K9YA Telegraph

Robert F. Heytow Memorial Radio Club — Volume 5, Issue 3, March 2008

"The Searchers"

Radio Intercept in Two World Wars

Philip Cala-Lazar, K9PL

At the dawn of a new century, 1905, in a conflict that foreshadowed events to come, there arose a seminal event in communications. The Russo-Japanese War forever changed the way military and covert services thought about communications. It was in that nearly forgotten struggle that the fledgling art, practice and science of *wireless*, or as it was soon called, *radio-telegraphy* was used to forward military communiqués. It was also in that year that messages were intercepted and the intelligence gathered used to facilitate victories in land and naval engagements.

A Riddle Wrapped in an Enigma

For every enigma, including *the* Enigma there is a solution. Thus the story of military radio communications, cryptography and monitoring during WWI and WWII. British historian Kenneth Macksey's (1923-2005) book, *THE SEARCHERS*: Radio Intercept in Two World Wars, Cassell, London 2003, ISBN 0-304-36545-9, narrates the history of radio intercept during the first half of the twentieth century. Though not addressing amateur radio directly, the author punctuates the text with the contributions of, primarily, British ham radio operators. These amateurs (and others) stepped in to fill the gap when experienced Morse operators were desperately needed for that nation's radiolocation and cryptographic services during both world wars. (See: *K9YA Telegraph*: "In the Beginning," July 2006; "Ham Radio on the Home Front," September 2006; and "Cold War Tales," February 2007.)

"…communications, cryptography and monitoring…"

The Amateur Angle

In Great Britain, as in the United States, amateur radio operators armed with their specialized skills contributed to victory. Author Macksey includes a fitting tribute to those amateur radio operators who served in the Great War: "Men who joined any of the listening teams were of high caliber and often recruited from the thousands of amateurs who, once restrictions were lifted 1919, were free to indulge in the hobby of practice and experiment with home radio." and "Many, using the latest valves, made significant contributions to the development of public broadcasting."

World War I

During "the war to end all wars," it was soon apparent that both wired *and* wireless communications were essential to the opposing forces tactically and strategically. One early wartime innovation was an induction device used to tap into field telephone circuits at the front.

In the air, radios were originally installed aboard zeppelins and, later, their bulk and weight reduced, aboard the fragile combat aircraft born of the conflict.

CONTINUED - THE SEARCHERS ON PAGE 8

Inside This Issue…

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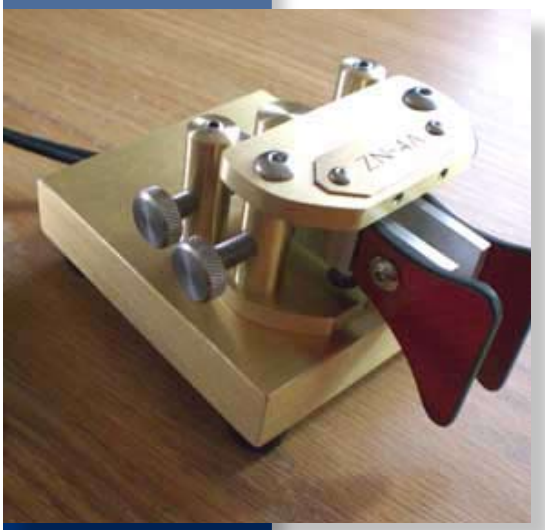
N3ZN Iambic Paddle Review

Chuck Adams, K7QO



N3ZN ZN-4A Paddles

First thing you have to ask yourself, "What do I want in an iambic paddle?" Ask any two CW ops and you'll most likely get two different answers. And, if you ask them to make a list there will be significant overlap in both lists. So, this review is biased by my wants and needs for an iambic paddle. Hopefully it will help you decide what you want in your next paddle purchase.

Tony Baleno, N3ZN, besides being a radio amateur, is a machinist and makes custom iambic paddles. You may see his iambic paddle models on his Web page at **http://www.n3znkeys.com/** where you can decide which model and price range fits your needs.

I chose, as the first model to order, the ZN-4A with a brass base. (Serial Number 020, so there aren't too many around as of November 2007.)

> *"You can't own just one."*

I own a few paddles. OK, I own more than a few. You can't own just one. All my favorites have several things in common and the following is a list of what they have in common and how the N3ZN fits among my favorite paddles.

Bearings: All my favorite paddles have four sealed roller bearings, two per lever. This alone adds around $60 to the price of materials in manufacturing the paddles.

The N3ZN, Hensley, Begali, W9WBL, WB9PLU, Kent, Mercury (N2DAN), Bencher Hex-paddle and others have ball bearing movements. This offers very smooth arm movement and allows me/you to adjust for the lightest of touches to activate the keyer.

The Hensley, W9WBL and WB9PLU (maybe), paddles are no longer made, so they are collectors items. The Begali Sculpture runs over $550 and thus puts it out of reach for the casual operator or any one on a fixed budget. The pricing for the N3ZN paddles run from the $100+ bracket and up. The model ZN-4A costs $175 for the steel base and $200 for the brass base, so we are talking about an excellent bargain for a very fine instrument.

A big plus for vertical pivot posts retained by roller bearings is absolutely no vertical movement of the finger pieces. Try that with your Bencher BY paddles priced at $145 for the BY-2. Try this with any paddle you own, and most likely your favorite paddle has no vertical movement for the finger pieces. I like the Bencher BY-2 and use one from time to time, but the pivot mechanism does not beat bearings.

Adjustments: Thumb knob screws with no slop in adjustment and no lock-down screw. Paddles I do, or have owned, bug the heck out of me if: (1) I adjust the spacing, (2) lock the setting using a lock-down nut, (3) and then find the spacing has changed. This is caused by not having close tolerances on screw threads and tapped holes.

I'd name names, but that is not the purpose here. You know what I mean. Also, using hex screws for locking mechanisms isn't a plus considering the time lost trying to locate the hex key. It never is where it is supposed to be, or

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when buying a used paddle the key is missing and you have to take one from your toolkit and keep it with the paddle. No way.

The N3ZN paddles use thumbscrews and there is no locking mechanism to adjust. Release the thumbscrew and the setting is maintained. Tony uses a mechanism that uses a spring and ball against the adjustment screw for tension. He presets the tension before he sends the paddle out. You can change it if you want, but I haven't found that necessary. With tighter tolerances you can come back to the paddle after any period of time and the spacing will be the same.

Tony uses 10-32 screws, which means there are 32 turns per inch, and you get finer adjustment of the spacing with a fraction of a turn of the screw.

I took a dial indicator used in machining measurements and found that, with the N3ZN paddle, I had the movement of the finger piece set for 1/1000 of an inch (1 mil). This is very good for any paddle setting and to have it remain fixed with this small spacing. It also feels like there is no movement when in operation.

I just did the math. With a 10-32 screw one turn moves it 31.25 mils (1 mil = 1/1000 of an inch). This means that about 11 degrees of a 360-degree revolution offers an adjustment of 1 mil. So, if you just close the contacts to where the keyer starts up and back off just a fraction of a turn, you will have a very, very close spacing. The paddle must possess close tolerances to maintain this spacing after long periods of use.

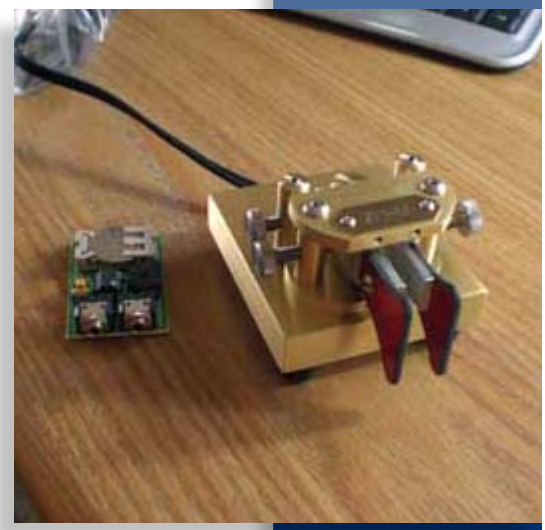
"Put the bug in a glass case…"

Magnetic vs. Spring Tensioning: The N3ZN paddles use magnets for tensioning. I'm not particular whether a paddle uses springs or magnets. Using the smallest spacing possible I can't really tell the difference between magnetic or spring forces.

I set the tension for the smallest force required to move the paddle and still have it return to the original position. For this to work the spacing must remain fixed without binding. The N3ZN paddle allowed me to set it up for a very, very light touch with no problems. Now, I figure that if the paddle will do all this with the lightest of touches, it will do well with heavier tensioning.

Weight: The brass base ZN-4A weighs 32 oz. So, for even the heavy-handed operator, it should do nicely.

Now here is where you and I may differ in our needs. Because I use a very, very light touch, (it really bugs the hell out of a lot of people that touch my paddles) I don't need a lot of mass in a paddle. I can put any of my paddles on a slick surface and still operate them without having them shift all over the place. The ZN-4A weighs 32 oz owing to its 7cm x 7cm x 1.5cm brass base. I comment about the ZN-6A at the end of this review.



If you have problems with paddle movement, just take a few hours and force yourself to learn to use a light touch. Put the bug in a glass case and leave it. I know. It irritates the hell out of you for me to suggest it, but do consider it. Move on and you'll find it is a lot easier to use an iambic paddle and keyer. You won't be as tired and you can operate for longer periods.

Arms: The two moving pieces in operation are the paddle arms. The N3ZN paddle's finger pieces are made of a composite material with a red coating. They are very stiff, which is one of my requirements. You do not want flimsy materials used in the finger pieces.

The arms are made of aircraft aluminum. Here again, you may disagree with me on this part. That's OK. Aluminum lends low mass to the arms. This means easier and faster movement than heavy arms. It's simple physics. I can and will do a four-page paper on why this is so, if you want it written up. I'm not proud—8" x 10" photographs with a paragraph on the back also, if needed.

Gold-plated contacts, so please, please do not use anything rough to clean the contacts. Being gold they should never need it.

Height of the finger pieces above the table: Here is my favorite pet peeve. Lay your arm down on the operating desk. What is the position of your thumb and first finger? For me, they are both touching the surface, which means a low profile. I use a paddle with the remaining three fingers (middle, ring and pinkie) tucked under and resting on the desk. This leaves the thumb and first finger about one cm from the desk surface. It requires effort to lift them higher. Give

Continued - N3ZN Iambic Paddle on Page 7

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Volume 5, Issue 3

K9YA Telegraph

Your Shack

NIØC's Amateur Radio Biography in Pictures

Chuck Guenther, NIØC

Chuck Guenther was first licensed at age 14 as KNØVSH on August 6, 1959, and upgraded to General Class (KØVSH) December 9, 1959. Main interests were DX chasing, CW traffic nets and QRQ CW ragchewing. Achieved WAS in 1960, WAC in 1961 and DXCC in 1963, running approximately 60 watts output to wire antennas. Upgraded to Extra Class in 1968. Operated from various apartment locations with indoor antennas from 1966 to 1969 using callsigns KØVSH and W6GZW. QRT from late 1969 through 1983.

Early 1959 SWL Listening post WPEØGR (SWL callsign issued by Popular Electronics magazine), showing a National SW-54 receiver and an unidentified kit receiver. The National receiver served as my Novice receiver (August to December 1959).

Early 1962, Station KØVSH, showing National NC-109 receiver, WRL Globe Chief 90 transmitter, VFO sitting on top of receiver, and an Eldico electronic keyer.

Late 1963, Station KØVSH, showing same equipment as above, except the keyer has been upgraded to a Hallicrafters HA-1 "TO" keyer.

My son, John, became interested in ham radio during 1982, and was first licensed as KAØSAC in early 1983. In August 1984, John and I went to an FCC test session in St. Louis, where he upgraded to General Class, and I re-acquired my Extra Class license with the callsign, NIØC. John later upgraded to Advanced, then Extra Class, with his present callsign, AAØBP.

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I am a member of QCWA, QRPARCI, Adventure Radio Society, FISTS CW Club, and the Mississippi Valley DX and Contest Club.

Early 1967, Station KØVSH (apartment QTH in Florissant, Mo.), showing a Gonset GSB-100 transmitter, Drake 2B receiver, and home made "TO" keyer with an Autronic single-lever paddle.

Early 1990, Station shared by NIØC and son AAØBP (apartment QTH in Kirkwood, Mo.), showing Kenwood TS-520S transceiver, Sony 2010 receiver (used for wide splits in DX pileups), and MFJ Grandmaster keyer with Vibroplex Vibro-keyer paddle. NIØC made the first CW QSO with the 1990 3D2AM Conway Reef expedition using this station.

Late 1967, Station W6GZW (apartment QTH in Lancaster, Ca.), showing Johnson Navigator, Hallicrafters HT-46 and WRL Globe Chief transmitters, and Drake 2B

Fast forward to 2008. ARS NIØC using Ten Tec Omni VI, Elecraft K2, Kenwood TS-930S, Ameritron Amplifier, MFJ DSP, computers, top-loaded Butternut HF-2V, Force 12 Sigma-40 vertical antenna and more!

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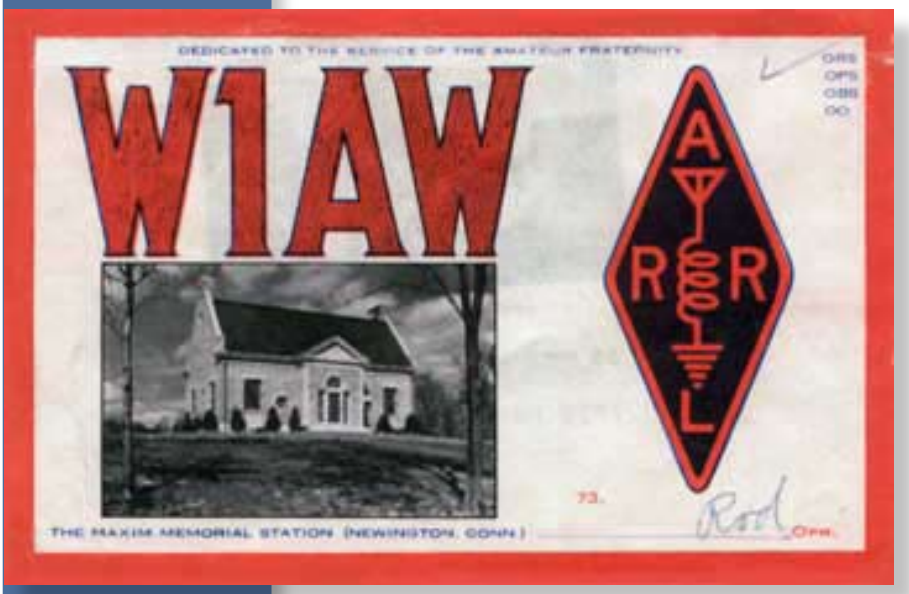
Volume 5, Issue 3

The Best Job I Ever Had

Fun, Frolic (and Work?) at old W1AW

Rod Newkirk, VA3ZBB/W9BRD



Sixty years ago ARRL's Hiram Percy Maxim Memorial Station looked strangely out of place in its rural setting. Newington wasn't much of a town then, just a bus stop crossroads with a few stores and scattered frame houses. The classic ten-year-old brick building perplexed local folk about what in the world went on there. Cows roamed a pasture at the far end of the lofty rhombic antenna farm.

My transition to civilian life after WW2 was brightened by a hitch as operator/custodian at W1AW. Its spacious central room housed an impressive row of giant rack-and-panel ham-built kilowatts for 80, 40, 20 and 10 meters. Rigs of less power served 50 and 144 MHz. The comfortable control console ran all transmitters simultaneously or separately as needed. The main receiver was a National HRO.

Contrary to present policy, W1AW's activity was emphasized on weekends.

Saturdays and Sundays were considered prime periods for ARRL's radio signals to interface the membership. The station had a human face then, participating directly in emergencies, traffic networks, contests and such special assignments as communicating with scientific expeditions in far corners of the earth.

> *"Warner, Budlong, Huntoon, Hart…"*

What I had intended to be a summer job lengthened to a year. Meeting and sometimes mingling with my *QST* heroes at the ARRL West Hartford office – Warner, Budlong, Huntoon, Hart, Goodman, Grammer, Mix, Bradley, McKean, et. al. – was heady stuff for a relatively new ham. My cozy billet in historic Hartford was a short distance from the Mark Twain Museum, former home of my all-time favorite author. DXing in town with random wires and a suitcase portable gave respite from high-power duties at W1AW.

It's not easy to distill a lifetime highlight into these few paragraphs. The *K9YA Telegraph* doesn't do books. I returned to Chicago for courses in television, a promising broadcast medium predicted to rival radio. Close future contact with new Connecticut friends was assured by my agreeing to handle *QST's* DX mailbag, remotely, by mail, a temporary arrangement that would endure for thirty years.

After my reluctant departure I heard that some local wag had put a bee in the bonnet of that old dairy farmer next to W1AW. Communications Manager Ed Handy, W1BDI, was nervously coping with complaints that the station's antennas were affecting his herd's milk. There was some belief around ARRL HQ that the prankster was me. ■

Contact Us

Questions and comments regarding the *K9YA Telegraph* may be directed to:
telegraph@k9ya.org

K9YA Telegraph Index

Click **HERE** for complete index of *K9YA Telegraph* articles. The index is updated monthly.

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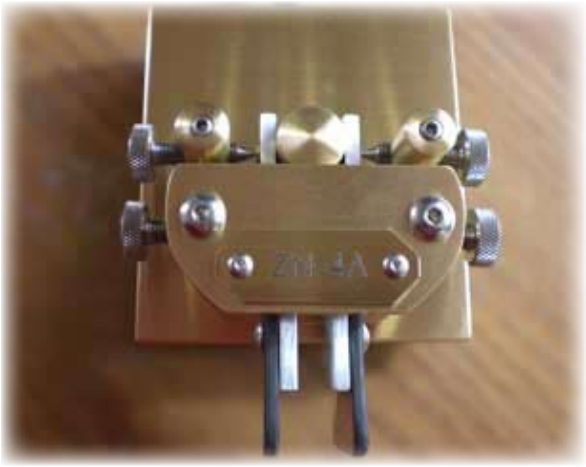
me any paddle that will slip in between the two fingers and I can start operating. The ZN-4A is that way as is the Begali Sculpture and some other paddles. The ZN-4A has its finger pieces set low so you can use them with little effort.

Finish: The brass has a thin protective coating on the surfaces, done in three passes. This means the brass will not tarnish over the years. I am not a fan of exposed brass surfaces that eventually oxidize and corrode.



As you can see, I am a fan of Tony's paddles and my only hope is that this review will not overload him. At his Web page, he suggests you email him ahead of schedule and check on availability and other particulars.

Renowned paddles made by guys named Dan, Stan, Rich and Don have disappeared due to several factors. The most important is that the manufacturing and machining of fine instruments takes time and love for the craft. It cannot be rushed. The price of materials is not getting cheaper. I am hoping Tony can continue to manufacture this quality paddle for a long, long time. He does good work. But do not rush him. Let him decide when and where he will deliver a paddle to the next person. There are 6.6 billion people, but only one Tony, N3ZN.

I liked the ZN-4A so much I immediately went back to the Web page and ordered the ZN-6A (Serial Number 009) with a shorter base. This gives it a smaller footprint on the desk. It has the same mechanism mounted to the base as the ZN-4A. The base is 5 cm x 7 cm x 1.8 cm. The increased thickness brings the total weight to 27 oz.

Tony did this for the large number of people that want a heavy paddle. I'm not one of those individuals as it slightly increased the height of the finger pieces above the desk. I may make a thinner circular base to lower it.

One more note about paddles. They are fine instruments to be used and maintained. I check the food storage container section at Wal*Mart to find plastic covers for paddles; they don't have to be fancy, just functional. I live in the high desert of Arizona, so dust is plentiful at all times of the year. Just a cover is all I need to keep it off paddles not in use.

I cry at hamfests walking through the flea market. I see paddles and keys that have been left out in the rain in McArthur Park. Just why any one would do that to things is beyond my comprehension. There should be a law. Take care of your paddle and it'll take care of you.

Thanks Tony and thank you, the reader, for your time. dit dit ■

ARCI News

The *K9YA Telegraph* article, "Ready Reckoners: Gone with the Slide Rule" (October 2007), was featured in the December 2007 issue of the Antique Radio Club of Illinois publication, *ARCI News*. (www.antique-radios.org)

K9YA Telegraph
7
Robert F. Heytow Memorial Radio Club
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Volume 5, Issue 3

CONTINUED - THE SEARCHERS FROM PAGE 1

Transmitter-equipped "aero planes" circling above the stalemated trenches were used as artillery spotters. According to *Jane's Fighting Aircraft of World War I* (Random House Group Ltd, London, 1990, ISBN 1 85170 347 0), these airborne spotters lacked receivers, "…consequently replies or requests from the ground had of necessity to be sent visually." The British soon realized wireless communications could be intercepted, and, using DF gear, the aircraft located with reasonable accuracy.

World War II

From the conflict's onset, and persisting for some time, suitable gear (Hallicrafters equipment is specifically mentioned) requisitioned from their ham and SWL owners eased a shortfall of the receivers needed for monitoring radio traffic.

Starting in 1939, the Royal Air Force, suffering a shortage of trained radio operators, made "…good use of volunteer, 'ham' operators." Using civilian-type Hallicrafters receivers (likely the Ultra Skyrider that tuned 3.76 to 53 meters) they would scan the "…VHF 40 MHz band for German aircraft."

Another tribute to the Chicago-built receivers: Seeking the source of a *Luftwaffe* bomber radio beam-directed navigational system, the Wireless Intelligence Development Unit used twin-engine Anson aircraft outfitted with Hallicrafters receivers.

The work, frequently in a language the operators did not speak and knew only as Morse equivalents, was always strenuous and often enervating. Monitors served eight-hour shifts to "…hear and record accurately faint or corrupted Morse at 20 wpm (25 wpm in Japanese)." Logged were time, frequency and callsign followed by the message transcript in the original language and its English translation. According to Macksey, "For an intelligent person it was quite easy to learn, though tiring."

THE SEARCHERS is not an easy slog, but offers the tenacious reader a detailed view of the people, technology and genius that met a very determined opposition and prevailed. It is rife with Royal Air Force and intelligence services acronyms and abbreviations. Although a flow chart of entities and their acronyms is provided early in the book, readers are advised to create their own reference guide to help preserve the text's continuity and cohesiveness. ■

Mailbag

I have a quick question that I would like to submit. It has to do with WW II training schools. There is a character that they used called the "tilted p."

I'd like to find out what the elements are and what it was used for. The reference occurs in the training material. dit dit

Chuck Adams, K7QO

Yet More… Lightning Calculator

A footnote to the article, "Lightning Strikes Twice" in the February 2008 issue of the *K9YA Telegraph*. A March 1934 advertisement in *Radio* magazine, offers both "LIGHT BOARD, 75¢; [and] HEAVY BOARD, $1.00" versions of R.W. Koechel's original Lightning Calculator. This was two years after the ARRL offered their licensed version at $1 in 1932.

Ham Parodies DICK SYLVAN, W9CBT

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