

<http://www.cq-amateur-radio.com>

\$6.99

Amateur Radio

COMMUNICATIONS & TECHNOLOGY
OCTOBER 2023

CQ

- **Youth on the Air Camp, p. 8**
- **1000 Portable Operations, p. 12**
- **1A0C: DXpedition to the Heart of Rome, p. 32**
- **VHF: Spectacular Heat Brings Spectacular Tropo, p. 91**

On the Cover: "Mr. Portable" ... Vladimir Kovaceski, Z35M, uses his bicycle as an antenna support during one of his 1000 portable operations, this one at Ohrid Lake in Albania. Details on page 10; story on page 12.



contents

OCTOBER 2023 • VOLUME 79 NUMBER 10



ON THE COVER: Each year since 2015, Vladimir Kovaceski, Z35M, has made one-day bicycle DXpeditions to Albania from his home in North Macedonia. These trips are among the 1000 portable operations Vlado writes about on page 12. Additional details on page 10. (Cover photo by Vladimir Kovaceski, Z35M)



features

- 8 YOUTH ON THE AIR CAMP IN THE AMERICAS – THE BEST WEEK EVER**
Helping young hams learn new skills at a week-long ham radio summer camp
By Abby Kimi Matsuyoshi, KK7CFJ and Jack Roberts, W9RFT
- 12 SNAKE ISLAND: Z35M'S 1000TH PORTABLE OPERATION**
For Z35M amateur radio is not just a hobby but a lifestyle; a look back at 14 years of portable hamming
By Vladimir Kovaceski, Z35M
- 20 THE RADIO ROOM OF THE KON TIKI EXPEDITION**
An expedition in 1947, by Thor Heyerdahl, that used ham radio to communicate with shore stations
By Mike Malloy, WD5GYG
- 26 CQ CLASSIC: RADIO AND THE LURE OF THE SEA**
QRP in the South Pacific
By Cam Hartford, N6GA (August 2012)
- 31 CQ BOOK REVIEW: A RADIO HISTORY–SHIP SHORE**
Reviewed By David J. Ring, Jr., N1EA
- 32 DXPEDITION TO THE HEART OF ROME**
The return of one of the most requested, mysterious and fascinating DX entities in the world
By Nicola Burdiat, IUØNIC

- 40 AN ASYMMETRIC MULTI-BAND VERTICAL DIPOLE ANTENNA**
A variation on the use of stacked coffee cans
By Hiroki Kato, AH6CY
- 43 RADIO RENAISSANCE: A RETIREMENT STORY**
The role of ham radio after retirement
By Bob Hopkins, WB2UDC
- 48 USING VERIFICATION REPLY CARDS TO INCREASE QSL RETURN RATES**
A method to improve one's response rate with stations that aren't used to having QSLs requested
By Mark Hughes, WB4UHI
- 50 THE PORTABLE TELEPHONE COMPANY**
A system that interconnects cellphones, corded phones and the ham radio cloud, and best of all it's portable
By Bob Dixon, W8ERD
- 54 "MUSEUM QUALITY"—A VISIT TO THE ORKNEY WIRELESS MUSEUM, GB2OWM**
Even on a "non-radio" vacation...
By Hy Chantz, W2HY
- 58 AT THE INTERSECTION OF ASTRONOMY AND AMATEUR RADIO**
Bringing the best of two hobbies, astronomy and amateur radio, together
By Paul Signorelli, WØRW
- 65 TRANSCEIVER TO COMPUTER INTERFACE**
An interface to reduce the risk of RFI
By Alan Hoffmaster, WA3EKL

FOCUS ON Young and Old(er) – We start out this month with the Young Ham of the Year award ceremony, a report from the Youth on the Air Americas summer camp, and how Z35M stays young by making lots of portable operating trips, many by bicycle. Then we shift to the other end of the age spectrum with a report from WB2UDC on how ham radio is helping him adjust to retirement, a look back at the radio gear on Thor Heyerdahl's *Kon Tiki*, a radio museum in Scotland, the history of maritime radio, "analog computers" from the mid-20th century and the way things "used to be" in the world of DX.

columns

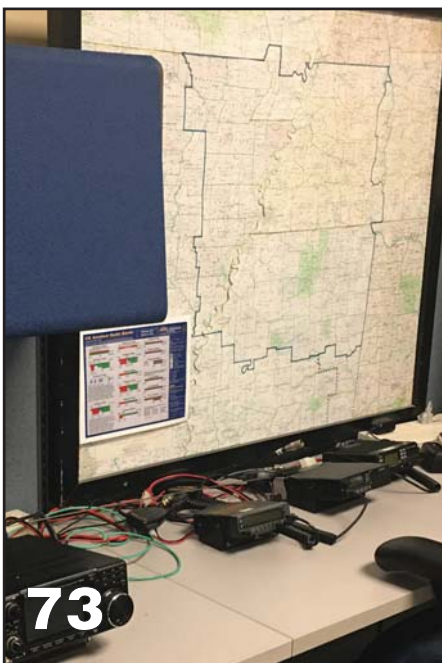
- 70 **EMERGENCY COMMUNICATIONS:**
Ethereal Adornments – Part 2: A Close Look at
End-Fed Antennas
By John Ferguson, K3PFW
- 73 **LEARNING CURVE:**
CQ Profile: Corey Caskelson, NØVKR
By Ron Ochu, KOØZ
- 78 **KIT-BUILDING:** Perfect Timing
By Joe Eisenberg, KØNEB
- 80 **ANTENNAS:** Sum and Difference
By Kent Britain, WA5VJB
- 82 **ANALOG ADVENTURES:** Analog Computing
By Eric P. Nichols, KL7AJ
- 84 **GORDO'S SHORT CIRCUITS:** Is There a Hitch in 'Ur
Git-Up Dial Knob? Plus, LDG's Meter Set and Gordo's
New General Class License Manual
By Gordon West, WB6NOA
- 87 **QRP: LOW-POWER COMMUNICATIONS:**
POTA's Plaque Event...Should a QRP'er Bother?
By R. Scott Rought, KA8SMA
- 95 **AWARDS:** Summits on the Air Awards
By Steve Molo, K14KWR

departments

- 91 **VHF PLUS:** Spectacular Heat Brings Spectacular Tropo
By Trent Fleming, N4DTF
- 98 **DX:** Used to Be...
By Bob Schenck, N2OO
- 103 **CONTESTING:** Solar Flare vs. NAQP CW Contest
*Plus Tweaks to ARRL Club Contest Rules and
WRTC 2026*
By Tim Shoppa, N3QE
- 108 **PROPAGATION:** October Shortwave Propagation
By Tomas Hood, NW7US

miscellaneous

- 2 **ANNOUNCEMENTS**
- 3 **HAM RADIO NEWS**
- 6 **ZERO BIAS**
- 7 **NEWS BYTES**
- 18 **OUR READERS SAY**
- 56 **OOPS!**
- 59 **BEHIND THE BYLINES**
- 77 **SPURIOUS SIGNALS**
- 93 **LOOKING AHEAD**
- 112 **HAM SHOP**



Old-timers may recall Thor Heyerdahl's Kon Tiki expedition in 1947, when he sailed a raft from South America to the South Pacific (others may have read his book or seen one of three movies based on his adventure). His crew used ham radio to communicate with shore stations. WD5GYG shares his research on the radio gear and more.

The Radio Room of the Kon Tiki Expedition

28 April to 7 Aug 1947

BY MIKE MALLOY,* WD5GYG

I first read Kon Tiki as a 12-year-old, and have been fascinated by this wonderful story my entire life. As an adult, I read it again (pre-Internet) and now as a 75-year-old, I have just finished rereading this tale of a high seas adventure once again.

While reading the story as an older person, I began to read between the lines of the exploits of the Kon Tiki. It was not a trip planned by James Cameron, the famed director of the movie *Titanic*, where everything falls into place at the exact moment it was supposed to. It was a sea adventure that almost did not happen. Heyerdahl was laughed at and insulted by various

corporations, including the National Geographic Society. I suppose in modern terms they did not want the insurance liability of six foolish young men fresh from World War 2 killing themselves on a crazy adventure with a balsa raft lashed together with hemp rope. No modern materials, such as bolts, screws, or wood cut to precise measurements. The Kon Tiki was to be a simple design as had been used 1500 years ago. The notion of drifting and sailing thousands of miles from Peru out to somewhere, but where exactly no one knew, was considered a foolish adventure.

The most recent movie on Kon Tiki, ("Kon-Tiki," 2012), with Norwegian actors (speaking English) was a fair

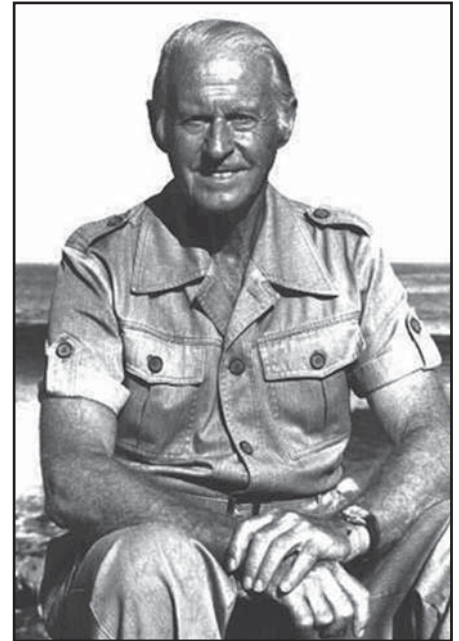


Photo A. Thor Heyerdahl, leader of the 1947 Kon Tiki expedition (courtesy Kon Tiki Museum, Oslo, Norway)

* E-mail: <mmlalloy100@gmail.com>



Figure 1. The approximate route of the Kon Tiki's 1947 voyage. (Source: Montres Publiques: "The Story of the Eterna Kon Tiki: An Expedition from Peru to Polynesia by Raft")



Figure 2. The Marquesas Islands, with Fatu-Hiva highlighted in red. (Wikimedia Commons map by Godefroy, Creative Commons licensing <<https://commons.wikimedia.org/w/index.php?curid=3951973>>)

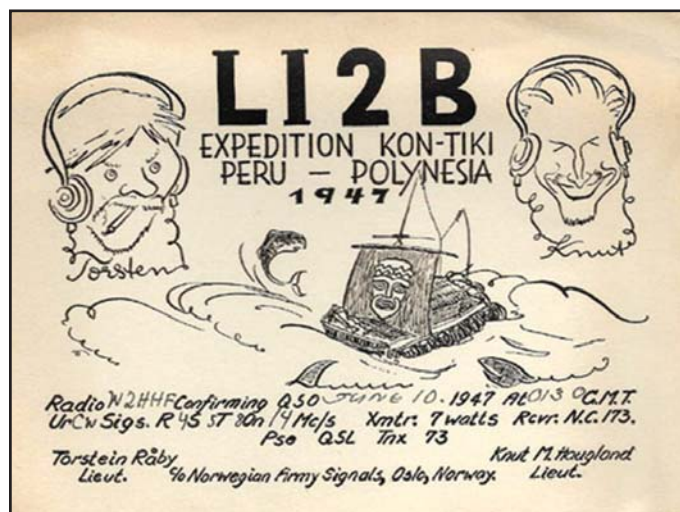


Figure 3. LI2B QSL card (courtesy K8CX Ham Gallery <hamgallery.com>)

South America in great detail. When Heyerdahl heard this story of how Tei Tetua's long-dead relatives came from a place where the sun rises (east), he began to realize that this old man was telling a tale very similar to one he had heard while studying South American folklore. Specifically, in the eastern part of South America, there was a sun king god named Virakocha, which is an Incan name. However, the more modern name (in antiquity) for this god was Kon Tiki, and this name was also a common reference to the sun god in Peruvian culture. This South American legend states that there was a massacre, but somehow Kon Tiki escaped to the coast and built a raft then took off due west, never to be seen or heard of again on the shores of Peru. The first part of the Norwegian movie "Kon Tiki" (English speaking) from 2012, covers this section quite well if you are interested in learning more.

Soon after returning to Denmark, WWII broke out, 1 Sept 1939. Heyerdahl went into the Norwegian military for about five years and there was no more talk of Polynesia.

Radio Room (LI2B)

The two Kon Tiki radio operators, Knut Haugland or Torstein Raaby, were not licensed amateur radio operators at the time of the voyage. The Norwegian call sign LI2B (Figure 3) was assigned to the raft. It was a ship station's amateur radio call but not an individual license. Here in the U.S., our amateur radio license is in reality two licenses in one, a combination of an operator license, which is the authorization from the Federal Communications Commission (FCC) to transmit on amateur radio frequencies, and a station license, to which a call sign is assigned. In the case of the Kon Tiki, licensed by Norway, the ship's license issued to the raft allowed the operators to transmit on both amateur radio and commercial marine HF frequencies.

Technical Analysis

In the book "Kon Tiki," Heyerdahl mentioned multiple times in various chapters that both radio operators were electrically "shocked" (RF burns, but close enough) the first 30 days or so out to sea. At some point during the voyage, the "shocking" ended (we think). So, why is that? There is no explanation in the book about this matter. Heyerdahl was really not interested in the radios.

representation of the actual story, but I recommend reading the book. The movie showed the difficulties Heyerdahl encountered when trying to launch his grand adventure. It was quite discouraging. Most men would have given up and gone home, but he did not.

This trip only lasted for a total of 101 days at sea. Sailing from Callao, Peru, (a subdivision of Lima), to Raroia Atoll in French Polynesia (4300 miles total – see Figure 1), created a story that will live in perpetuity.

The Story of the Kon Tiki

Before we dive into the radio room, let us first explore how and why the Kon Tiki came into being.

Thor Heyerdahl (Photo A) was a zoologist who graduated Oslo University in 1937. From there he went to the Polynesian atoll of Fatu Hiva, which is in the southern part of the Marquesas Islands in French Polynesia (Figure 2), to collect biological samples. A side interest of his was a fascination with ancient cultures of both South America and the South Seas, specifically Polynesia. During his time on Fatu Hiva, he began to talk to some of the older residents at night after collecting bug specimens all day. The conversations lead to the explanation of how the natives believed they came to be on these islands.

During his 8-month stay, an old chief, Tei Tetua,¹ told Heyerdahl stories relayed to him by his father and grandfather about the Polynesian god; Tiki, sun Tiki or Illa Tiki, the fire Tiki.² Heyerdahl had studied the culture and history of

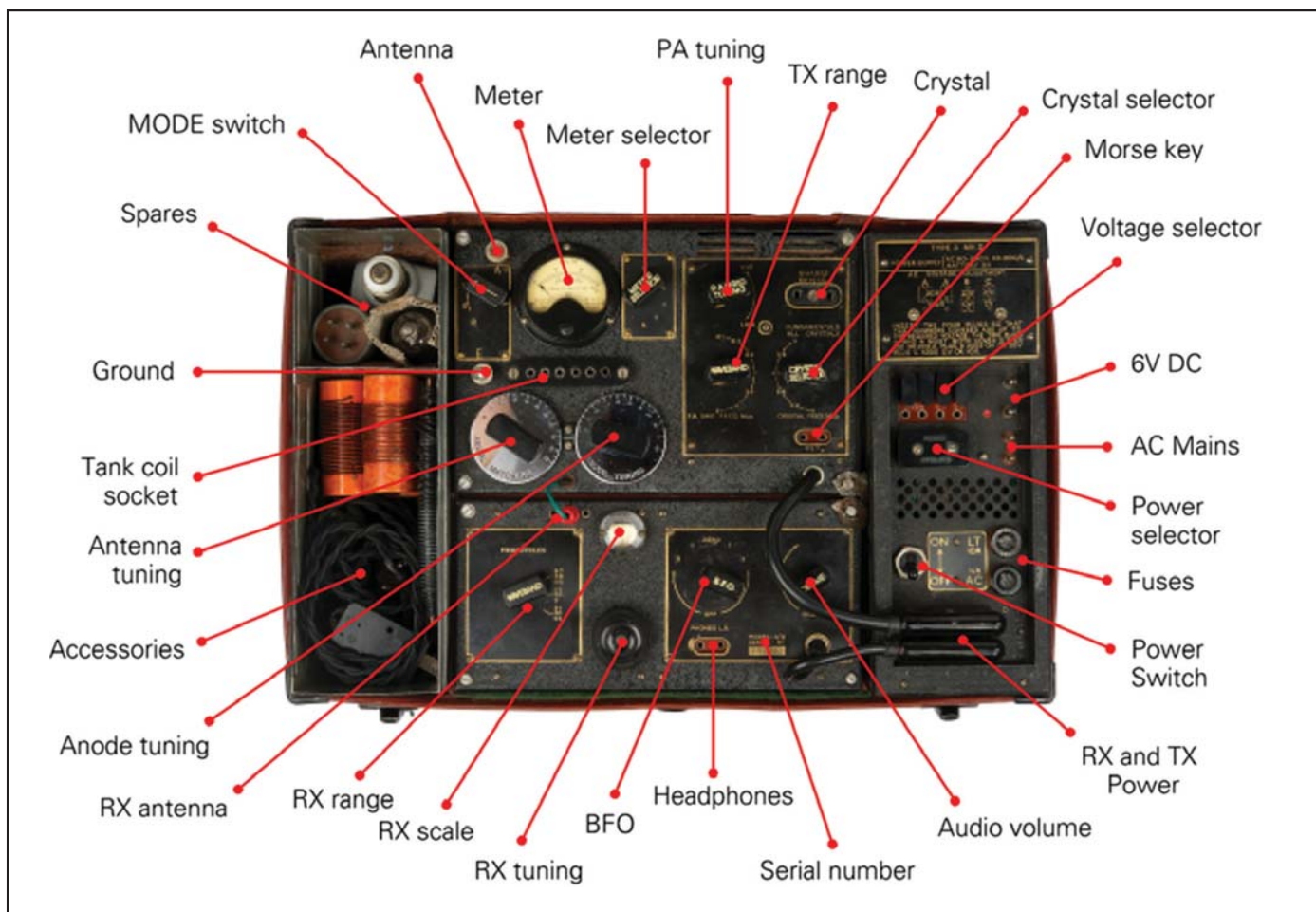


Figure 4. Type 3, MKII, B2. (courtesy Cryptomuseum.com)

Heyerdahl was quoted in his book when told of the necessity of having radios on board the Kon Tiki: "Radio! I said, horrified. What the hell do we want with that? It's out of place on a prehistoric raft."³

The counterargument of safety made radios a necessity and he was also presented with the notion that a radio will not have any effect on his migration theory. Heyerdahl was eventually convinced a two-way radio was important to maintain contact with shore, but his main focus was keeping the Kon Tiki afloat and proving his theory that the Polynesian peoples came from the west coast of South America (generally) and not from the orient.

The radios were installed on board, most probably with insufficient time for testing before launch. This is conjecture, but their main transmitter (7-14 MHz), built by Calvin Hadlock, W1CTW, was the radio that would "shock" the operator: "...one got electric shocks both in the hinder parts and in the finger tips if one touched the Morse key. And, if one of us outsiders tried to steal a pencil from the well-equipped corner (radio room) either his hair stood

straight up on his head or he drew long sparks from the stump of the pencil."⁴

Great, but why the electrical "shocks"? Well, let me state for the record that any conclusions I draw are based on synthesizing the information from the book "Kon Tiki." I attempted to research how these shocks occurred. I could find no definitive answer. I am sure that there was a radio log kept at one time, but it appears that it has been

lost to time. That log might have been able to answer a number of important questions. The answer is most probably the radio team did not install a proper electrical ground on the ship before setting sail. I contacted the Kon Tiki Museum in Oslo about this matter, but no explanation was to be found. However, I had a discussion on Facebook (Radio Telegraph Operators) with Mr. Hans Saethre, LA9LT,⁵ who lives in Norway.

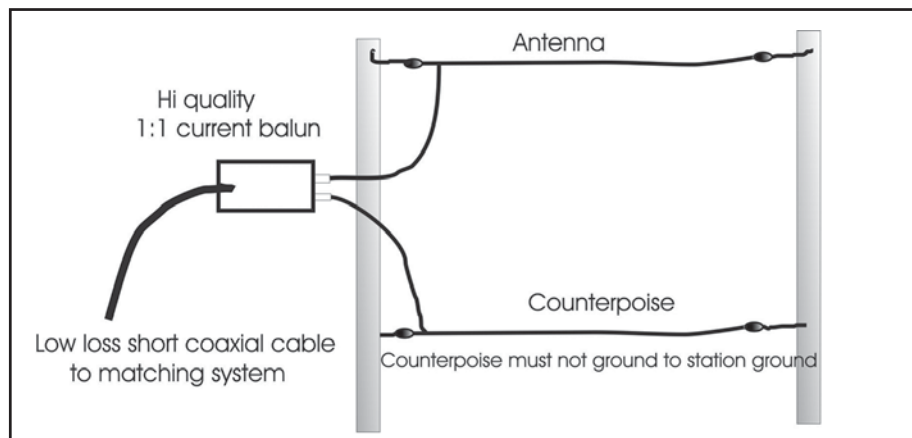


Figure 5. Basic long-wire antenna. (Source: < http://www.w8ji.com/long_wire_antenna.htm>)

He knew Knut Haugland (one of the two radio operators) before he passed. Mr. Saethre stated that the Kon Tiki did in fact have a "ground" for their radios. He called it an "electrode." If so, then why the multiple shocks?

Side note: Mr. Saethre said that after the voyage, the original radio equipment was stored in a military warehouse, and at some point was thrown away. So we have no physical components to examine.

I can only speculate as to what produced these "shocks":

a. They were using a longwire (end-fed, sometimes called a voltage-fed antenna); more on this later.

b. The radio room was always wet because water would come up between the logs.

c. The grounding "electrode" must have been very small and did not represent a proper counterpoise to the transmitting antenna.

By definition, a counterpoise is a "mirror" image of the antenna. In effect, it must be a true reflection of the transmitting antenna. You may argue that they had the entire Pacific Ocean at their disposal, so what is the problem? It appears likely that the electrical counterpoise and the Pacific Ocean were not touching each other.

If I were to design a counterpoise for

this system, I would have built a series of three or four 8-foot ground rods on the bottom of Kon Tiki. They would have been connected in parallel, and connected at each end, making a nice submerged rectangle. Floating in salt water, spread out on the underside of the Kon Tiki, the multiple ground rods all connected would have presented a

6 On Raft Drift Across Pacific

KON-TIKI EXPEDITION PICKS NATIONAL RECEIVERS

Somewhere in the vast loneliness of the Pacific a frail, balsa wood raft is drifting westward, carrying six Norwegian scientists toward the Polynesian Islands. Their mission: to prove that the Polynesians could have been settled by prehistoric Peruvian Indians.

Courage, yes, recklessness, no. These adventurers are scientists, not stunt men. Before setting out from Peru they made sure that they would have the finest radio equipment in the world... National receivers, of course (Models NC-173 and HRO-7).

For safety... to bring in the weakest signal in the worst kind of weather... for science... to exchange vital weather and navigational data with land stations thousands of miles away. Battered by wind and sea for months on end these superb National receivers aboard the Kon-Tiki Expedition raft are still functioning as reliably as ever.

What better testimonial than operator Knut Haugland's cheerful "All's Well" radioed from the Tuamotu Archipelago... 4000 miles across the Pacific, and still going strong.

Congratulations are also in order to W6AOA, W6EVM, and W3YA who have been in regular contact with L12B. 27.98 and 14.142 megs have been assigned for general contact. Next time you go on the air, why not see if you can contact Haugland and get the Expedition's story first-hand.

National Company, Inc.
Malden, Mass.

MAKERS OF LIFETIME RADIO EQUIPMENT

September, 1947

47

Photo B. The National NC-173, at the lower right in this old CQ advertisement, was the principal receiver on the Kon Tiki.



Photo C. Knute Houglund, one of the two radio operators aboard the Kon Tiki. Haugland was also a cinematographer who shot the first Kon Tiki movie in 1950. (Photo courtesy <digitalmuseum.no>)



Photo D. Kon Tiki radio operator Torstein Pettersen Raaby. (Harris Ewing photo from the Kon Tiki Museum, Oslo, Norway)

sufficient surface area (electrically) to bring any transient voltages running around the radio room to zero.

I don't think this happened. So then why, all of a sudden during the voyage, did the radios start working and the complaints about the lack of reception of radio signals and "shocks" on transmissions end? Probably because they switched radios after all the trouble with the first transmitter. They had a MK-3, Type 2, SOE portable radio system (Figure 4). Both Raaby and Haugland had used these radios in WW2 reporting on German troop movements. The radio also had as part of its kit a long piece of wire to be used as a counterpoise. It would have been a very simple operation to work the wire down in-between the logs and let it trail under the raft as they sailed along. That would allow the MK-3 to work like a sewing machine. The principal receiver on board was the National NC-173 (Photo B).

Antenna

The main antenna used on the Kon Tiki expedition was made of wire. I hesitate to use the word "long wire" because there is an exact definition of this type of antenna. That is, the wire is at least one wavelength long ($L=984/F$ MHz).

The first radio contact while out at sea was with the military radio station in Lima, Peru (where they launched from). The Kon Tiki was using a true long wire at that time, vertically supported by either a kite or balloon. This did not last. The winds were unpredictable and would drive the kite into the water, and the heat of the equatorial sun would melt the balloon supporting the wire. However, this was not the final demise of the "long wire" antenna.⁶

The radios and antennas were working at this point (if you did not mind the "shocks" while transmitting), but there was trouble brewing. The Kon Tiki had a radio saboteur on board, the green parrot. For whatever reason, it decided to chew on the vertical long wire supported by a kite or balloon and the antenna floated away in the noon day sun and all communications stopped.

"At first the parrot was the bane of our radio operators. They might be sitting happily absorbed in the radio corner with their magic earphones on and perhaps in contact with a radio 'ham' in Oklahoma. Then their earphones would suddenly go dead, and they could not get a sound however much they coaxed the wires and turned the knobs. The parrot had been busy and bitten off the wire of the aerial".⁷

E-mail correspondence with LA9LT alluded to the fact that after this incident occurred, the two radio operators took the remaining wire, strung it across the mast and fastened it to the bow of the raft.⁸ This undoubtedly changed the radiation pattern of their radio emissions dramatically, but now they were able to communicate on a regular basis. The antenna became a random length, non-resonant antenna, probably at least a half a wavelength at 20 meters. It worked and that is all that mattered!

A really excellent reference to long wires with more information that you may need can be found at <www.w8ji.com>. This is the home page. He has developed a repository of information on all sorts of problems and designs from baluns to Rohn towers to long wire antennas. I recommend you bookmark his index page.

Why Not?

The Kon Tiki expedition almost did not happen, but it did. This story will live in perpetuity. We should be thankful that ham radio was a big part of this adventure. The two men who ran the radio room (Photos C and D) were in Norwegian special forces in WWII, parachuting behind enemy lines. They would provide communications back to their headquarters on enemy positions and troop movements. It was only natural that Thor Heyerdahl contacted them about joining his grand adventure on the high seas. To paraphrase the late Robert F. Kennedy, some men may have asked "why?" They asked, "why not?"

Notes:

1. Heyerdahl, "Kon Tiki" (see Reference 1), p. 13
2. Heyerdahl, p. 18
3. Heyerdahl, p. 31
4. Heyerdahl, p. 149
5. H. Saethre correspondence, Dec. 2022
6. Heyerdahl, p. 83
7. Heyerdahl, p. 146
8. op. cit. 6

REFERENCES:

- Heyerdahl, T. (1990), "Kon Tiki," Enriched Classics, Simon and Schuster.
- Saethre, Hans (2022), Facebook, Group: Radio Telegraph Operators.
- TITANIC, (1997) [Feature film], Paramount Pictures, Los Angeles, CA.
- <www.w8ji.com>, long wire antenna drawing.
- Kon Tiki, (2012) [Feature film], Weinstein Company, NY,NY.
- Kon Tiki Museum, Oslo, Norway. Email communications, Dec 2022.
- For 75 years the Kon Tiki Museum have kept her a secret (.pdf article). Kon Tiki Museum Publication. March 2022. Pages 1 to 43.
- Brenda Torrejon Estrada, Biblioteca Nacional del Peru. E-mail correspondence. Jan, 2023.

DITS and DAHS

The A B C's of Morse Code Operating

BY ED TOBIAS, KR3E

This small but solid guide is the perfect read for those interested in learning or improving CQ operating techniques!

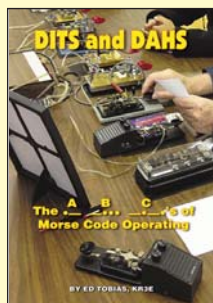
Within its pages you'll find

- The secret of becoming a proficient CQ Operator
- Where and how to practice, practice, practice.
- Straight Key or Paddle?
- Keyers, Iambic Keying and Bugs
- Contests & Events, DXing
- Operating QSK
- CW Filters
- Signs, Signals and Procedures
- Tips on Taking CW On the Road...

and much, much more!

Order your copy today!

Shipping and Handling US and Possessions \$3,
CN/MX \$5, All Other Countries \$10



6 x 9 Paperback
Only \$15.95

CQ Communications

<http://store.cq-amateur-radio.com>

Radio and the Lure of the Sea

To accompany this issue's article about the radio gear aboard the Kon Tiki during Thor Heyerdahl's 1947 expedition by raft from South America to Polynesia, we thought it would be fun to reprise a QRP column from just a little over 10 years ago, when N6GA reported on a ham who was installing a Heyerdahl-inspired (but solar-powered) transmitter on his sailboat. The August 2012 column also takes a look at a QRP mini-expedition to Easter Island. Enjoy...

qrp

BY CAM HARTFORD, N6GA

QRP in the South Pacific

This month we turn our attention to the South Pacific for a couple of QRP adventures. Remember the Kon-Tiki? (See opening photo.) It was the raft used by Thor Heyerdahl to sail from Peru to the Polynesian islands in 1947. His purpose was to show that the South Seas islands could have been populated by people who traveled from South America. To this end, he built the raft using materials and techniques that would have been available to the native population at the time, using balsa logs and other materials gathered locally in Peru. Heyerdahl permitted himself a deviation from the "original equipment" track by including some modern-day communications equipment. This consisted of transmitters for the 40-, 20-, 10- and 6-meter bands. These were tubetype rigs with about 10 watts input, which would fall pretty close to our current definition of QRP. The receiver they carried was a National NC-173. After the first 20 days of the trip, communication via ham radio frequencies was established and continued for the remaining 80 days of the voyage. An article describing the radio operation aboard Kon-Tiki was published in the December 1947 issue of *QST* magazine.

I was reminded of the Kon-Tiki adventure by Gary Davis, KD9SB. Gary wrote: "I have recently completed a 20-meter 1-watt output QRP transmitter for use on my sailboat (photo A). My transmitter was inspired by Thor Heyerdahl's 1947 *Kon-Tiki* balsa-raft voyage across the Pacific from Peru to Polynesia.

"The solar-powered transmitter has one sixth of the power output of the Kon-Tiki raft's 20-meter 6-watt transmitter. The transmitter has a loop-through connection for the receiver, weighs 5.5 oz., and has diode protection for high SWR. It can also be built for 40 meters, with 1.5 watts out. The inductors for the oscillator, RF amp, and Pi output filter are off the-shelf miniature parts from Mouser Electronics."

The schematic of Gary's transmitter is presented in fig. 1. For a complete parts list, contact the author at <gdavisKD9SB@sbcglobal.net>.

Gary uses a Yaesu VR500 pocket communications receiver with his homebrew transmitter. His best DX



KON-TIKI EXPEDITION PICKS NATIONAL RECEIVERS

Somewhere in the vast loneliness of the Pacific a frail, balsa wood raft is drifting westward, carrying six Norwegian scientists toward the Polynesian Islands. Their mission: to prove that the Polynesians could have been settled by pre-historic Peruvian Indians.

Courage, yes, recklessness, no. These adventurers are scientists, not stunt men. Before setting out from Peru they made sure that they would have the finest radio equipment in the world... National receivers, of course (Models NC-173 and HRO-7).

For safety... to bring in the weakest signal in the worst kind of weather... for science... to exchange vital weather and navigational data with land stations thousands of miles away. Battered by wind and sea for months on end these superb National receivers aboard the Kon-Tiki Expedition raft are still functioning as reliably as ever.

What better testimonial than operator Knut Haugland's cheerful "All's Well" radioed from the Tuamotu Archipelago... 4000 miles across the Pacific, and still going strong.

Congratulations are also in order to W6AOA, W6EVM, and W3YA who have been in regular contact with L12B, 27.98 and 14.142 mcs have been assigned for general contact. Next time you go on the air, why not see if you can contact Haugland and get the Expedition's story first-hand.

National Company, Inc.
Malden, Mass.

MAKERS OF LIFETIME RADIO EQUIPMENT

September, 1947

HRO-7
Brand-new successor to the famous HRO used throughout the world. 11 tubes plus a voltage regulator... Frequency coverage from 50 to 450 and 480 to 30,000 kc... Adjustable threshold noise limiter... Streamlined grey cabinet. AM phone and code reception.

NC-173
A new and versatile receiver, popularly priced. Frequency coverage from 540 kc to 31 mc plus the 48-54 mc range. Colored meter band spread on 6, 10-11, 20, 40 and 80 meter bands. Photograph or microphone pick-up jack.

Courtesy of Science Illustrated

47

Thor Heyerdahl sailed his raft Kon-Tiki on an adventurous voyage shared by hams around the world. National Radio provided the receivers and made sure everybody knew it, as seen in this ad from the September 1947 issue of *CQ*.

so far was with KD6JUI, a distance of 1886 miles. For an antenna, Gary uses a Zepp that is fed with window line. A full description of the antenna can be found in his article entitled "A 20 Meter Antenna for Sailboats," published in the October 2006 issue of *QST*.

CE0/YV5IAL: A QRP Digital Portable Mini-Dxpedition

If *Kon-Tiki's* path across the Pacific had dipped about a thousand miles to the south, it might have encountered Easter Island, from where our next story comes. Many of us dream of someday doing a portable operation from an exotic location. Roberto, YV5IAL, has done just that, and not from any ordinary, remote locale (photo B). Easter Island claims to be the most remote inhabited island in the world. Roberto journeyed there for a QRP mini-DXpedition. Here's his account:

"On the first days of January 2010, I made my dream come true—transmitting from an exotic DX entity in the middle of the Pacific Ocean. Easter Island is the most isolated island on the planet, thousands of miles away from anywhere.

Easter Island is more than 14 hours by plane from Caracas. The airfare is very expensive and the maximum weight of luggage allowed is less than 40 pounds per person.

I decided to work QRP, because the Yaesu FT-817ND, portable antenna, and accessories weighed less than 14 pounds, and the full station fit in two small bags (one for the radio and accessories and another for the antenna). I decided not to take the 100-watt station (Yaesu FT-857D and accessories) because the weight would have been twice or more. . . .

"After 20 hours of travel, I arrived at the hotel in Hanga Roa (the only town on the island). Immediately, I asked permission to install the antenna. Thirty minutes after, the Buddipole antenna was installed on the balcony and the radials (counterpoises) were spread all along the wood hotel room railings. CE0/YV5IAL, QRP digital portable station was ready to start the First World Easter Island PSK activation (January 9 to 11, 2010).

Roberto's station components can be seen in photo C. His QRP PSK station consisted of an FT-817 and an HP 1910 IPAQ Pocket PC running PocketDigi software. Roberto continues with his observations about operating low power from a place where your signal has to travel for thousands of miles before it gets to the first available ham stations: "Wasting valuable time insistently calling DX will not work. Never forget that you're at a disadvantage. Only good antenna stations will be able to copy you. Avoid competing with another station, and wait patiently for the DX station calling CQ again."

When it came time to pack up and leave, Roberto's log included QSOs with the USA, Hawaii, Marshall Is., Uruguay, Argentina, Chile, Colombia, and Brazil. His most distant QSO: V73RS, 9750 km (6,058 mi) for 2437 km/watt. A very good show for a QRP rig and a portable antenna!

Flyweight Feedline

The subject of Flyweight Feedlines surfaced on QRP-L a couple of months ago. That prompted me to make a trip to the garage to retrieve some lightweight stuff with which I had experimented. My motivation for fabricating this feedline is now lost in the mists of time, but I think it had something to

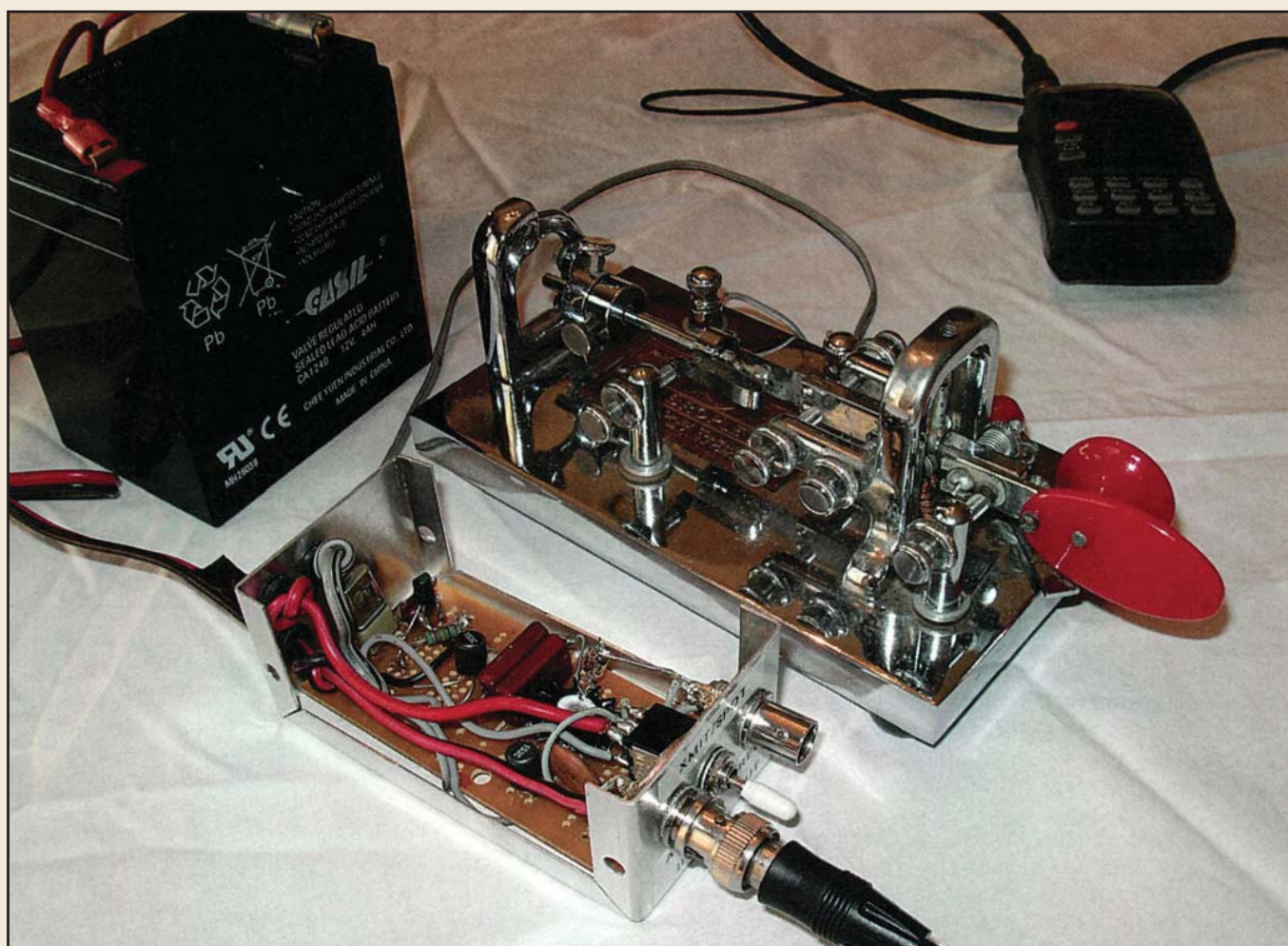


Photo A- KD9SB's Kon-Tiki inspired 20 meter CW transmitter.

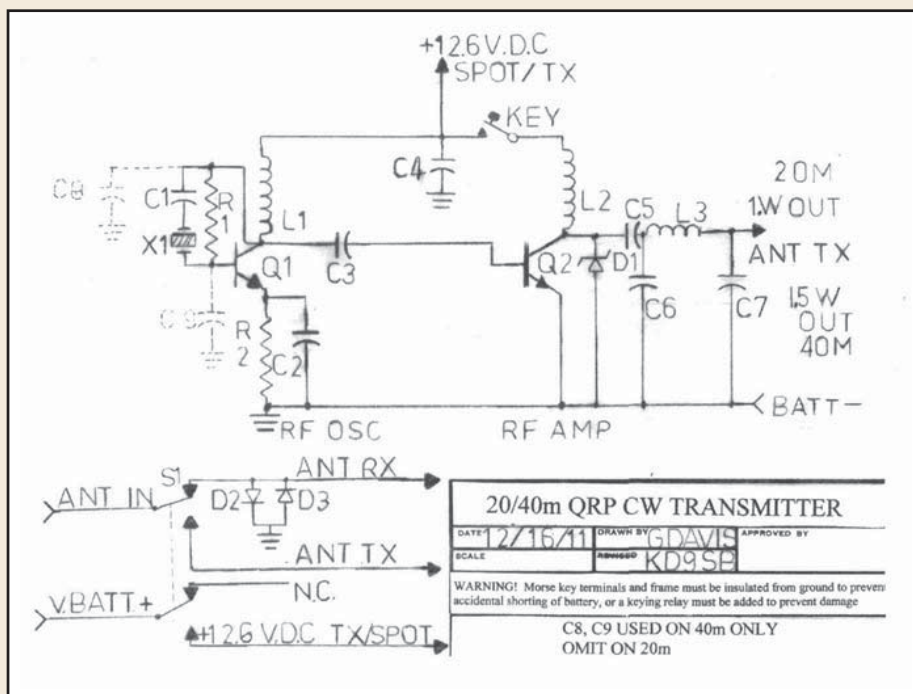


Fig. 1- This is the schematic of KD9SB's transmitter. The parts list can be obtained from the author. (See text for details.)

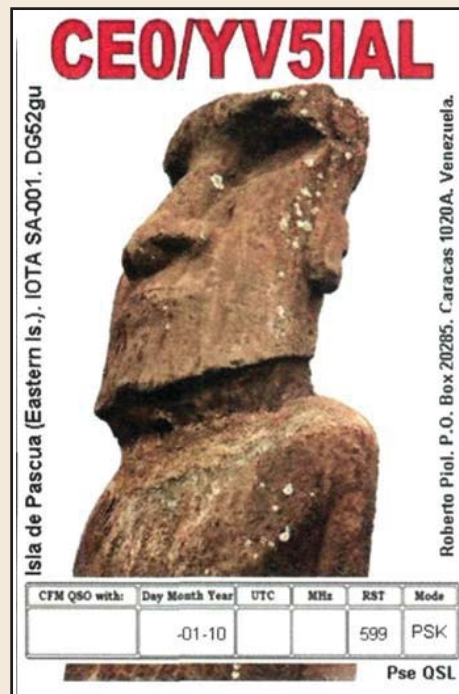


Photo B- YV5IAL's QSL card from Easter Island.

do with trying to make a portable antenna that would work well with my 4-band Elecraft K1.

I've used short lengths of RG-174 to feed a well-matched 20-meter dipole, but this little coax would never do well in feeding a non-resonant 4-band antenna. The feedpoint impedance would be all over the map, and the resulting feedline loss would gobble up most of my RF. Over the years people have pressed zip cord, computer ribbon cable, and all manner of hookup wire into feedline service, with varying results. The first use of computer ribbon cable I could find

was "The St. Louis Doublet" by Dave Gauding, NF0R, published in *QRPp*, Spring 1999. Dave used a length of 2-conductor computer ribbon cable. This was followed by Doug Hendricks' KI6DS "Norcal Doublet" published in the Winter 2002 issue of *QRPp*. Doug's feedline was a length of 4-conductor flat ribbon cable, of which he used the outer two conductors for the feedline, the inner conductors providing only spacing.

Fast forward several years. A box of flat-ribbon cable caught my eye at a swap meet and followed me home. It was

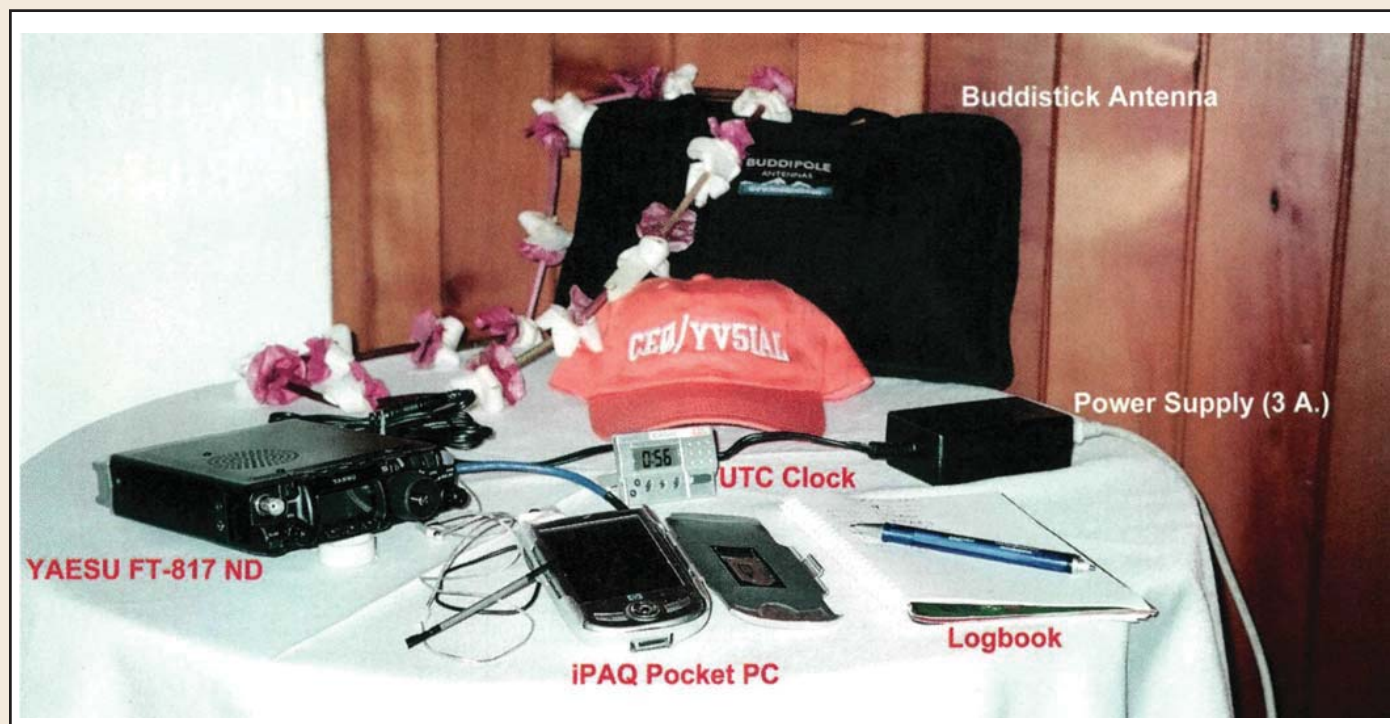


Photo C- The portable QRP PSK setup used by Roberto, YV5IAL, on Easter Island.

100 feet of 37-conductor cable, enough to build 18 NorCal doublets. Since there was so much of it, I decided I could easily experiment and hopefully find something that would represent an improvement over the existing designs.

After many iterations I ended up with the feedline that you see in photo D. I peeled off a seven-conductor strip of the

flat cable, used the two outer strands on each side for the conductors, and cut out the inner three conductors to make faux window line. Why? The losses in a feedline come primarily from the I²R losses in the conductors and dielectric losses in the space between the conductors. In this ribbon cable the conductors are #28 stranded wire, which



Photo D- Balanced feedline made from flat ribbon cable, flanked by RG-58 and RG-174.

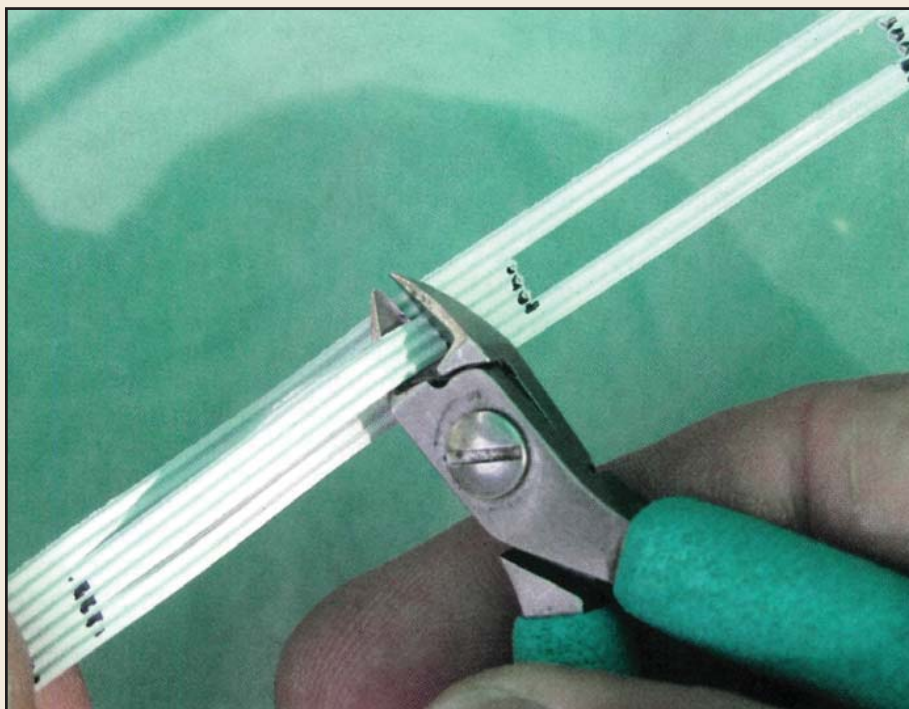


Photo E- The last step in fabricating the flyweight feedline.

seemed a little wimpy to me. Doubling up on the conductors is a fairly painless way to cut down the ohmic losses. Likewise, air is the best dielectric we know other than vacuum, so by removing most of the inner three conductors we have a fairly good dielectric—not perfect, but pretty darn good.

Admittedly, constructing this feedline is a little more labor-intensive than making the NorCal Doublet feedline, which requires practically no work at all. However, the results are fairly impressive. I enlisted the help of Charlie, W6JJZ, and his AIM 4170 VNA to run some tests on this feedline. It ends up having a characteristic impedance of 280 ohms, a velocity factor of .87, and .9 dB loss per 100 feet at 10 MHz, which means this feedline weighs about the same as RG-174 but has the loss characteristics of RG-59 with foam dielectric.

The hard part is making it. I did it in three passes. The first pass was to mark the 7-conductor cable where the windows were to be cut out using a permanent marking pen. To speed up this task I made a template on a sheet of paper which I attached to a clip board. I laid the cable next to the template and marked it, and then slid the cable forward to the place where I could mark the next set of cuts.

In the next pass I made the slits in the cable between the conductors and the inner part which was to be cut out. A hobby knife worked well for this.

The last pass was to cut out the window sections, and this was done easily with a small set of diagonal cutters, as seen in photo E. It is a time-consuming process, but I found the time passed more quickly if I listened to code practice. Nothing like multi-tasking to make the time fly!

April Reader Survey—QRP

A monthly feature in *CQ* is the Reader Survey, wherein the editorial staff asks a series of questions aimed at learning more about our readers and, hopefully, improving the focus of the magazine. The subject of the April survey was QRP, and I found the results to be illuminating, if not downright profound.

This survey is voluntary, and of course not a statistical cross-section of the whole ham spectrum, so you'd expect that the ones who responded have at least a passing interest in low-power operating. Their attitude toward QRP operating bears this out, with the answers "I enjoy it when I do it" and "Love it" comprising 75% of the responses. "Great for Others" scored

10%; "Life's Too Short" came in at 9%; and "Hadn't thought about it" rounded out the responses with 7%.

The responses to the "Time devoted to QRP operating" question were skewed by the 19% who answered "Don't operate QRP at all," so I tossed out the non-QRPs and rearranged the numbers. The biggest response was in the 1-25% group, with 43% of QRPs responding. If you then add the 26-50%

group (13%), the conclusion indicated is that a majority of QRPs spend less than half of their time operating QRP. Which means that half the time they are doing something else, from which it follows that they do have a variety of interests in the radio world. Psychiatrists would probably say that this indicates a healthy state of mind, unlike the 18% of respondents (myself included) who operate 100% of their time at QRP lev-

els. At least we're not irradiating our brains with dangerously high levels of RF, though.

The answers to the question about what modes are most often used are not surprising, with 61% of respondents using CW, followed by 32% for SSB, 16% Digital, 14% FM, and 2% Other. If the survey were to be run again in a couple of years, it wouldn't surprise me if the results showed an increase in the use of digital modes. Newer modes such as PSK, WSPR, and JT65 work quite well at QRP levels.

"Where" you operate QRP is pretty much what you would expect: 68% of respondents said Home, followed by 27% for Remote/Off Grid, 21% for Vacation Home/Hotel, 20% for Car/Truck, 6% for Other, and 2% for Boat/Plane.

The last two questions were about the equipment we use. In the "Antenna" category, the home antenna was mentioned 61% of the time, a likely answer in that we operate from home most of the time per the answer to the "Where" question above. This was followed by portable homebrewed at 38% and portable purchased at 26%. Finally, 20% of respondents say they use a mobile antenna, which is notable because I've often heard it said that one can't operate mobile with anything less than 100 watts. 20% of the respondents would disagree.

Regarding what rigs we use, commercial QRP rigs edge out QRP kits 36% to 34%, meaning that we buy and build a kit almost as often as we buy a factory-built rig. 21% say they use the "Big Rig" by turning down the power. Way down the list is Scratch Built at 5%. I'll have to admit that I last scratch built a rig about two years ago. It's getting harder to scratch build with through-hole parts becoming scarcer and so many more designs using surface mount parts and on-board processors. It appears that QRPs still have a desire to build their rigs and kits are fulfilling that need.

Thanks to the editorial staff here at CQ for running the monthly Reader Survey. From the 2012 April survey I feel like I have a more-focused picture of who we QRPs really are.

Signing Off

As I'm writing these words, Field Day plans are coming into focus and gear is being retrieved from storage in anticipation of another good weekend in the woods. As you're reading this, FD'12 is history. I hope you had as great a time as I hope to! 72/73, Cam, N6GA



*Were you first licensed
25 years ago
and licensed today?*

**Then you should join the
Quarter Century
Wireless Association, Inc.**

The Quarter Century Wireless Association, Inc., celebrates Amateur Radio operators achieving 25 years in Amateur Radio and develops resources to assist young Amateur Radio operators in furthering their education through the QCWA Scholarship Program.

To Join or Renew, Visit:

<http://www.qcwa.org/join-renew.php>

**For more information please contact
om@qcwa.org**

Maritime radio evolved alongside amateur radio, sometimes involving the same cast of characters. Marine radio historian (and former ship's radio officer) N1EA takes a look at a history of ship-to-shore radio penned by another radio officer/ham.

CQ Book Review:

Radio History - Ship Shore

by Spurgeon G. Roscoe, VE1BC, former Radio Officer, VCS and other stations and ships

REVIEWED BY DAVID J. RING, JR., * N1EA

From flags and pennants to Morse code and complex telecommunications, "Radio History: Ship Shore" is a treatise on the navigational aids vessels have used over the centuries. Author Spurgeon "Spud" G. Roscoe takes the reader on a journey through the evolution of communication systems globally, from the days of Columbus to modern times.

Roscoe also mines his first-hand experience as a radio officer who sailed on a dozen ships, including a reproduction of the ill-fated HMS Bounty. Now in his eighties, he has been meticulously collecting the content for "Radio History: Ship Shore" for more than five decades. The result is a hefty tome in which Roscoe shares his encyclopedic knowledge and unyielding fascination with communications systems.

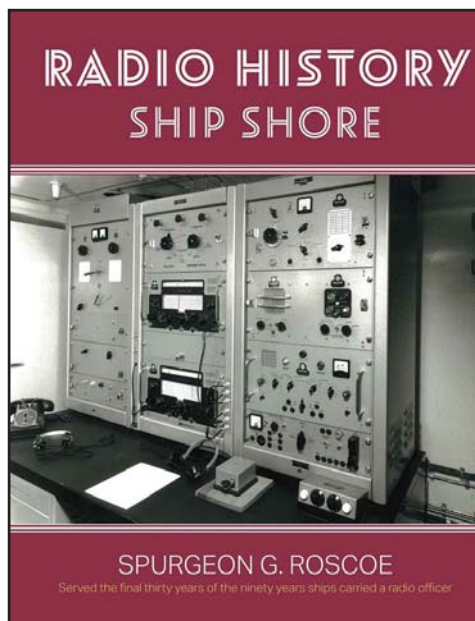
The book includes all the vessels in the Royal Canadian Mounted Police marine section (and, later, marine division), the Royal Canadian Air Force marine squadrons, the Royal Canadian Navy, the Canadian Government Merchant Marine, and the Canadian Coast Guard, including the weather ships and icebreakers.

"Radio History: Ship Shore" is complemented by a wealth of historic photos of everything from warships to Canada's famous Bluenose schooner.

Spurgeon G. Roscoe has been fascinated with living the life of a radio operator since the age of seventeen. In fact, he became so enthralled with his work that, one year, he was at home for only six weeks. Although he officially retired years ago, Roscoe's interest in the navigational aids and communications systems used by ships has never waned. He belongs to a number of organizations, including the Halifax Amateur Radio Club, American Radio Relay League, Radio Amateurs of Canada, the Nova Scotia Lighthouse Preservation Society, and the California Historical Radio Society. Spurgeon G. Roscoe lives with Joan, his beloved wife of 61 years, in Halifax, Nova Scotia.

I highly recommend this book to anyone with an interest in the history of radio on the high seas. It's available from Amazon at <<https://amzn.to/3BTPNNO>>.

* E-mail: <n1ea@arrl.net>



From **MILLIWATTS**
To **KILOWATTS**
More Watts per Dollar
**Transmitting &
Audio Tubes**



**COMMUNICATIONS
BROADCAST
INDUSTRY
AMATEUR**

Immediate Shipment from Stock



3CPX800A7	4CX1000A	810
3CPX1500A7	4CX1500B	811A
3CX400A7	4CX3500A	812A
3CX800A7	4CX5000A	833A
3CX1200A7	4CX7500A	833C
3CX1200D7	4CX10000A	845
3CX1200Z7	4CX15000A	6146B
3CX1500A7	4CX20000B	3-500ZG
3CX3000A7	4CX20000C	3-1000Z
3CX6000A7	4CX20000D	4-400A
3CX10000A7	4X150A	4-1000A
3CX15000A7	572B	4PR400A
3CX20000A7	805	4PR1000A
4CX250B	807	...and more!

Se Habla Español • We Export

Phone: **760-744-0700**

Toll-Free: **800-737-2787**
(Orders only) **800-RF PARTS**

Website: **www.rfparts.com**

Fax: **760-744-1943**
888-744-1943

Email: **rfp@rfparts.com**



After an absence of four years, the 1A prefix returned to the air in July 2023, thanks to a DXpedition to the heart of Rome, or better yet, to the heart of the Order of Malta, one of the most requested, mysterious and fascinating DX entities in the world.

DXpedition to the Heart of Rome

1A0C Sovereign Military Order of Malta - Where Extraterritoriality Makes the Difference

BY NICOLA BURDIAT,* IU0NIC



Photo A. Blessed Fra' Gerard, founder and first Master of the Order (Photos courtesy of the Sovereign Military Order of Malta, except as noted)



Photo B. The journey of the Order from Jerusalem to Rome

For a week this past summer, hams around the world were treated to the first operation in four years from the Sovereign Military Order of Malta, an extraterritorial entity headquartered in the heart of Rome that has its own place on the ARRL DXCC list. An international team of 15 amateurs operated 1A0C for eight days in late July and early August, making nearly 80,000 contacts and helping to raise funds for the Order's worldwide relief efforts.

While many amateurs are familiar with "SMOM" as a DX entity, far fewer know much about its nearly thousand-year history or its humanitarian mission. So let's start there...

The Order of Malta

The Sovereign Military Hospitaller Order of St. John of Jerusalem, of Rhodes and of Malta (this is the complete name of the Order, also known as SMOM) is one of the oldest institutions of Western and Christian civilization. It was founded in 1048, when a group of merchants from the maritime republic of Amalfi, in southern Italy, obtained authorization from the Caliph of Egypt to build in Jerusalem a church, convent and hospital named after St. John the Baptist to assist pilgrims and, later, all those in need, regardless of their origin or religion.

* E-mail: <nicola.burdiat.iu0nic@gmail.com>

It was under the leadership of Blessed Fra' Gerard, founder and first Master (Photo A), that the religious community became a lay religious order of the Catholic Church. Thanks to the bull of February 15, 1113, Pope Paschal II recognised the Order of St. John, placing it under the protection of the church and granting it the right to freely elect its superiors, without interference from other lay or religious authorities, thus creating a sovereign entity, subject only to the Holy See.

After the loss of the Holy Land in 1291, the Order of St. John moved its seat and hospital to Limassol on the island of Cyprus, acquiring more possessions on the shores of the Mediterranean Sea (Photo B shows the Order's travels from Jerusalem to Rome over a period of more than 500 years). In 1307, the knights of the Order landed on Rhodes, where they transferred their seat in 1310. At that time, the defense of Christendom required a naval force, so the Order navigated the eastern Mediterranean with its powerful fleet, thanks to its independence from other nations, with the right to maintain and deploy armed forces and to appoint ambassadors.

In 1523, after six months of siege and fierce combat against the fleet and army of Sultan Suleiman the Magnificent, the knights were forced to surrender and left Rhodes with military honors. Seven years later, in 1530, an order by Emperor Charles V with approval of Pope Clement VII granted the



Photo C. Aerial view of Magistral Villa on the Aventino Hill (Photo by IK5RUN)



Photo D. Magistral Villa is an extraterritorial seat



Photo E. The "buco della serratura," or keyhole, with a spectacular view of St. Peter's Basilica

Order of St. John the possession of the Maltese islands. Since then, the Order has been known as the Order of Malta and its members as the Knights of Malta.

The Order's fleet joined the Holy League, set up by Pope Pius V to prevent the advance of the Ottoman Empire and, on 7 October 1571, it contributed to the victory of the Christian fleet in the battle of Lepanto, that marked the turning point of Ottoman expansion in Europe. The Order of Malta became the most important fleet in the Mediterranean Sea and its naval school was famous and trained numerous French and other European naval officers.

Unfortunately, its strategic position in the Mediterranean led Napoleon Bonaparte to occupy Malta during his Egyptian campaign of 1798. The knights were forced to leave the island, also because the Order's code prohibited them from raising arms against other Christian nations. The Treaty of Amiens, signed in 1802, confirming the Order's sovereign rights over the island of Malta, was never applied and the Order's government had to face one of the most dramatic historic and political moments of its long existence.

In 1834, the Order finally settled in Rome in the then Pontifical State (Photo C), where it was able to focus on its original charter of assistance to the poor and the sick. During the 19th and 20th centuries, the Order thoroughly updated its statutes, Constitutional Charter and Code. The first National Associations (the German one in 1859, followed in 1875 by the British one and in 1877 by the Italian one) were created.

In the second half of the 19th century, the Order's original mission of medical and social assistance again became its main focus, intensifying during the last century thanks to the work of the Grand Priorities and National Associations in many countries worldwide. Large-scale medical and charitable works were carried out during World Wars I and II. In the second half of the 20th century, the Order's activities grew until they reached the furthestmost regions of the world.

Today, the Order of Malta is active in 120 countries, caring for people in need through its medical, social and humanitarian works, providing a constant support for forgotten or excluded members of society. It is especially involved in helping people living in the midst of armed conflicts and natural

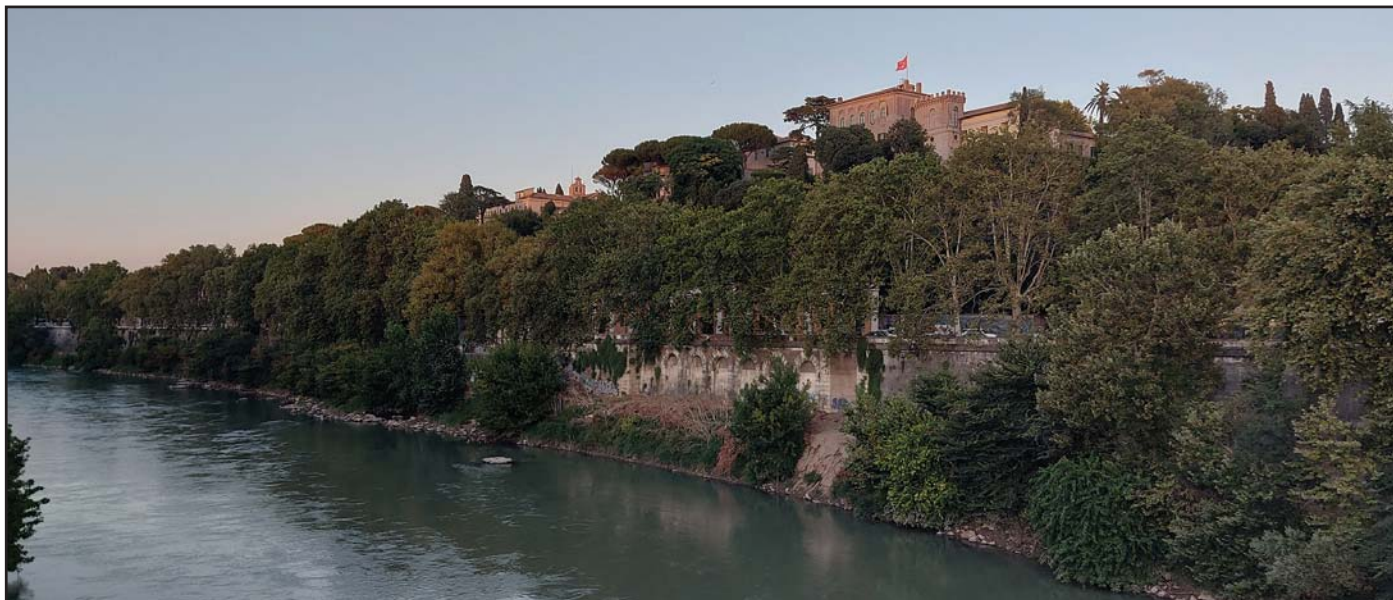


Photo F. The Magistral Villa on the Aventino Hill, seen from the Tevere (Tiber) River (Photo by EA5C)

disasters by providing medical assistance, caring for refugees, and distributing medicine and basic equipment for survival. Across the world, the Order of Malta is dedicated to the preservation of human dignity and the care of all those in need, regardless of their origin or religion. It is made up of more than 13,500 Knights, Dames and Chaplains. Next to them stand 95,000 permanent volunteers and 52,000 employees, most of them medical personnel.

The Sovereign Military Order of Malta has diplomatic relations with 112 states and the European Union, and permanent observer status at the United Nations. It operates through 11 Priories, 48 National Associations, 133 diplomatic

missions, 1 worldwide relief agency and 33 national volunteer corps, as well as numerous hospitals, medical centres and specialist foundations. It does not pursue any economic or political goal and, now as 900-plus years ago, does not depend on any other state or government.

Full Sovereignty and Amateur Radio

Recognized as a sovereign entity by 112 states, the European Union and many international organizations, the Order of Malta has its seat of government in Rome, where it is guaranteed full extraterritorial rights by the Italian government (Photo D).



Photo G. The 1A0C 2023 Team (Photo by EA5Z)



Photo H. Giorgio, IZ4AKS, in action (Photo by F2JD)



Photo I. Author Nicola Burdiat, IU0NIC, who is also the Order's Post and Philately Director, on the air from 1A0C. (Photo by IZ4AKS)

The extraterritorial seat of the order is composed by two different buildings: the Magistral Palace, situated in the heart of Rome's historical center, on Via dei Condotti, home of the Grand Master, seat of all the government's bodies and headquarters of the Grand Magistry's administration; and the Magistral Villa on Aventino Hill, seat of the Grand Priory of Rome and the Embassy of the Order to the Italian Republic, famous for its marvelous gardens (where the Grand Master receives heads of state and representatives of governments) and for its "buco della serratura," a keyhole framing the dome of St. Peter's Basilica (more on this below and in Photo E).

Thanks to its extraterritorial status, the Order of Malta, as a sovereign authority, has the right to run its own Amateur Radio Service. To understand how the Order's ham radio was born and how it works, it is necessary to start by saying that it is completely functional to the achievement of the Order's high purposes (i.e., providing assistance to those in need). Since the Order, strictly speaking, has no population, except the Grand Master and a few Professed Knights who permanently live in the Magistral Palace, there is no need for private amateur stations. Members of the Order throughout the world use their own national call signs, according to the regulations of the country in which they live or operate.

The need for a unique call sign of the Order of Malta first came in late November 1980, when a group of volunteers of the Order operated an extraordinary ham radio station after the devastating earthquake that caused more than 2,900 deaths and 280,000 displaced people in southern Italy. The station having been operated from the extraterritorial seat of Magistral Villa on



Photo J. The 5-band Spiderbeam Yagi on the terrace of Magistral Villa (Photo by IZ4AKS)

Aventino Hill (Photo F), the group of radio hams, with the permission of the Order's authorities, started using the unique 1A prefix. The 1A0KM station (in which KM stands for "Knights of Malta") relayed thousands of messages from people hit by the earthquake to relatives and friends in Italy and abroad, in addition to those sent to the Order's relief corps operating in the devastated area.

After the emergency was over, the team kept operating 1A0KM, to let the ham radio community throughout the world know the existence of the Sovereign Military Order of Malta and its Radio Service.

The next step was the official inclusion of the Order in the DXCC list of the ARRL. A first positive opinion was adopted by majority by the DX Advisory

Committee, but not all members of the committee were convinced by the status of the Order (then, as now, the United States had no diplomatic relationship with the Order of Malta). Thankfully, further examination of the huge amount of legal documentation provided by the radio team of the Order (mostly composed by lawyers) and a visit to Rome by the DXAC Chairman led to a positive response. On September 29, 1981, the ARRL announced that the Sovereign Military Order of Malta was finally added to the DXCC List. Since then, a very limited number of ham radio stations with 1A prefix have been activated at the extraterritorial seat of Magistral Villa in Rome.

It is important to note that only institutional stations (i.e., stations activated



Photo K. A vertical antenna in the gardens of Magistral Villa (Photo by EA5C)



Photo L. Cross Yagi antennas for satellite contacts (Photo by F2JD)

under the authority of one of the Order's entities) have been authorized by the Grand Magistry of the Order in recent times. Namely, all these ham radio stations are linked to the Italian Relief Corps of the Order of Malta (CISOM), under the supervision of radio amateur members of the Order and with the primary aim of raising funds for specific projects.

In 2007, a DXpedition worked with call sign 1A4A, raising funds for the School of Rumbek in South Sudan. Both the 2012 and the 2014 DXpeditions raised funds for the CISOM assistance to refugees in the Mediterranean Sea, running the 1A0C station. The last activation from the Order of Malta in 2019, again with call sign 1A0C, allowed CISOM to buy radio equipment for emergency use.

The 2023 1A0C DXpedition

After the Covid-19 hurricane, which kept us from celebrating the 40th anniversary of both the first activation of a 1A station and the recognition by the ARRL as a new country, the CISOM ham radio team planned a new DXpedition to take place in 2023.

Rome is definitely a very easy city to reach, but it is not so easy to obtain all the necessary permissions to use the Magistral Villa for a couple of weeks, even for an institution belonging to the Order of Malta itself. The Villa is an important institutional venue, with many official events planned every week, most of them with the Grand Master's presence. Thus, CISOM was allowed to operate its ham radio station from July 26 to August 2, during the less busy summer season. We hoped that this week would coincide with a period of very good propagation!

The 1A0C team leader, Antonio Gonzales, EA5RM, planned all the organizational details with CISOM. This meant that, first of all, a project to be financed with the proceeds of the DXpedition had to be found. Since the Italian region of Emilia-Romagna was hit in May 2023 by a severe flood, with many victims, people forced to leave their homes and very bad damage to infrastructure, it was decided to donate all the proceeds to a reconstruction project in that area. By the way, the radio equipment bought with the proceeds of the 2019 DXpedition was used by CISOM during the 2023 emergency in Emilia-Romagna.

CISOM also provided lodging for members of the 1A0C team at its dormitory located within the Magistral Villa area. A good chance to sleep in an extraterritorial zone! Meals would come from the many "trattorie" around Aventino Hill. A good chance to enjoy typical Roman food!

The team was made up of 15 expert ham operators from many countries (Photo G), able to ensure top performance to the DXpedition, working as many stations as possible (as we all know how important it is for a DXer to log such a prestigious prefix). The team included: Fernando Conde, EA5C; Eugene Mosiychuk, EA5EL; Raul Blasco, EA5KA; Javier Dominguez Ferrer, EA5KM; Antonio Gonzales, EA5RM (Team Leader); Angel Turpin Guillamon, EA5Z; Arturo Rivera Gallardo, EA7KE; Jose Ramon Hierro Peris, EA7X; Gerard Jacot, F2JD; Simone Sarti, IK5RUN; Fabrizio Vedovelli, IN3ZNR; Nicola Burdiat, IU0NIC (Photo H); Giorgio Minguzzi, IZ4AKS (Photo I); Junichi Tanaka, JH4RHF, and Dmitry Zhikharev, RA9USU.

The team members, coming by car, train or plane, met in Rome on July 25 and immediately started raising the first nine antennas on the grounds and roof of the Magistral Villa: a 5-band Spiderbeam Yagi (Photo J), a 5-element 6-meter Yagi, three monoband verticals with elevated radials for 30, 40 and 80 meters (Photo K), a 60-meter inverted V and, for satellite, a Wimo cross Yagi 432 2x10 elements, a Wimo cross Yagi

Photo M. The radio station inside the Coffee House
(Photo by EA5Z)



Photo N. The Receiver of the Common Treasure of the Order of Malta, Fabrizio Colonna, sending a message to all radio hams listening (Photo by EA7X)

144 2x7 elements (Photo L) and a 100-centimeter dish plus homemade helix for QO-100. An additional inverted V antenna for 160 meters was raised on July 29, because of the high demand for this band.

A total of ten antennas were thus raised, and this was a record, because of the size of the Magistral Villa area. All operations were even more difficult because of the need to avoid discomfort to the many tourists standing at the famous keyhole of the Villa. From the monumental portal of Magistral Villa, you can enjoy one of the most intriguing views of the dome of St. Peter's Basilica: Framed by a thick laurel hedge, it gives the illusion of being larger and, therefore, closer through the keyhole. Some of the antennas on the ground of the panoramic terrace of the Villa had to be raised in such a way not

to interfere with the trajectory of the view seen from the keyhole!

An Outstanding Achievement

The team decided to be active from 6 to 80 meters (including WARC bands) on CW, SSB, RTTY and FT8 with at least three stations on the air simultaneously on different bands and modes. As noted above, the 160-meter band was eventually added as well. The station was also active on LEO (low Earth orbit) and QO-100 satellites (QO-100 is the first and so far only geostationary amateur satellite, covering much of the Eastern Hemisphere and some of South America. – ed.).

Operating from 10:24 UTC Wednesday July 26, to 07:15 UTC Wednesday August 2 (Photo M), the 1A0C 2023 station reached the record result of 79,959 QSOs, working 20,599

different stations in 157 DX entities, mostly in the United States (12,004 QSOs) and Japan (5,532 QSOs). It was an outstanding achievement, with demand increased by the lengthy inactivity of the 1A prefix.

The operation was a great satisfaction for the entire team, which also received a special visit on the second day of the DXpedition. The Receiver of the Common Treasure (i.e., the Minister of Finance of the Order, also responsible for the telecommunication sector), His Excellency Fabrizio Colonna dei Principi di Paliano, accompanied by the Post and Philately Director of the Order of Malta, Nicola Burdiat, IUONIC, visited the 1A0C station and transmitted a special announcement to all radio hams listening (Photo N). Introduced by Giorgio Minguzzi, IZ4AKS, Colonna said:

First of all, good morning and thank you all for your work, for what you do. This is not just a hobby or a sport, it is an activity which is supporting a lot of other activities throughout the world. It is an activity which is saving lives throughout the world. For us, it is supporting our works, our mission, which is to help the sick, and the poor and the refugees. So we will continue in improving this activity in time being and we will certainly need your competence, your help, your support, your knowledge, your assistance, your suggestions on what we want to achieve. First of all, in order to improve the message of peace coming from the Holy Father which we try to deliver through our works and through our mission. Thank you all, thank you!

A meaningful message, able to summarize the nine-century-old work of the Order of Malta at the service of all those who are in need.

SMOM Ham Radio Postage Stamps



Photo O. As a sovereign entity, the Order of Malta operates its own postal service



Photo Q. A special postmark was put into use on July 27, 2023, to celebrate the 1A0C DXpedition

Just like all the sovereign entities of the world, the Order of Malta runs its own postal service and issues its own postage stamps. Since 1966, "Poste Magistrali" (Photo O) is the postal operator of the Sovereign Military Order of Malta, designated for the collection and dispatch of correspondence originating within the extraterritorial seats of the Order (the Magistral Palace and the Magistral Villa in Rome). It is currently possible to send mail franked with stamps issued by the Order of Malta to Italy and other 57 countries with which the Order has concluded bilateral postal agreements.

The postage stamps and stationery issued by Poste Magistrali have always stood out because of their topical content and image, closely linked to the Order of Malta.

On July 23, 2023, the Order paid tribute to its radio amateurs with a set of four stamps depicting different historical and operational contexts related to ham radio communications within the Sovereign Military Order of Malta (Photo P). The first stamp depicts Guglielmo Marconi wearing the insignia of the Order of Malta: he was indeed a Knight of Malta!

In addition to the set of stamps, a special postmark was put into use on July 27 to celebrate the 1A0C 2023 DXpedition (Photo Q). All the mail posted at Magistral Palace received this special cancellation and a special souvenir card was produced for philatelic collectors. Stamps and souvenir cards are available until exhaustion of stock directly from the postal administration of the Sovereign Military Order of Malta. For more info, visit <<https://postemagistrali.orderofmalta.int/en/>>.



Photo P. On September 22, 2023, the Order of Malta issued a set of four stamps dedicated to its Amateur Radio Service. One of the stamps is dedicated to Guglielmo Marconi, who was a Knight of the Order.

ADVANCED SPECIALTIES INC.

Orders/Quotes 1-800-926-9HAM

www.advancedspecialties.net

BIG ONLINE CATALOG



VX-6R
Tri-Band
Submersible
Hand Held



FTM-300DR
Dual-Band Digital

AMATEUR RADIO EQUIPMENT &
ACCESSORIES • SCANNERS
ANLI • COMET • UNIDEN • YAESU

(201)-VHF-2067

114 Essex Street, Lodi, NJ 07644



Closed Sunday & Monday



HamCall™
US and International
Callsign Database

The most current and complete
source for over 2.5 million callsigns!

Available on DVD
(\$50), USB (\$54), and Download (\$45).

BUCKMASTER
INTERNATIONAL, LLC

HamCall.net 540-894-0907



HamTestOnline™ students are
50 times more likely to give us
5 stars than request a refund
because they failed an exam!

eHam.net reviews

★★★★★ 1040

5.0 out of 5 stars

5 star	1015
4 star	20
3 star	3
2 star	1
1 star	1

Best study method, study materials, customer
support, and guarantee in the industry!

www.hamtestonline.com

Amateur radio and astronomy share many common elements and WØRW, an amateur astronomer as well as an amateur radio operator, does his best to bring the best of both together.

At the Intersection of Astronomy and Amateur Radio

BY PAUL SIGNORELLI,* WØRW

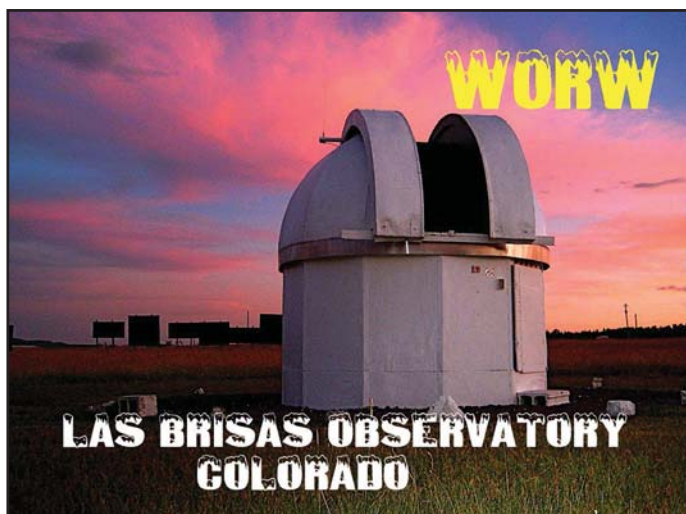


Photo A. WØRW is as serious about astronomy as he is about ham radio. This is his personal observatory, which also makes a great spot for low-noise hamming when it's cloudy!

Both hobbies, astronomy and amateur radio, have unique and separate paths, yet they meet at a confluence. Short version: When the bands are dead and sky is clear, do astronomy; when the sky is cloudy, do radio.

My astronomy observing location (Photo A) is in a remote dark location which is also away from all power line noises that limit weak signal reception. That also makes it a great radio location. If I am waiting for the skies to clear or the Moon to set, I turn on my radio and check the band conditions. If I get a good astrophotography night, I get a nice star or comet picture (Photos B and C); if I get some radio DX, I get a cool QSL card (Photos D and E).

Most of my star pictures were taken with a Celestron C14 telescope or an 8-inch Schmidt camera. The radio equipment has been a DX60/75A4, TS440, or a PRC319 using a vertical antenna.

Advance Planning Needed

You don't need your own observatory ... a telescope and a dark sky will do ... but getting ready for these activities requires some planning and prediction of conditions. The prediction of good sky conditions is pretty accurate by using the "Clear Sky Clock." It is available for all parts of the USA.

* E-mail: <w0rw1@msn.com>

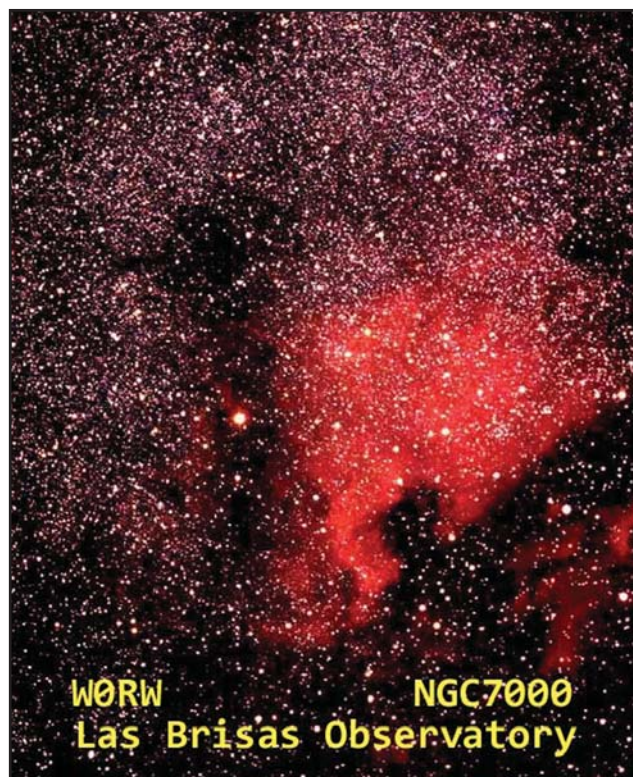


Photo B. On a clear night, Paul can get some great star photos ... which can also make very cool QSL cards!

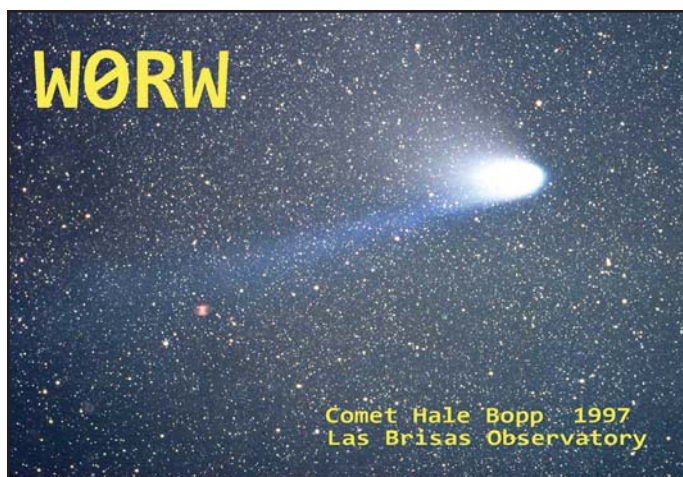


Photo C. Comet photos are among the most striking.

My chart is at <<https://tinyurl.com/y54ksywz>>. From that site, you can find a chart near you or search for “Clear Sky Clock” plus your city. So before you get your telescope out and set it up, you will know when the sky will be clear.

The prediction of good radio conditions is not that simple but there are a lot of resources. You can watch the DX Cluster <<https://dxheat.com/dxc/>> and see what DX signals are being heard. The Reverse Beacon Network (<<http://reversebeacon.net>>) and WSPRNet (<www.wsprnet.org>) can also be very helpful. Radio DX is worldwide; astronomy DX is measured in light-years and is always on the air.

If bad conditions shut everything down, it is time for pizza!

behind the bylines...

... a little bit about some of the authors whose articles appear in this issue.

Abby Kimi Matsuyoshi, KK7CFJ (co-author, “Youth On the Air Camp in the Americas,” p. 8), hails from Arizona and has been a ham since November 2021 after being introduced to the hobby by a local ham. She is passionate about amateur radio, finding herself exploring the many facets of it such as CW and kit building. Outside of ham radio, she is a student pilot and full-time staff assistant for a local office.

Jack Roberts, W9RFT (co-author, “Youth On the Air Camp in the Americas,” p. 8), has been a ham since January 2020. After a slow start, Jack is beginning to branch out into the broad world of radio and finds himself learning new things about it every day. He currently serves as a PR specialist and the Assistant Webmaster for Youth on the Air. Outside of ham radio, he is a freshman at Indiana University-Purdue University Indianapolis, studying cybersecurity.

Mike Malloy, WD5GYG (“The Radio Room of the Kon Tiki Expedition,” p. 20), first read about Thor Heyerdahl’s adventure as a 12-year-old in the 1960s. He re-read it more recently with a more critical eye, after being a ham for 46 years and working as a marine electronic technician and merchant marine radio officer. He followed up with additional research to produce this article. Mike lives in Corpus Christi, Texas.

Nicola Burdiat, IU0NIC (“DXpedition to the Heart of Rome,” p. 32), is a member of the Sovereign Military Order of Malta and serves as the storied entity’s Post and Philately Director. As such, he was responsible for the issuance of the special postage stamps honoring amateur radio and the commemorative postmark used during this year’s 1AOC expedition.

Bob Hopkins, WB2UDC (“Radio Renaissance: A Retirement Story,” p. 43), is a recently retired professor of computer science and technology director at a major New York City university. His first article for CQ, “The Nine-Minute QSO – Ham Radio Brings Space Down to Earth,” published 20 years ago, began a long and delightful relationship with our readership and a great friendship with your editor.

Hy Chantz, W2HY (“‘Museum Quality’ – A Visit to the Orkney Wireless Museum, GB2OWM,” p. 54), passed his Advanced Class license exam in November, 1968, on the first day of “incentive licensing,” and was originally issued the call sign WB2HYW. He lives in Scarsdale, New York and is a member of the Yonkers Amateur Radio Club.



Photo D. Two of the QSL cards received for contacts made from the observatory.



Photo E. High-flying QSO ... AP2FLY is a pilot, which puts him just a little bit closer to the stars than W0RW's telescope!



analog adventures

BY ERIC P. NICHOLS,* KL7AJ

Analog Computing



Photo A. Eric's excellent collection of "analog computers," commonly known back in the day as slide rules.

When I was attending El Camino College, all the engineering majors were required to take a one-semester class in slide rule. The spring semester of 1972 was the first year they allowed calculators in math classes, and our slide rule instructor, whose name I regretfully have forgotten, was not particularly amused. He said "a calculator is a machine that will give you the wrong answer to fifteen decimal places." That was a pretty insightful statement, and one that I've never forgotten.

My dad made me learn how to use a slide rule at the tender age of nine, when he had me figuring out all the gas mileages for our two gas guzzlers. It was cruel and unusual punishment, but I somehow managed to survive the ordeal, and it certainly helped me understand some crucial math concepts, some of which can be learned in no better way than slipping and sliding with the slip-stick.

As you can see in Photo A, I have a fair-sized collection of slide rules, but nothing to compare with that of Bill Beam, NL7F, who also has a vast collection of mechanical clocks of every sort (another great way to learn some physics).

For those not familiar with slide rules, they all perform their magic by the addition and subtraction of logarithms...just as an electrical analog computer does. Every known arithmetic function can be performed by the judicious use of logarithms and antilogarithms.

All of the slide rules shown, except for the Pickett Electrolog, third from the left, and an 'el cheapo' to its immediate right, were my dad's. He attended Rensselaer Polytechnic Institute (RPI) for his mechanical engineering studies, and ended up designing helicopters for Hiller Helicopters, in Palo Alto, California, where he earned several patents. (Many folks don't realize that Silicon Valley was an aeronautics hub long before it was an electronics hub.) The Pickett Electrolog was geared specifically for electrical engineering, and has a lot of additional scales besides the traditional "log-log decitrig" scales used by engineers all around the planet for decades. By the way, the higher quality slide rules were constructed of ivory laminated on bamboo. Nobody knows how many elephants were sacrificed in the name of engineering education and practice.

Specialized Slide Rules

In addition to "real" slide rules, numerous companies had specialized slide rules geared to their specific products, as shown in Photo B.

These "giveaway" slide rules are exceptionally useful; a transmission line calculator, shielding calculator, motor sizing calculator, antenna gain calculator, ferrite core calculator, and even a circular cropdusting calculator are represented.

Now, let us revisit the "normal" slide rule for a moment. One of the things a slide rule does is force you to make reasonable estimations. Whereas a calculator's "wrong answer to fifteen decimal places" can cause you to "strain at a gnat

*3763 Lyle Avenue, North Pole, AK 99705
email: <kl7aj@cq-amateur-radio.com>

and swallow a camel,” a slide rule’s inherent imprecision nudges you toward the correct answer, even if slightly less precise. I mentioned a while back that when I teach electronics, some student will invariably ask something like, “Should we use 3.14159 for pi, or 3.1416?” I always answer, “How about 3.1?” I explain that resistor color codes only have two significant digits, so why would we use five or six significant digits for formulas using pi? A little consistency with respect to precision is in order. A slide rule will always give you two significant digits, and sometimes three, but in either case, it’s more than adequate for 95% of all we do in radio calculations. (Frequency determining components need a bit more precision, of course, but most radios will WORK with two significant digits of precision in the components from which they’re constructed...or 20% tolerance, whichever comes first!)

The slide rule reminds us that radio by its very nature is an analog phenomenon (as are most other physical phenomena). To be fair, on a minuscule level, we do have “digital” things like photons and other particles, but we don’t normally think on a “photonic” level in radio. Our radio signals involve massive mobs of particles, the collective behavior of which is very strongly analog.

For those of you whippersnappers who have no clue how to use a slide rule, here is a great tutorial, along with the justifi-



EVERYTHING YOU EVER WANTED IN AN ANTENNA TUNER

- 1.8-54 MHZ • 1-125 WATTS
- Works with ALL Modern Radios
- Includes Interface Cables

2 Year Warranty

WWW.LDGELECTRONICS.COM

410-586-2177



TUNE SWR STATUS

LDG Z-100A

Z-100A

cation of *why* it works, by Professor Peter Alfeld of the University of Utah: <<https://tinyurl.com/yc67zmrs>>.

Now, while it’s probably true that nothing short of the Zombie Apocalypse will make the use of a slide rule *necessary*, it’s certainly an educational thing to know, and a great deal of fun. On a similar note, it’s gratifying to know that the U.S. Army is teaching orienteering again, using analog compasses. It’s probably far more likely that the GPS

system will fail than for every calculator to suddenly drop dead. But it doesn’t hurt to be prepared for any scenario.

I’m curious as to how many fellow Analog Adventurers have some slide rules they’d like to show off. I’ll be happy to share them in a future episode.

Coming up next time, we’re going to take another look at instrumentation and measurement. Until then, keep those soldering irons hot and shiny!

73, Eric



Photo B. Examples of specialized slide rules geared to various companies’ specific products. These were usually giveaways.

Used to Be...

Lately, I have been thinking (very dangerous territory) about the “good old days” of DXing. I got my license (WB2RJJ) in 1965 and was almost immediately immersed in the world of chasing DX. Back then, chasing DX was just a little bit different than today. Not better. Not worse. Just different. It was common to tune the bands for stations either calling CQ or running a pileup. I always tell the story about two “happen chance” DX contacts that I made back then.

While tuning around on 20-meter CW one night at 0130 UTC (8:30 PM EST) with my old HT-37 transmitter and Hammarlund HQ110AC receiver, I came across VU2DIA calling CQ. I thought “INDIA!” I’d never worked India! I answered his CQ and he came right back, giving me a 349 report. I was truly excited that I worked my first INDIA station! 100 watts! I’m not sure which antenna I was using then, I think it was probably a Gotham (aluminum spreader) quad. But that worked too poorly, so it could have been the replacement W2AU quad which I put up at one point. Not sure. Regardless, I thought I’d worked my first station in India! Wow! I was truly excited! I immediately mailed my QSL to him with an IRC. Some months later I received my VU2DIA QSL card in the mail. (see Photo A). Hold on I thought! Didn’t I see Andamans on my ARRL DXCC list? Yup, there it was! Andamans! I worked the Andaman Islands! Then I looked at the map and was even more surprised to see just how far away Andaman was from me! Incredible! So, I asked my DX chasing buddy Steve (then WB2VFT, now KZ2I) about the Andamans and he said something like “YOU worked Andaman? That’s one of the rarest ones around!”. Yes, back then I believed that the only ham on Andaman was Hegde, VU2DIA. As I understand it, he was really VU2DI but when he was in the Andamans, he had to add the “A” onto the end of his call. Photo B shows the VU2DIA QSL card for W3EJF that shows the “A” added with a pen. Again, Andamans was EXTREMELY rare back in 1967. I believe that India did not

allow any “portable” activity back then. So, it was not possible for anyone, not even a ham in India, to travel to Andaman and activate it for a DXpedition, or for any temporary time-frame. It had to be a resident who could get permission somehow. Guest operators were similarly forbidden to operate in India, including Andamans and Laccadives (now called Lakshadweep), as I recall. Apparently, Hegde was a resident and not a visitor and was probably the last ham on Andaman for a VERY

long time before more recent operations were allowed. It took me another 41 years to work another Andamans station (VU4MY in 2008).

But what about INDIA? I still needed India for my DXCC! After hunting for 7 more months, I finally worked my first INDIA station, which was Bala, VU2LE, on 20-meter CW, receiving a report of 559. (See Photo C).

Moving forward to 1968... By this time, for some reason I decided to buy a Heathkit HW-32 transceiver which

The WPX Program

CW
4093.....AE3J
4094.....WØGN

SSB
4500.....I2OLV
4501.....W1MKC
4502.....WØGN

Mixed
4651.....I6JOW
4652.....HB9HZC
4653.....DL6ED
4654.....DL1KJ
4655.....JS6UAK
4656.....VC7BEPIS
4657.....W8IJN
4658.....VE4ZIM
4659.....W1MKC
4660.....VE9EX
4661.....KQ4CQA
4662.....N6ACA

Digital
1974.....HB9HZC
1975.....DS4OMS
1976.....KQ4BBC
1977.....JS6UAK
1978.....KC3WDW
1979.....VC7BEPIS
1980.....VE4ZIM
1981.....W1KMC
1982.....SP9IZV
1983.....W8MEJ
1984.....JF1TFC
1985.....JK1OGT
1986.....N6ACA
1987.....AA4PB
1988.....WØGN

CW: 350: AE3J. 450: AA8SW. 1200: WØGN.
1400: WS9V

SSB: 350: DL1KJ. 400: W1MKC. 450: N5JED, W3RFX. 500: WØLMU. 600: GØOFD, WØGN. 900: IZ4DPV. 1150: W4TTO. 1200: WS9V

Mixed: 450: DL1KJ, KQ4CQA, DU3GKT. 500: I6JOW, SP9IZV, DL6ED, VE9EX, VC7BEPIS, WØLMU. 550: EI4GEB. 600: JS6UAK, SP9IZV. 700: HB9HZC. 800: VE4ZIM. 850: GØOFD. 900: W1KMC. 1000: JQ2MPJ. 1100: KD2RUY, N2YU. 1150: KDØBQS.

1200: OE7BJT. 1350: N5JED, IZ4DPV. 1400: WØGN. 1500: K5DB. 1600: JG1JPE. 1800: WR7X. 2100: WU9D. 2300: WS9V. 2900: TF5B

Digital: 350: JF1TFC. 400: GØOFD, N6ACA. 450: ACØDH. 500: I6JOW, VC7BEPIS. 550: JS6UAK. 650: HB9HZC, OH6HSD. 700: IZ4DPV. 750: W1MKC. 800: VE4ZIM. 950: N2YU. 1000: JQ2MPJ. 1050: N5JED, IU1HGN. 1100: KD2RUY, OE7BJT. 1150: WS9V, KDØBQS. 1200: W4DWS. 1600: JG1JPE. 1700: WR7X. 2000: WU9D. 2350: AA8SW. 2800: TF5B

160 Meters: WS9V, AE3J, WØGN
80 Meters: WS9V, KDØBQS, VE4ZIM, WØGN, OE7BJT
40 Meters: WS9V, KDØBQS, VC7BEPIS, VE4ZIM, W1MKC, WØGN, W4DWS
30 Meters: WS9V, KDØBQS, WØGN, OE7BJT
20 Meters: WS9V, HB9HZC, N2YU, ACØDH, I2OLV, VC7BEPIS, VE4ZIM, W1MKC, VE9EX, N6ACA, WØGN
17 Meters: WS9V, WØGN, OE7BJT
15 Meters: WS9V, KDØBQS, WØGN, OE7BJT
12 Meters: WS9V, KDØBQS, WØGN
10 Meters: WS9V, KDØBQS, WØGN
6 Meters: WS9V, IZ4DPV, WØGN

Asia: WS9V, I6JOW, HB9HZC, N5JED, DS4OMS, KDØBQS, I2OLV, OH6HSD, JS6UAK, SP9IZV, JK1OGT, N6ACA, WØGN, OE7BJT, DU3GKT
Europe: I6JOW, HB9HZC, DL6ED, DL1KJ, JS6UAK, KC3WDW, W8IJN, VE4ZIM, W1MKC, SP9IZV, VE9EX, WØGN

Oceania: K5DB, I2OLV, JS6UAK

North America: HB9HZC, I2OLV, KQ4BBC, IZ4DPV, JQ2MPJ, VC7BEPIS, W8IJN, VE4ZIM, W1MKC, AE3J, W8MEJ, VE9EX, KQ4CQA, N6ACA, AA4PB, WØGN

South America: WS9V, K5DB

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage for air-mail) to “CQ WPX Awards,” P.O. Box 355, New Carlisle, OH 45344 USA. Note: WPX will now accept prefixes/calls which have been confirmed by eQSL.cc. and the ARRL Logbook of The World (LoTW).

*Please Note: The price of the 160, 30, 17, 12, 6, and Digital bars for the Award of Excellence are \$6.50 each.

*email: <n200@comcast.net>

was a 20-meter-ONLY SSB-ONLY transceiver. Why? I have no idea. I had no CW gear for a period of time in 1968. Add to that, my quad was destroyed by an ice storm so I concocted a 20 meter rotary dipole out of the junk pile from my Gotham quad. I spent a lot of my time on the "YL International SSB System." My number was 6223 which was a pretty low member number. I had found a way to chase some pretty

good DX there. My little HW32 worked fine on 14.332 MHz. I vividly remember Ellie, K4RHL, running the net almost every day. Don't ask who I worked there. That was a long time ago. But it was definitely a sidebar to my DXing life. One QSO that I remember having with that HW32 was not on the net. I was scanning the band for a clear spot to call CQ. When I found one, I asked if the frequency was in use. I immediately got a

Photo A. When Bob had this QSO with VU2DIA in 1964, he thought he had finally worked India ... but was amazed to discover that the station was actually in the very rare Andaman Island

Photo B. VU2DIA was actually VU2DI when at home in New Delhi, but had to add the "A" to his call when operating from Andaman.

Photo C. Bob finally got his first mainland India contact three years later when he worked VU2LE.

QSL of the Month: JT1YL

JT1YL (home call OK1KX) was Milada (Mila) Klouckova. Her husband was Ludvik Kloucek, JT1AA (OK1KW). In 1957/58 Ludvik was a radio operator at the Czechoslovak Embassy in Ulan Bator, Mongolia's capital. Mongolia was in great demand on the ham bands, not just for a new country, but for CQ Zone 23.

Ludvik decided to get on the air with a homemade call sign, JT1AA. The Mongolian government tracked him down, but a few strings were pulled and Ludvik was given the official call JT1AA, while Mila was given JT1YL. They were both very active on 15- and 20-meter CW. This was the only activity from Zone 23 at the time. They operated in the 1958 CQWW DX contest. Milada went QRT on December 29, 1958. They returned to Prague on February 3rd, 1959.

(Photos and information courtesy Tom Roscoe, K8CX, <<https://hamgallery.com>>)



Photo D. This QSO with ZD9BE in Tristan da Cunha happened when Bob asked if a frequency was in use and Alan came back and said "no, but would you like a QSO?"

Forty First DXpedition of the Month

TRISTAN DA CUNHA

Z D 9 B E

SOUTH ATLANTIC OCEAN, ZONE 38

Greetings W3RRT We QSL QSO of
14 Jan 68. 0035 GMT on 14 Mcs.
 CW AM 2XSSB Your report 57

Operator: Alan Humming
Ex GW3SWQ

QSO verified by [Signature] "73" Alan

QSL VIA
 STUART MEYER, W2GHK
 BOX 7388
 NEWARK, NEW JERSEY
 07107 U.S.A.

HOME PRINT

The WAZ Program

SINGLE BAND WAZ

6 Meter

232JA1BK, 39 Zones
 233F6DAY, 30 Zones
 234EA5CI, 26 Zones

10M Digital

14CT1BWU
 15W4UM
 16F6DAY

10M SSB

614EA3EQT

12M CW

119J12UDK

12M Digital

20CT1BWU
 21W4UM
 22F6DAY
 23EA3EQT
 24EA5CI

15M Digital

32W4UM
 33EA3EQT

15M SSB

694EA3EQT

17M CW

149EA5CI

17M Digital

51CT1BWU
 52W4UM
 53N1RR

20M Digital

97CT1BWU
 98W4UM
 99EA3EQT

20M SSB

1279WK9R
 1280OE2KGL

30M Digital

31CT1BWU
 32W4UM
 33EA3EQT
 34EA5CI

40M Digital

37W4UM
 38EA3EQT
 39K3FRK

MIXED WAZ

Mixed

10613CT1BWU
 106149A5R
 10615IZ3AYS
 10616IK4SBR
 10617EA9ACR
 10618K6RM

10619J1JIMZ
 10620JG1GJH
 10621JA1PTO
 10622DL6ED
 10623NX4DP
 10624W5BR
 10625LU3DDH
 10626JA1BK
 10627N7GVV
 10628D44PM
 10629JA4NIM
 10630JE1PHH
 10631EA3EQT
 10632OE2KGL
 10633N8XE
 10634K7CTV
 10635PD0WAG
 10636W9DCT

SINGLE MODE WAZ

CW

1280W4UM
 1281JA1BK

Digital

554JA4SSM
 555CT1BWU
 556IK4SBR
 557EA9ACR
 558N3RC
 559J1JIMZ
 560JG1GJH
 561W4UM
 562JA1BK
 563K3NF
 564JE1PHH
 565K7CTV
 566PD0WAG
 567W9DCT

SSB

5581SQ5EBM
 5582DK9HN
 5583LU3DDH
 5584OE2KGL

SAT

95XE1AO, 25 Zones
 96J15USJ, 25 Zones
 97JE1FQV, 25 Zones
 98K6FW, 25 Zones
 99N6UK, 25 Zones
 100AG7NR, 25 Zones
 101NS3L, 30 Zones

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Award Manager, Jose Castillo, N4BAA, 6773 South State Road 103, Straughn, IN 47387. The processing fee for all CQ awards is \$6.00 for subscribers (please include your most recent CQ mailing label or a copy) and \$12.00 for nonsubscribers. Please make all checks payable to Jose Castillo, N4BAA. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. N4BAA may also be reached via email: <n4baa@cq-amateur-radio.com>.

reply saying "No, the frequency is not in use but would you like a QSO? This is Zulu Delta 9 Bravo Echo (ZD9BE was Alan ex-GW3SWQ) on Tristan da Cunha in the southern Atlantic Ocean." (See Photo D for that QSL.) Now, again, for me, this was another one of those "moments" I will never forget. I had never heard a ZD9 before and it took me another 35 years to work another one (ZD9IR in 2002).

So, that was how I started chasing DX. Tuning the band. As I got older, I would subscribe to the DX newsletters that were mailed in the US Mail. Yeah, no internet. We relied on either word of mouth on the air, or those super DX newsletters. The ones that I primarily got were the "West Coast DX Bulletin" by Hugh Cassidy, WA6AUD, and his XYL, Virginia, which were published weekly from 1968 thru 1979. If you would like to reminisce, go to <<http://tinyurl.com/yjkahc66>>. There were others I remember, like "DXer's Magazine" by Gus Browning, W4BPD; "The DX Bulletin" by Jim Cain, K1TN, then later by Chod Harris, VP2ML; "QRZ DX" by Carl Smith, N4AA, and the Long Island DX Bulletin. Probably many others. All were "mailed" to you, normally weekly. So, your DX news was never "instant" news like we have today. That is how it "used to be."

Personal Spotting System

In the 1970s, after I moved to southern New Jersey (from North Jersey), my friend Steve, KZ2I, also came south and bought a house a few hundred feet down the street from me. A wonderful idea, I guess, if we were not both hams running full power. But we learned to live with each other's QRM. After moving

CQ DX Awards Program

NO UPDATES

The basic award fee for subscribers to CQ is \$6. For non-subscribers, it is \$12. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager, Please make checks payable to the Award Manager, Keith Gilbertson. Mail all updates to Keith Gilbertson, KØKG, 21688 Sandy Beach Lane, Rochert, MN 56578-9604 USA. We recognize 341 active countries. Please make all checks payable to the award manager. Photocopies of documentation issued by recognized national Amateur Radio associations that sponsor international awards may be acceptable for CQ DX award credit in lieu of having QSL cards checked. Documentation must list (itemize) countries that have been credited to an applicant. Screen printouts from eQSL.cc that list countries confirmed through their system are also acceptable. Screen printouts listing countries credited to an applicant through an electronic logging system offered by a national Amateur Radio organization also may be acceptable. Contact the CQ DX Award Manager for specific details.

To wrap this up, the nostalgia of how it “used to be” will always be in my memory as a fun time chasing DX. It is so much different today. Again, not better, not worse, just different.

down, we befriended Gary, W2EQK, who later became N2CW. The three of us had our own “personal” spotting system. We shared each other’s DXCC want lists and if any one of us came across anything that any of us needed for our mixed DXCC, we would call them on the telephone. Yes, our XYLs just “loved” this system, especially if the call was made at 3 A.M. But that is how we started our spotting system. After a bit, we went to the “one ring” telephone call system. Hear one ring? Get on 2 meters. Then we would “coach” each other on 2 meters to help try to work the DX station. This system was “a little” more tolerable by our XYLs. But probably not much. That’s how it used to be for me with DX spotting.

To wrap this up, the nostalgia of how it “used to be” will always be in my memory as a fun time chasing DX. It is so much different today. Again, not better, not worse, just different. With the internet, everything changed drastically for

helping find that rare DX entity that you need for your awards. We have gotten to the point where a spot for a needed entity can come in from the spotting network that will instantly check your logging program to see if it is an entity that you NEED. That will automatically switch your radio to the proper band and mode, select the correct antenna and turn your antenna to the right heading. This still leaves you to actually work the station. But we sure have come a long way, baby. Then there is the Reverse Beacon Network (RBN) that surely would have detected that CW signal of VU2DIA on the Andamans and would have instantly generated a HUGE pileup. My RST 349 signal would never have gotten through.

The RBN (<<http://reversebeacon.net>>) is a network of so-called *skimmers*. These are broadband receivers that listen to the CW portions of ham radio bands. These skimmers report every CQ call (also beacons, etc.) back to a central server. These reports contain the call of the transmitter, signal-to-noise ratio and speed (WPM) of the transmitter. I will try to tell you more about the RBN another time.

So, is it better today? Yes of course. But in reality, it is just different today than the way it “used to be.”

See ya’ in the pileups! De N2OO

5 Band WAZ

As of September 15, 2023

2538 stations have attained at least the 150 Zone level, and **1148** stations have attained the 200 Zone level.

As of September 15, 2023

The top contenders for 5 Band WAZ (Zones needed on 80 or other if indicated):

Callsign	Zones	Zones Needed
AJ9C	199	23
AK8A	199	17
DF2GH	199	31
DM5EE	199	1
EA5RM	199	1
EA7GF	199	1
H44MS	199	34
HA0HW	199	1
HA5AGS	199	1
I5REA	199	31
IK0XB	199	19 on 10M
IK1AOD	199	1
IT9GSF	199	1
IZ3ZNR	199	1
JA1CMD	199	2
JA5IU	199	2
JA7XBG	199	2
JH7CFX	199	2
J14POR	199	2
JK1BSM	199	2
JK1EXO	199	2
K1LI	199	24
K3LR	199	23
K4HB	199	26
K5TR	199	22
K7UR	199	34
KZ4V	199	26
N3UN	199	18
N4NX	199	26
N4WW	199	23
N4QS	199	18
N4XR	199	27
N8AA	199	23
N8DX	199	23
N8TR	199	23 on 10M
RA3S	199	1 on 10M
RA6AX	199	6 on 10M
RU3DX	199	6
RW0LT	199	2 on 40M
RX4HZ	199	13
RZ3EC	199	1 on 40M
S58Q	199	31
SM7BIP	199	31
SP9JZU	199	19 on 10M
SV8CKM	199	1
US0SY	199	1 on 15M
VE2EBK	199	26
VK3HJ	199	34
VO1FB	199	19

Callsign	Zones	Zones Needed
W1FJ	199	24
W1FZ	199	26
W3NO	199	26
W4LI	199	26
W6DN	199	17
W6RKC	199	21
W6TMD	199	34
W9OO	199	18 on 10M
W8CZ	199	24
W9XY	199	22
ZL3CW	199	34
9A5I	198	1, 16
AB4IQ	198	23, 26
DL6JZ	198	1, 31
EA5BCX	198	27, 39
F5NBU	198	19, 31
F6DAY	198	2 on 10M & 15M
G3KDG	198	1, 12
G3KMQ	198	1, 27
G4OWT	198	1, 27
HB9FMN	198	1 on 80M & 10M
I1EIS	198	1 & 19 on 10M
JA1DM	198	2, 40
JA3GN	198	2 on 80M & 40M
JA7MSQ	198	2 on 80M & 10M
JH1BNC	198	2 on 80M & 10M
JH1EEB	198	2, 33
K0DEQ	198	22, 26
K1BD	198	23, 26
K2EP	198	23, 24
K2TK	198	23, 24
K3JGJ	198	24, 26
K3WA	198	23, 26
K3XA	198	23, 34
K4JLD	198	18, 24
K9MM	198	22, 26
KI1G	198	24, 23 on 10M
KZ2I	198	24, 26
LA3MHA	198	31 & 32 on 10M
N4GG	198	18, 24
N5AO	198	22, 23
N7IR	198	17, 22
NOI	198	18, 23
ON4CAS	198	1, 19
OZ4VW	198	1, 2
RL3FA	198	2 on 80 & 10M
UA4LY	198	6 & 2 on 10M
UN5J	198	2, 7
US7MM	198	2, 6
W5CWQ	198	17, 18
W7AH	198	22, 34
W9RN	198	26, 19 on 40M
WC5N	198	22, 26
WL7E	198	34, 37
Z31RQ	198	1, & 2 on 10M
ZL2AL	198	36, 37

The following have qualified for the basic 5 Band WAZ Award:

Callsign	5BWAZ #	Date	# Zones
NN4Q/RP	2519	06/17/2023	192
WB5TOI	2520	06/21/2023	188
ON6QRP	2521	07/03/2023	152
DJ3ZF	2522	07/08/2023	150
NA5Z	2523	07/11/2023	178
JE2EBT	2524	07/11/2023	158
W3KB	2525	07/11/2023	195
JE4RAL	2526	07/22/2023	163
PY5EW	2527	07/22/2023	200
K2CYS	2528	07/22/2023	156
KD0BQS	2529	07/24/2023	160
JR3PKO	2530	07/29/2023	150
DL2RPN	2531	07/29/2023	161
WA9GON	2532	08/02/2023	181
LA2IR	2533	08/05/2023	172
LU6ETB	2534	08/12/2023	197
JA4SSM	2535	08/19/2023	181
W4MAY	2536	08/19/2023	196
CT1BWH	2537	08/19/2023	187
JE1PHU	2538	09/09/2023	188

Updates to the 5BWAZ list of stations:

Callsign	5BWAZ #	Date	# Zones
EC7B	2524	11/20/2022	157
HB9ECS	2307	6/12/2021	190
EC7B	2425	11/20/2022	165
WT2P	2420	10/25/2022	180
JA2MNB	2237	8/6/2020	190
TF5B	2093	12/7/2018	163
N8MR	1359	12/29/2003	165
H13T	2318	8/19/2021	193
W4JS	2277	2/1/2021	190
RA3S	1952	5/9/2017	199
W0DJC	1706	12/24/2010	187
NT9J	2320	9/16/2021	170
EA3EQT	1005	5/9/1996	191

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Award Manager, Jose Castillo, N4BAA, 6773 South State Road 103, Straughn, IN 47387. The processing fee for the 5BWAZ award is \$10.00 for subscribers (please include your most recent CQ mailing label or a copy) and \$15.00 for nonsubscribers. An endorsement fee of \$2.00 for subscribers and \$5.00 for nonsubscribers is charged for each additional 10 zones confirmed. Please make all checks payable to Jose Castillo. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. N4BAA may also be reached via email: <n4baa@cq-amateur-radio.com>.

***Please note: Cost of the 5 Band WAZ Plaque is \$100 shipped within the U.S.; \$120 all foreign (sent airmail).**

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries. With few exceptions, the ARRL DXCC Countries List is used as the country standard. The CQ DX Award currently recognizes 340 countries. Honor Roll listing is automatic when an application is received and approved for 275 or more active countries. Deleted countries do not count and all totals are adjusted as deletions occur. To remain on the CQ DX Honor Roll, annual updates are required. All updates must be accompanied by an SASE if confirmation of total is required. The fee for endorsement stickers is \$1.00 each plus SASE. (Stickers for the 340 level and Honor Roll are available.) Please make checks payable to the Award Manager, Keith Gilbertson. Mail all updates to Keith Gilbertson, KØKG, 21688 Sandy Beach Lane, Rochert, MN 56578-9604 USA.

CW

DL3DXX.....339	K7LAY.....339	W8XD.....339	K1FK.....334	OZ5UR.....328	W6YQ.....319	K4IE.....295
HB9DDZ.....339	K7VV.....339	WK3N.....339	K9OW.....334	AB4IQ.....327	HA1ZH.....318	YU1YO.....295
K4IQJ.....339	K8LJG.....339	WØJLC.....339	PY2YP.....334	K6CU.....326	N4RF.....318	WA2VQV.....292
K9MM.....339	N4AH.....339	WØVTT.....339	WG5G/.....334	KE3A.....326	N6PEQ.....318	4XIVF.....286
N4MM.....339	N4CH.....339	YU1AB.....339	QRPP.....334	EA5BY.....325	CT1YH.....316	K6YR.....284
WB4UBD.....339	N4JF.....339	K8SIX.....338	WD9DZV.....334	KA3S.....325	EA3ALV.....315	PP7LL.....282
WS9V.....339	N4NX.....339	KA7T.....338	K2OWE.....333	K7CU.....324	RA1AOB.....313	WR7Q.....282
EA2IA.....339	N5ZM.....339	WA5VGI.....338	K5UO.....333	N3RC.....324	WA4DOU.....312	N2VW.....280
F3TH.....339	N7FU.....339	W9RPM.....338	N6AW.....333	N7WO.....324	YO9HP.....312	K4EQ.....280
K2FL.....339	N7RO.....339	G3KMQ.....337	W4MPY.....333	KEØA.....322	W6WF.....309	W8BLA.....280
K2TQC.....339	NØFW.....339	KØKG.....337	K6LEB.....331	YT1VM.....322	KT2C.....307	WB5STV.....277
K3JGJ.....339	OK1MP.....339	W1DF.....337	K9VKY.....331	4Z5SG.....321	K4DGJ.....307	YO6HSU.....275
K3UA.....339	W3GH.....339	W7IT.....337	N7WO.....331	N2LM.....321	W4ABW.....306	
K4CN.....339	W4OEL.....339	K8ME.....336	OK1DWC.....331	ON4CAS.....321	K7ZM.....305	
K4JLD.....339	W5BOS.....339	W6OUL.....336	K6YK.....329	W2OR.....320	HA5LQ.....301	
K4MQG.....339	W7CNL.....339	JA7XBG.....335	W9IL.....329	HB9DAX/.....319	RN3AKK.....300	
K5RT.....339	W7OM.....339	F6HMJ.....334	IKØADY.....328	QRPP.....319	WA9PIE.....298	

SSB

AB4IQ.....340	KE5K.....340	W7BJN.....340	W9IL.....338	WD9DZV.....333	KE4SCY.....326	KA1LMR.....308
DJ9ZB.....340	KM2P.....340	W7OM.....340	N4FN.....337	AA1VX.....332	KF4NEF.....325	RA1AOB.....308
DL3DXX.....340	KZ2P.....340	W8ILC.....340	IØZV.....336	KE3A.....332	W6WF.....325	XE1MEX.....308
DU9RG.....340	N4CH.....340	W9SS.....340	K3LC.....336	N2VW.....332	W9GD.....325	IK5ZUK.....307
EA2IA.....340	N4JF.....340	WB4UBD.....340	K8ME.....336	N5YY.....332	VE7EDZ.....324	IØYKN.....306
EA4DO.....340	N4MM.....340	WK3N.....340	EA3BMT.....335	W1DF.....332	WA5UA.....324	XE1MW.....305
HB9DDZ.....340	N5ZM.....340	WS9V.....340	F6HMJ.....335	K5UO.....331	F6BFI.....323	K4IE.....304
I8KCI.....340	N7BK.....340	XE1AE.....340	HB9DQD.....335	KC2Q.....331	ON4CAS.....323	K4ZZR.....304
IK1GPG.....340	N7RO.....340	YU3AA.....340	IKØAZG.....335	SV3AQR.....331	VE6MRT.....323	K7ZM.....303
IN3DEI.....340	NØFW.....340	JA7XBG.....339	IW3YGW.....335	WØROB.....331	W5GT.....323	4Z5FL/M.....302
K2FL.....340	OK1MP.....340	KØKG.....339	OE2EGL.....335	WØUL.....331	N6PEQ.....322	K7SAM.....301
K2TQC.....340	OZ3SK.....340	W2KF.....339	VK2HV.....335	XE1MEX.....331	W4MPY.....322	K8YYZ.....301
K3JGJ.....340	OZ5EV.....340	W4UNP.....339	W4WX.....335	KD5ZD.....330	K8IHQ.....321	4X6DK.....298
K4CN.....340	VE1YX.....340	W9RPM.....339	WB3D.....335	WA4WTG.....330	KW3W.....320	K2HJB.....295
K4IQJ.....340	VE2GHZ.....340	EA3EQT.....338	AA4S.....334	WØYDB.....330	T18I.....320	F5MSB.....293
K4JLD.....340	VE2PJ.....340	K3UA.....338	EA5BY.....334	ZL1BOQ.....330	YO9HP.....320	W9ACE.....291
K4MQG.....340	VE3MR.....340	K7LAY.....338	K9OW.....334	AD7J.....329	XE1RBV.....317	N3KV.....289
K4MZU.....340	VE3MRS.....340	K9HQ.....338	PY2YP.....334	N3RC.....329	N7YB.....315	W6MAC.....289
K5OVC.....340	VE3XN.....340	N4NX.....338	VK4LC.....334	VE7SMP.....329	IV3GOW.....312	N5KAE.....283
K5RT.....340	VK2HV.....340	YU1AB.....338	W8AXI.....334	WØULU.....329	N8SHZ.....312	IZ1JLG.....282
K5TVC.....340	W3AZD.....340	4Z4DX.....338	XE1J.....334	CT1AHU.....328	K7CU.....311	WA9PIE.....282
K6YRA.....340	W3GH.....340	K1UO.....338	CT3BM.....333	N1ALR.....328	OK1DWC.....311	WD8EOL.....281
K7VV.....340	W4ABW.....340	N7WR.....338	IK8CNT.....333	N2LM.....328	KU4BP.....310	IWØHOU.....277
K8LJG.....340	W5BOS.....340	WA5VGI.....338	K8LJG.....333	AE9DX.....327	W6NW.....310	AKØMR.....276
K8SIX.....340	W6BCQ.....340	W2CC.....338	N6AW.....333	K7HG.....327	I3ZSX.....309	NØAZZ.....275
K9MM.....340	W6DPD.....340	W7FP.....338	OE3WWB.....333	K6GFJ.....326	G3KMQ.....308	SQ7B.....275

RTTY

NI4H.....338	N5ZM.....338	K8SIX.....334	K3UA.....332	N4MM.....302	IN3YGW.....275
WB4UBD.....338	OK1MP.....337	W9RPM.....334	AB4IQ.....323	K4IQJ.....300	
WK3N.....338	K4CN.....334	W3GH.....333	K4WW.....323	K8ME.....278	

DX World Guide 4th Edition!

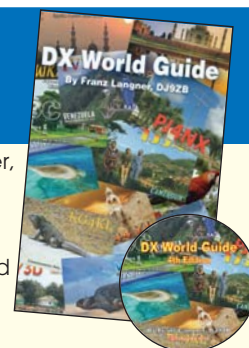
By Franz Langner, DJ9ZB

Known throughout the DX and DXpedition world as a meticulous and tireless operator, Franz Langner, DJ9ZB, is also noted as one of the most knowledgeable individuals in Amateur Radio in terms of documenting DXCC entities.

This is the fourth edition of his series of books bearing the title *DX World Guide*. It was first published in Germany in 1988 and followed by a second edition, also in Germany in 1977. The third edition, published in the U.S.A in 2012 was the first to use color throughout. This 380-page, fourth edition, also full color throughout, includes information on well over 300 DX entities.

**This 380-page, Fourth Edition is available in paperback and on CD! 6 X 9 Paperback – only \$49.95
Book on CD – only \$34.95 Buy both the Paperback and CD – only \$68.95**

Plus applicable shipping and handling charge. Single item shipping charge applies when you purchase both the book and CD together.



CQ Communications, Inc. 516 681-2926 <http://store.cq-amateur-radio.com>

propagation

BY TOMAS HOOD,* NW7US

October Shortwave Propagation

Quick Look at Current Cycle 25 Conditions:

(Data rounded to nearest whole number)

Sunspots:

Observed Monthly, August 2023: **115**

Twelve-month smoothed, February 2023: **118**

10.7 cm Flux:

Observed Monthly, August 2023: **154**

Twelve-month smoothed, February 2023: **153**

One Year Ago:

(Data rounded to nearest whole number)

Sunspots:

Observed Monthly, August 2022: **70**

Twelve-month smoothed, February 2022: **64**

10.7 cm Flux:

Observed Monthly, August 2022: **118**

Twelve-month smoothed, February 2022: **109**

The following is a band-by-band summary of DX propagation conditions expected from mid-October through mid-December and centered on the two CQ World Wide DX contest weekends, hence we will focus on bands active in the contests. Next month's column will update this summary.

160 Meters: Considerably decreased static levels, and longer hours of darkness in the northern latitudes should provide good DX openings on this band. These openings will often be weak due to the relatively high signal absorption since we are not yet to the longest periods of daily darkness. But give this band a try, as fairly good openings should be possible toward Europe and the south from the eastern half of the United States, and toward the south, the Far East, Australasia, and the South Pacific from the western half of the country. Other DX openings might also be possible. The best propagation aid for this band (and for 80 and 40 meters as well) is a set of sunrise and sunset curves, since DX signals tend to peak when it is local sunrise at the easterly end of the path. A good Internet web site featuring a greyline map display is found at <<https://www.fourmilab.ch/earth-view/>>. Follow the link, "map of the Earth" showing the day and night regions.

80/75 Meters: These should be good for DX openings to many areas of the world during the hours of darkness and into the sunrise period. The band should peak towards Europe and in a generally easterly direction around midnight. For openings in a generally western direction, expect a peak just after sunrise. The band should remain open towards the south throughout most of the night. Propagation in this band is much like what we expect on 40 meters, except that signals will be somewhat weaker on average, noise levels will be a bit higher, and the period for band openings in a particular direction will be a bit shorter.

40 Meters: This should be the hottest DX band during hours of darkness as the seasonal static levels are lower than they were during the summer. The band should be open first for

DX toward Europe and the east during the late afternoon. Signals should increase in intensity as darkness approaches. During the hours of darkness expect good DX openings to most areas of the world. Signals should peak from an easterly direction about midnight, and from a westerly direction just after sunrise. Excellent openings toward the south should be possible throughout most of the nighttime period. When the Last-Minute Forecast indicates **Above Normal** or **High Normal**, the choice for best nighttime band will be between the 40- and 20-meter bands.

20 Meters: DX openings should be possible on this band both day and night. Conditions should peak from about an

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for October 2023

Propagation Index	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal:	A	A	B	C
2,4-9,13-14,19-21,29,31				
High Normal:	A	B	C	C-D
3,11,15,18,25-26,30				
Low Normal:	B	C-B	C-D	D-E
12,22				
Below Normal:	C	C-D	D-E	E
1,10,16,23,28				
Disturbed:	C-D	D	E	E
17,24,27				

Where expected signal quality is:

A—Excellent opening, exceptionally strong, steady signals greater than S9

B—Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.

C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.

D—Poor opening, with weak signals varying between S1 and S3, with considerable fading and noise.

E—No opening expected.

HOW TO USE THIS FORECAST

1. Using the Propagation Charts appearing in "The CQ Shortwave Propagation Handbook, 4th Edition," by Carl Luetzelshwab, George Jacobs, Theodore J. Cohen, and R. B. Rose.

a. Find the *Propagation Index* associated with the particular path opening from the *Propagation Charts*.

b. With the *Propagation Index*, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the *Propagation Charts* with a *Propagation Index* of **4** will be fair on October 1, excellent from October 2 to October 9, then fair on October 10, and so forth.

2. Alternatively, you may use the *Last-Minute Forecast* as a general guide to space weather and geomagnetic conditions throughout the month. When conditions are *Above Normal*, for example, the geomagnetic field should be quiet, and space weather should be mild. On the other hand, days marked as *Disturbed* will be riddled with geomagnetic storms. Propagation of radio signals in the HF spectrum will be affected by these geomagnetic conditions. In general, when conditions are *High Normal* to *Above Normal*, signals will be more reliable on a given path, when the ionosphere supports the path that is in consideration. This chart is updated daily at <<https://SunSpotWatch.com>> provided by NW7US.

* P.O. Box 110

Fayetteville, OH 45118

Email: <nw7us@nw7us.us>

@NW7US (<https://Twitter.com/NW7US>)

@hfradiospacewx (<https://Twitter.com/HFRadioSpaceWX>)