

# VWOA NEWSLETTER

Email Issue #60

Francis T. Cassidy Editor

2010



W7LR Radio Operator  
Today

The following story previously appeared in Reflector and was brought to my attention by VWOA Members, George Levities and Ray Minichiello. Permission was given by the Author to publish it in the VWOA Newsletter, it is entitled:

## *MIDWAY*

*By Author Robert E. Leo W7LR*

This is a story about the secret Japanese radio codes; the intercept and deciphering of those by our Navy in WW-II; and the use of the radio intelligence from that to make our victory and destruction of the Japanese naval fleet at the battle of Midway in June 1942 more possible. My role in this as a Navy radioman was to be ready and trained to copy that Japanese radio code from the Farallon Islands just off the coast of San Francisco, thus in the continental U.S. in CA and not at Midway nor on a battleship.

I didn't know what the Japanese radio messages said, but copied their radio signals

and wrote down the corresponding Japanese symbols, for our Navy's translation and use.

My interest in writing this story is as an example of a contribution made towards helping win the war without having been on a battleship or airplane or beachhead, where many men and women showed so much bravery and sacrifice.

The word code has several meanings in this story. One use of this word is to refer to Morse code, used by radio operators to send radio messages by dots and dashes. Another meaning is as in the Japanese secret radio codes. Secret codes are used to send information intended to be understood by only a certain audience. Ancient civilizations did this

with cave or stone carvings. In WW-II our military utilized the Navajo soldiers as code talkers to send secret messages by voice. The Japanese sent some diplomatic messages by electronically scrambled voice, which were generally easy to decipher. The vast majority of Japanese wartime messages were sent by short wave radio using Morse code of dots and dashes. The patterns of the dots and dashes corresponded to the Katakana characters of the Japanese language involved.

There are many different sets of characters used for Japanese writing. These may be somewhat like complex Chinese characters, or as Katakana characters. The complex characters are not suitable for radio transmission, and the 46 Katakana characters are used. These characters have equivalents of symbols, short English letter equivalents, or for radio transmission 46 different sets of dots and dashes. The radio intercept operator hears the dots or dashes in Morse code, and then transcribes that by copying those Katakana symbols by hand onto paper. On the paper the symbols are written to begin in the upper right corner of the paper, then continue downward in that first column, and in a similar fashion in columns to the left. This was commonly known as copying the Japanese code. The operator does not know the meaning of these coded messages, but sends those off to be deciphered. That radio intelligence is then forwarded to the fleet commanders to improve their chances in a naval battle.

ホ	HO	— • •
ノ	NO	•• — —
ル	RU	— • — — •
ル	RU	— • — — •
SYMBOLS	ENGLISH EQUIV.	MORSE CODE EQUIV

A few of the Katakana symbols are illustrated above.

In this example the English equivalents and Morse code equivalents are also included. The word Honolulu is used, and written in the downward vertical column as HO NO RU RU. There is no L Katakana character. The example also shows that a message could be sent in plain language and be readable by those knowing that language.

In wartime the messages would be sent with scrambled characters, then being able to be quickly decoded by the Japanese, or by our Navy with much difficulty.

The secret aspects of these events of 68 years ago, have been declassified for many years, and are described in many books. The best book that I have found on these subjects was by Rear Admiral Edwin Layton, title: "And I Was There, Pearl Harbor and Midway, Breaking the Secrets", published in 1985, and copyright for the Layton estate by Konecky and Konecky of Old Saybrook, CT. They have given

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me permission to use extracts from that book in this story. Some extracts of Layton's book follow.

The Naval battle of Midway June 4th, 1942 was a turning point towards winning WW-II in the Pacific against the Japanese.

The leadership and strategy of Admiral Nimitz with the U.S. aircraft carriers, Navy airplanes and brave pilots under his command made this possible.

Admiral Nimitz had the advantage of having radio intelligence information from our radio intercept of the Japanese code, and the decoding of that. His belief that the intercept information was accurate allowed him to reach Midway before the battle, and to prepare for that.

Layton, p405, paragraph one. Nimitz trusts Rochefort's work and results with the Japanese code messages. Rochefort was brilliant with deciphering the Japanese code and may have been one of the most important persons in the Navy with radio intelligence information towards the success at Midway.

Paragraph two. Hypo (the code facility in Hawaii) and those in Washington had many serious personality conflicts, resulting in the lack of vital information being sent back to Hawaii. This could have had an effect at Pearl Harbor, and dispels the myth about knowing of the Pearl Harbor attack ahead of time.

p411. Rochefort figured out that the characters AF in Japanese messages were shorthand meaning Midway. He also had some

information in messages about the Japanese battle plans for Midway.

The Hypo crew devised and sent some messages about a fictional failure of the water system on Midway. Following that with several messages back and forth by both the Japanese and Americans, Rochefort was able to decode more important information regarding the Japanese Midway battle plans and dates.

Layton's book in chapters 32 and 33 give the most interesting views about the battle of Midway, both before and during that event. The U.S. Navy decoders had an office sign that read, "You don't have to be crazy to work here, but it helps". Rochefort and his decoders used 3 million IBM cards a month, as this was before computers. He analyzed 140 messages a day, and could recall information or clue about a code back among the scattered boxes of IBM cards from months earlier. This was all by the amazing ability of his mind instead of a computer hard disk. His code unit Hypo kept trying to pinpoint the estimated date of the attack on Midway. They believed it was between 2 and 4 June, which was correct, but in conflict with the mid June date, believed by admirals in Washington. It was imperative for Nimitz and the U.S. fleet to arrive near Midway before the attack. It was only the belief by Nimitz in the accuracy of Rochefort's radio intelligence that the day was saved. Of course there were many more other decisions than radio intelligence made by U.S. commanders that were also important.

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Layton's chapters on the actual battle are extremely interesting but too long to repeat here. Briefly the U.S. Navy made good decisions and plans and few errors, in contrast with the Japanese errors. It wasn't easy – Japan had 145 warships, to our 35. War is hell. The Japanese had lost four carriers, one cruiser, 2,500 men, and 322 aircraft.

We paid a price too, 347 lives, one carrier, a destroyer, and 147 aircraft. Of course there were other big losses at Pearl Harbor, Pacific fighting, and in Europe and Africa.

Midway is a 2.4 square mile atoll, NW of the Hawaiian Islands. There are three islands with a total of 1500 acres, within a 15,000 acre lagoon. Midway is about half way between North America and Asia. In the 1940s the U.S. viewed Midway as an important defense post, and defenses there were improved. The islands are home to about 3 million birds, and 250 marine life species nearby.

How did I happen to do this work, or be prepared for that? I started getting ready at age 12. My father brought home a radio magazine then that showed how to build a simple radio. It had a radio part called a coil, made from wire, and that was wound onto an oatmeal box. It included other simple parts, one small tube, and some batteries. I would listen to it by the hour and hear radio Morse code of dots and dashes sent from commercial or Navy stations near and far. Eventually I could tell a dot from a dash, and then that three dots and a dash was the letter V, which was often sent many times before the

radio station sent their call sign. I had many notebooks in which I recorded those call signs. All of this whetted my appetite for radio and engineering and the start of a career in electrical engineering and radio communications. Along the way I discovered amateur radio as a hobby and service where we communicate by Morse code or voice to other amateurs all over the world. By 1937 at age 16 I took the exam in SF for the radio amateur license, and received the call W6PBV. By then I had built a 3 tube better receiver, and had bought a used transmitter for \$50 by working in a grocery store for \$2 a day. I was soon contacting far off places like Manchuria.



In our lives we have many mentors. One in San Mateo, CA, where I lived during the above time, was Doc Redeker. He was our radio instructor at the Junior College, but also a Captain in the Naval Reserve. He encouraged and helped many of us young guys to join the local Naval Reserve Unit in San Mateo. There

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we attended meetings and classes and learned the Navy message procedures. Our other mentor was Dave Baker, W6WX, who was our instructor. I started in that Naval Reserve unit as a radioman third class, Rm3c, and later in the Navy reached Rm1c. I was in the Navy five years during WW-II from Feb. 1941 to January 1946, all in the continental United States primarily in radio intelligence work. Later after Midshipman's school and staying in the Naval Reserve, I became an officer as LtCmdr.

We jump ahead to Feb 14<sup>th</sup> 1941. The Navy called me to active duty to operate their radio station NPG in San Francisco. My Navy duty was at their headquarters in SF to operate their Morse code circuit 8 hours a day. In one shift I might handle 180 messages, sometimes typing those on an old typewriter or sometimes sending with a radio key called a bug (which is sent by hand to make dots and dashes). I was prepared to immediately take over this very important assignment and task at age 19 due to my radio experience since age 12, the Naval Reserve training in San Mateo, and my ability as an amateur radio operator.

I always feel that some of us have been given special talents, and mine were great ability with Morse code, and with typing (I was 26 lessons ahead of my high school typing class). The Navy radio station NPG was the headquarters to serve and control Navy communications in the entire Pacific and western North America, and we were in contact with Navy ships in the Pacific, and Navy shore stations in

Hawaii NPM, Guam, Canal Zone, Philippines, Seattle, San Diego, etc. For big shore radio stations the headquarters; transmitters (that send out the Morse code), and the receiving stations are usually in separate locations, to not cause interference between locations.

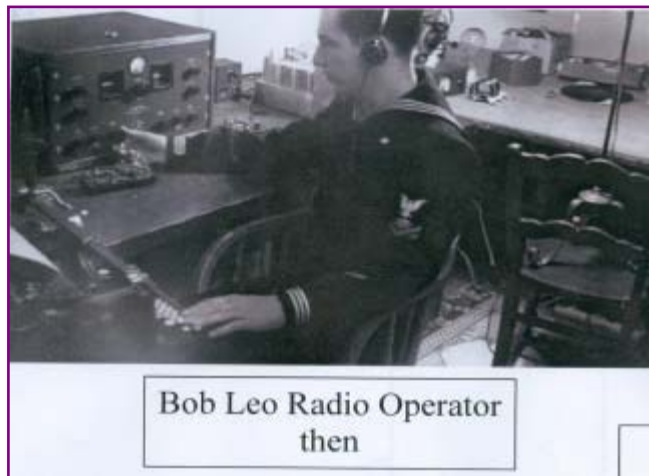
The NPG transmitters were at Mare Island near Vallejo, north of SF. I had a telephone line to that, and if I needed more radio power to contact the Philippines I could call up and ask for more — the radiomen at the transmitter site could then bring up a 50,000 watt transmitter to do the job. Amateur radio transmitters are limited to 1,500 watts. NPG had many radio operators, each to contact certain ships or areas. Each operator had a separate circuit with a separate radio channel or frequency and a separate receiver and transmitter and antenna. In the operating room was a small conveyer belt to deliver messages to be dropped off to the operator of a certain circuit. The operator could also use the belt to add messages that he had copied, to be on their way for proper distribution or action. On transmit he would validate each such message by his shorthand notation and date with one hand while sending with the other hand. A few rare operators could copy or send a message and carry on a voice conversation with someone at the same time. I never achieved or had that ability, but could send or receive for hours or an entire shift without error. This was important as many messages were encoded with five letter code groups in English letters.

Sometime in 1941 I was transferred to the Farallon Islands, 30 miles off shore from SF, and about 20 miles distant from Pt. Reyes in Marin County. Describing those islands is a whole story in itself, for another time. The Spanish called those the pointed rocks. The Navy callsign there was NPI. At that time it was part of a direction finding system to help ships enter the Golden Gate and not pile up on the rocks of the Farallones. The system had 3 stations, one NPI on the Farallones, one NLG at Pt Reyes, and a third one north of Half Moon Bay, NMC at Montara. Japanese commercial ships were welcome at that time, and from NPI I would get a message from one of their ship radio operators: "Please Mr. NPI, can you give us a bearing? The three Navy or Coast Guard stations would take bearings to the ship, and we would determine their location and advise them of that. The direction finder system there used an amateur radio receiver the National HRO, and a special direction finder antenna. This was all mounted in the second story of a silo type building. We could measure bearings of distant ships or stations to about one degree.

The Pearl Harbor attack occurred on December 7<sup>th</sup> 1941. Everything changed after that. Soon I was sent to Bainbridge Island Washington, near Seattle, to learn the Japanese code. I was sent back after that to the Farallones to copy the Japanese code from their ships and shore stations, and to give es-

timates of their bearings. This was before, during, and after the battle of Midway.

*THIS WAS MY MOST IMPORTANT WW-II CONTRIBUTION.*



Sometime soon after the above effort from the Farallon Islands, the Navy had other assignments for me. The first one was to send me to Marin County CA, with another navy radioman, Bud Gearhart. We lived in Inverness in a rented house on main street between the post office and the local bar, but our Navy duty was nearby at the AT&T radio receiving station near Pt. Reyes CA. This was on the Pacific coast overlooking the ocean with a giant antenna farm of huge rhombic antennas. It was a quiet location with no radio noise so that we could receive the faintest radio signals from Japan or elsewhere. We used another amateur radio receiver, the Hammarlund SuperPro. Our duty was to receive and record diplomatic radio traffic from Japan sent to Rome or South America or elsewhere. Radio reception was

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outstanding at such a location and facility, and you could hear a pin drop radiowise. The messages were scrambled but in a very old fashioned simple manner, and our boss Lt Ray Kempf had designed and built electronics to unscramble those messages. We sent that information on to the Navy for them to forward to our state department for diplomatic radio traffic. The Navy kept me on the move. They next sent me to the Two Rock Ranch an Army radio facility near Petaluma CA. There were just two of us Navy personnel there, to teach radio intelligence work.

I next heard about the Navy V12 program. That was to send some sailors to a university to obtain an engineering degree, then become a Navy officer, and so be trained for further duty. One of the Navy yeomen (secretary to you) at the SF headquarters let me know of the V12 program and said he could help me to apply for that. There were two openings for radiomen from the entire 12<sup>th</sup> Naval District. I was selected for one of those and sent to Caltech in Pasadena, where I worked toward a BSEE degree which I received in 1945. I was then sent to Notre Dame for Midshipmen's school and became an Ensign. Then returned to CA again to Long Beach Navy yard and taught radio until discharged in January 1946.

At the time of ending naval active duty, I received a letter from Simon Ramo. He was forming the electronics division of Hughes Aircraft, and had three engineers at the time.

The letter offered me a position there to be the fourth engineer. I turned it down for a variety of reasons. It was another turning point in my life.



List of books:

The Complete Story of Code breaking in World War II, Stephen Budiansky, Simon and Schuster, 2000

And I Was There, Pearl Harbor and Midway, Breaking the Secrets, Rear Admiral Edwin T. Layton, 1985

Miracle at Midway, Gordon Prange, 1982, Penguin Books

The Farallon Islands, Peter White, 1995, Scottwall Associates

QST amateur radio, October 1943, page 31, The Japanese Morse Radiotelegraph Code, Charles Holden, ARRL, Newington, CT

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Maritime Radio Historical Society, Radio Compass Station NLG, Pt Reyes, CA

[www.omniglot.com](http://www.omniglot.com), Japanese Katakana description

Some of my Navy records

The Code Breakers, David Kahn, New American Library, 1973

The American Black Chamber, Herbert O. Yardley, Copyright 1931, Ballantine Books, NY, especially Japanese Secret Codes.

The Japanese Morse Telegraph Code, Donald Millikin, QST, p23, Sept. 1942

Also, RELAY, Dec 1942; and RADIO, May 1941 (neither located).

**Author:**

**Robert Leo, Bozeman, MT W7LR**

**July 31, 2010**

**revised August 22, 2010**

Received the following SK announcement from VWOA 2<sup>nd</sup> Vice President and VWOA Chaplain Douglas Stivison:

*“Please share the news with the board that my mother-in-law and VWOA Veteran Member Diana Eigen passed away this afternoon November 2, 2010”*

Diana Mackay Eigen was an active participant and supporter at the annual VWOA Awards Luncheons held at Governors Island and the Seaman’s Church Institute in New York City during her membership.

She received a VWOA Marconi Memorial Award in 1994

The background in 1994 was listed as follows:

Diana Mackay Eigen first learned the Morse Code as a Girl Guide in her home town of Edinburgh, Scotland. With the outbreak of the Second World War, she put aside other career plans to try to immediately get involved with war service. Although she was not old enough to enlist, she received her parents’ permission to join the Royal Air Force. Because of her prior knowledge of Morse she soon found herself posted to RAF Bomber Command’s underground headquarters in Naphill, near High Wycombe. Frequently working directly for the legendary “Bomber Harris,” she served throughout the entire war in the thick of the air offensive against Germany.





Veteran VWOA Member Diana Mackay Eigen SK

As a wireless operator at the highest levels of RAF Bomber Command, Di was inculcated in the need for complete secrecy and she still says that she has trouble talking freely about her war experiences. The longevity of her posting to such a critical position, however, attests to her communications skills. During the war she met and married an American airman, and after the war they settled in New Jersey, where they raised their two daughters. Retaining her British citizenship barred Diana from pursuing amateur radio in the country, but she has been an active crafts instructor, a successful retailer, and community leader and church-woman. She has served on several boards of directors of community groups, especially the YWCA. Currently, she lives in Up-

per Montclair, New Jersey, close to her two daughters and her four grandchildren. She is a Veteran Member of the VWOA.



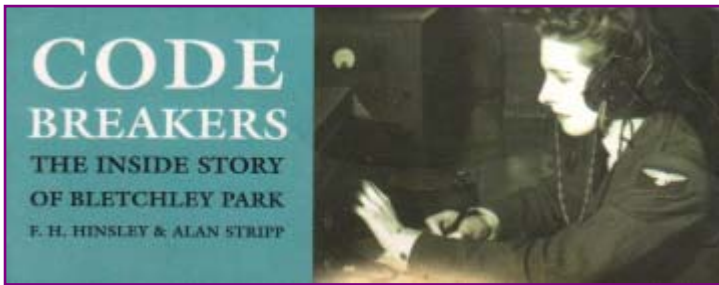
Diana and Douglas receiving their Membership Plaques at Governors Island Annual Award Luncheon



The young blonde RAF operator on the left in the photo is Di. This was a pix that ran in a Scottish newspaper to show young women being trained for the war effort.

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Then there was the VWOA Newsletter #29 in which VWOA told you about a book that provides many details about the Code Breakers working at Bletchley Park cracking the ENIGMA code and all recognized her on the front cover.



Her Obituary is as follows:

Diana Mackay Eigen, 87, passed away on November 2, 2010. Born in Edinburgh Scotland on April 21, 1923, the daughter of William John Mackay and Robina McIntosh Mackenzie, she was the eldest of seven children. A graduate of the Leith Academy, she served as a radio operator in the Royal Air Force Bomber Command for the duration of World War II. During her service with the RAF, she was involved with many secret missions and in the interception of German coded messages that were used by the famous ENIGMA code breakers at Bletchley Park. Diana was

an exceptionally good CW operator and while she remained silent for decades about her activities in the area of code-breaking she always took pride in her CW skills, especially for the number of times she was asked to “talk them home” helping bring in disabled aircraft. She became a Veteran Member of the Veteran Wireless Association and received the VWOA’s Marconi Memorial Plaque in recognition of her wartime service. She was thrilled to discover a picture of herself, copying CW, on the cover of a 1993 book on the history of the Bletchley Park Code Breakers.

While serving in the RAF, she met an American airman from Passaic, NJ, David Eigen and they were married in 1945. She joined him in America in 1947.

While raising her children, Diana was active in a host of civic organizations including serving on the board of the Passaic-Clifton YWCA, president of the Cosmopolitan Club, and several school PTA’s. She was an accomplished gardener and painter and taught pri-

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vate oil painting classes at the YWCA, the Pas-  
saic Adult School, and to many private stu-  
dents.

For 15 years she was a partner in  
Whigmaleerie Yarns in Clifton.

Widowed in 1977, she moved to Upper  
Montclair in 1986, sharing a house with her  
daughter, Heather, her son-in-law, VWOA  
Chaplain Douglas Stivison, and her two grand-  
children, Megan and Beth.

She is the mother of two married  
daughters, Sheila (John Viemeister), and  
Heather (Douglas Stivison), and four grand-  
children: Ian and Dolina Viemeister, and Me-  
gan and Elizabeth Stivison. She is survived by  
four overseas brothers: Hugh (Scotland), Bill  
(New Zealand), and Alistair and Ken (Eng-  
land), and many nieces and nephews around  
the globe.

A memorial service was held on Saturday, No-  
vember 6, at 11 AM at Union Congregational  
Church, 176 Cooper Avenue, Upper Montclair,  
NJ.

Memorial donations may be made to the  
Montclair Volunteer Ambulance Unit, 95 Walnut  
Street, Montclair, NJ 07042 or the Presby  
Memorial Iris Garden, 474 Upper Mountain  
Avenue Upper Montclair, NJ 07043.

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### *WENDELL'S NEWS CORNER*

We sadly report that we have re-  
ceived notice recently of the following  
SK VWOA Members:

Life Veteran VWOA Member  
Robert S. Lukenbill W6DO  
SK 06/11/2010

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Veteran VWOA Member  
Diana Mackay Eigen  
SK 11/02/2010

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From: Saul Yochelson  
Date: October 29, 2010 11:45:20 PM EDT  
To: Wendell Benson  
Subject: Bob Lukenbill Obituary

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Hi,

It was a pleasure talking to you today.

I was able to scan Bob's Obituary as it appeared in the July 2010 Anchor Light as well as the top of the first page of the paper.

I'll ask the Lane Victory's office to send you a copy of the whole Anchor Light.

Please feel free to ask if you need additional info or help

Saul Yochelson W6AS

Robert S. Lukenbill 1920-2010

Robert S. "Bob" Lukenbill, resident of Mutual 1. Died June 11, 2010

Mr. Lukenbill was the son of a Federal Bank examiner.

His father taught him and his sister Morse Code.

Mr. Lukenbill earned a degree in electrical engineering from the University of Kansas. During World War II, he was a radio man for Merchant Marine ships.

Mr. Lukenbill was the director of communications for Los Angeles County, including Catalina Island, and later worked for Aramco for

three years in Saudi Arabia as a telecommunications Engineering supervisor.

He made several business trips to Europe and Asia, accompanied by his wife, Genevieve "Jenny." Mrs. Lukenbill was a good Secretary and radio operator, having her own call letters.

Mr. Lukenbill enjoyed swimming and sailing in his 27-foot boat. He and his wife sailed from California to Hawaii.

After returning from Saudi Arabia, Mr. and Mrs. Lukenbill learned about the plans to bring the S.S. Lane Victory to San Pedro and got involved.

They moved, to Leisure World to be near the ship.

He was preceded in death by his wife of 50 years, Genevieve in 1995.

Mr. Lukenbill is survived by his sister Lillian Hayes Gower; niece Barbara (Vic) Irwin, Naples, Long Beach; and special friend, Kate Pedigo, Mutual 5, whom he met during a Golden Rain Saturday Night Dance.

Mr. Lukenbill's ashes will be spread at sea from the S.S. Lane Victory on July 24.

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TO MIKE SHAW:

-----Original Message-----

From: John Dilks, K2TQN <oldradio@comcast.net>

To: Recipient list suppressed:

Sent: Fri, Oct 15, 2010 7:33 pm

Subject: Presentation on the Airship America is on [www.ehthistory.org/](http://www.ehthistory.org/)

Hi,

Here's my presentation on the Airship America, now on line at the

<http://www.ehthistory.org/> (my website). I made the presentation last Friday night. I thought you might want to see it.

I have been working on this story for over 6 years.

50 minutes.... My presentation starts about 2-minutes into the video.

<http://www.ehthistory.org/>

One hundred years ago this October Jack Irwin made history by using wireless to call CQD from an airship to a ship at sea. The rescue was successful but I'm ahead of myself. The story about how he got to the point where he needed to be rescued is really interesting. His airship adventure would begin in Atlantic City.

On the morning of October 15, 1910, Jack Irwin was awakened about 4 o'clock and told to go aboard. There was not a breath of wind. A dense fog dripped down over everything. The crew of the ship consisted of Messrs. Walter Wellman, commanding; Melvin Vaniman, chief engineer; Louis Loud and Fred Aubert, assis-

tant engineers; Murray Simon, navigator; and Marconi Wireless man Jack Irwin. With the help of a few hundred police and firemen, they proceeded to launch the largest non-rigid airship ever constructed. At 8 AM all was in readiness and the crew climbed aboard. The last to embark was the mascot, a pretty foundling kitten that had been a stray pet around the hangar. The crew had jokingly told visitors that the kitten was going along with them and just as the word to "let go" was passed, somebody in the crowd threw the kitten into the lifeboat where Irwin had taken his station. Up they went and the cat was one of the crew! Kitty, at first, appeared scared and raised an awful "holler," but he (yes, it was a Tom!) soon settled down. In the long days and longer nights that followed, Irwin admitted that he was grateful for that kitten's affectionate company. It was always to be found cuddled up to next to Irwin in the wireless corner of the lifeboat. And so the adventure begins....

50 minutes....

<http://www.ehthistory.org/>

73, John Dilks, K2TQN

See 2006 VWOA YEARBOOK FOR HIS AWARD AND PRESENTATION TO VWOA at URL:

[http://www.vwoa.org/Newsletters/VWOA\\_2006\\_Yearbookweb.pdf](http://www.vwoa.org/Newsletters/VWOA_2006_Yearbookweb.pdf)

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From: [Wendell R. Benson](#)  
Sent: Sunday, October 24, 2010 4:29 PM  
Subject: INFO

Recently, my attention was called to a URL which I found to be outstanding.

You may already have it in your files.

[http://www.koreanwar-educator.org/topics/merchant\\_marine/index.htm](http://www.koreanwar-educator.org/topics/merchant_marine/index.htm)

Also another URL which is loaded with LINKS which you may find useful,

<http://www.usmm.org/links.html>

73

Wendell VWOA Asst Secty

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From: [Wendell R. Benson](#)  
Sent: Monday, October 25, 2010 11:35 AM  
To: [Francis T. Cassidy](#)  
Subject: Fwd: [Radio Officers, &c] NEW WEB SITE FOR EX R/OS

Begin forwarded message:

From: "VA3ICC"

Date: October 24, 2010 9:03:40 AM EDT

To: "RADIO OFFICERS" <[radio-officers@googlegroups.com](mailto:radio-officers@googlegroups.com)>

Subject: [Radio Officers, &c] NEW WEB SITE FOR EX R/OS

Reply-To: [radio-officers@googlegroups.com](mailto:radio-officers@googlegroups.com)

The following web site has been added recently and provides a great collection of British ship's radio station scenes of the 60s and 70s.

A description of changes that took place and are still taking place are included within the discipline of electronics at sea today.

Great nostalgia for those of my vintage 50s and 60s and beyond!

<http://www.fortperchrockmarineradiomuseum.co.uk>

Ian Coombe VA3ICC

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The VWOA Editor is desperately in need of news stories. Can you take some time out of your Daily Chores and submit something, short, medium or long.

We would prefer to hear from you by Email at:

[ftcassidy@optonline.net](mailto:ftcassidy@optonline.net)

Or

[wenben@nyc.rr.com](mailto:wenben@nyc.rr.com)