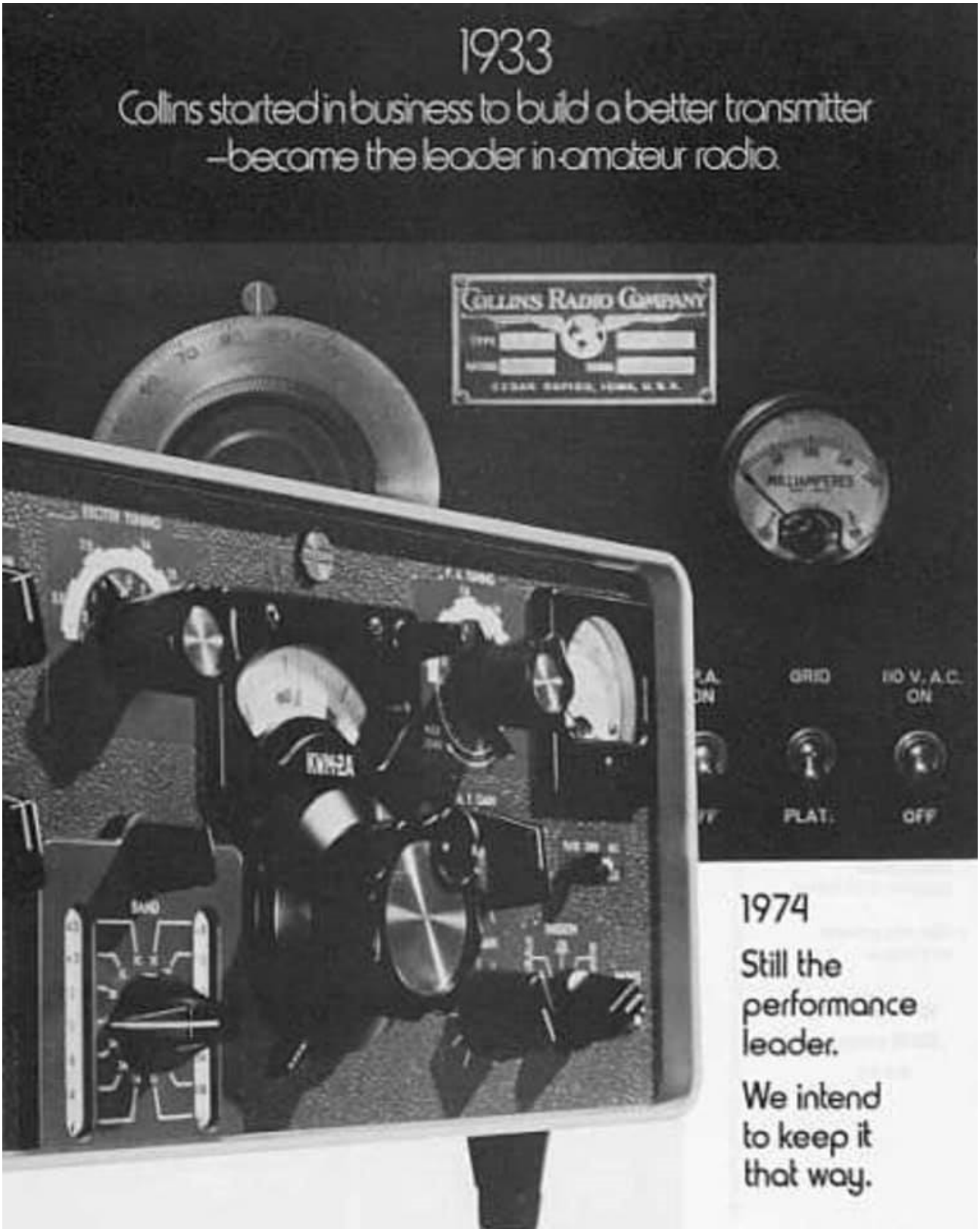
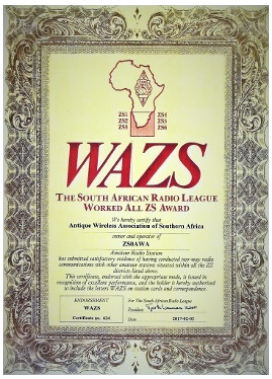
Antique Wireless Association of Southern Africa Newsletter

 # 189 **April 2022**





Inside this issue:

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Reflections:

And so the first quarter has come and gone. The leaves are already turning brown and falling from the trees. The pundits are forecasting a cold winter and the others are forecasting band conditions to improve by mid year (no one is saying which year of course).

We keep seeing photo's of outbursts on the sun and one group will say this will cause a disturbance in the ether and radio communications could be severely hampered, while others say this could bring an opening to the bands that we have been waiting for.

There always seems to be such a difference of opinion in what is going on throughout the world, but one thing is for sure, that we will still be around for a long time to either endure or celebrate the dichotomous society in which we live.

We can even see this in the amateur society where some of us are totally engrossed with modern technology and how we can use old tech, and incorporate new tech into it. Whereas some will say, "no, that's just not ham radio".

I would tend to say, therein lies our strength, because more often than not we tend to tolerate the opinions of others instead of having a stand up fight over it.

Of course, these are my opinions and being the editor, I get to place them here without fear of reprisal.

Someone once said, "Change is inevitable", it's how we adapt to change that makes it what it is to us.

Looking back over the years as change has happened, starting with the introduction of SSB (the Donald Duck mode), to the removal of CW as a requirement for an unrestricted licence, to the introduction of VHF/UHF repeaters and now the DMR radios, there has always been some who kick against change, while others welcome it.

Inevitably, we have no choice but to accept it, otherwise we will be left behind in the stone age.

Again, some will accept without any problem, others will accept kicking and screaming, but in the end they will accept.

This does not mean though that we have to leave the things we love behind. Valve radio's will always be there. They may not be able to talk on the internet, but they will always be there. We can incorporate them into many of the new modes and still use them. They may not be as stable as some of the new stuff, but they can still operate there.

So here's to a new era, whatever it may be, there is bound to be something new coming out soon and we will welcome it with open arms and incorporate it into our old systems....why, because we can.

May your valves burn brightly in the future.

Best 73

DE Andy ZS6ADY

Wikipedia

Solar flares and coronal mass ejections

The solar magnetic field structures the corona, giving it its characteristic shape visible at times of solar eclipses. Complex coronal magnetic field structures evolve in response to fluid motions at the solar surface, and emergence of magnetic flux produced by dynamo action in the solar interior. For reasons not yet understood in detail, sometimes these structures lose stability, leading to solar flares and coronal mass ejections (CME).

Flares consist of an abrupt emission of energy (primarily at ultraviolet and X-ray wavelengths), which may or may not be accompanied by a coronal mass ejection, which consists of injection of energetic particles (primarily ionized hydrogen) into interplanetary space. Flares and CME are caused by sudden localized release of magnetic energy, which drives emission of ultraviolet and X-ray radiation as well as energetic particles. These eruptive phenomena can have a significant impact on Earth's upper atmosphere and space environment, and are the primary drivers of what is now called space weather.

The occurrence frequency of coronal mass ejections and flares is strongly modulated by the cycle. Flares of any given size are some 50 times more frequent at solar maximum than at minimum. Large coronal mass ejections occur on average a few times a day at solar maximum, down to one every few days at solar minimum. The size of these events themselves does not depend sensitively on the phase of the solar cycle. A case in point are the three large X-class flares that occurred in December 2006, very near solar minimum; an X9.0 flare on Dec 5 stands as one of the brightest on record.

FREQUENCY MODULATION (FM).

FM radio has become a very popular method of radio communication. It employs an entirely different system of super-imposing intelligence such as sound and music on the radio frequency wave. 5

It enjoys its popularity because the capabilities of frequency modulation allow relatively high audio sound to be transmitted and still remain within the legal spectrum space assigned to the broadcast station. Also the general~acceptance of stereophonic sound has been encouraged by FM transmission of dual channels of sound by multiplex systems.

Beginning with a constant amplitude continuous wave signal, the frequency is made to vary at an audio rate.

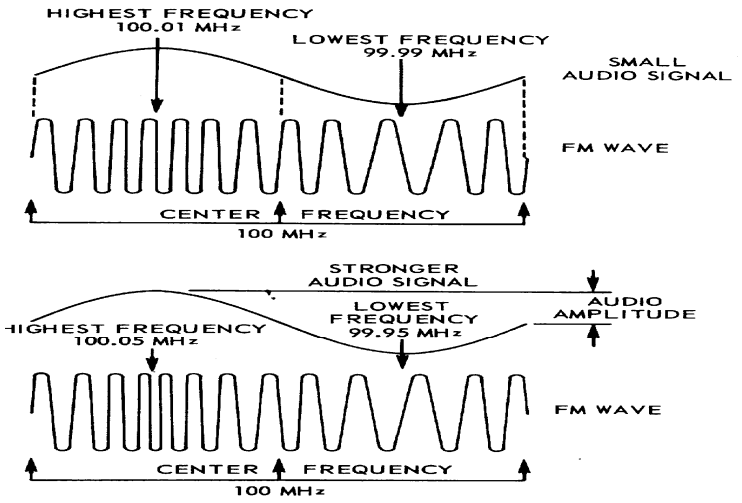
The amplitude of the modulating signal determines the frequency swing from centre frequency. audio signal causes the frequency of the carrier wave to vary between 100.01 MHz and 99.99 MHz and the deviation is f 10 KHz. In the second example a stronger audio signal causes a frequency swing between 100.05 MHz and 99.95 MHz or a deviation of f 50 KHz.

The stronger the modulation signal, the greater the FREQUENCY DEPARTURE and the greater the band occupancy.

The RATE at which the frequency varies from its highest to lowest frequency depends upon the FREQUENCY OF THE AUDIO MODULATING SIGNAL. Two graphic examples are found in figure.

If the audio signal is 1000 Hz, the carrier wave goes through its maximum deviation 1000 times per second. If audio signal, is 100Hz then the frequency changes at the rate of 100 times per second.

FM is frequency modulated and thus not prone to interference as other modes. There are of course regulations regarding the modulation. Amateurs use Narrow Band FM, allowing sufficient channels for the amateur activity on all Bands.



Although a station may be assigned a centre frequency and stays within its maximum permissible deviation, the formation of sidebands really is the determining factor on the bandwidth required for transmission, In FM, the bandwidth is specified by the frequency range between the upper and lower SIGNIFICANT sidebands. A significant sideband is one which has an amplitude of one percent or more of the unmodulated carrier.

NARROW BAND FM. (AMATEUR RADIO.)
If maximum deviation of a carrier wave is limited so that FM wave occupies the same space as an AM wave carrying the same intelligence, it is called NARROW BAND FM. Some distortion is present in the received signal. It is quite satisfactory for voice communications, but not for high fidelity music.

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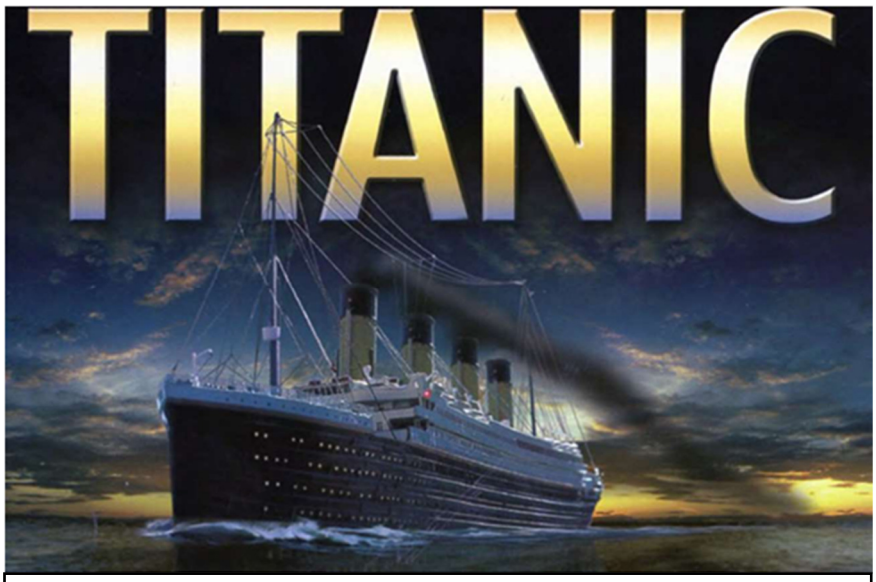
Wireless Aboard the Titanic

... - Allan Brett, Jerry Proc and Parks Stephenson (article submitted to the CVRS by Jerry Proc and edited by Gerry O'Hara)

April 14/15 this year will mark the 110 year anniversary of the sinking of the Titanic. I thought it appropriate to mark the occasion with an article on the topic that has a particular focus on the part played by radio in the events of that fateful night. This two-part article, written by folks very knowledgeable in that subject, was kindly offered for publication in Canadian Vintage Radios by CVRS member jerry Proc, who is recognized as a leading expert in the Marconi marque-t-Ed.



Above: The Titanic, depicted at dawn on Sunday April 14, 1912. It was to be the last sunrise for Titanic and 1,200 people. The day was beautiful but disaster was at hand. Titanic would strike an iceberg at 11:40 pm that night and slip beneath calm seas at 2:20am on April 15 (Rocklin Press image)

The story of the distress calls from the Titanic has been repeated in many amateur radio publications particularly the use of '50S' being sent for the first time. But what actually did happen? Was this story true? Did the operators on the Titanic keep sending until the encroaching water flooded their radio room? Did they go down with the ship? The answer to these questions and many other examples of heroism and human failings which this disaster produced can be found in the records of the two official hearings, the United States Senate Hearing and the British Court of Inquiry.

With wireless still in its infancy, Marconi operators spent most of their time sending and relaying private traffic for paying customers. Ship-to-ship messages, including ice warnings, were relayed to the bridge almost as a professional courtesy and rarely with any sense of urgency. In his published account, Second Officer Lightoller writes that it was just such a delay that " ... proved fatal and was the main contributory cause to the loss of that magnificent ship and hundreds of lives."

"Everyone is eager to point the finger at someone else ... " says Naval Historian Kit Bonner " ... but in reality no one person can be blamed. The collision with the iceberg was the culmination of several minor mishaps and 'if only's.'"

As often happens in real-life situations, 'truth is stranger than fiction'. Many parts of the [1997] blockbuster movie 'Titanic' are based on the recorded facts, however, many are not and are the result of 'artistic licence'. One of the closest representations still remains the 1958 black and white British production 'A Night To Remember', based on Walter Lord's excellent book of the same name. Those CW buffs among our numbers will find that the Morse depicted in this film is actually readable. This film also spends much time on the most ironic event in the chapter of calamities which befell the stricken liner, that being the Marconi operator on the Californian shutting down his operations half an hour before Jack Phillips (the Titanic's first radio operator) commenced sending distress signals.

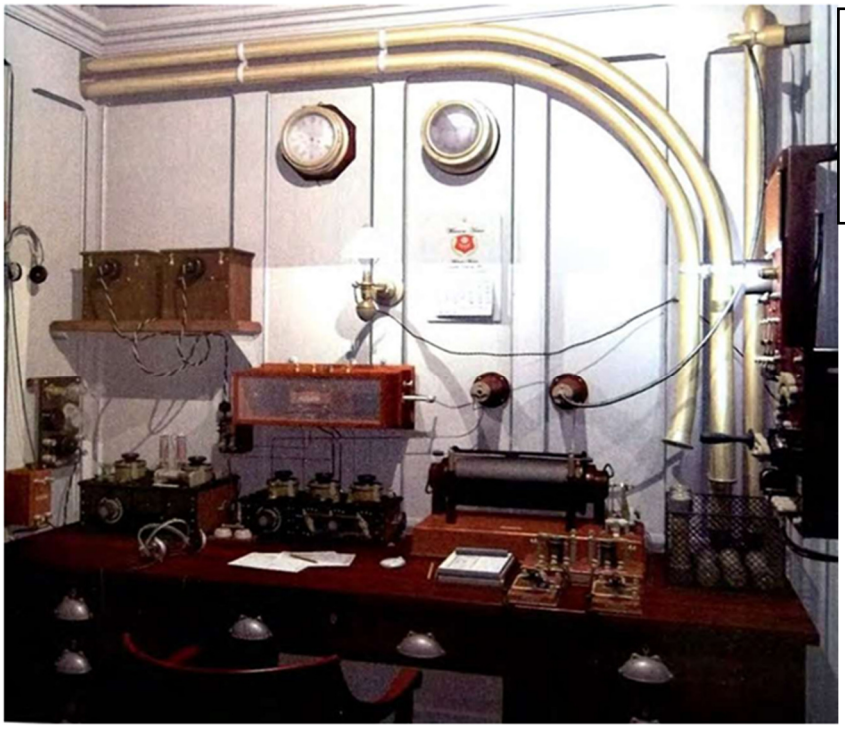
It was most probable that the Californian, which was the nearest vessel, could have responded long before the Carpathia, the eventual rescue vessel, but for this unkind twist of fate. You may have noticed that the Titanic's wireless operator was referred to as a 'Marconi' operator. Yes, our old friend Guglielmo really had the game sewn up relative to maritime communications in 1912. The operators all worked for him and he hired them out to the shipping companies. Wireless and the operators played a pivotal role in the Titanic disaster. Operators were by today's standard overworked and underpaid. According to testimony, Jack Phillips aboard the Titanic, forwarded an ice warning from the America to Cape Race regarding ice about 19 miles southward of the Titanic's course. This message was never sent to the bridge, probably due to the workload which he had to carry. At 9.05pm, about two and a half hours before the collision with the iceberg, the Californian sent "We are stopped and surrounded by ice."

The reply from the Titanic was "Shut up. I am busy. I am working Cape Race." Cyril Evans, the operator on the Californian, stated to the British inquiry that he was not insulted by this rebuff as the larger or faster ships took preference in sending their traffic. Evans had a long day in any case - he had been on duty since 7.00am that morning and therefore he retired to his bunk at 11.30pm-the operators on the Titanic were required to work six hours on and six hours off. Even at the cost of 12 shilling and 6 pence for ten words and 9 pence. for each additional word, the passengers lined up (at least the wealthy passengers) to

Above: Although Titanic's wireless room was only featured briefly in the final cut of blockbuster movie of the same name, no effort was spared to recreate the original in every detail as the above Douglas Kirkland photo reveals. The Marconi Room set in the 1997 'Titanic' movie was based on RMS Olympic, since that was all the information that was available when the movie was being made. Titanic's wireless station was split into two compartments - one for receiving (pictured above) and one for transmitting. The transmitting room was known as 'The Silent Room' (photo on page 8) because it was sound-proofed to reduce the acoustical noise generated by the transmitter.

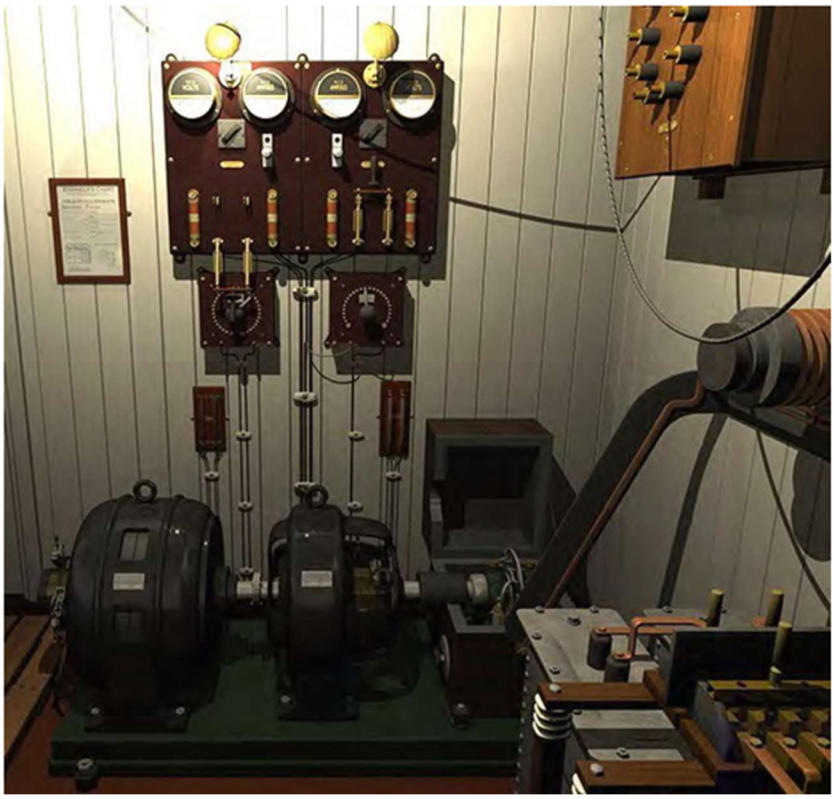
send a message home via this new-fangled service. The remuneration for operators, from the evidence given by Marconi, started at US$4, up to US$12 per week, with board and lodging. It was no problem to fill these positions as this rate of pay was considerably more than their land based colleagues.

Another point of interest was the [young] age of the operators involved in the saga: Jack Phillips was 24 years old, Harold Bride, the Titanic's second operator, was 22 years, Cyril Evans of the Californian had only six month's experience at the age of 20 years, while Harold Cottam of the Carpathia was 21 years old. At 11:40pm on Sunday April 14, the lookout on the Titanic rang the bell three times and activated the ships telegraph. "What do you see?" came the request. The answer was "Iceberg right ahead!". The events which unfolded then did not have any immediate effect on the two operators. Jack Phillips was flat out getting through the traffic which had accumulated. Harold Bride was in his bunk but was turning out early to relieve Phillips, who as we have seen had a heavy shift. Harold Bride had just taken over, and Jack Phillips was preparing to turn in when Captain E. J. Smith appeared and said "You had better get assistance". Jack Phillips came back into the room and took over, and commenced the distress messages at about 12.05am, Monday 15 April 1912. Phillips and Bride then stayed at their posts even after they were relieved by the Captain.



The photo, left, is a CGI rendering of Titanic's wireless office by Parks Stephenson. Since no photos of Titanic's wireless office exist, the CGI rendering was based on a photo taken of the wireless office aboard Olympic, Titanic's sister ship.

According to Bride, the Titanic's wireless was functioning until ten minutes before the ship's final death throes at about 2.20am Monday April 15. As noted, Jack Phillips, as the principal operator, came back on duty and commenced sending 'CQD' followed by 'MGY'. CQD was the Marconi conventional distress signal and MGY was the Titanic's call sign. While 'S0S' was also used, there was much discussion at the American Senate Inquiry as to whether CQD actually stood for an abbreviation and if it was in accordance with the international convention. Marconi himself replied that it was not in accord with international convention but that it was a conventional company signal. He went on to say that the international distress signal decided at the Berlin Convention was SOS. The first reply to the CQD call was from a German ship, the Frankfurt, which, although some 200 miles distant, had a very strong signal. The operator on this vessel evidently became confused and did not recognize the gravity of the situation as twenty minutes after being sent the Titanic's position in latitude and longitude, he sent 'What is the matter?". This proved too much for Phillips who snapped back with a message to the effect that the Frankfurt's operator was a fool and to keep out. This may have been injudicious, as was pointed out in the American Senate inquiry, but, as it turned out, the Frankfurt was much too far distant [to be of assistance]. In the meantime, another more promising reply had been received from Harold Cottam on the Carpathia. Cottam received the Titanic's call merely by chance.



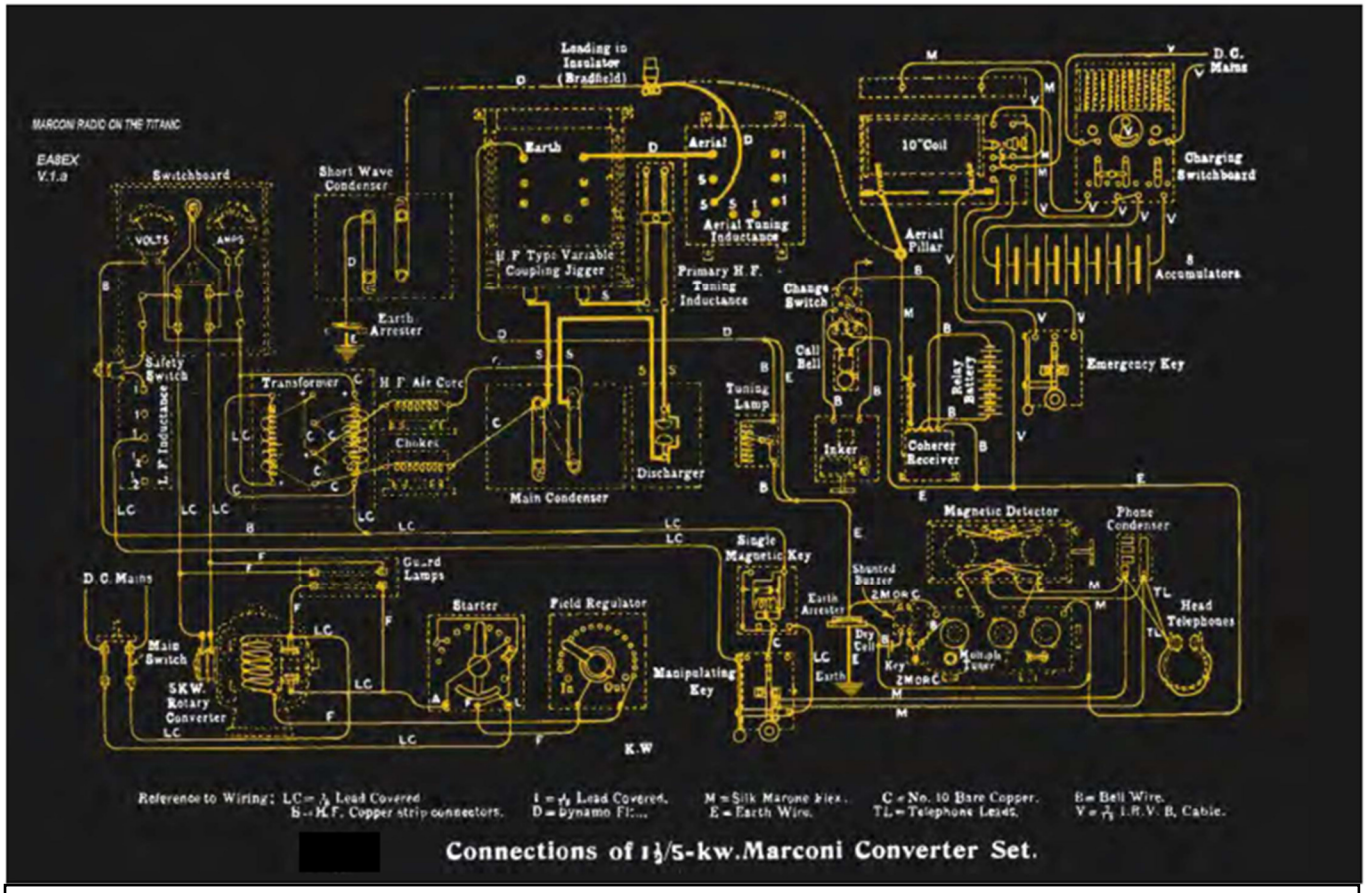
This computer-generated image (CGI) above shows the placement of the major components in the 'Silent Room'. The transmitter was called a 'disk discharger' in order to distinguish it from ordinary spark gap sets of that era. From left to right on the deck is the DC motor, the alternator, the disc discharger unit and the condenser bank. Above the condenser bank is the spiral inductance coil. In the upper right corner was the ATI (Aerial Tuning Inductance) inside the big wooden box. On the wall above the motor and generator are the DC and AC switchboards, with the regulators underneath and the graphite shunts below them. The equipment layout is that of Titanic's sister ship Olympic as there are no Titanic Silent Room photos in the archives. The lighting in this room was not very bright so the CGI tries to capture that effect. There was one lamp on the deck head (ceiling) and an indicator lamp on each of the two switchboards. (CGI by Parks Stephenson)

Like Evans, the Californian's operator, he [Cottam] had been on duty since 7.00am and was due to turn in for the night but he still had his headphones on awaiting a reply from another vessel when he overheard Cape Cod trying to contact the Titanic with a bunch of messages (remember this was 1912 and the range of transmission was restricted and much of the traffic relied on third party transmission). Imagine Cottam's surprise when he called the Titanic with "I say OM ['old man'] do you know there is a batch of messages coming through for you from MCG" (Cape Cod's call sign), and received, "Come at once it's CQD, OM. Position 41 '46N, 50'14W'. Cottam replied, "Shall I tell my Captain? Do you require assistance?" The cryptic reply was, "Yes come quick". Despite Cottam racing to the bridge with the CQD message and the consequent awakening of Captain Rostron, the master of the Carpathia, and his heroic efforts to push his ship beyond its capabilities, it was about 4 hours before they arrived at the scene, too late to save the 1,527 who perished, but in time to rescue those who had survived the night in lifeboats.

Phillips and Bride remained at their posts after being released from their duties by Captain Smith until they could no longer transmit due to the failure of the generators. They had been in touch with other ships and stations including the Titanic's sister ship, the Olympic. When they came onto the deck, all the lifeboats had long been launched and some of the officers were attempting to get off the last collapsible boat which was attached to the roof of the officers' quarters. The attempt was only partially successful, the boat being washed off as the Titanic broke apart and sank.

This lifeboat ended up inverted with Bride being trapped under it in an air pocket. He was eventually able to extract himself after a considerable time and make his way onto the top of the overturned boat. Phillips also managed to make his way to the same boat but died of exposure during the night. Bride survived with frostbitten feet and injured ankles and was picked up by the Carpathia. Bride's participation in the actual events was not to end there as he was carried to the wireless room of the Carpathia towards the end of the survivors trip to New York to relieve a totally exhausted Cottam who had been on duty since receiving the "come at once" message from the Titanic. Bride received $1,000 and Cottam $ 750 for the sale of their stories to the press of the day. These payments caused some controversy at the time as it appeared that the Marconi organization had told them to maintain their silence until they reached New York thus depriving a news hungry public news of the tragedy.

As a result of the part played by wireless in the events surrounding the loss of the Titanic, a 24 hour radio watch was introduced so that the strange set of coincidences which resulted in one radio operator shutting down at a critical time and another contacting the stricken liner by pure chance would not be permitted to happen again. On the debit side, the Titanic operators actions in ignoring and not passing on several ice warnings contributed to numerous oversights which when taken as individual events, could not be regarded as serious, but when combined reached overwhelming proportions. For the operators, it was clearly a case of overload of often frivolous messages from the wealthy passengers. On the credit side, both operators stayed on even after they were released from duty sages that night, with the exception of the operator on the Frankfurt (the operator who was called a fool by the frustrated Phillips). Did the operator on the Frankfurt recognize the CQD message? "Certainly" replied Marconi. Although the wireless equipment on the Frankfurt had been supplied by a German company and SOS had recently been adopted by the Berlin Convention, it was a Marconi company, of which Marconi was a director, and as such used the Marconi conventional signals and in any case, CQD was more widely recognized than SOS this is an example of the almost total control which Marconi exercised over the 1912 maritime communication scene with the Marconi distress signal being rated above the



Above: The Titanic Radio System. This graphic shows the main 5KW transmitter, the 1.5KW main spark emergency transmitter, as well as the main and backup receivers. Titanic's radio gear was installed, tested, aligned, and operated by radio operators Jack Philips (age 25) and Harold Bride (age 21) at the Harland and Wolff shipyards in Belfast, Ireland. (Image via Titanic Radio Room Blog)

international signal. As stated in the opening to this discussion, the story of the Titanic is one of human failing, sacrifice and endeavour, and was arguably the night when 'Wireless came of age'.

FOLLOW ON TO THE STORY ....

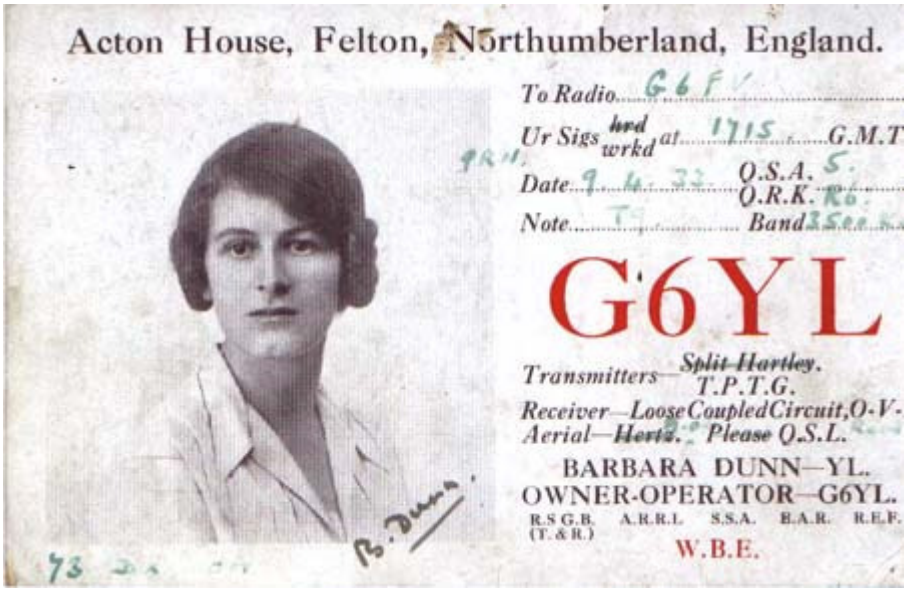
[Some years ago] The Discovery Channel produced a documentary, titled" Last Mysteries of the Titanic." and in doing so, it captured some ROV footage from inside the Marconi Room. It was examined in both 2001 and 2005. Part 2 of this article will provide an analysis report from the technical advisor (Parks Stephenson). by the Captain, only ceasing transmission when their spark ceased due to the failing generators as the ship sank. The sending of the first distress call was made at 12.45am on 15 April 1912.

The Captain had called at the wireless room to ascertain the progress of the attempts to summon assistance and enquired as to which distress call was being sent? - "CQD" was the reply. Bride recalled that SOS had recently been agreed as the international distress signal and suggested that Phillips might send that as well, "it might be the last chance you have to send it, he added prophetically.

There was little emphasis given to this historic event in the evidence presented to the US Senate inquiry at which Bride and Marconi appeared.

Phillips and Bride were both Marconi employees, and so were almost all of the participants in the passing of messages.

G6YL, Barbara Dunn, 1st British YL



Barbara is 32 years old in this photo

G6YL, Barbara Mary Dunn, born February 25, 1896, became SK September 1979 in Carlisle, Cumbria, England. In 1906 a talk and demonstration of wireless was given at Barbara's school (she was age 10) and she eagerly volunteered to take part in the demonstration. She remembered sending SOS in Morse and said she was thrilled. Barbara lived in the Essex village of Stock and in 1923 (age 27) her father purchased a wireless set to listen to the new British Broadcasting Company transmissions from 2LO in London on 350 metres (857 kHz). In early February 1923 while listening to 2LO she noticed a rasping kind of interference on the transmission. She was unable to tune the interference out so decided to try and find the cause.

In those days most of the smaller ships operating in the Thames still used spark transmissions which spread over a wide frequency range and it was these spark Morse signals on 600 metres (500 kHz) that Barbara had been picking up. Fascinated by the signals she decided to teach herself Morse code by copying down the dots and dashes as fast as she could. By March 1923 she was able to copy slow Morse and by May 1 she could copy at 10 words per minute. On July 10 she was thrilled to be able to copy messages at speeds of up to 20 WPM.

She used her own crystal set and "cat's whisker" so that the main wireless set could continue being used for 2LO (BBC) reception. Her greatest thrill was when she picked up her first SOS and copied the Latitude and Longitude. Her father was a bit sceptical and took the trouble to visit Lloyds in London the next day to confirm her information. He came back satisfied and impressed. Her next thrill was in picking up signals from Marconi's yacht Elettra on about 90 metres. As he asked for reports she wrote to him but wisely, given the misogyny of the era, simply signed it B.Dunn so as to give no clue to her gender. To her surprise and great joy Marconi answered and asked her to continue listening and reporting.

Yacht 'Elettra' enters Mounts Bay from the harbour at Penzance.

Barbara breezed through the 12 WPM reception test and the examiner even sent her 25 WPM which she copied. She received her transmitting licence G6YL on April 14, 1927. She was the first British licensed transmitting YL but didn't have her first contact until November 21, 1927 when she worked T.P. Allen GI6YW in Belfast. She initially transmitted on 49 metres but GI6YW told her and she retuned to 45 metres. Her first transatlantic contact with the USA took place on April 12, 1928 when she was running just 6 watts DC input on 45 metres.

Barbara Dunn, when first licensed, was living at Lilystone Hall, Stock, Essex where she operated on 45 meters & 23 meters. After the Washington Conference of 1927, amateur bands were changed to 160M, 80M, 40M, 20M etc. as per today, upon which Barbara operated. In 1928, she moved to a place called Acton House, Felton, in Northumberland. In the 1930's, ladies rarely attended P.D.M.'s. Provincial District Meetings were localized meetings of "The Society", later to become RSGB. There were 2 important exceptions. Barbara Dunn, G6YL, was the 1st exception. Being of a quiet and retiring nature, few of the hundreds who contacted her efficient and intensely active low power station at Stock in Essex, knew the operator was a lady. Gerry Marcuse, G2NM, president of The Society 1929 - 1930, did know, however, and it was he who was probably responsible in persuading Miss Dunn to come to the 1930 convention. A few weeks earlier, G6YL had been awarded the newly donated 1930 Committee Cup for outstanding work in the first series of 1.7 Mc/s tests. Her presence at the Convention Dinner caused quite a stir as did the fact that when G2NM made the presentation she became the first lady to become the holder of a Society trophy. Barbara Dunn, who was licensed in 1927, remained Britain's only YL transmitting amateur until 1932 when Nell Corry (the second exception) of Tadworth, Surrey, doubled the number by becoming G2YL.

In August 1939 amateur stations closed down and their equipment confiscated for the duration of WWII. Amateurs volunteered for the Royal Naval Volunteer Wireless Reserve and the RAF Civilian Wireless Reserve. John Witty G5WQ licensed in 1923 was Barbara's brother. Both G5WQ and G6YL (along with around 1500 others) helped with the war effort in 1939-45. They were "VI's", Voluntary Interceptor's in the "Radio Secret Service" listening for German transmissions. Large numbers of VIs sent their received traffic for onward transmission to Bletchley Park for decryption. Among the VIs were three ladies, Barbara Dunn G6YL, Nell Corry G2YL and Constance Hall G8LY. The RSGB continued publishing their journal the "T&R Bulletin" during the war, T&R bulletins for 1939 and 1940 make reference to Barbara. There was no mention of her wartime work which was not made public until 1979 with a BBC broadcast by Rene Cutforth, called the Secret Listeners. Barbara was not mentioned by name in the programme. The "VI's" were not paid so no record has been kept of who they were.

http://www.lothiansradiosociety.com/lrs-news/75-annual-general-meeting-2010
http://hamgallery.com

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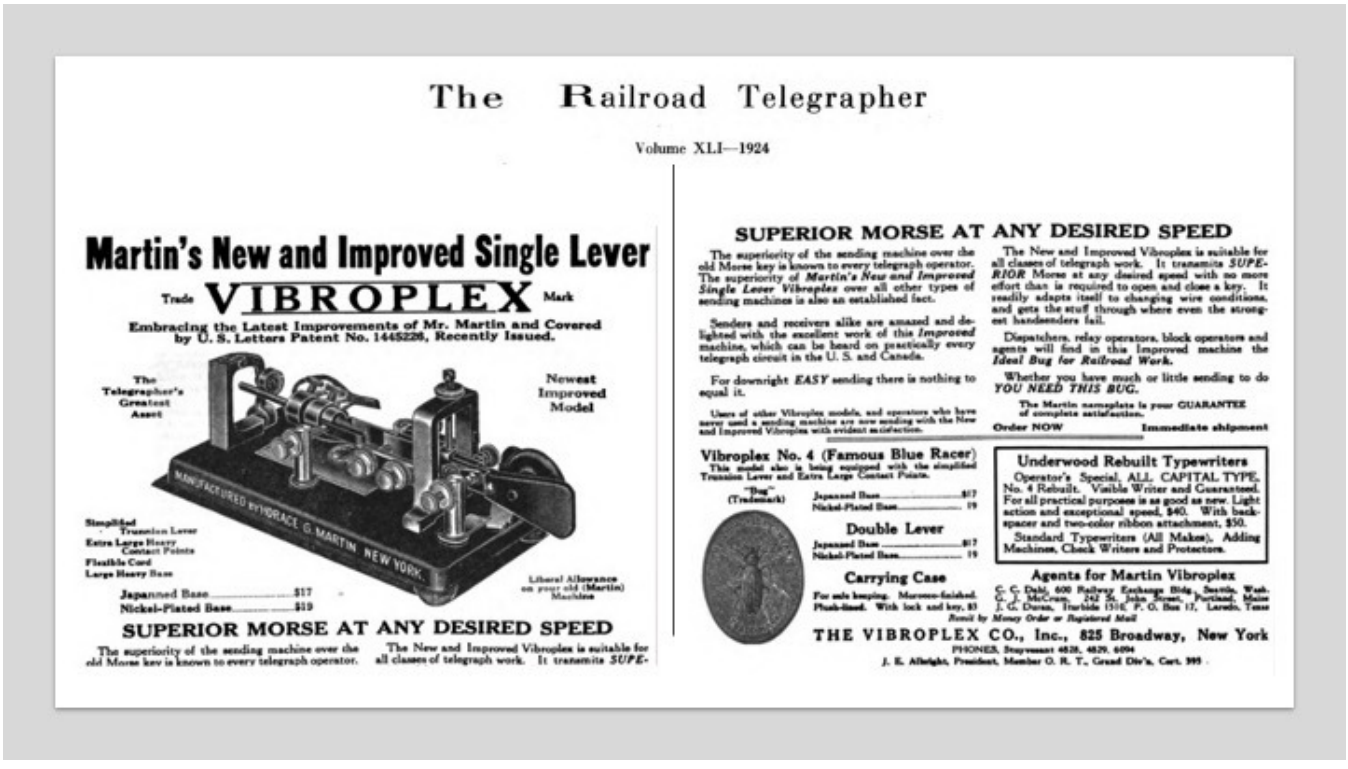

The Railroad Telegrapher

Volume XLI—1924

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Hams in Space (part III)

By Jacques Botha (ZS6MAV)

It has become time for another instalment of the Hams in Space series, and as promised in the last issue, this time we will look at some of the antennae, modes, and methods that the astronauts employ.

But, perhaps first, we should whet those insatiable RF appetites of our avid and voracious readers by dispensing with some upcoming RF activity on this topic.

Hams are invited to take part in "listening in only" on QSO's between Educational Ground Stations (read Schools) and the ISS on the following dates:

- ***École Elementaire Ste. Jean D'Arc, London, ON, Canada, Telebridge via K6DUE*** *on Tue 2022-04-05 17:09:27 UTC*
- ***Leonardo-Da-Vinci Campus Nauen, Nauen, Germany, direct via DC1RSN*** *on Wednesday 2022-04-06 11:48:08 UTC*
- ***École Secondaire Sainte Marguerite d'Youville, St. Albert, AB, Canada, telebridge via K6DUE*** *on Wednesday 2022-04-06 16:21:23 UTC*
- ***Herzliya Science Center Israel, Herzliya, Israel, direct via 4X4HSC*** *on Thursday 2022-04-07 07:46:54 UTC*
  Space Hardware Club, Huntsville, Alabama, direct via K4UAH *on Thursday 2022-04-07 17:07:39 UTC*

These QSO's can take place in one of three modes:

A "Direct" radio link that is established between the ground based Amateur Radio Station and the ISS.

A "Telebridge" which occurs via an ARISS ground stations and the ISS first. The ARISS ground station then relays audio via conventional means such as telephone.

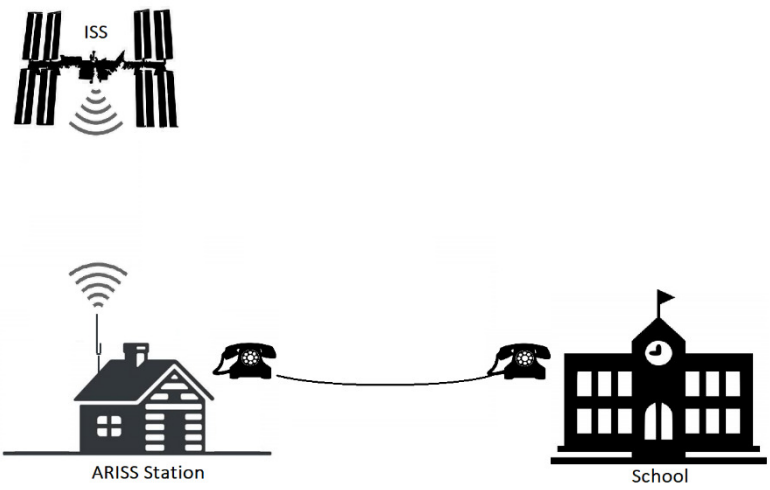

Figure 1 - Telebridge Communications between the ISS and a School

A "Virtual Telebridge" where students virtually attend school via some platform such as Google Classroom or similar. This means that the student sits in the comfort of his/her home and that the ISS, is in essence connected to all these houses. This is also known as an ARISS Multipoint Telebridge via Amateur Radio.

The goal of all of this, as it has ever been, is to stimulate interest in STEM (Science, Technology, Engineering & Mathematics) in our new generation.

Having dispensed with this juicy snippet of news we can now shift our attention back to our orbital lab and the antennae in use.

The Lira (Лира) Antenna
This antenna is mounted directly to the Zvezda module.

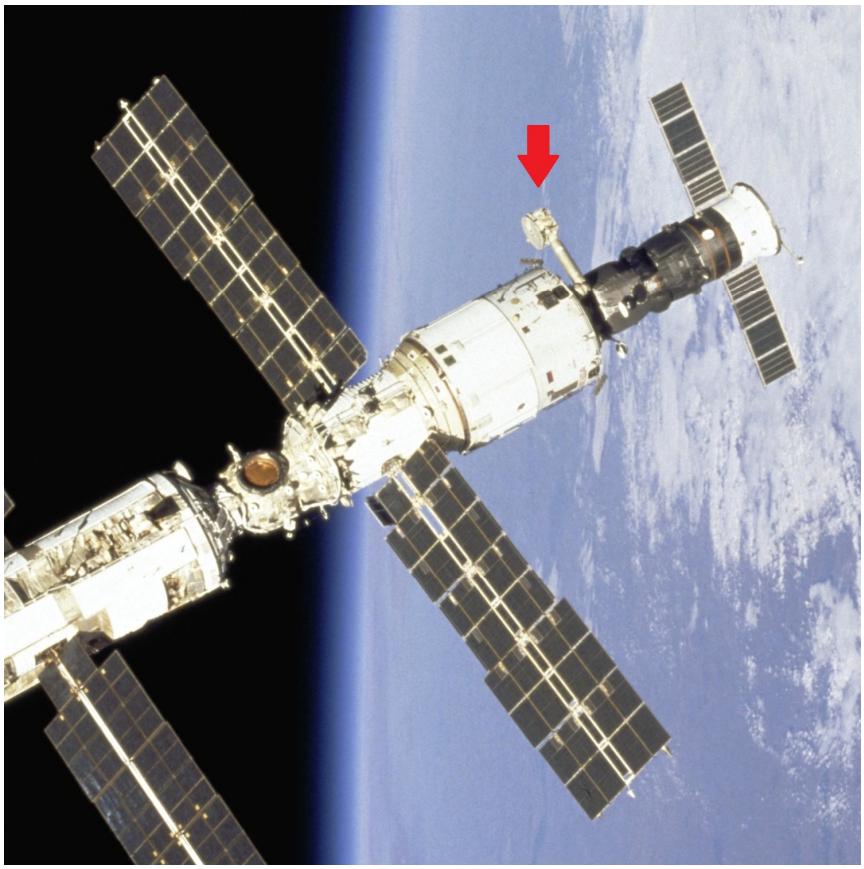

Figure 2 - The Lira Antenna on the Zvezda Module (Photo credit - NASA)

The S-Band antennae
There are two of these S-Band antennae for the sake of redundancy (Remember that they do after all provide audio, telemetry and command data) and they are mounted on the P1 and S1 Trusses respectively.

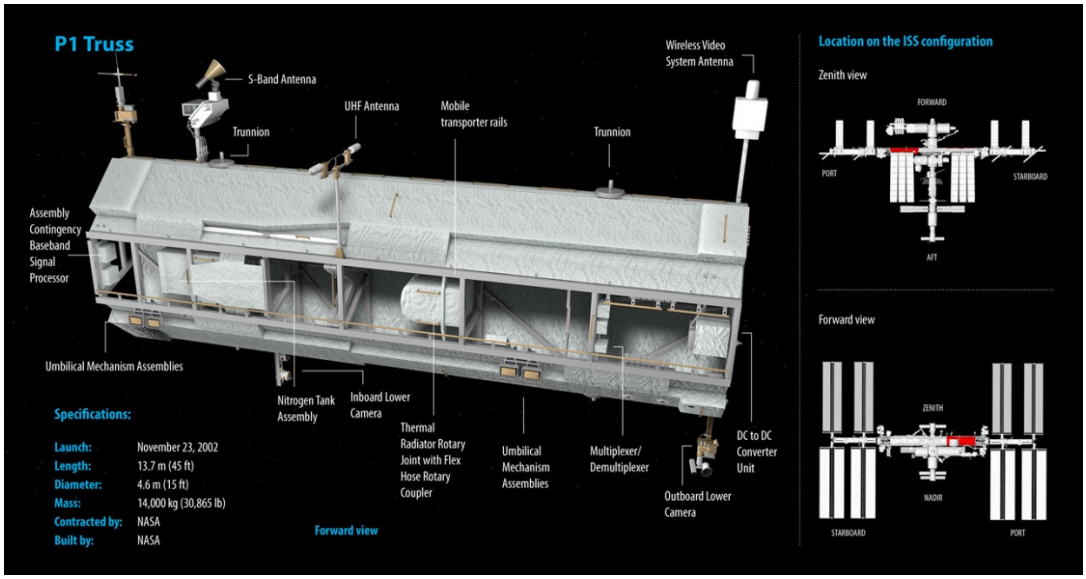

Figure 3 - An illustration of The P1 Truss and its location on the ISS

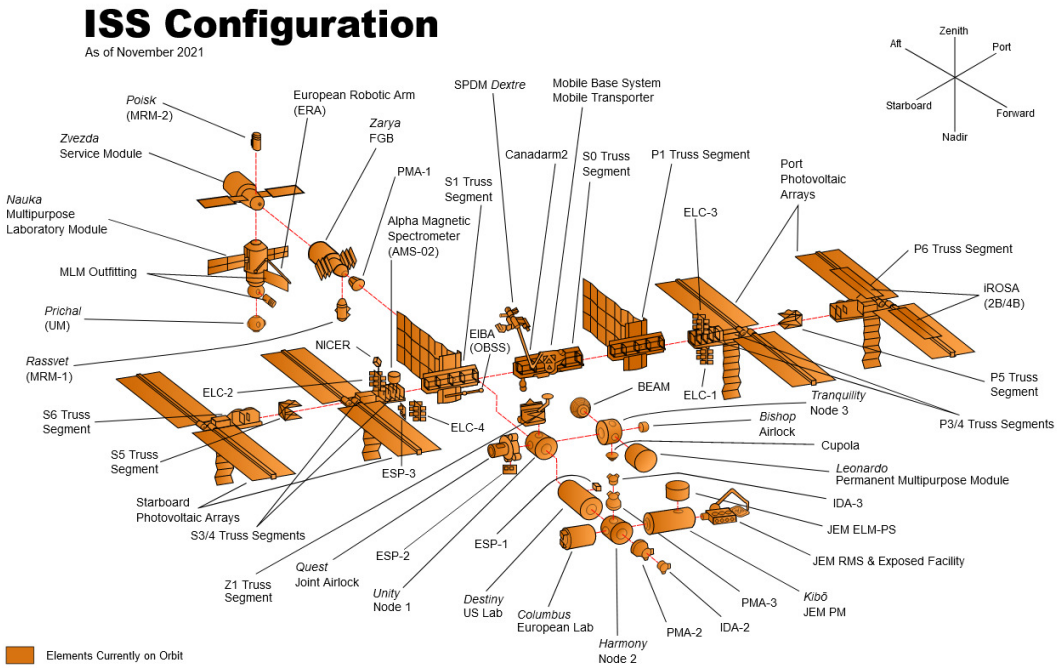

Figure 4 - An expanded view of the ISS showing the different modules and Trusses (note the location of P1 and S1)

For a nice little animation of the Trusses and modules please point your browser to:

https://upload.wikimedia.org/wikipedia/commons/f/fb/ISS-assembly-animation.gif

The Ku Band antennae

When initially launched in October 2000 there was only one SGANT (Space to Ground Antenna). Currently there are two working in unison and streaming video down to NASA Ground Stations.

The Ku Band system provides a 50Mbps downlink and can be configured to stream full motion video (as we see on our Televisions) or stop motion video that only transmits some frames of the standard 25/30 fps videos. This results in a kind of jittery or staccato video which oftentimes is still sufficient to use but saves on used bandwidth.

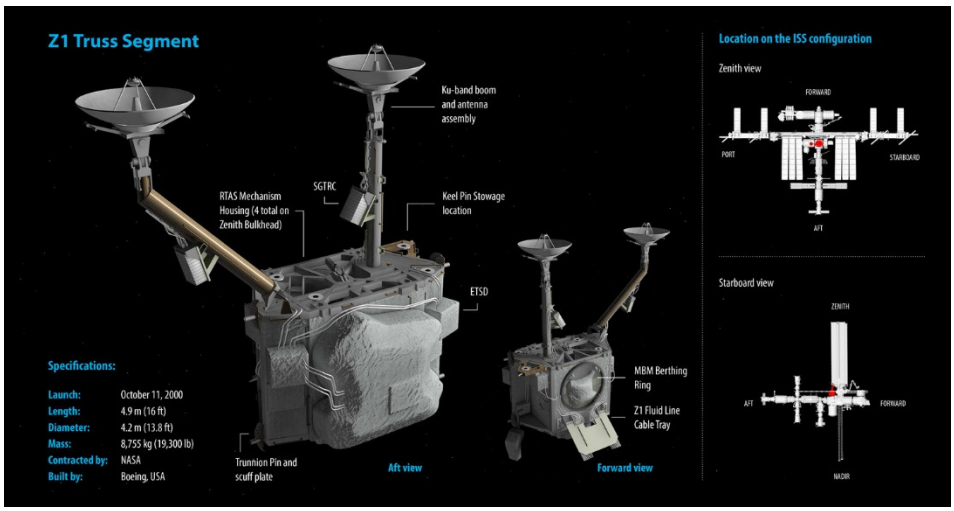

Figure 5 - The Z1 Truss showing the Ku Band antennae

Next month – More antennae, modes and methods.
Look out for the next issue of the AWASA Newsletter

All image credits and references available from the author on by request.

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Echolink—ZS0AWA-L
Relay on 10.125 and 14.135 (Try all and see what suits you)
Saturday 14:00 (12:00 UTC)— CW Net—7025

AWASA Telegram group:

Should you want to get on the AWA Telegram group where a lot of technical discussion takes place, send a message to Andy ZS6ADY asking to be placed on the group. This is a no-Nonsense group, only for AWA business. You must download Telegram App first. …..+27824484368