



# Western Suburbs Radio Club Inc.

## May 2005 Newsletter

ZLIAC, Branch 03 NZART 3000 Great North Road New Lynn, PO Box 15-122, New Lynn.

President: Andrew Barnett ZL2ALW, Secretary: John Turnwald ZL1JT

Newsletter Editor - John Neill ZLINE

VHF Club Net Wednesday 07:30pm 146.525 MHz, HF Club Net Fridays 07:30pm 3.623 MHz

Website <http://www.qsl.net/zliac>

### Club Calendar

Monday	9 <sup>th</sup>	May	APRS. Irving ZL1MO will give a talk and demonstration on this subject.
Saturday	14 <sup>th</sup>	May	Cambridge Market Day - Vendors 9:00am Doors Open 10:00am
Friday	4 <sup>th</sup>	June	NZART Conference at New Plymouth
Saturday	5 <sup>th</sup>		
Sunday	6 <sup>th</sup>		
Monday	13 <sup>th</sup>	June	Conference Review

### Club Evening Monday 9<sup>th</sup> May

Irving ZL1MO will give us a talk on ARPS update us on recent developments in the field. If you have a computer with a sound card and a 2-metre radio, then after a few minutes work with the soldering iron you can connect the two together. Software is available from the web and then you will be enjoying the digital radio world. Come along and find out how.

### Club Nets

VHF Net 146.525 MHz 7:30pm every Wednesday, HF Net 3623 KHz +/- QRM/QRN 7:30pm every Friday. All are welcome to check in on the nets. The HF Net Controller Roster is shown below.

6 May	ZL1JL	John
13 May	ZL1ACZ	Barry
20 May	ZL1WI	Roy
27 May	ZL1VRR	Ross
3 June	ZL1MW	Brian

### In Search of Guglielmo

By Bob Tripi, NIKFV March 17, 2005

It was a cold, stormy afternoon at Signal Hill in Newfoundland. A man sat in the old military hospital on a cliff 600 feet above the harbor, listening intently to static with an earphone. Outside, his assistants used a kite to lift a wire 600 feet into the sky. Finally he thought he heard 3 dots, the letter S in Morse code, but he wasn't sure if he only imagined it. He called to an assistant to listen. Yes, the assistant heard it too. It was December 12, 1901 at 12:30 PM, and Guglielmo Marconi had received a signal sent from Cornwall in England to St John's, Newfoundland.

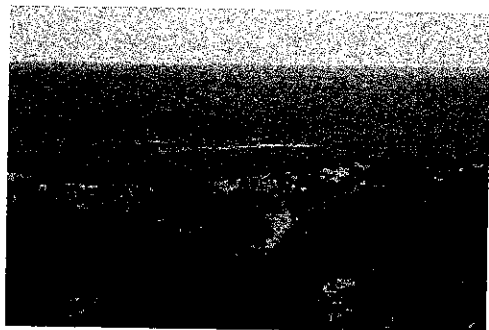


Fig. 1 The Marconi Station in Wellfleet, Cape Cod, Massachusetts, overlooks the Atlantic Ocean.  
[Photos by the author]

I have been interested in Marconi even before I started in ham radio. When I chanced on a new book about him (Signor Marconi's Magic Box, by Gavin Weightman), my interest was aroused. Soon after I finished the book, a friend offered us the use of his cottage in Orleans, Massachusetts, not far from where Marconi's first station in the US was built in Wellfleet on Cape Cod. I decided to visit the station and see what was still there. This is the story of what I learned about the station.

#### The Station Then

Marconi had a transmitting station at Poldhu on the coast of Cornwall, England to try different receiver designs and to work at increasing the distance he could receive a signal. He was able to contact ships over long distances, but he had not yet figured out why his receiver worked over much greater distances at night. By this time, the Marconi Company had been formed by a group of investors. Marconi wanted to send a signal from Cornwall to North America before anyone else did, but he wanted to be very sure he could prove to the world and his investors that he had actually done it.

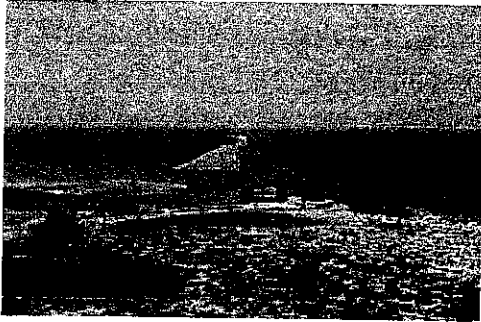


Fig. 2 This shelter has a model of the Marconi station and other displays.

In early 1901, Marconi began his station in Wellfleet. He met Ed Cook who knew the area well, but as word spread about Marconi's plans he was unable to buy any site on the outer Cape. Finally, Cook sold him an 8 acre piece of his own land in South Wellfleet that was otherwise useless. Goods were brought into the Wellfleet harbor, nearby or by rail. From there they traveled by horse and wagon to the site using a trail called "Wireless Road." The site was sand and brush with a few trees. The land ended with a 60 foot drop to the Atlantic Ocean. The station was modeled after Poldhu with a circular ring of twenty 200-foot ship masts, set about 165 feet from the cliff edge in sandy soil. The station construction attracted local residents, who predicted the next storm would blow the masts down. A barbed wire fence was put up to keep everyone a safe distance away. In September, the towers at Poldhu blew down in a storm, one mast pulling the next down until the antenna array lay in ruins. A "V" shaped array was built using two salvaged 150-foot masts, which was later replaced by a set of four towers. In November, the masts at Wellfleet were also blown down and Marconi headed for Newfoundland (which was closer to Poldhu and more likely to work) to do his transatlantic experiments.

Marconi was successful, but he was presented with a "Cease and Desist" order because the Anglo-American Cable Company considered his wireless experiments to violate their 50 year monopoly on communications in Newfoundland. As Marconi packed up to go back to England, William Smith, the secretary of the Canadian Post Office offered him land in Nova Scotia, Canada at Glace Bay and money to set up a wireless station there. Soon a station was under construction.

#### Another First

On December 17, 1902, Poldhu and Glace Bay stations were able to exchange messages, giving Marconi another "first." Thomas Edison told Marconi that it was impossible to send a message very far because radio waves go straight and would go off into space. Marconi always believed that radio waves would bounce off the atmosphere. He was right, and in 1926 Professor Edward Appleton of Cambridge University performed an experiment that showed the atmosphere was made of layers whose reflection was based on frequency.

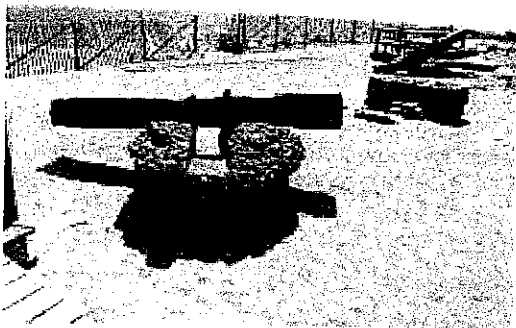


Fig. 3 A few of the tower anchors ("dead men") are at the site.

By February 1902, new towers, 210 feet high and similar to Glace Bay, were built at Wellfleet. The towers formed a square, 200 feet on a side. With a base of 24 feet square, they tapered to 8 feet square at the top and were built with 12 x 12 inch timbers with 3 x 12 cross braces, all painted barn red. They sat on 4 foot deep square cement pads. Twelve 1 inch steel cables were used to guy each tower with 12 x 12 inch crossed timbers (called "dead men") buried 10 feet into the sand and covered with cement to anchor the towers. The guy wires were tightened by giant turnbuckles and insulated by rubber hoses and manila rope with melted sulphur connectors. There were about 200 wires between the towers, in a conical arrangement that came together at the bottom into one lead that went into the transmitter house.

There was no power on this part of the Cape, so Marconi built a 30 x 60 foot powerhouse east of the transmitter building. It contained a 110 V dc generator powered by a kerosene engine for lighting and to start a second engine, which powered a 2.2 kV ac generator. This output was applied to the transmitter where it was stepped up to 25 kV.

A 20 by 60 foot bungalow was constructed to house the station crew (manager, chief engineer, assistant engineer and three operators). A woman from Wellfleet was hired to do cooking, cleaning and laundry.

### 35 kW via Spark Gap

The heart of the station, the transmitter house contained the oscillation transformer and transmitter coil, a bank of 33 capacitors (made from glass sheets and metal plates in oil) and the rotary spark gap. The spark gap produced 35 kW of RF. This was the first known commercial use of a rotary spark gap. In use, the spark gap produced deafening sound and dangerous voltages. Compressed air was directed across the spark gap to help break the spark and cool the gap electrodes. The heat generated required a 15 minute cooling period after 45 minutes of use.

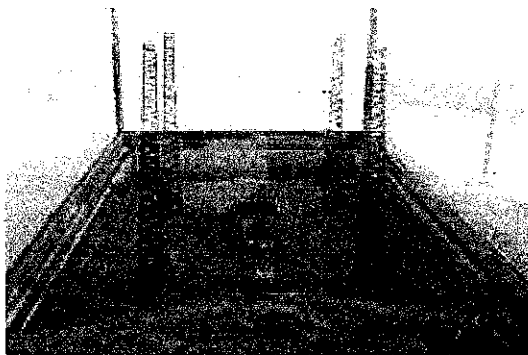


Fig. 4 The station model inside the shelter.

A door with painted glass was installed to separate the operating room from the spark gap allowing the operator to observe the transmitter without the danger of entering. The operator sent code with the use of a long wooden pump handle that broke the high voltage circuit. Transmission was limited to about 15 words a minute. A telegraph's average speed was about 30 WPM at that time. About 1905, telegraph lines were brought to the site and connected to the bungalow. The operators could work in comfort here and had the use of a Wheatstone Morse printer and a Profolover tape punch. The operator could punch messages on tape and send them through a tape reader that would key the transmitter. The station operated better at night (10 PM to 2 AM) when the atmosphere was most conductive. It is claimed that the sound of the spark gap carried 5 miles downwind.

President Theodore Roosevelt gave Marconi a message to send to the King of England. On the night of January 18, 1903, Marconi sent the message, planning to relay via Glace Bay to Poldhu. But instead of Glace Bay acknowledging, everyone was shocked when Poldhu acknowledged the message. Marconi had sent a message over 3000 miles!

On December 19, King Edward sent his reply via the station in Poldhu and it was directly received at the Wellfleet station. Marconi planned to use the station at Wellfleet to relay messages to England, but decided that using Glace Bay was more practical. The station at Wellfleet became Marconi's "ship to shore" station. Wellfleet sent nightly news and personal messages to ships. Ships captains soon realized that they could receive weather information, and more importantly they now had a way to call for help in an emergency.

On April 15, 1912, after Wellfleet had shut down for the night, the British ship Titanic ran into an iceberg. The Titanic carried two Marconi operators and they began sending a distress signal. Other ships and the New York Marconi station picked up the signal. A total of 712 lives were saved and Marconi was honored everywhere for his life-saving invention.

The station call letters were first CC (for Cape Cod), then MCC (Marconi Cape Cod) and finally, WCC when eastern stations were assigned "W" call letters. A local, low powered station, WSW, was also set up using materials from the array that blew down in 1901.

## Erosion Plays its Part

Even though the station had been built 165 feet from the cliff, the Atlantic Ocean had been eroding away. Marconi's engineers had first warned him of the danger in 1906. In 1914, construction on a new station had begun in Chatham, 20 miles south of Wellfleet. By 1916, 150 feet had been eroded and the outermost towers were in danger of falling into the ocean. In 1917, WCC and other commercial stations were shut down due to World War I. New advances such as the vacuum tube marked the end of the spark gap. At the end of the war the towers were taken down and the equipment salvaged. By 1920, there was little but abandoned buildings.

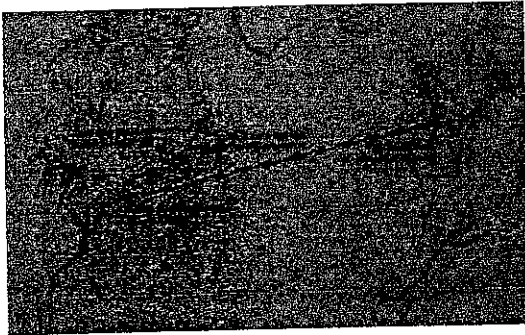


Fig. 5 One of the displays in the shelter is a map showing Poldhu, England; Glace Bay, Nova Scotia, and Cape Cod, Massachusetts.

Because of government concerns about foreign ownership of communications facilities, about 1920, Marconi was forced to sell his US assets to Radio Corporation of America (RCA), a consortium of General Electric, Westinghouse Electric, American Telephone and Telegraph, and the United Fruit Companies. Station WCC now in Chatham became part of the RCA network. In 1921, the first commercial, marine vacuum tube transmitter was installed. Like the Wellfleet station, the new station's role was ship to shore. Chatham covered the Atlantic Ocean, the North Sea, the Indian Ocean, the Mediterranean, the Caribbean and the Gulf of Mexico. As the years went on, advances in technology and the declining use of Morse code ended the usefulness of the station and it formally shut down in 1997.

During World War II, the government established Camp Wellfleet at the Wellfleet site as an artillery training facility. The Camp was closed after the war. In 1953, the Wellfleet Historical Society dedicated a plaque at the site and with the establishment of the Cape Cod National Seashore; the National Park Service acquired the site in 1961. In 1963, a pavilion was erected and in 1974, a shelter was built to house the model of the station. Park department signs call the area "Marconi Station." A few miles away is the access to the ocean called "Marconi Beach."

Marconi conducted many experiments, including working with microwaves. He also predicted radar based on observations made when ships passed between his transmitter and another station. In 1909 he was awarded the Nobel Prize for "development of the wireless telegraph." He claimed he was "not an inventor, but an improver of inventions."

## The Marconi Station Today

Marconi station is reached from Route 6, a major Cape Highway. Sand and trees cover both sides of the road and except for a water tower peeking above the trees; there are few traces of civilization.



Fig. 6 As members of the news media crowd in, Princess Elettra sends "cordial greetings, good wishes" to Commander Bowersox, KD5JBP, aboard the International Space Station on January 18, 2003.

About 2 miles along is a parking lot. You can follow the path to the observation platform and look out toward Poldhu, England (Figure 1) across the Atlantic Ocean. To one side is the exhibit shelter, built to house the model of the station and various displays (Figure 2). This area is part of the National Seashore and a habitat for many fragile species. Much damage was caused by Camp Wellfleet and poor land use, which stripped the topsoil. As you move about, please respect the wildlife areas. There is little left of the station and as the beach erodes, more ground slips into the ocean. Some of the "dead men" that anchored the towers have been set out for viewing (Figure 3). The sign on the fence warns of the unstable cliff.

Just outside the shelter is a plaque in honor of the message sent in 1903 to the King of England and in the shelter is a model of the station as it was then (Figure 4). Displays show the text of the 1903 messages, the different parts of the original station, a schematic of the original spark gap transmitter, a map showing Poldhu, Glace Bay and Cape Cod (Figure 5), a bust of Marconi, and other information about Marconi and the station.

Near the end of the parking lot is the entrance to the Atlantic White Cedar Swamp Trail, a mile and a half nature trail. As you enter, the trail to the right is the remains of "Wireless Road."

In 2003, on the 100th anniversary of the message to King Edward, Marconi's youngest daughter, Princess Elettra, sent greetings via Amateur Radio from the National Park Service site in Eastham (near Wellfleet) to the International Space Station. See Figure 6.

Readers can find more information about Marconi and the station on the Web site of the Marconi Company. Also see the Web site of The US National Marconi Museum.

BRANCH 03 GOES OUT AND ABOUT WITH ZL1AC! Edited from Ross ZL1VRR's notes.

#### RALLY of NEW ZEALAND 2005.

During the 7th. to 10th. April, the Propecia Rally of NZ was run up North, on some very good gravel roads, surrounding the Paparoa Service Park. The weather was good until the second night. 20 of the top drivers and best cars from the top manufacturers battled for outright place. Then down to Raglan to finish with some of the best coastal scenery and roads, with 72 cars starting - some being repaired to continue - but only 53 finishing. Merv, ZL1SK and Ross, ZL1VRR were at the 5km point, and Brian, ZL1MW and Bob, ZL1GD assisted with the "shake down" time when drivers and co-drivers were getting to know the roads!

#### WORKING BEE!!

Last Wednesday, ZL1SK, ZL1GD & ZL1VRR started dismantling large cabinets stored in the clubhouse. They only managed to complete about a third of them. SO! Anyone able to assist on Wednesdays from 9am to about 3pm with a break for lunch, PLEASE ring Ross on 6290504 The More that help, the faster the job will be done (and perhaps some club funds will result)!

#### JUMBO TROPHY!

Wednesday 20th April saw a team from Branch 03, comprising Bob, ZL1GD and XYL Peggy; Brian, ZL1MW & Ross, ZL1VRR and XYL Betti head to Albany to do battle with indoor bowls for the Trophy! 3 games each 7 ends were played. Our team lost in two games with just small margins, but drew the last one being down to start but coming back at the last end! Four Clubs played each other and one game against the local Albany Indoor Bowling Club. At the end of the evening after tallying results, North Shore Br.29 won the Trophy; Second North Shore B Team with Papakura a close third. Our team were fourth for the Wooden Spoon! Its not the winning that counts, it's the participation which is important! Good on you!

#### AREC.

Help is still needed for operators to assist at Civil Defence HQ at Elcoat Ave. Henderson twice each month to make Radio Checks to the Outposts in the Western Suburbs region. If you possibly can help, please contact either of our AREC Deputy Section Leaders Merv, ZL1SK (828-71740) or Ross, ZL1VRR, (629-0504) ASAP!

WSRC AREC plans to have a meeting soon, to discuss and plan for the coming months. Meetings will on the 5th Monday each month at 7.30PM at Clubrooms

73 from Irving ZL1MO who has eddited Ross's notes to fit available space!

**National System Frequency Changes** - commencing over Anzac Weekend (April 23/24/25), repeaters on the National system are being moved up in frequency to remove a significant source of interference from short range devices.

1. Why do we have to change?

In 2003, the Ministry of Economic Development (MED) created a General User Radio Licence (GURL) for Short Range Devices (SRD), on frequencies between 433.05 MHz and 434.79 MHz, occupying almost all of the 433 to 435 MHz repeater input frequency range. As a consequence many repeaters (and the National System) are suffering increasing interference from these devices. Interference to the National System is particularly annoying, since all of the National System repeaters turn on when any one of them is triggered by a SRD. After considerable discussion, the only practicable solution is to vacate that part of the 70cm band occupied by SRD's and in particular, move all the National System repeaters to higher frequencies in the 70cm band.

2. The New Plan

FMTAG, after extensive study, proposed a two-pronged approach - relocating the National System 70cm repeaters "up" the band by approximately 800kHz, using frequencies above 434.79 MHz and relocating local 70cm repeaters to lesser-used SRD frequencies. A number of factors were considered, including ATV use and "propagation overshoot lock-up" - caused by the indiscriminate mixing of inverted and non-inverted repeaters on the same frequency, especially during periods of enhanced tropospheric ducting.

The existing National System frequency plan (first created in 1987) made provision for 72 stations (36 repeaters and 36 ULS), on 15 frequency pairs. With the move up in the 70cm band, only 7 or 8 interference free frequencies are available at the top end of the band. Therefore, co-channel interference is likely to increase when all of these stations have to be accommodated on seven frequency pairs.

3. How does it affect you?

If you have a crystal controlled 70cm radio, you will need to get new crystals. The new frequencies of the National System repeaters in the Waikato, Auckland, Whangarei and further north are as follows:

Auckland repeater	439.875 MHz transmit 434.875 MHz receive
Brynderwyn repeater	434.950 MHz transmit 439.950 MHz receive
Bay of Islands repeater	439.975 MHz transmit 434.975 MHz receive
Doubtless Bay repeater	434.900 MHz transmit 439.900 MHz receive
Edgecumbe repeater	439.975 MHz transmit 434.975 MHz receive
Hamilton repeater	439.975 MHz transmit 434.975 MHz receive
Kaimai repeater	434.850 MHz transmit 439.850 MHz receive
Rotorua repeater	439.925 MHz transmit 434.925 MHz receive
Whangarei repeater	439.925 MHz transmit 434.925 MHz receive