

K9YA Telegraph

Robert F. Heytow Memorial Radio Club

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Ft. Tuthill 80

Simply Wonderful!

Philip Cala-Lazar, K9PL

I didn't have an 80-meter QRP rig and so was missing that band's activity during NAQCC events and for low-power tooling around. I set about looking for one and just about that time the Arizona ScQRPions QRP

Club announced the imminent arrival of their new Ft. Tuthill 80 kit. When the kit appeared on their Web site I mail-ordered one. <http://www.azscqrpions.com/fttuthill80.html>

The kit arrived about two weeks later. While inventorying parts I had my first inkling that this project was going to be an excellent experience: no missing parts! Just quality components, professional-looking PCB and two sets of sharp decals for labeling your chosen enclosure.

Specifications from the ScQRPions Web site:

Receiver

- Direct conversion receiver
- Current Drain: Approximately 28 ma @ 12v
- Supply voltage range: 12 to 13.8v
- Receiver bandwidth: ~700 Hz
- Five pole R/C active filter provides the selectivity, nominally 3 dB down at 1 KHz, 40 dB down at ~2 KHz, 100 dB down at ~8 KHz
- MDS receiver sensitivity: -116 dBm in a 700 Hz bandwidth
- Third order distortion (IP3): +25 dBm (10 KHz away limited by the R/C filter response)
- Blocking Dynamic Range (BDR): ~100 db (10 KHz away limited by the R/C filter response)

Transmitter

- Power Output adjustable from 0.1 to 2.5w (12v)
- Current consumption 2.5w output power using 12v and 670 mA current drain
- All output harmonics less than -49 dB down
- Transmitter is set up for a straight key input

Features:

- RIT ~ +/- 1200 Hz allows user to move from USB to LSB to allow moving away from an interfering signal on the opposite sideband.
- Tuning range: 50 KHz segment of the 80m CW band. This can be extended to 80 KHz by using the other half of the main tuning capacitor.
- Spot switch to allow setting precise TX spotting. Spotting mode is entered via a push button. An 800 Hz blip is sent once a second to remind the user that the rig is in the "spot" mode.
- Transmit protection - When the transmitter is left key down for more than three seconds, the transmitter goes into a "dotting" mode (33% duty cycle) to protect the finals.

"...no missing parts!"

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So You Think You Want to Be an Expeditionary Radio Op?

John Kirk, VK4TJ



Wally Hannam, VK2QI

2010 marks the 100th anniversary of the oldest amateur radio society in the world, the Wireless Institute of Australia. Doubtless, the next couple of years will bring forth a number of additional “100ths” as amateur radio embraces a second century, but with VK in the spotlight this month, we could bore you with an account of the back room wrangling by which six state societies became one in a country that was barely a

decade old itself, but an insight into how one of the WIA’s founding fathers and it’s first secretary, Wally Hannam, VK2QI, earned his daily bread, is, in our opinion, a more riveting read...

The year is 1910, and Douglas (later Sir Douglas) Mawson, is recruiting for a scientific expedition to Antarctica to study the flora, fauna, cartography and the magnetic anomalies around the continent which menace shipping. For the first time on a major exploratory expedition, Mawson proposes to take along “wireless,” a fairly radical decision, given that the field is still in its infancy. Telefunken GmbH, supplier of the of 1.5 kW quenched spark wireless “plant,” were certainly not offering any guarantees that the 3,000 meter wavelengths then in use would actually be heard back on the Australian mainland, some 1,700 miles away. Mawson mitigated this risk to a degree by establishing a relay station on Macquarie Island, a desolate sealer’s base “only” 1,000 miles from Antarctica, but would still rely heavily on passing ships to pass on his traffic.

What follows is *not* the “situations vacant” ad Wally would have responded to fulfil his life’s dream of participating in groundbreaking exploratory work, but it should have been, had there been truth in advertising legislation back then:

“...brown stew of dubious provenance.”

1. Must be comfortable working at heights. Had Mawson been able to erect the full height masts he envisioned, the wireless “mechanic,” as he was known, would have been hoisted to 120 feet in a boatswain’s chair-like apparatus to affix the aerial wires to the mast. As it was, this proved impossible due to the climate, and “only” 90-foot masts were deployed.
2. Must be able to work in extreme conditions. Atop the masts, the wireless mechanic was often required to work in minus 40- degree weather, in 60 mph winds, assembling intricate fittings *with his bare hands*. Fortunately, Mawson called a work stoppage when gusts of up to 200 mph made continuing impossible and deadly dangerous.
3. Not afraid of a little manual labor. The “dead-man” guy anchors for the masts had to be excavated by shovel. This task, too, often fell to the wireless operator. Initially, Mawson had planned to use dynamite, but the holes drilled to accommodate the explosives filled with water so rapidly, then froze, that this often proved impractical.
4. Must be an accomplished chef. Working only with tinned goods and dried staples, Hannam was expected to turn out wholesome and satisfying meals for the entire crew. Accounts of the time indicate that he was profoundly successful at this, though every meal seemed to consist of a brown stew of dubious provenance.
5. Must be an accomplished blacksmith. Tools forged in gentler climes were found to shatter with use in the extreme cold, so Hannam, with the help of an assistant, built a makeshift forge and retempered them. As well, parts damaged in the movement of matériel from ship to base had to be repaired or replaced from odd bits of metal scrounged here and there.
6. Must be an accomplished carpenter. Hannam played a very active role in the construction of



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living and working quarters, first on Macquarie Island, then on the Antarctic continent.

7. Must be an experienced motor mechanic. When Telefunken sold you a wireless “plant,” they even included the power plant. The wireless mechanic became a “real mechanic” whenever it coughed or stuttered.
8. Must be a night owl. MF radio conditions are at their best in the wee hours, so the wireless operator had to be at his best then too, trying to sleep during the day when the camp was at its busiest (and noisiest!).
9. Must be blessed with the patience of Job. The blowing snow generated many kilovolts of static. For this reason, the Antarctic base was more often than not, unable to receive. To update the waiting world, they often sent the same message over and over again, sometimes for a week at a time, blindly into the ether, never knowing if it had been received or not.
10. Must be accomplished in the operation of magnetographs. Say what? Yes, although the expedition had a “magnetician,” these incredibly sensitive and frail instruments required round-

the-clock attention, and since the wireless operator was up anyway...

11. Must be of exceptionally sound mind. Another radio operator on the expedition, Sidney Jeffries actually succumbed to paranoid fantasies, almost certainly as a result of the difficulties described in point 9. He had to be relieved of his duties five months before he could be sent home on the resupply vessel. That had to have been awkward!
12. Oh yeah, did we mention—needs to know Morse and advanced wireless troubleshooting techniques?

So—would they have found your résumé in the pile, had Mawson been required to truthfully advertise the requirements? Even a “warbird” radio op had a pretty cushy life by comparison. I know my résumé would have been conspicuous by its absence! ■



Hannam's Masts

Expeditionary Quotes

From Hannam's diary for 21 November 1911, before AAE's departure from Hobart:

“Today marks the start in life that I have longed for since I was a child and read Nansen's *Furthest North...* we hope to link up Antarctica for the first time with civilization.”

Of Macquarie Island:

In 1822 Captain Douglass, of the ship *Mariner*, called it “the most wretched place of involuntary and slavish exilium that can possibly be conceived; nothing could warrant any civilised creature living on such a spot.”

Robert Falcon Scott wrote, “Great God! This is an awful place and terrible enough for us to have laboured to it without the reward of priority.”



Ham Quips

DICK SYLVAN, WACBT



IF TARZAN WAS A HAM



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What's Wrong With This Picture?

Chuck Guenther, NIØC



KØVSH (1963) with
NC-109 Receiver

Although I was named after my father, we were different in many ways. He was a liberal arts major, not a technical person. He was a librarian, a writer and translator of poetry, and he published thirteen books. When I began studying algebra in the eighth grade, Dad passed along his high school algebra book, *Algebra and its Uses*, to me, referring to it as “algebra and its uselessness.” Yet, despite his literary background and interest in languages, he had

great respect for technical achievements. He recognized the invention of the super-heterodyne radio receiver as one of the most significant advancements in communications that occurred during his lifetime. I recall his almost reverent, enunciated, pronunciation of the word, “super-heterodyne” that conveyed wonder and awe concerning the “magic” of radio.

Dad was always supportive of my interests in scientific and technical subjects, especially amateur radio. He found an amateur radio operator at his workplace who would administer my Novice license test during the summer of 1959. After I got on the air as KNØVSH, Dad promised me a new receiver to replace my lowly five-tube superhet (National SW-54) as soon as I upgraded to General Class. Christmas 1959 brought a shiny new NC-109 that featured an RF amplifier stage, a bandspread dial, and an adjustable crystal filter. Dad and I both looked forward to the mail deliveries—he was waiting for acceptance letters from his publishers as I was looking for QSL cards. He frequently asked me about the new countries I was working as he and my mother tolerated the inevitable TVI.

I had entered the local science fairs since the fifth grade. When I was a senior in high school, I chose “radio-wave propagation” as the subject of my final science fair exhibit. I always took pride in crafting

these exhibits myself, so I was naturally resistant when my father interjected an idea for this one. He suggested I include the NC-109 receiver as part of the display. I argued there would be no radio reception in Washington University’s Field House (where the fair was held), since there was no room for any kind of a decent antenna. No matter, Dad said the radio didn’t even have to be powered up—it would serve as a visual static display of the subject of my exhibit.

I had other reasons, though, for not wanting to exhibit my receiver. Most importantly, it would put me off the air for about a week at a time when I was hotly pursuing my first DXCC award. Besides, I didn’t want people tweaking the band spread tuning knob and other controls on my pride and joy. But Dad was pretty persuasive. Reluctantly, I pulled apart my station so the science fair judges and others would have something more concrete to look at than my research report, tables and graphs, and some pictures I had taken of sunspots.

Father Knows Best

In the end, I had to admit my father was right—I walked away from the 1962 Greater St. Louis Science Fair with a full four-year scholarship to St. Louis University’s Institute of Technology. My logbook indicates I was off the air between April 6 and April 13, 1962, and the NC-109 was no worse for the

wear. On April 16, I worked VQ4DW in Kenya for my 92nd country, and received DXCC in March 1963. I probably should have kept that NC-109, but sold it shortly before graduating in 1966 with a B.S. in electrical engineering and a membership in Eta Kappa Nu, the EE honor society.

Through the years since then, Dad continued to inquire about DX I was working, and once in a while he would ask to see my QSL albums when he visited. In 2007, my parents gave me generous birthday and Christmas gifts, which I applied toward the purchase of an Elecraft K3 transceiver. After months of waiting, my K3 kit arrived June 12, 2008; just two days after my father fell at home and was hospitalized. I managed to complete assembly and testing of the K3 within a week. The work was

“...the magic
of radio.”



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a good escape during evening hours after visits with my rapidly deteriorating father (by then he had been transferred to a skilled nursing facility). The K3 is a splendid radio, and it was welcomed into my ham shack as enthusiastically as the NC-109 was nearly fifty years earlier.

A Family Crisis

Then, on July 4, Dad got the bad news from his oncologist, and he agreed to hospice care. My wife and I canceled our planned vacation to Oregon, knowing the end was near for Dad. He passed away the evening of July 24. He was 88 years old. His wife of 66 years, his son and two daughters and daughter-in-law, and his oldest grandchild (my son John, AAØBP) were all present during the moments of his passing. It was a sad and profound experience—I had never seen someone die before my eyes before, and I'm grateful to have been with him and that he went so peacefully. However, looming in the background of my mind was my own brush with what could have been a violent and painful death that occurred in my backyard only a few weeks earlier, on July 6.

The title of this essay, "What's Wrong with this Picture," refers to a November 2007 picture of two

vertical antennas in my backyard: a Force 12 Sigma 40 and a Butternut HF-2V visible in front of the back fence and behind power lines. Barely visible across the top of the picture is a high voltage line that feeds a pole transformer in the next-door neighbor's yard. That HV line was only about 10-12 feet (horizontal distance) from the vertical antennas. I say, "was" because there are no antennas there any more!

Sometime during the late spring of 2008, I took down the HF-2V and replaced it with a Force 12 Sigma 40XX, a small vertical dipole with long T-bars at top and bottom. I configured the antenna for 30-meters, which meant installing small loading coils, plus a "hairpin" matching coil across the feed point at the center. I used an MFJ-4712 remote antenna switch to select between the Sigma



Newspaper Clipping Showing
Scholarship Winners
Chuck is in Upper Right
April 1962

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40 (for 40-meters) and the Sigma 40XK. The remote switch, which operates from 12V DC through the coax, was mounted on a fence post about 25 feet to the left of the Sigma 40.

On July 6, around noon, I went to the backyard with some tools, took down the Sigma 40XK, and removed the three coils from the feed point in order to configure the antenna for the 20-meter band.

A Very Close Call

Then I got into trouble. In order to facilitate making such band changes to the Sigma 40XK, I had fit a piece of 3/4 inch PVC pipe to extend the base of the antenna so that the base could be dropped into a larger galvanized pipe that was concreted in the

ground. When I raised the antenna to drop it into the ground mount, I had to keep it steady and also avoid tripping over the coax dangling from the center feed point. It was hot, and sweat was dripping into my eyes from under my baseball cap. With the antenna nearly vertical, I rested the base on the ground for a moment to steady it for the final lift and drop. However, with the weight of the antenna resting on a rather flexible piece of PVC pipe, the top started wobbling uncontrollably. I heard a loud explosion from above (it sounded like a shotgun), and I knew instantly that the top T-bar had touched the HV line, and that my life had been spared—somehow. I felt nothing—I was uninjured. Relieved but scared, I pushed the antenna toward the back fence, and let go.

For the next half hour I was very calm. Working in the shadow of the power line, I methodically took the antenna apart, knowing I would never put it (or anything else) in that location again. The top T-Bar (1/2 inch aluminum tubing) had a large hole melted in it at the point of contact with the power line. The soldered connections on the coax balun assembly were melted. I realized that my life was saved by the fiberglass insulator between the two halves of the antenna, and the fact that I had just removed the hairpin matching coil that would have

provided a direct electrical path from the HV line to my hands! In other words, had I changed the antenna the other way (from 20m to 30m) I could be dead.

I looked at the remote antenna switch. The heavy plastic case was blown apart, and the circuit board was charred. I wondered about where the top of the case had landed, and I wondered if any neighbors heard the blast. I realized people were used to hearing occasional fireworks during the 4th of July weekend and no one probably gave it a thought. I was right—even my wife, who heard the noise from her office upstairs, dismissed it as kids shooting firecrackers. After inspecting the damage, I began to process the event that had just occurred. I shook and began to weep when I finally told my wife what had happened. (Naturally, we discussed my future in ham radio in the many talks that followed.)

Fellowship and Support

Within a day or so I posted a note reporting my foolish accident to the Force 12 on-line reflector, and I only recently learned that the story spread to the Tower Talk forum as well. The name “Darwin” was mentioned in one comment; however my fellow hams were generally grateful to me for sharing the story. I received an e-mail from a severely disabled ham who survived a horrible electrocution accident while working for a power company. His QRZ.com bio gave graphic details of his injuries and his seven-month stay in hospitals. I wonder every day about the second chance I got, and why I was so lucky.

I get a sick feeling when I approach the southeast corner of my backyard.

I am enormously grateful to my local friends Merle, WØEWM; Tom, KØHNB; and George, AAØFT, who helped me take down the remaining Sigma 40 safely, and assisted me in putting up another antenna in a safe location. The reader will naturally be curious concerning my justification for the original perilous location of my antennas. In the end, there is none—so I offer only apologies and no excuses. I hope my experience will serve as an invitation to all hams who may have compromise antenna installations in small backyards with overhead power lines to consider all the “what-ifs” and to take the appropriate corrective action. ■

“...heavy plastic case was blown apart...”

Remote Antenna Switch Damaged from the Blast



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- Audio limiting - The audio output has been designed to drive headphones and have been provided with diode limiting to protect the user from sudden, large signals.
- Accessory 5v output - A regulated 5v output has been provided for external accessories such as a keyer kit.

The kit includes a 3.5" x 3.5" PCB, all board mounted parts and all chassis mounted parts including main tuning capacitor and mounting hardware, volume pot, RIT pot, headphone jack, spot switch, BNC antenna jack, power jack and straight key jack.

A Leap Forward

The kit's construction manual is a wonder of clarity and, I believe, sets new standards for this type of document. It is profusely illustrated featuring sharp color photographs; multiple, step-by-step, PCB component overlays; and concise language. Areas where builders might conceivably run into difficulty are noted and explained. In addition, the manual has been frequently updated, in almost real-time, with suggestions from Ft. Tuthill list subscribers. <http://groups.yahoo.com/group/FtTuthill80/>

Thanks to the excellent manual, I never experienced a moment's pause about what component goes where and how. Subscribers to the aforementioned list will notice my building experience is the rule rather than the exception; there are remarkably few mentions of building problems or the need to troubleshoot post construction.

Getting the rig on the air requires little more than removing a few turns from toroid L9 to set the lower limit of the desired frequency range and then fine

tuning with trim cap C82. Output power is adjusted with trim pot R46 and—that's it. The Ft. Tuthill 80 is ready to make QSOs.

The construction manual notes it should take about six hours to complete the kit. It took me about 18 hours including preparation of the enclosure. The manual suggests using a headband magnifier. Although the three SMDs in the circuit come pre-mounted, I found the magnifier a very helpful aid, if a bit cumbersome. My magnifier was purchased at a recent hamfest and appears identical to this one at Harbor Freight: <http://www.harborfreight.com/cpi/ctaf/displayitem.taf?Itemnumber=38896>



Taking a hint from the Ft. Tuthill group list, I used the stand-offs included with the NorCal 2N2/20 kit at the PCB's four corners to raise it off the building surface and make soldering more accessible and convenient. It all went together, including the enclosure, problem-free, aside from one small hitch. Testing the completed PCB with the NorCal power meter resulted in zero output, some deductive reasoning settled on the low pass filter components. I reheated the pads of toroids L4 and L5 and, hey presto, RF output. The insulation on the wire supplied to wind the toroids is formulated to melt when heat is applied, but it takes a bit more heat than I first used to properly do the job.

"A big tip of the Stetson..."

I followed the lead of Jerry Haigwood, W5JH, in his use of this Hammond enclosure and Eagle knobs.

Mouser Numbers:

Hammond enclosure: 546-1598BSGY

Eagle knobs: 450-2034-GRX .59" D X .55" H and 450-2039-GRX 1.39" D X .71" H.

The Hammond enclosure's aluminum end panels feature a thin plastic film to protect the finish during the drilling/punching process.

Ventilation holes for the finals are suggested in the manual and depicted in the enclosure layout plans by



A Work in Progress

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Ft. Tuthill 80



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W5JH available in the group's Files folder. A Dremel® drill press was used to drill 1/8" pilot holes for all the controls and jacks.

Rust-Oleum white primer was used to prep the end panels, white enamel over the primer and Rust-Oleum clear gloss finish over the decals. The "Ft." in both sets of the decals I received were fractured and unusable, thus "Tuthill 80."

On the Air

The Ft. Tuthill is a very pleasant rig to use. The DC receiver offers excellent sensitivity, selectivity and resistance to overloading from nearby strong signals. I had little trouble picking individual signals out of the CW maelstrom presenting itself during ARRL International DX Contest weekend. Excellent, unsolicited, signal quality reports have been received, QSK delivers no clicks or pops, and the rig's sidetone level is just right.

In use, I have not experienced any hand capacitance and no microphonics unless the shack desk receives a really heavy thud. It's a very rewarding build, even L9 with its very fine wire goes smoothly once there's a few winds on it to lock the wire in place.

I set the output at 3.2 watts at 13.6 volts. I originally metered over 4 watts, but the designer says around 3 watts is best. Frequency coverage as configured is 3.540 MHz to 3.590 MHz.

My first QSOs with the new rig from my QTH just north of Chicago were with: Adrian, Mich. (193 miles); Des Plaines, Ill. (5 miles); Buchanan, Mich. (68 miles); Ottumwa, Iowa (251 miles); and Chicago (26 miles). Conditions were not great, but signal reports ranged from RST 599 into Adrian to RST 339 into Des Plaines on ground wave.



Rear Panel View of Completed Ft. Tuthill 80 Transceiver

A big tip of the Stetson to Dan Tayloe, N7VE, who designed it and to the ScQRPs for producing the Ft. Tuthill 80 kit. Simply stated, it's a great little rig that features elegant design and exceptional on-air performance.

Forty-, 15- and 160-meter versions are promised for later this year from QRPKITS.

As I recently wrote to an e-mail correspondent: "Almost nothing in amateur radio beats hearing a rig you've built come alive with signals when turned on for the first time. Akin to the delight of our radio forefathers and their crystal sets snaring signals from the ether."

P.S. The Ft. Tuthill 80 works great with the 4SQRPEZKeyer reviewed in the March 2010 issue of the *K9YA Telegraph*. ■

S. L. Seaton's Radio Autobiography

In the June 1931 issue of *QST* S.L. Seaton of the non-magnetic yacht *Carnegie* (see: *K9YA Telegraph*, May 2010) discusses his, to that time, amateur radio autobiography. He was 15 years old in 1922 when licensed as 3BWL and got on the air with a "...Sears Roebuck spark coil and a loose coupler." The following year, after acquiring a vacuum tube, he was running 5 watts CW with regular increases in power through 1928.

For the next couple of years, as an employee of the Potomac Electric Power Co., he helped develop a radiotelephone system to communicate with the utility's field trucks and to coordinate frequencies with other power companies.

In 1929 he began work with the Department of Magnetism, Carnegie Institution of Washington as a "...Radio Operator and Observer..." aboard the *Carnegie*. Following the loss of that vessel in November of that year, at anchor, in Apia, British Samoa he went on to the Institution's Huancayo, Peru, observatory. At Huancayo he installed radio gear to communicate with Watheroo, Western Australia and Washington, D.C. While there he also designed and installed equipment "...for measurements of the height of the Kennelly-Heaviside layer." The rest, as we know, is radio history.



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