

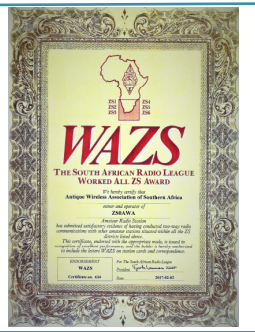


Newsletter

The Antique Wireless Association of Southern Africa

140

March 2018



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Reflections:

I cannot believe that we are already in to the third month of the year and time is flying by. How well I can remember as a youngster in school that time used to seem to just drag by and everything took an eternity to happen. These days with our busy schedules it is no longer the case.

Having been in and out of retirement, even when I was at home, enjoying the days working on radios and having regular QSO's, it did not take long for the days to just whizz by. Maybe something has changed as far as time lines is concerned and the world has shrunk, which means it turns faster and the days go by quicker, but we'll leave that for some of the conspiracy theorists to work out.

My brain however still seems to think that I am a youngster and I find so many times that I am doing things that my body cant

keep up with anymore. It's a crying shame really that such a young mind should go to waste.

The reality of it all though is that I reckon I still have a good number of years before my brain catches up with my body. I have no doubt this will happen, but until then, I will remain, in the words of one singer, forever young.

One thing for sure is that the parts are still functioning fine. There are no burnt out capacitors yet and the tubes still glow with most of their original luminescence. That could be because I have lost a lot more hair.

At least the radios that I have seem to be in a similar condition. The capacitors are all still in good shape, the tubes are shining bright and the resistors are still resisting at the right values. Long may

they continue to function at the right values.

And so they should, they have been well maintained, fed with the right voltages and generally never over-driven.

They will continue to function in this manner as long as I look after them and feed them correctly until the day that the brain will catch up with the body and there will be a breach in the system.

What a philosophical thought provoking piece this has been . It makes me really wonder what I am doing sometimes and makes me wonder about my own sanity.

And now you can stop singing that song and get back to some serious radio operating in these trying times.

Best 73
DE Andy ZS6ADY

WIKIPEDIA

Amateur radio: The International Telecommunication Union (ITU) governs the allocation of communications frequencies worldwide, with participation by each nation's communications regulation authority. National communications regulators have some liberty to restrict access to these bandplan frequencies or to award additional allocations as long as radio services in other countries do not suffer interference. In some countries, specific emission types are restricted to certain parts of the radio spectrum, and in most other countries, International Amateur Radio Union (IARU) member societies adopt voluntary plans to ensure the most effective use of spectrum.

In a few cases, a national telecommunication agency may also allow hams to use frequencies outside of the internationally allocated amateur radio bands. In Trinidad and Tobago, hams are allowed to use a repeater which is located on 148.800 MHz. This repeater is used and maintained by the National Emergency Management Agency (NEMA), but may be used by radio amateurs in times of emergency or during normal times to test their capability and conduct emergency drills. This repeater can also be used by non-ham NEMA staff and REACT members. In Australia and New Zealand ham operators are authorized to use one of the UHF TV channels. In the U.S., amateur radio operators providing essential communication needs in connection with the immediate safety of human life and immediate protection of property when normal communication systems are not available may use any frequency including those of other radio services such as police and fire and in cases of disaster in Alaska may use the statewide emergency frequency of 5167.5 kHz with restrictions upon emissions.

Similarly, amateurs in the United States may apply to be registered with the Military Auxiliary Radio System (MARS). Once approved and trained, these amateurs also operate on US government military frequencies to provide contingency communications and morale message traffic support to the military services.

A Simple 2 Tone Generator for Testing SSB Transmitters

John ZS5JF

Introduction

When testing of a single side band transmitter needs to be performed the requirement is for an audio generator system that can generate two different tones with very low distortion. There are a number of choices for the audio oscillator, but all oscillators apart from the Wien Bridge types, suffer from some distortion. How low that distortion is depends on the oscillator type. The Wien Bridge has the lowest of all common oscillators but is also the most complex to construct. It has one desirable feature that can be a benefit, it has an in-built AGC system that holds the output level constant. Apart from that feature it can be bettered by other circuits with a little extra circuitry.

All oscillators are run in what is known as a “saturated mode”, where the output level is held constant by the compression of

the signal in the active device. Compression, however, causes harmonics to be generated and needs to be countered in some way. The simplest method is to pass the output from the audio oscillator via a low pass filter network to reduce the harmonic distortion products to very low levels. For IMD testing we require two low distortion audio signals that are not harmonically related. Hence, a 1kHz and a 2kHz signal is not going to work. Normally the choice of the frequencies is constrained by the bandwidth of the SSB filter in use. Most SSB filters are around 2.5kHz total bandwidth and so the tones must be less than this frequency. Very often a 1kHz and a 1.5kHz tone system suffices. The exact separation is not critical as long as the spectrum analyser used can distinguish between them. If the tones are 1kHz and 1.5kHz then the beat note produced is 500Hz and this generates the IMD products at a separation of 2 x the beat note or 1kHz on the spectrum analyser.

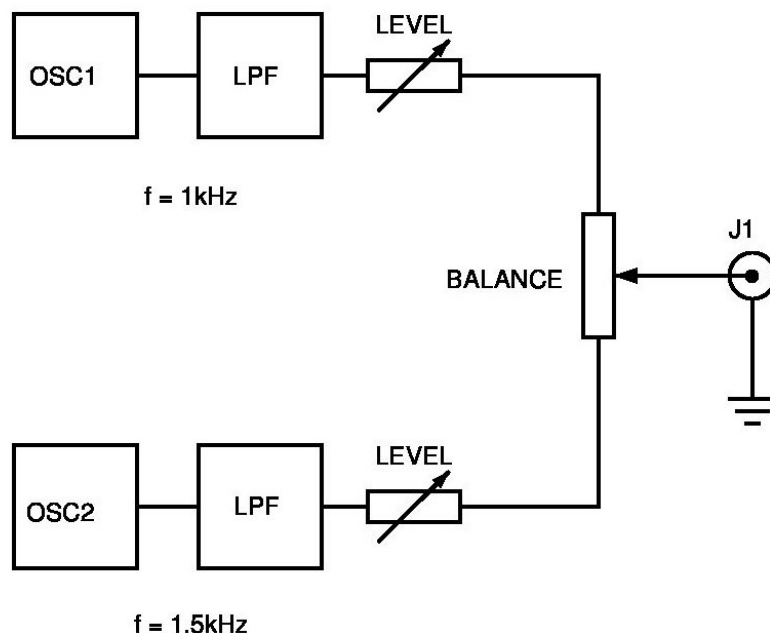


Figure 1 Block diagram of two tone generator

A simple solution

Below are the details of a 2 tone oscillator system I recently constructed for IMD testing of a typical SSB transmitter. This uses the versatile Twin T oscillator to produce a low distortion output signal suitable for SSB transmitters. The Twin T oscillator is a mixture of a high-pass and a low pass network both connected between the collector and base of an amplifier device. The frequency of oscillation is determined by the frequency at which the two filter response cross. To allow for some adjustment in the frequency it is necessary to make one of the filter networks adjustable. In the Twin T oscillator a variable resistor in the high pass filter network is the simplest method. An alternative would be to use a twin gang variable resistor in the low pass network. In the schematic the high pass network consists of C1, C2, R4 and VR1. The low pass network consists of R2, R3 and C3.

The schematic is shown below for one half of the two tone oscillator system. The second oscillator is virtually identical and the two outputs pass via level setting pots and a balance pot to ensure both tones are identical amplitude. Some components are different for the second channel and these are shown on the schematic. TR1 can be any small signal NPN transistor,

2N2222, BC109 etc. C1 and C2 should be closely matched, 5% polyester capacitors are the best choice. Similarly R2 and R3 should ideally be identical values and 2% resistor will suffice.

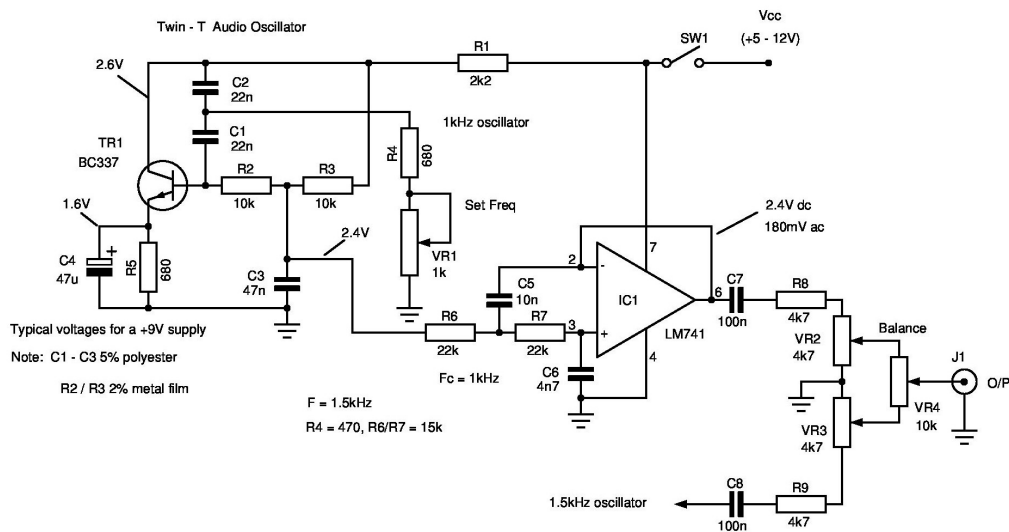


Figure 2 Schematic of a low distortion two tone generator system

The signal at the collector and the base is very distorted due to the compression effect. The output is taken from the middle of the low pass filter network as this point is almost a perfect sinusoidal signal. This is applied to the second order Sallen & Key audio low pass filter which reduces the harmonic content to virtually zero. Each channel has a different cut-off frequency to only allow the fundamental frequency to pass, all the harmonics are reduced to very low levels. The low pass filter has unity gain at the fundamental frequency.

To set up the oscillator system requires an oscilloscope to view the output waveforms. Using this you can adjust each frequency pot to obtain the desired frequencies. With one oscillator on and the other off there should be a perfect sinusoidal tone present at the output. Adjust the level control pot to obtain, say, 50mV peak to peak with the balance pot at mid travel. Switch off the first oscillator and switch on the second and repeat the adjustment for an identical output level. Now switch on both oscillators and the output waveform with a slow X time base setting should appear the same as a 100% modulated AM carrier. (See below for a typical picture). If the waveform is not a perfect 100% modulated signal it means that one of the oscillators is a higher level than the other. To correct this adjust the balance pot to obtain the ideal waveform.

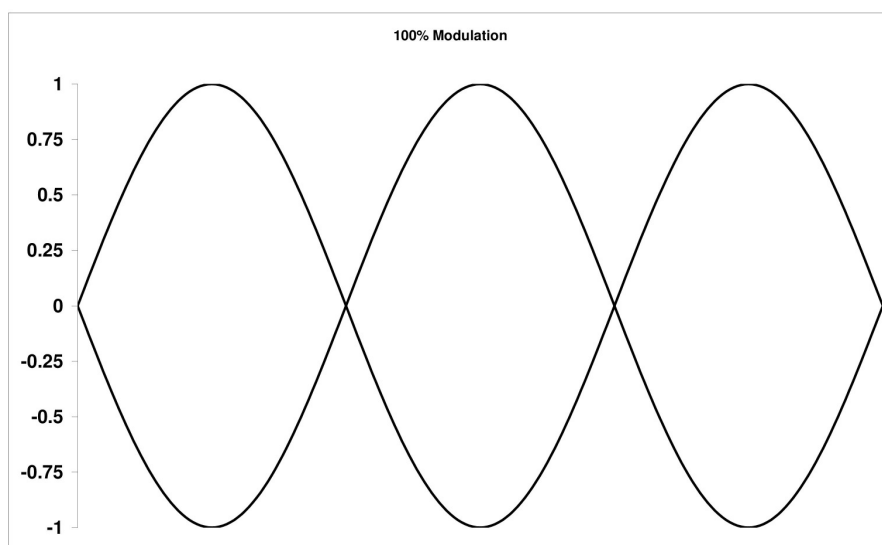


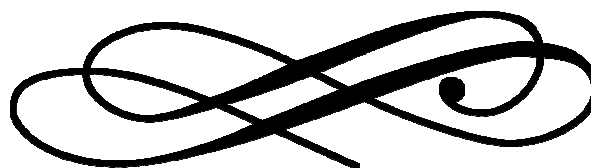
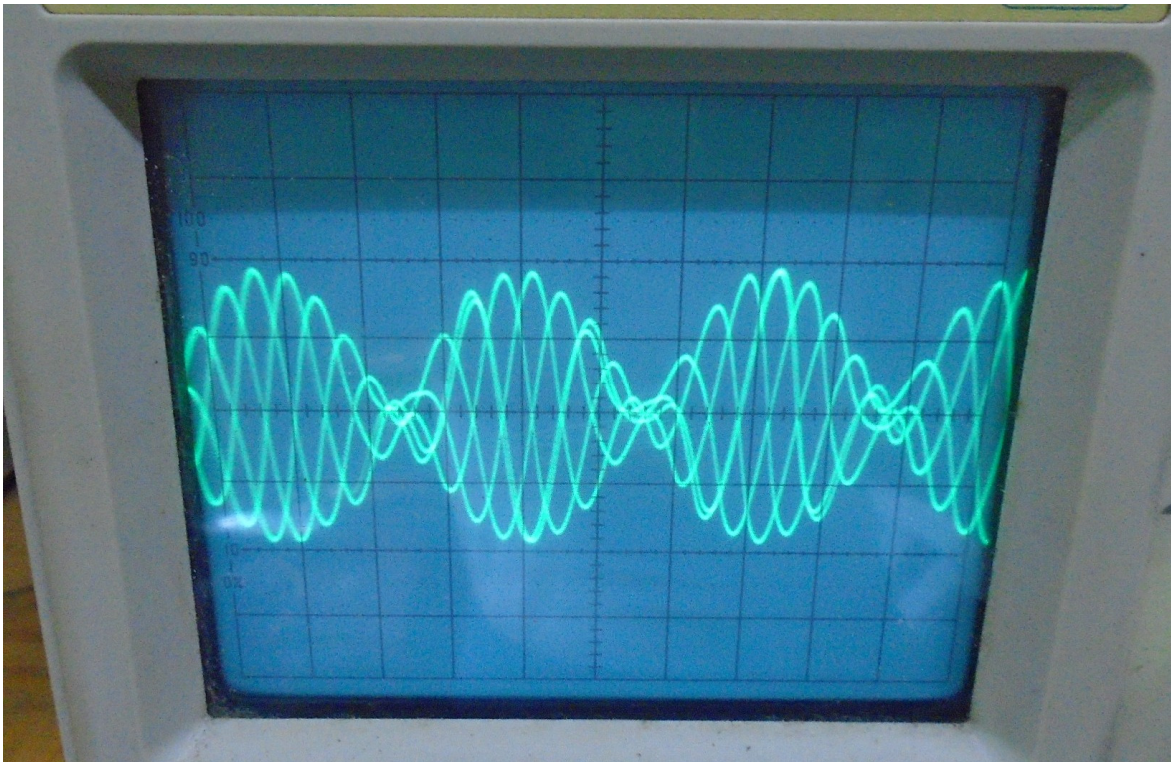
Figure 3 Correct output waveform

Using the two tone signal

It is well to understand the level setting of the SSB transmitter under test. Assume that it is rated at 100W pep output. When setting up the transmitter start with one oscillator switched off and the signal applied to the microphone connector. Tune up for full power and then reduce the mic gain control to obtain exactly 25W carrier. Switch off the first oscillator and switch on the second and ensure that it also reads 25W carrier level. If it is higher or lower then adjust the balance pot to attain exactly 25W for each both tone when applied separately.

When the two tones are applied they sum algebraically to produce an output level of $4 \times 25W = 100W$ pep. If the SSB transmitter has some non-linearity it will cause the signal to appear distorted when viewed as the AM 100% modulated condition. The average reading wattmeter in line with the transmitter should read 50W and not 100W. If the output appears distorted on the oscilloscope it means that the true peak power is less than the nominal 100W pep. If the signal cleans up when the mic gain is adjusted to lower the power output the true pep level is twice the wattmeter indicated average power. So don't be surprised if your 100W pep transmitter only gives 80W pep (40W average indicated) or less.

If you have a dual beam scope then to compare the input and output waveforms is simple. Connect one scope Y input to the audio generator output and use this to trigger the scope to obtain a display like Figure 3. Connect the second Y amplifier input to a sample of the transmitter RF output and display the two traces. Adjust the Y amplifier gain so the two traces have the same height. By moving the audio trace over the RF trace you will clearly see any differences. If no distortion occurs then they should fit exactly.



HF Happenings:

Latest from the Republic of Kosovo (11 February)

The weather has been warming up in Kosovo lately and is currently above the freezing mark. Many are wondering why it isn't possible to eliminate the noise by setting up camp in the quiet open field. The underlying fact is that Pristina is more than 650 m above the sea level and this winter has been particularly cold with -13 C temperatures experienced during the activation period. There are prospects in place for the final and upcoming week to operate from a better place. Driton, Z61DX, has been testing the location and reception is dramatically better than at Z60A.

Considering that Kosovo will stay on the DXCC map and that this is the very first activation, not all noise and other challenges are expected to be resolved. However, a remote location for RX/TX is underway and the first tests may be done this week. Bill, AA7XT, has donated an XR9 antenna to this application and it is now used at a temporary location by Z61DX - soon to be moved to the remote site. The project seeks a reasonably priced pair of second-hand TS590 rigs for remote implementation. Please contact N7NG or OH2BH.

The purpose of this first activation was to bring in delegates from as many countries as possible. This helps Kosovar amateurs in expanding their network of friends into many interesting countries – something that had not happened over the past years of “none” status. During this coming week Toivo, ES2RR, will boost the number of delegate countries to ten (10).

The departing German/Slovenian team of DJ5IW, DM5TI, DD2ML and S57AW did a fantastic job while introducing the data modes (RTTY and FT8). They made up to 10 000 digital QSOs (some 4 000 in the WPX RTTY), with the Z60A project total now reaching 70 000. Driton, Z61DX, and his brother Agim, Z61AS, were also active all-day Saturday on FT8 as a result of the past week's work by Ulli, DD2ML, and others.

During this RTTY weekend, the SHRAK HQ location was exclusively activated on 20 m SSB by locals: Z61VB, Z61FF, Z62FB and Z63DBB.

The DX community has been generous to their fellow amateurs in Kosovo. All donations are temporarily marked for SHRAK needs and will be managed by the Yasme Foundation directors Martti, OH2BH, and Hans, PB2T, together with Pertti, OG2M, and SHRAK president Vjolca, Z61VB. The “early LoTW with fast paper QSL” concept will continue to 15 March 2018. Thanks also to Jyri, OH2KM, for managing all related data operations.

The final jubilee week is now starting. An international delegation will participate in the ceremonies celebrating the 10th anniversary of Independence. In addition, they will give out new DXCC contacts to those who still have an “ATNO” need and be active in the ARRL DX CW contest. The team includes Z61DX, ES2RR, OG2M, OH1MA, OH2BH and others.

Regards from the vibrant city of Pristina, with many new prospects underway!

Print a footswitch

Forgot your footswitch for a contest, but just happen to have access to a 3D printer, and have a micro-switch in the junk box? Try this 'printable' design from RemoteQTH.com <https://remoteqth.com/3d-ptt-foot-switch.php>. You might have to tread lightly to make it to the end of the contest.

St Patrick's Day

In Ireland we traditionally celebrate St Patrick's Day on 17 March (*coincides with my wedding anniversary!*) But with radio we go world-wide by getting on air following the time zones as people celebrate across the globe from 12:00 on 16 March until 12:00 on 18 March. So why not take part in this fun e-award and help turn the bands green for St Patrick's Day. For more information go to <http://stpatrickaward.webs.com>

It is also the wedding anniversary of ZS4BS and his beautiful wife (17 March) but no award is available for that!

3Y0I Bouvet DXpedition News (Rebooted DXpedition)

According to the Web page <https://bouvetoia.org/>, operators Dominik, 3Z9DX, Stanislaw, SQ8X, Leszek, SP3DOI, Branko, YU4DX and Frans, J69DS have rebooted their plans to activate Bouvet Island. They state, "Our trip originally planned at the end of 2017 was cancelled at the request of the organisers of the '3Y0Z' expedition. Due to the cancellation by the organizers, we are now returning to the implementation of our project and preparations for our trip as a matter of urgency." No dates are mentioned on the web page, but "DX-WORLD.net" states that they "received information from a Norwegian contact that the 3Y0I license has been renewed. A landing permit has also been issued by the Norwegian Polar Institute. No dates of activity are mentioned, but the permit is good until February 2019. However, DX-World contact suggests activity could be some-time this year." The expedition plans are as follows per the Web page:

How? For the purposes of the expedition, a 24-m-high seagoing yacht with a Power Sail sails and 2 engines of 250 HP was chartered. The unit is adapted to move in extreme weather conditions. During the stay on the island, before the bad weather, we will be protected by proper construction of expedition tents.

Where? Our expedition will start in South Africa, from where we will sail to the Bouvet Island. We will cover over 2 800 nautical miles in the far South Atlantic. It is over ... 5 200 km! After landing on Bouvet Island, we will install a camp and shortwave radio on the glacier plateau (it covers 93% of the island's surface. In good weather, we will get Olavtoppen - the highest peak of the island rising 760 m above sea level.

When? Our expedition will take place during the sub-Antarctic summer in the Southern Hemisphere. A sea journey in stormy conditions will take about 12 days one way. If the weather is favourable for us, we will spend about two weeks on the island. With successful winds, the expedition plan will close in about a month and a half. Stay tuned for further details.....

3Y0Z Bouvet DXpedition News (From 3Y0Z Web page)

On 5 February, the captain of the MV Betanzos decided that it was the best interest of safety and expediency to proceed directly to Cape Town, South Africa, rather than Punta Arenas, Chile. They also headed north to avoid the possibility of encountering ice and then headed easterly toward Cape Town. The entire team was reported safe resting in their bunks and in good spirits.

It was reported on Thursday 8 February at 2045 UTC, "49.32 degrees South, 6.73 degrees East. 1,058 nautical miles from Cape Town. We are continuing our slow voyage to Cape Town, currently making 6 knots, with one of our two engines out. The team is healthy, with plenty of food and water and working to keep our spirits up. We cannot, however, escape the cloud of disappointment hovering over us and the DX community.

We travelled 2 700 nautical miles to Bouvet, but the last mile proved to be the most difficult.

As we type this, a tugboat is on its way to assist our vessel to the port of Cape Town. We will continue to keep everyone informed, as this saga plays out. We would like to thank all our friends and families who have been with us every mile of the way. Your good wishes, thoughts and prayers have sustained us over the last three weeks.

Ralph, KOIR, Bob, K4UEE and Erling, LA6VM

Remember to visit the team's media pages (Twitter, Facebook) as well as their Web page to read up-dates, see pictures and videos of their trip 3Y0Z Web page www.bouvetdx.org/news-and-updates; 3Y0Z Face-book www.facebook.com/groups/639362206232014 and 3Y0Z Twitter https://twitter.com/Bouvet_3Y0Z. Also remember to follow their voyage by watching the following URL links <https://share.garmin.com/bouvet> and www.marinetraffic.com/en/ais/details/ships/shipid:777230/mmsi:725000291/imo:7310923/ves-sel:BETANZOS#IrljZAqtjXemvHHQW.99

DXCC News

ARRL Announces Mobile DXCC Operating Award. The ARRL posted the following on 9 February, on their Web page, "ARRL this week announced a Mobile DXCC Operating Award available to radio amateurs who have contacted at least 100 DXCC entities from a working vehicle with antennas and power source capable of operating while in motion. ARRL Radiosport Manager Norm Fusaro, W3IZ, advised those pursuing the award to put safety first.

Distracted driving is a serious concern, so we hope all mobile operators exercise care when operating from a moving vehicle," he said.

Full, official details are on the Mobile DXCC Operating Award page www.arrl.org/mobile-DXCC. Read the complete announcement at www.arrl.org/news/arrl-announces-mobile-dxcc-operating-award.

DXCC's Most Wanted (ClubLog)

The "DXCC Most Wanted" entities list has been updated on ClubLog as of 7 February. The list contains 340 entities and the top 10 entities seems to have changed with the addition of Kosovo:

1. P5 DPRK (North Korea)
2. 3Y/B Bouvet Island
3. FT5/W Crozet Island
4. Z6 Republic of Kosovo
5. CE0X San Felix Islands
6. KH1 Baker Howland Islands
7. BS7H Scarborough Reef
8. BV9P Pratas Island
9. KH7K Kure Island
10. KH3 Johnston Island

The complete "DXCC Most Wanted" entities list is available at <https://secure.clublog.org/most-wanted.php>

African DX

Contacts with stations on the African continent count towards the SARL's All Africa Award.

Rwanda, 9X (Unusual call sign). By the time you read this, Christian, MOUPL, will be active using the unusual call signs 9XSDA from Kigali, Rwanda, until 18 February. The suffix "SDA" stands for "Seventh Day Adventist Church". Activity will be on 40 and 20 meters using mainly SSB. QSL via MOUPL direct to: Cristian Panaitescu, 131 Stafford Road, CR0 4NN, Croydon, United Kingdom.

Benin, TY. Wim, ON6DX (www.dxpediton.be/Benin.html) will be active again as TY1TT from Grand Popo, Benin between 20 and 28 February. He will operate CW, SSB and RTTY between 160 and 10 metres. QSL via ON6DX, direct or bureau and LoTW.

Women's Role in the Early Telegraph Industry

An aerial view of the entire telegraphic system of the United States, if such a thing had been possible in the spring of 1861, would have revealed some curious and striking things. In the West, the telegraph lines in Nevada and Nebraska were moving toward one another at a rapid rate as the transcontinental telegraph approached completion; but in the east, all along the Mason-Dixon line, the telegraph wires connecting North and South were being cut and torn down as war approached.

Since its first public demonstration in 1844, the telegraph had become an important part of American life; it was put to widespread use for news reporting, business communications, and personal notices. Over 50,000 miles of telegraph lines crisscrossed the continent in 1860. Though still in their corporate infancy, large telegraph companies like the American Telegraph Company and the Western Union were beginning to exert influence on business and politics.

In addition to creating a new industry, what we call the "telecommunications industry" today, the telegraph created a new type of technical worker - the telegraph operator. As depicted in fiction and the cinema, the telegraph operator was a solitary character, shown seated at his (or occasionally her) operating table at the local railroad depot or telegraph office, manipulating a set of mysterious-looking instruments that emitted a audible series of incomprehensible dots and dashes.

Harper's New Monthly Magazine for August 1873 depicted a typical rural telegraph office in an illustration that appeared at the head of an article that was titled simply, "The Telegraph." No mention is made in the text of the fact that the operator shown at the key is a woman, something that would have been a familiar sight to the average reader. The equipment on the operator's table is accurately portrayed: to the left of the table is a battery box, containing two Daniell cells, which supplied local power for the station; on the table, in order from left to right, are a telegraphic relay, a telegraphic register for recording dots and dashes on paper tape, a cutoff switch for disconnecting the line during storms, and the telegraph key, used by the operator to send the dots and dashes of Morse Code. On the wall above her head is a coil of wire, which serves as a lightning arrester; to the right is a hook, used to spindle message blanks after sending them.

The census of 1860 lists approximately 2000 men who were employed as telegraph operators. Perhaps 100 or so women were similarly employed, though it is difficult to estimate the number with any certainty, since the census of 1860 did not break down occupations by gender. Virginia Penny, whose book, *How Women Can Make Money*, was written in the early 1860's, noted that around fifty women were employed at that time in the Northeast by the New York and Boston Magnetic Telegraph Company; it is reasonable to assume that an equal number of women were employed in other parts of the country. Women had, in fact, worked as telegraphers since the beginnings of the telegraph industry, in the late 1840s; it was one of the first technical professions open to women. One of the earliest women to have become a telegrapher, perhaps the first, was Sarah G. Bagley, founder of the Lowell Female Labor Reform Association; Bagley was already known as a newspaper editor and women's rights advocate when she became the telegraph operator in Lowell, Massachusetts, in 1846.

The railroads began to adopt the telegraph as a signaling system in the 1850's, and the telegrapher's office became a standard feature of the railroad depot. Elizabeth Cogley of Lewistown, Pennsylvania, became one of the earliest railroad telegraphers in 1855. Like many boys of the era, she had gone to work as a messenger for the Atlantic & Ohio Telegraph Company in the early 1850's, and eventually learned to telegraph. She learned the craft from Charles C. Spottswood, the previous operator, who boarded with her family. When the telegraph office was moved into the railroad depot in the winter of 1855-6, Cogley became the depot railroad operator as well.



Elizabeth Cogley (1833-1922).
Telegrapher, Pennsylvania Railroad, 1856-1900
(Photo Courtesy of the Library of Congress)

Railroad operators had to know the language of the railroads as well as the language of the telegraph. Nineteenth-century railroad telegraphers performed a function that was analogous to that of modern air traffic controllers; they had to note the exact time that a train passed the station, and transmit this information to the next station on the line. They also had to pass orders telegraphed from a central dispatcher's office to train engineers. Sometimes this involved handing orders to trains "on the fly" by holding up a train order hoop as the train sped by, as depicted on the cover of a 1935 *Railroad Magazine*.

2. Civil War-era Women Telegraphers in Non-Military Roles

Telegraphy became a critical occupation as the Civil War began; of the 2000 or so men who were employed as telegraphers in 1860, over half entered military service as members of the Union Army's Military Telegraph Corps. As male telegraphers enlisted or were drafted into the Military Telegraph Corps, they were replaced by women in many offices. Elizabeth Cogley's skill and seven years' experience earned her a promotion to a position at Pennsylvania Railroad headquarters in Harrisburg in 1862, where, according to her obituary, written sixty years later, "expert and reliable operators were called to meet the important demands of the service." Abbie Strubel, who studied telegraphy at a school set up by the Baltimore & Ohio Railroad in Pittsburgh in the 1860's, found her skills to be in demand as well; she was one of the earliest operators to learn to receive by sound alone. She operated for the B&O during the war, and, according to her obituary, "was credited during the Civil War with many acts of heroism," though no record of her wartime service survives.

Many put their telegraphic skills to work for the Union cause out of patriotic motives. While working as a telegraph operator in Massachusetts in 1862, Mrs. M. E. Randolph heard many messages pass over her line about the care and treatment of wounded soldiers; she volunteered to go to Camp Tyler, near Baltimore, and manage the distribution of supplies to the sick and wounded. Annette F. Telyea, a native of Kentucky, came to Readville, Massachusetts, to take charge of the telegraph office at the recruiting camp located there; she remained in charge of the station for the duration of the war.

Others turned to telegraphy as a means of support after losing a husband in the war. Hettie Ogle became a professional telegrapher after the death of her husband, Charles, who had enlisted early in the war and was killed at the siege of Richmond. She learned telegraphy at the Western Union office in Bedford, Pennsylvania, and later managed the telegraph office in Johnstown, Pennsylvania. Twenty-five years later, she became famous for her heroism at the Johnstown Flood of 1889, in which she lost her life.

In the Confederacy as well, women took charge of telegraph offices as men went off to war. Although even less is known about Confederate women operators than their Northern counterparts, it appears that women worked as telegraphers and office managers in Georgia, South Carolina, Louisiana, Florida, and Alabama during the Civil War.

3. Women as Military Telegraphers

In 1861, the telegraph had not yet seen extensive use in war. To be sure, the newly-strung wires were used to bring back news reports of battles in the Mexican War in 1848; but military leaders were not yet confident enough of the "talking wire" to send commands or intelligence via telegraph. The telegraph did see some limited use in the Crimean War in 1854; this was noted by an American observer, Captain George McClellan.

In April of 1861, Secretary of War Simon Cameron asked Thomas A. Scott, Vice-President of the Pennsylvania Railroad, to come to Washington and organize the railroads in support of the war effort. Scott requested that Andrew Carnegie, the young superintendent of the Pittsburgh Division of the Pennsylvania Railroad, be given the task of organizing a military telegraph system.

Carnegie recruited many telegraphers from the Pennsylvania Railroad and other telegraph companies to serve as operators for the military system he put in place. Materials and funds were provided by the private telegraph companies, including the American Telegraph Company and the Western Union.

On April 12, 1861, the day on which the bombardment of Fort Sumter began, Governor Dennison of Ohio asked Anson Stager, General Superintendent of the Western Division of Western Union, to assist George McClellan, now a general, in setting up a telegraph system for use by the military. Remembering what he had seen in the Crimea, McClellan ordered Stager to set up a field telegraph system for use by the military. If commercial telegraphs were available, Stager used them; if not, he strung new military wires. Thus for the first time, the telegraph wires followed the armies wherever they went, enabling them to be commanded from afar, and enabling Washington to get intelligence in a timely fashion. Already in July 1861, McClellan's army had operational field telegraphs as it moved through western Virginia.

By spring of 1862, the military telegraph network in the North enabled McClellan to communicate directly with General Buell in Louisville, General Halleck in St. Louis, and Commodore Foote in Cairo. For the first time in military history, it became possible to coordinate military operations, spread over vast areas, from a central command site.

Operating the military telegraph system required the efforts of skilled telegraph operators. At first, a civilian telegraph operator was simply assigned to each field unit. Conflicts quickly arose between the telegraphers, who had no use for military discipline, and the army regulars. The Signal Corps were particularly jealous of the new interlopers, whom they correctly suspected of usurping their prerogatives. The army Quartermaster refused to issue supplies to the telegraphers, since they had no rank. Lower-ranking officers resented the fact that the telegraphers reported directly to the unit commander, and often were in possession of information to which they had no access. These problems were partially solved when a pseudo-military structure was set up, in which the telegraphers became members of the Military Telegraph Corps and reported to the Superintendent of Military Telegraphs, nominally a Major. Thus the telegraphers became civilians under military command; though they frequently ate, slept, and shared danger with the soldiers, they received no military benefits, such as pensions or commendations.

A few women served in the Military Telegraph Corps; their names can be found in the roster of 1079 military telegraphers which William Rattle Plum appended to his history of the Corps, *The Military Telegraph During the Civil War in the United*

States, published in 1882. The only woman telegrapher about whom Plum provided any information is Louisa E. Volker, whose intelligence activities on behalf of the Union army at Mineral Point, Missouri, put her at risk of capture during Sterling Price's invasion of Missouri in 1864.

Louisa E. Volker was born in St. Louis, Missouri, in 1838, the daughter of German immigrants, Emanuel and Emily (or Amelia) Volker. In the 1850 Census, Emanuel Volker was listed as residing in the second ward of the city of St. Louis; his occupation was given as "grocer." Louisa, then twelve years of age, had an older sister, Mary, two younger sisters, Lorinda and Sarah, and a brother, Rudolph.

In the 1840's, Emanuel Volker had purchased land from the U.S. government in Crawford County, Pulaski County, and in the city of St. Louis. In the 1850's, he and members of his family began to buy and sell land in Washington County. Atypically for the age, the female members of the Volker family, including both Louisa and her mother Emily, participated in the land transactions. In 1858, Louisa Volker, then only twenty years of age, bought several parcels of land in Washington County from William C. Inks. In a series of complex transactions, she first transferred the property to an E. Gardner Obear and then reacquired it, selling portions of it in turn to a William Lohman in the same year. She retained ownership of several tracts of land in Mineral Point, which was located in Washington County.

Around 1860, the family relocated from St. Louis to Mineral Point. In the 1860 Census, Emanuel ("Manuel") Volker is shown as a resident of Breton Township in Washington County, Missouri; his occupation is listed as "Tavern Keeper." Louisa, now aged 22, is still shown as living with her parents. However, Mary, Lorinda, and Sarah are not shown as part of the household, and there is a new brother, Robert, aged six. Mary (or Maria) Volker had married Charles A. Snell in St. Louis in 1855; his name appears as Notary Public on several of the aforementioned land transactions. Lorinda and Sarah had also married, in 1856 and 1858 respectively.

Mineral Point was an important junction for the St. Louis and Iron Mountain Railroad, which had been built south from St. Louis to Pilot Knob, Missouri, in the late 1850's. Louisa Volker probably learned telegraphy from C. T. Barrett, the operator at the railroad depot in Mineral Point in the 1860's; why she decided to enter what was then a male-dominated field is not known. Clearly, the Volker family was fairly prosperous in the 1850's and early 1860's; thus the need for an independent income, the standard reason for women to enter the field at the time, was probably not the motivation for Louisa Volker's becoming a telegrapher. It is more likely that she was motivated by a desire for personal achievement, and a desire to put her pro-Union sentiments into action as the Civil War approached.

Sometime around the beginning of 1863, Louisa Volker became a member of the Military Telegraph Corps of the Union army. She probably volunteered for the position as Military Telegrapher, and was accepted due to the shortage of telegraph operators in the area. The only surviving written account of her work as a Military Telegrapher appears in Plum's book, *The Military Telegraph During the Civil War in the United States*, where Plum discusses the situation in southeastern Missouri in the summer of 1863:

About seven months previous, Miss Louisa E. Volker, a most estimable young lady, had relieved C. T. Barrett, operator at Mineral Point, and became at once not only the first lady operator in the corps, west of the Mississippi, but the only operatrix who had ever telegraphed on that side of the river. Entering upon duties which, heretofore, had devolved exclusively upon young men, she realized that peculiar feeling of responsibility which arises from an important but experimental trust, and hence, with all the zeal of a leader, she undertook the fulfillment of this new role of feminine usefulness in war. . .

On a former occasion, the station six miles north of the Point was attacked by cavalry, surprising Captain Lippencott's company, which being driven off, collected at Mineral Point. Miss Volker had previously ascertained the presence of the enemy and telegraphed to Pilot Knob the situation, and started the repairer north to mend the line if possible, which was actually accomplished during the night, she sitting by the instrument all night in expectation of an attack on Mineral Point.

Under normal civilian conditions in the big cities of the east, women operators were generally not expected to work nights, as it was not considered proper for unescorted women to be out at night; some telegraph companies even used this as a justification for preferentially hiring men. However, women operators in the West, and especially railroad operators, were frequently required to work nights, as they had to be present whenever trains passed the station.

In November 1863, while she was serving as a Military Telegrapher, Louisa Volker transferred ownership of a block of land and several lots in Mineral Point to Augustus Rauschenbach of St. Louis, who was the husband of her sister Sarah, and trustee for her mother, Emily. She may have transferred ownership of the land to prevent it from falling into the hands of the Confederates, in the event that she was captured. Her telegraphic skills made her a strategic target; Confederate raiders often kidnapped the local telegrapher when they invaded a town, and forced him or her to listen for intelligence, or even send false reports to confuse the enemy. However, her desire to protect the family's property led her to remain in Mineral Point, together with an unidentified sister, during Confederate General Sterling Price's raid into southern Missouri in September 1864.

On September 19, 1864, Price crossed over from Arkansas into Missouri at the head of a force of about 12,000 men. His plan was to capture St. Louis and Jefferson City, and install a secessionist government; he erroneously believed that the majority of the state's inhabitants were Confederate sympathizers, and would come to his support.

One of Price's primary targets was the town of Pilot Knob, which is located approximately eighty-five miles south of St. Louis. In addition to being the southern terminus of the St. Louis and Iron Mountain Railroad, Pilot Knob had Union supply depots and iron works that were considered vital to the defense of the region. Pilot Knob was defended by a Federal garrison of about 1500 men who were stationed at nearby Fort Davidson.

Union forces under the command of Major General A. J. Smith were encamped in the area of Mineral Point. Smith's primary task was to defend the railroad link against attack by Confederates, who sporadically attacked the trains. Louisa Volker found herself in a position of great strategic importance as the only telegraph operator in the vicinity. Plum's account continues:

At Mineral Point, sixty-one miles from St. Louis and twenty-five north of the Knob, a good part of General Smith's command was concentrated to meet a portion of Price's troops expected there. Smith called in his out-posts, planted his guns and awaited attack. A train laden with soldiers and refugees, including the Irondale operator, was delayed in consequence of injury done the road near the Point. The attack on the train which followed was repulsed, the track repaired, and the train saved. By this time the woods were filled with Confederates, and picket firing began. Miss Louisa Volker, operating at the Point, having been at her instrument continuously for two days and nights, was relieved by the Irondale operator.

Price had originally intended to attack St. Louis. Sensing this, Union General W. S. Rosecrans, who commanded the Department of Missouri from headquarters in St. Louis, ordered General Smith to move in the direction of St. Louis to reinforce his position. Hearing of this, Price then made Fort Davidson, near Pilot Knob, his main target; he also began to destroy the rail and telegraph links to St. Louis, to prevent their being used to send any more reinforcements. Price sent units under General Joseph Shelby to accomplish this; by the morning of September 27, Shelby had succeeded in destroying the railroad tracks just south of Mineral Point, and in cutting the telegraph wires, thus isolating the Federal garrison at Fort Davidson. Confederate Colonel B. Frank Gordon was then ordered to attack Mineral Point. General Smith had been ordered to fall back toward St. Louis, leaving Mineral Point defenseless against attack. Plum gave this account of the invasion of Mineral Point :

At noon of the twenty-eighth, General Smith was telegraphed to fall back, and by three, P.M., the last train started. Every male citizen, fearing conscription, left also. Miss Volker and sister remained to protect their father's home from destruction. After hiding all evidences of her employment, and placing a pistol in her pocket, with a fixed purpose of defending herself and sister against violence, she overlooked the little village from her window, and discovered Confederate cavalymen, ragged and dirty, with "lean and hungry" looks, suddenly possess the place and begin their ravenous search for food, not to mention their hunt for plunder. This rabble was composed of men, barefooted, but spurred; others clothed in gaudy-colored curtain damask; all manner of hats and caps; some in Federal uniform, and strapped to their saddles was all kinds of plunder--calico, domestic, shoes, boots, tin pans, bed quilts, etc. Volker's house was soon filled by men who stole blankets and clothing, and helped themselves to the edibles at the same time. Miss Volker now discovered the depot, tank and engine-house in flames. Mineral Point and Coles bridges were also destroyed. By five o'clock, the enemy had all passed north, and the silence that prevailed in that deserted village was more trying than the presence of the dreaded enemy... Night approached, and darkness and imagination multiplied terrors in Volker's house, at least. The two young ladies, armed with pistol and their father's shot-gun, stood in the center of a room, still as death, listening intently. Morning brought report that St. Louis was captured. Not long after, an unfounded rumor that Indians had deluged Potosi in blood, stampeded the women and children from the Point.

The rumors were totally unfounded. Fort Davidson's defenders, under the command of Union Brigadier General Thomas Ewing Jr., successfully repulsed the first attack by the Confederates; they then slipped out of the fort and rode toward Rolla, Missouri, after blowing up the powder magazine. Price, unaware that the defenders had left, mounted a second attack at dusk on September 27, and, to his embarrassment, found the fort empty when his troops entered it. Price then turned westward, and finally returned to Arkansas in December, having failed to achieve any of his strategic objectives.

Plum's account of Louisa Volker's work as a Military Telegrapher ended rather dramatically at this point; he gave no further information on Louisa Volker's life after the war. However, a search of archives in Washington County, Jefferson City, and St. Louis, Missouri, yielded information on her later activities.

During the war, Louisa Volker made the acquaintance of Thomas Hanlon Macklind, a lawyer and civil engineer in Potosi, Missouri. He had been born in Ireland and came to the United States with his parents, who settled in Pittsburgh. He was educated at the Franklin Institute as a civil engineer, and moved to Missouri in 1856, where he participated in the construction of the St. Louis and Iron Mountain Railroad. While at Potosi, he studied law, and was admitted to the bar in 1860. In 1861, he and several other pro-Union men of Potosi organized a volunteer unit, the Twelfth Missouri Cavalry of the Missouri State Militia, for defense against local Confederate sympathizers. The unit participated in several battles in southeast Missouri, and Macklind was promoted from Second Lieutenant to Captain.

In May 1865, Captain Macklind and Louisa Volker were married in St. Louis. They moved to St. Louis, where Macklind became an engineer with the Street Department. Macklind continued to be connected with the Street Department until his death in 1904. They had two sons -- William R, who was born in 1869, and Thomas V., who was born in 1880.

Louisa Macklind evidently gave up telegraphy after her marriage. However, she took an interest in a field that was just beginning to be open to women in the 1870's - stenography. Prior to the Civil War, most clerical work was performed by men; only with the employment of women by the Treasury Department during the Civil War did women begin to enter the field of general office work. It is likely that her background in telegraphy led to her interest in stenography; good penmanship, a high degree of literacy, and excellent spelling skills were basic requirements for telegraphers as well as stenographers.

Stenography consisted of taking dictation from a speaker, and then reformatting the shorthand notes into a formal business letter or memo. Stenographers replaced the earlier copyists, who were largely male; they in turn were replaced (or supplemented) by typists. Louisa Volker not only learned stenography, but also gave free instruction to poor girls of the city.

Late in life, she began still another career that was unusual for women of the age. In 1895, at age 58, she graduated from Women's Medical College in St. Louis, and was granted a license to practice medicine. The Women's Medical College had been founded in 1892 to provide women with a means of attaining a medical education; most medical schools of the time did not

admit women, as it was considered improper to teach anatomy and similar subjects to a mixed audience. The school was the subject of controversy throughout its short existence; its graduates were denied internships in St. Louis hospitals, and the school closed in 1896 due to lack of funds.

She was granted license #6720 for regular practice on May 18, 1895, and was listed in the Register of Physicians maintained by the State Board of Health. Although the St. Louis City Directory for 1902 and 1903 listed her as a practicing physician, she never practiced extensively, and most of her medical practice was devoted to charity cases.

Louisa Macklind died on May 21, 1905, at the age of 68. Her obituary appeared in the May 22 *St. Louis Post Dispatch* under the heading, "First Woman War Telegrapher Dead". Cause of death was listed as senile debility, aggravated by ulcers. She was buried in Bellefontaine Cemetery, in the same plot with her husband and parents.

Military Telegraphers, who were civilians under military command and not part of the Regular Army, sought to gain recognition for their service after the war. In particular, they wished to have their service recognized as regular military service, so that they could receive pensions and similar benefits. David Homer Bates, who had been Manager of the War Department Telegraph Office during the Civil War, was particularly instrumental in petitioning Congress to recognize the service of the Military Telegraphers. His efforts finally met with partial success in 1897 when Congress passed Senate Bill 319, "An Act for the Relief of Telegraph Operators who Served in the War of the Rebellion." However, as Bates himself noted in 1907, "The act was carefully drawn . . . to exclude us from receiving pensions." Nevertheless, former military telegraphers, including women, were recognized by this act as honorably discharged members of the United States Army.

The only female Military Telegrapher other than Louisa Volker to receive a certificate of Honorable Service under the Congressional Act of January 26, 1897, was Mary E. Smith Buell, of Norwich, New York. Nothing is known of her service during the Civil War; she is listed in Plum's roster of Military Telegraphers in *The Military Telegraph During the Civil War in the United States* as "Mary E. Smith." She lived in Norwich, New York, and was admitted to the Society of the United States Military Telegraph Corps in 1909, shortly before her death at the age of seventy-eight on May 24.

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of Southern Africa**

Mission Statement

Our aim is to facilitate, generate and maintain an interest in the location, acquisition, repair and use of yesterday's radio's and associated equipment. To encourage all like minded amateurs to do the same thus ensuring the maintenance and preservation of our amateur heritage.

Membership of this group is free and by association. Join by logging in to our website.

Notices:**Net Times and Frequencies (SAST):**

Saturday 06:00 (04:00 UTC) —AM Net—3620
Saturday 07:00 (05:00 UTC) —Western Cape SSB Net— 3630
Saturday 07:30 (05:00 UTC) —KZN SSB Net—3615
Saturday 08:30 (06:30 UTC) — National SSB Net— 7140; (Echolink, connect to Sandton repeater ZS6STN-R)
Experimental relay on 3620 for those having difficulty with local skip conditions.
Saturday 14:00 (12:00 UTC) — CW Net—7020; (3550 after 15 min if band conditions not good on 40)
Wednesday 19:00 (17:00 UTC) — AM Net—3620, band conditions permitting.

Amateur Radio License fee increase

ICASA has informed the SARL that the licence fee will be increased by 5.3% on 1 April 2018. The new fees will be :

1 Year -	R 141.00
2 Year -	R 269.00
3 Year -	R 386.00
4 Year -	R 492.00
5 Year -	R 588.00

ICASA will start the invoicing process for the 2018/2019 period from 5 February 2018. Radio Amateurs are reminded that it is their responsibility to ensure their license is up to date. If for some reason no invoice is received, check that ICASA has been informed of any address changes.

Avoid the hassles of having to renew each year, opt for a multi-year licence. Simply, when renewing pay the appropriate amount. On the EFT state 5 Year licence and your callsign. Also send an email to dkuhr@icasa.org.za with a copy of the EFT payment.