K9YA Telegraph

Robert F. Heytow Memorial Radio Club

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Flight of the Southern Cross

The Amateur Perspective- Part II

Philip Cala-Lazar, K9PL

The Agreement

On 21 May 1928 was entered into a hiring contract between Charles Kingsford-Smith and Charles Ulm (the Owners) and James Warner (the Radio Operator) for Warner's services as radio operator on a flight to Australia. Warner's employment was to span 21 May 1928 to 24 June 1928. As radio operator he was "to devote the whole of his time to the services of the Owners and do all such acts and things as may be necessary or conducive to safe undertaking of said flight."

> *"They thought they were rid of me J."*

As originally agreed, Warner was to "accompany the owners on said flight to Australia only so far as Suva in the Fiji Islands, and upon arrival of the airplane at Suva or elsewhere in the Fiji islands, the Radio Operator's employment by the owners shall cease…." This clause, of course, was not adhered to as Warner continued on the flight to Brisbane and, a day later, Sydney.

Warner's pay as radio operator was "…a weekly sum of $40.00 per week [Consumer Price Index equivalent to $509 in 2010 dollars] from date hereof until the commencement of said flight to Australia and further agree that upon arrival at Suva or elsewhere in the Fiji Islands to pay the Radio Operator a sum being equal to ($500.00) five hundred dollars [$6,360]…."

In addition, Warner was not to share in any prize money awarded by the Australian or American governments.

A letter from the U.S. Department of Commerce dated 28 May 1928, and bearing the subheading, "Supervisor of Radio, Customhouse, San Francisco Calif.," authorized James W. Warner to "…act as radio operator Monoplane Southern Cross on flight Pacific Coast to Australia." It was signed, "W.D. Terrell, Chief Radio Division."

Warner scrawled across the page, "They thought they Were rid of me J."

In the Air, On the Air

Following *Southern Cross*' departure from Oakland Airport June 1, 1928, amateurs in San Francisco and Oakland, California monitored its progress all the way to the Loyalty Islands (New Caledonia), located about 900 miles east of her destination, Brisbane. Throughout its flight hams reported KHAB's signal strength varied from R4 to R8.

Kingsford-Smith and Warner in a phone call to League headquarters to gather amateur support for their flight stated, "Just stick by us, we'll try to make it interesting for you of the A.R.R.L."

Out of Oakland the first to work *Southern Cross* was 6ARD, identified as the "non-amateur" station of Hearst's San Francisco Examiner newspaper. Despite their promise to "make it interesting for you," Warner transmitted a QST to radio amateurs cautioning them that the Examiner would "prosecute all those giving out messages addressed to 6ARD, under previous contracts."

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Genesis

Part 1 of 2

Garey Barrell, K4OAH

Garey, K4OAH, in 1958

I started in "electronics" in the third grade. In class each of us built a "burglar alarm" that consisted of a 6V lantern battery, a doorbell, a mousetrap, some sewing thread and some wire.

We drilled a hole in the wood baseplate of the mousetrap just below the trip pad. Can you picture something this "dangerous" going on in today's government schools? A short wood screw was driven into the base just where the wire bail hit when the trap was tripped. Anyway, the mousetrap was glued to a sidewall of a cigar box (you remember those, right?), and the hole aligned with a corresponding hole in the box. A few pieces of wire finished it up, one wrapped around the screw installed earlier, then to the doorbell, a piece from the doorbell to the lantern battery and another from the battery to the center spring of the mousetrap.

"SNAP! – Rrrinnnnng!"

This resulted in a switch that closed when the mousetrap was tripped, ringing a very loud bell. The last touch was a piece of dark sewing thread tied around the trip pad, fed through the hole, and stretched across the path to be "protected!" Setup was easy, string the thread, set the trap, and wait for the unsuspecting "burglar," (AKA, my usually tolerant Mom), to either step on or catch the thread with her foot. Great fun, although she became very careful about where she walked, constantly watching the floor all the way! She never knew when… "SNAP! – Rrrinnnnng!"

Hardware store doorbells were quite loud, even inside a cigar box, when rung in a typical home.

My "take-away" from this project, which has served me well over 60 years in electronics was, "It takes two wires to ring a door bell!" This later evolved into "It takes a complete circuit for current to flow," a rule that has explained MANY difficulties encountered in the design, development and construction of electronic equipment.

The novelty soon wore off, Mom more so than me, and so the burglar alarm was retired. Which of course meant disassembled, so the parts could be used for the next experiment.

Various experiments were conducted over the next few years, all battery powered of course.

When I was about ten years old, my Dad's company installed a new telephone system, and the old one went in the dumpster. He thought it might keep me out of trouble for a day or two, and so brought home a trunk-load of desk sets, patch panels and cables, and miles of wire. I played around with that for a while, but we already HAD a telephone, so there was limited interest in setting up my own system.

I had a friend who lived one house down from mine, who was a little younger, but also interested in electricity. He agreed the phones were duplicating something that worked a lot better than anything we could come up with, so we started looking for something more interesting.

One day in the library at school I came across *The Radio Amateur's Handbook* published by something called the American Radio Relay League. We had no idea what that might be, but the book was FULL of all kinds of information we just knew we had to have! Fortunately, there was a second *Handbook* in the library so we could read and compare notes at school or on the weekends.

Morse code seemed interesting, and we didn't have a telegraph link in our houses, so that became a goal. We ended up with a 40W light bulb in a ceramic socket mounted on a piece of wood, with a brand new J-38 telegraph key ($0.50 at the local surplus store) bolted down next to it. A line cord from a junked (scrounged) radio, a few pieces of wire, and when the key was pressed, the light lit up! Yes, by now we had graduated to AC power, straight from the wall! We couldn't see each other's windows because of the house between us, so with our newfound knowledge, we strung a wire (insulated of

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course) from my window, through the neighbor's trees, and to my friend's window. A little experimentation with line cords, and we had our telegraph link, using the power ground as the return. Fortunately, the neighbor was not into trimming his trees, or we could have had a large problem!!

After a few remote light bulb lighting experiments coordinated by telephone, we determined we would have to learn Morse code to make our system useful, so that became the next goal. That kept us busy for the next couple of weeks, starting by comparing the light to the code table kept next to the key, and soon reading each other directly. This lasted for about two months while we delved further into our *Handbook*s, and determined that radio was the next step.

We were most fortunate to find an Elmer, Ray Porter, W4EEI. He invited us to his home, where we saw his Hallicrafters SX-28, and Johnson Viking II transmitter in action! We were HOOKED! He was older, probably all of 35, and the MOST patient man I have ever met.

A rather intense course of study was begun with a borrowed *License Manual*, audible Morse code, and listening to Ray's receiver. Pretty soon we were able to pick out letters, then words and actually understand what was being said! What a kick!

The intensity stepped up during Christmas break, 1956, and right at the end we took the Novice test from Ray at his home. I passed, but my friend did not! I never let him forget it either! He retook the test 30 days later and passed, and then the wait began. I received a Heathkit AR-3 for that Christmas and started building it immediately. By the middle of January, I was listening to hams, and itching to get on the air!

Ray decided that a transmitter published in *QST* in the late 30s would be a good choice, if for no other reason than that he had all the parts in his junk box. This transmitter was called a QSL-40, and consisted of a single 6L6 tube, link-coupled on 80M, (again, Ray had a crystal in the 80M Novice band.) The old TV transformer we used resulted in a little over 600 VDC out of the 83 (mercury vapor) rectifier that glowed the most beautiful violet color when the key was pressed. That glow is still one of the most treasured memories of that time in my life.

ARS K4OAH Today

FINALLY, when I came home from school on Friday, March 1, 1957, there it was. The little envelope with the official looking document inside bearing MY call sign, KN4OAH, and signed by C. B. Plummer! I WAS a ham. I spent the next two days calling CQ, and finally a local across town, K4CSH, took pity on me and called. It took me a full two minutes, and several calls by the other station, before I got up the nerve to actually press the key. I forgot my QTH, (Louisville, Ky.), but since the other guy knew me it didn't matter much!

Now I REALLY was a ham. ■

K9YA DXpedition Announcement

CHICAGO — The Robert F. Heytow Memorial Radio Club is pleased to announce their premier DXpedition to Sylvania Island. Operating as 6JB6A, *K9YA Telegraph* staffers are looking forward to QSOs with their many readers. Sylvania is awaiting its final approval for the DXCC list and represents one of the most desired entities for any ham's logbook.

Sylvania Island has been deserted since the 1950s, except for a thousand native women.

DXpedition Sponsors:

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A Bicycle Mobile Adventure

Part XI - Finale

Scott B. Laughlin, N7NET

Alice, Wiley, Bob and Cliff were entering the outskirts of Las Vegas, when Cliff signaled for a timeout and coasted into a café parking lot.

"Coffee time," he announced.

"Great suggestion," said Alice. "You go ahead. We'll be along as soon as we care for McBark."

"I have a question," said Cliff, rather than heading into the café, his eyes focusing first on Wiley then Alice. "Would you consider doing a presentation for our radio club?"

"I don't know if we're prepared for such an undertaking. When is the next meeting?" said Wiley.

"It's on Friday. Four days."

Alice and Wiley exchanged glances. "We'd love to, but it takes us more time than we have to develop a presentation. And, of course, our budget is very limited. If you haven't toured long distances on a bicycle you may not realize that days off are more expensive than days on the road."

"I suspected as much, but I have a possible solution. My wife and I own a Bounder motor home. It's parked behind the house. We'd be glad to put you up for a few days. It has heat, air conditioning, and lights, even a laptop and Internet. You are welcome to the use of it to prepare your presentation," explained Cliff.

Wiley and Alice exchanged glances once again, exercising their ability that some married couples have developed silent communication. "I think we're somewhat like John Steinbeck explained about himself in his book, *Travels With Charlie*. We can't compile much data until after the event is finished and a couple of months cooling off period have passed."

Alice could read the disappointment in his eyes. Nevertheless, he said he understood.

The rear tire on the tandem went flat. Wiley stopped and they walked the bike into another cafe parking lot where he went through the routine of removing the panniers, tent and other possessions before he could pull the wheel and shuck the tire. After extracting a short piece of stiff wire, probably from a steel belted car tire, he patched a small hole in the tube. Inside a quarter-hour they were ready to roll.

"Let's have more coffee since we are already stopped," suggested Bob. No one objected and they found a table near a window that gave them a commanding view of the bicycles.

"How come you chose a tandem rather than two bikes?" asked Cliff. "You would have had more space and weight carrying capacity with two half-bikes."

"True. Two mountain bikes would have been perfect. But I'm stronger than Alice. I think I already explained that she is a cancer survivor. She gets tired quickly and recovers more slowly. If we had chosen two separate bikes we would have traveled more slowly and exceeded our budget in the first couple of weeks," said Wiley.

"This is perfect"

Both men nodded, gazing out at the bikes. They continued with small talk until the coffee was gone, then they headed further into Las Vegas.

Cliff's home, an ambling ranch style, blended with the yard. It was an oasis. The Bounder was in back, beneath a metal roof sheltering it from the scorching Nevada sunshine.

"This is perfect," said Alice as Cliff unlocked the motor home door and let it swing open.

Wiley was grateful for this break, seeing that she was totally exhausted.

The next morning Alice fixed them both generous servings of ham, eggs, grits and toast. She was moody, more silent than usual, and Wiley knew something was afoot. At last, after pouring them a second cup of coffee, she spoke out.

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Satellite Communications

How to "Work the Birds" for the Rest of Us - Part 2 of 2

Paul W. Ross, W3FIS

In my second article, I would like to discuss the basics of satellite orbits, tracking software and some other enhancements I have made to my satellite radio system. First, I'd like to discuss some the issue of satellite etiquette.

- First, and most important, is to listen before transmitting, to ensure your transmissions don't step on another station. It is a good idea to set your station up so you can monitor the downlink while transmitting, so you can hear how well you are accessing the satellite.
- Be brief. As traffic levels will often be quite high, contest style (call sign/signal report/next station) operation is best for most situations.
- Take turns. If you've just worked a handful of stations, be polite and hand the transponder over to someone else so they can work a few.
- When calling, a simple announcement such as "W3FIS listening" will suffice, like it does on a terrestrial repeater. Only call CQ when there's a distinct lack of activity. I find this applies to late evening passes, to the east of me out over the Atlantic Ocean.
- Wait your turn. If a QSO is in progress, wait until it finishes before putting in your call.

> *"Wait your turn."*

As you might suspect, things can happen pretty quickly during a typical five to fifteen minute satellite pass. At the beginning, I was trying to aim the antenna, correct for Doppler shift, make QSOs and take notes. This will not work, at least for me. I ran out of brains and hands pretty quickly. The note taking issue can be handled quite nicely with a digital voice recorder. Most speaker microphones for HTs have an earphone jack. Put a two-way splitter in, and run one line to the microphone input of the voice recorder. Plug your headphones into the other jack. Using headphones greatly reduces the distraction of nearby noises. Depending on the design of your earphones and the speaker microphone, a monophonic to stereophonic adapter might be needed. You will usually need earphones that can be switched to a monophonic mode. Make a "dry run" on the audio setup by working your local repeater to set up levels and the like. When the pass starts, you will not have a lot of time for fussing around with things.

Attach the voice recorder to the top of the diplexer with Velcro® strips. In this way, you can quickly disconnect the recorder and take it in the house to perform a "post mortem" on the pass.

MFJ-916B

I mentioned the issue of a diplexer. If you use two HTs, one for uplink, and the second for the downlink, you do not need a diplexer. However, I wanted to try a variety of dual-band HTs and, at some point, try my multi-mode Yaesu FT-817ND transceiver to attempt to work the SSB satellites. To do this, I need a diplexer, so I can feed the two antennas from one input/output on the transceiver or HT.

I opted for the MFJ-916B diplexer (which they incorrectly list as a "duplexer"). The MFJ-916B is fitted with the common UHF connectors. All I had to do was fabricate three short BNC to UHF jumpers. I attached the diplexer to the side of the radio bracket with some #4-40 machine screws and a couple of small washers for spacers. Not that I plan on using this rig in a rain storm, but I did seal things up a bit with some silicone rubber caulk, just in case. There is minimal loss in the diplexer, so don't worry about inserting it in the signal path.

Now, on to the issue of what the orbits of a low earth orbit satellite looks like. For those of you who had a college physics course, you remember that the higher the orbit of a satellite, the slower it goes. It also takes more energy to get a satellite to a higher orbit, which translates to higher cost for the satellite launch.

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"I want to quit the bike trip," said Alice.

"I suppose I should be surprised, but I'm not. Your energy level has decreased since we left Williams," said Wiley, bringing his eyes from the window to meet her gaze. "What do you want to do?"

"You don't mind if we quit?" she said, her eyes welling with tears.

"Of course not. We set out on this adventure because we were on borrowed time. We may still be on borrowed time. Who knows? But if the shine has worn off cycling then we need to change our agenda. I say again, what do you want to do?"

"I'd like to buy a car, get a carrier for the bike, and then drive on to Oregon to see the kids."

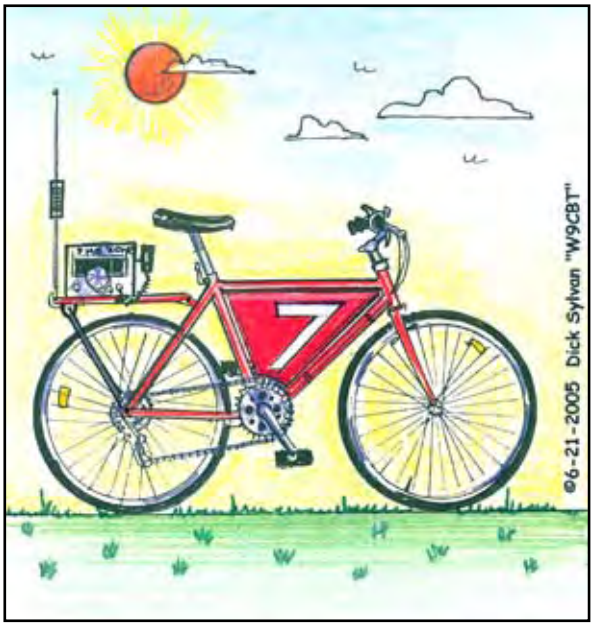
"It's a done deal."

"But what will Bob and Cliff think?"

"I suppose they will be disappointed, but that doesn't matter. Your health and welfare is the issue here," said Wiley, pushing his breakfast plate away. Let's go find a newspaper and see what kind of vehicle we can afford."

The taxi arrived shortly after Alice had finished the dishes and the two of them set off to begin a new adventure. ■

Ham Lingo DICK SYLVAN, W9CBT



7 MEGA-CYCLE MOBILE

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Since the various amateur satellites depend on being lifted into orbit with all sorts of other projects, this has pretty well predicated that lower orbits will be used. They are typically about 400 miles up, in what I would call a "semi-polar" orbit. The plane of the orbit is slightly slanted from what would go directly over the north and south poles. You can think of the orbit as essentially fixed in space, with the earth rotating under it. The apparent satellite track then moves from east to west (like the sun), and describes a sinusoidal path. Typically, the passes will be over your location every couple of hours. This is where some tracking software comes in. Check for upcoming passes, note the direction for the start of the pass, and go to it!

I expected I would have to be careful in aiming my antenna, both as to direction and elevation. It turns out, fortunately, that the Arrow antenna is not a directional, as I feared. A good pocket compass is sufficient for the direction. Get your bearing for the beginning of the pass, pick out an object on the horizon, and aim the antenna there. I was also concerned about the issue of accuracy of the antenna elevation. That didn't turn out to be a problem either. It is easy to estimate a 45-degree angle. Half of that is 22.5 degrees. The horizon is the horizon (level).

You do have to account for the Doppler effect. It is the change in frequency of a wave for an observer moving relative to the source of a wave. It is commonly heard when a vehicle sounding a siren or horn approaches, passes, and recedes from an observer. The received frequency is higher (compared to the emitted frequency) during the approach, it is identical at the instant of passing by, and it is lower during the recession. It is also proportional to the frequency being received, so that the change in apparent frequency for the typical 70-cm downlink will be larger than the two-meter uplink frequency. Setting your downlink frequencies in increments of about 5 kHz for three steps before the posted downlink frequency, and three steps after the downlink frequency seems to suffice. Hold the uplink frequency constant for the FM satellites. Most HTs allow for programming "splits," so this does the trick. Start at the higher frequency and step lower as the satellite approaches you. Generally, I hear "quieting" as the satellite comes into "view," followed by conversations. At that point, I turn on the voice recorder.

Again, do some listening first, then "work the birds!" ■

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Heeding Warner's declaration, "Amateur operators did not copy messages addressed to 6ARD, the 'San Francisco Examiner,' or personal messages, in spite of the fact they were 'QST 6ARD de KHAB' and that it was an emergency case in which the general public was interested."

Later, *Southern Cross*' crew, grasping that statement was likely to lose them an invaluable asset–a cadre of experienced operators monitoring the flight round the clock, softened their stance. Warner then commenced sending progress reports under a "general Q.S.T., non-addressed." Among the calls listed monitoring the flight was 6AM, Don Wallace, one of America's preeminent amateurs; 6CKC, 6SFU and 6JS supplied information to "an Oakland newspaper"; 6RJ, "furnished dope to a broadcasting station"; 6ALX and 6CGM "assisted A.R.R.L. operators"; and 6ARD "… attended to the wants of its proprietor and 6KW kept watch for a press association."

The pernicious nature of commercial, "non-amateur" stations during this era is here clearly delineated. Business entities, for pecuniary interest, were using radio spectrum allotted to licensed amateurs and threatening those same hams with legal sanctions. (*K9YA Telegraph*, January 2012, "Defending Our Bands")

When daylight propagation dropped out for West Coast hams and nighttime conditions favored the antipodes amateurs in Australia and New Zealand heard *Southern Cross*' signals.

J. Walter Frates, 6CZR, in his August 1928 *QST* article, "Following the 'Southern Cross' to Brisbane," bowed to commercial stations for conducting most of the radio traffic.

However, he emphasized that over long stretches of ocean where no commercial stations existed hams at island-based cable stations monitored *Southern Cross* on her flight: these dots in the void included the Trans-Pacific Cable station (the "All Red Line" serving Canada and Australia) at Fanning Island, 1AJ.

Honolulu, Hawaii

One and one-half hours after departing Oakland several Hawaiian stations reported hearing her signal. Ten miles out from Wheeler Field, Warner reeled in the trailing antenna.

Ralph Heintz was in "constant communication" with the *Southern Cross* during its flight from Oakland Airport to Wheeler Field in Honolulu. En route to Hawaii Warner declaimed, "We are lost." Two U.S. Navy men-of-war and a Hawaiian land station heard his distress call; the plane's position was soon triangulated and reported to navigator Lyon as, "O.K. Off Hilo."

Twice again, when they went astray, the crew was saved by, "The smallest and lightest radio set ever installed in a plane on a long-distance flight…." And, of course, a diligent group of ship and shore radio operators.

Suva, Fiji Islands

Suva, Fiji Islands

Before departing for Suva, *Southern Cross* flew a short hop to Barking Sands, Kauai, about 100 miles distant. June 3 she left Barking Sands headed for Suva. Monitors in San Francisco heard Warner on this, the flight's longest leg, 3,144 miles and over 5,000 miles from San Francisco. This was "the longest distance over which messages ever had been sent and received from an airplane in flight." That record was short-lived as her signals were also heard in Bloemfontein, South Africa, about 9,000 miles distant.

Brisbane, Australia

On the final leg, Suva to Brisbane, 1,795 miles, the Heintz transmitter's signals were heard 7,000 miles away in San Francisco, "a distance from which a station never had been heard in the California port."

> *"O.K. Off Hilo."*

As described in Part I of this article, upon their arrival in Brisbane "all four men were totally deaf for some time after making their landing" from motor and wind noise. That temporary handicap certainly challenged the signal-to-noise ratio for radio operator Warner, making his performance all the more remarkable. Further frustrating shipboard communications was the large fuselage-mounted fuel tank separating those in the cockpit from the rest of the aircraft.

Throughout its flight many land and sea stations heard *Southern Cross*. Later, evaluating the radio set's in-flight performance, it was realized that even when Warner could not hear incoming stations, his outgoing transmissions were heard. So, the aircraft never completely lost radio contact on its long flight.

The tri-motor covered 7,400 miles in 83 hours and 38 minutes making it the, "…greatest feat in the history of aviation but also the final proof of the great value

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of short-wave radio communication for aviation and a great triumph for the amateur radio operators in all countries bordering on the Pacific."

With pride, author Frates added: *It was with some satisfaction that wire services reported that reports from amateur stations were "beating those of 'non-amateur's' stations, Navy radio and the commercial companies."*

Frates believed that when transcontinental and transoceanic flight became commonplace communications would rely on shortwave, just as marine traffic depended on 600-meters. He stated amateurs would be credited for their "pioneering efforts" in devoting their "time and equipment unselfishly for the advancement of the art and without pecuniary interest." Again, Frates emphasized the difference between amateur and "non-amateur" stations.

Not to be bested by the Australian government's largesse, on Warner and Lyon's return to the United States the private sector, including San Francisco Examiner publisher William Randolph Hearst and the citizens of Oakland awarded them each a prize of $10,000 [$127,000] and a four-ounce gold commemorative medal. ■

http://aso.gov.au/titles/tv/an-airman-remembers/clip1/

The *Southern Cross* Today

Today, the original *Southern Cross* aircraft and a Kingsford-Smith memorial are housed in a climate-controlled glass hangar at the Brisbane Airport.

http://www.gold-coast-aus.com/Brisbane_Airport.html

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THE *K9YA TELEGRAPH* AT 100 MONTHS

100 Issues and Growing

You are reading issue number 100 of the *K9YA Telegraph*. April 2012 marks our 100-month anniversary. In that time we've covered the globe and gamut of amateur radio activities, proclivities, personalities and history. The *K9YA Telegraph* index of articles now runs to 30 pages.

Every issue of the *K9YA Telegraph* features articles submitted by its subscribers. The quality of their work may be gauged by the number of articles praised and reprinted in other publications online and in print.

The *K9YA Telegraph* is proud to offer the radio amateur community a growing number of print-on-demand books and a photo calendar sold at cost. No profits accrue to the *K9YA Telegraph* or its staff.

From the staff of the *K9YA Telegraph*: Thank you to our subscribers for getting the word out and helping us grow, and especially to our authors upon whose genius this high quality publication is built. We could not have done any of it without all of you.

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