mailman had put it there so it wouldn't be visible from the street, and I'd gotten home late the previous night, missing the box in the shadows, I shoved it inside the house and went on to the school bus yard.

That evening, I peeled the box open and my jaw hit the floor. Inside was a brand new high-zoot portable receiver, a Magnavox D2935. Wow, digital tuning, multiple memories, ferrite bar and whip antennas; a *BFO*. Seems I'd sent in my name to be a member of a listener's club for KUSW in Salt Lake City, a commercial station that tried to take its mainstream rock'n'roll to international shortwave (sadly, the effort didn't last more than a few years, both KUSW and WRNO out of New Orleans were sold to religious broadcasting interests by the early 1990s). Apparently my name had been drawn in something, so now I had a spiffy new cap, a handful of bumper stickers and a new radio!

"…a new radio!"

Now, where do I put this marvel? Eventually, space was found atop the refrigerator in the kitchen. Memories were programmed for the local news stations, baseball games, a couple of rock'n'rollers, a few favorite shortwave broadcasters and some FISTS CW club calling frequencies.

After awhile, I found myself more and more often tuning across the low end of the ham bands to an occupied frequency (occupied by more than one station–the passband on a D2935 is wider than a barn door), listening to CW as I scrubbed pots and pans. This may seem odd to the outsider, but to the dedicated CW op, it's music at its finest, coming from all corners of the globe. Local ragchews, DX pileups–the rhythm of the key along with tiny soap bubbles…

After a move and much rearrangement of things, the radio still sits atop the fridge, issuing its dulcet tones of dots and dashes from all over the world. I tried listening to SSB one evening, but let's face it–phone just doesn't have the cachet that CW does. As background music ("mental chewing gum" is Mom's definition), CW is very satisfying. The mind stays alert, as opposed to "fazing out" from boredom, while the hands are taking care of last night's mac'n'cheese surprise.

If you have a spare communications receiver available (and who doesn't have an old Hallicrafters S-38 gathering dust somewhere?), try this. First, astound the significant other by offering to do the dishes for a few days. Second, while said other is off enjoying themselves, put the receiver somewhere out of the way, plug it in and tune it up and see what's out there while scraping down the remnants of veal parmigiana. I can promise that it's a unique experience that will change your views on basic housekeeping–and it's a marvelous justification for buying another radio! ■

Robert F. Heytow Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

Continued - Stealth from Page 5

for if it can get a match, it is unique (not like the "T" design), but with my "short" antennas, I can't throw in enough inductance to match the antenna. There are a couple of answers–room for more experimentation–but a quick answer is to use an impedance transformer. Simply transform the rather high impedance of the end-fed antenna down to something the auto tuner can swallow. Fortunately, LDG offers a nice 4:1 balun, which can be used as an impedance transformer by simply grounding one side of the output, and fitting the antenna to the other output connection. Problem solved! The "T" tuner—an MFJ-902—can now be freed up for other experiments and field operations.

What if you don't have an attic? I also have had pretty good performance with a piece of #28 magnet wire out the upstairs window. From ten feet away, unless you have eyes like a hawk, you simply cannot see it. If the wind breaks it, just run another piece! ■

Enter the K9YA Telegraph Photo Contest

Click HERE for Details

Ham Quips

DICK SYLVAN, W9CBT

"MULTI-OP" CONTESTER

Continued - Bicycle Mobile from Page 3

sent his call due west. Wiley's QRP signal left him at a disadvantage. More powerful stations outgunned him on his first two tries. But the NCS recognized him on the third try.

What Can We Do For You?

"I have one routine message for Oregon."

The NCS relayed his request and there was a taker. Wiley put his message into the system. In a few hours a local ham would dial Kelly's number and read the message to her.

Within the hour they began ascending the hill Paul had mentioned. The landscape seemed to change with each pedal rotation. Behind them lay the lower desert and cactus that had accompanied them from the beginning. The smell of greasewood was replaced the fresh, aromatic scent of pine and juniper. Soon, the other three cyclists were far in the distance. Not to be rushed, Wiley shifted into the lowest chain ring and adjusted their speed to accommodate Alice.

The sun was a hand's width from the horizon when they rolled into Prescott. Bruce and Carmen were waiting on a bench outside a small diner.

"Is Paul headed back home?" asked Alice as they dismounted and leaned the bike against a pine tree.

"Paul met his wife at a café further back. You probably met them. He said he was going on duty tonight," Bruce said.

"That must be who honked and waved." Wiley said. "You guys get a room here?" he added nodding his head toward a motel across the street.

Bruce and Carmen exchanged glances. "We thought we'd continue on for a couple of hours," explained Carmen.

"We need some time off the saddle. Tomorrow will be a rest day for Alice and me."

After parting handshakes and watching Bruce and Carmen pedal away, they pushed the bike to the motel and saw to McBark's needs before seeing to their own.

"We travel too slowly for them," said Alice as they stepped off the curb, heading for the diner."

"Doesn't matter." ■

K9YA Telegraph

Robert F. Heytow Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

Volume 8, Issue 7

CONTINUED - NESCAF FROM PAGE 1

make your own decision. For me, building it with the mod from the get-go, no objectionable distortion is heard between rigs even at quite high headphone output levels.

Building the Kit

Power supply components are installed first, followed by a smoke test. Applying power to the partially populated board, voltage readings are taken at IC 1, 2 and 3 pads/socket terminals.

Next, audio amplifier components are mounted and tested: This test requires an AF generator or rig. I used a Panasonic R-8 transistor radio as my AF source.

Then, after installing the 555 chip, the oscillator frequency (70 KHz) is checked. For this I used the frequency counter included in the very useful 4SQRP Test Set (*K9YA Telegraph*, December 2009).

The board was installed in a NOS Bud enclosure and mounted with 4-40 hardware on ¼" plastic spacers. The standard kit includes the panel-mounted single and dual-gang potentiometers, knobs, LED, and DPDT toggle switch. My purchase included the optional connector kit: two phone jacks, power jack and power plug.

On the Air

Hitched to my PFR-3 for an afternoon of casual QSOs the NEScaf acquitted itself well. On 14.060 during a QRP to QRP chat another signal popped up near enough to cause readability problems. I twisted the bandwidth to its narrowest setting and tweaked the frequency–the QRM disappeared as the target signal peaked.

For sprints and contests I narrow the bandpass to around 150 Hz, or less, to separate pockets of competing signals. During the ARCI Spring QSO Party I found I could easily resolve three or four nearby signals to single signal reception.

A VY FB Kit

The last couple of pages in the construction manual would benefit from a more detailed description of the DPDT switch wiring to the PCB and audio connectors and the C17 modification included at the appropriate point in the text, on the schematic and the stencil layout.

This is an excellent kit–quick to build, simple to set up and a joy to use–it does all that is claimed for it. The board's small size means it can be built into or added to many rigs. If you're looking to add (additional) variable selectivity to your rig(s) check out the NEScaf, but don't wait too long, they sell out fast.

If you decide to purchase the kit, or are just curious, visit the New England QRP Club mailing list and site for availability and updates. ■

Raymond Daves, Silent Key

Raymond Daves, whose biography, *RADIOMAN*, was reviewed in the June *K9YA Telegraph* passed away June 3rd in Spokane, Washington. He had celebrated his 91st birthday two days earlier.

He has rejoined his shipmates.

Robert F. Heytow
Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org