



AWA Newsletter

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Antique Wireless Association of Southern Africa

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Reflections:

This last week of this month there has been a lot of hype over the Moon landing when Astronaut Neil Armstrong took man's first steps on the moon.

I can remember I was a young lad of 13 at the time and was in boarding school in Queenstown when this all happened. One of the teachers, who was an ardent SWL, taped all the buzz from Voice of America and the very next night we were all invited to come to the school hall to listen to the recording of this great event.

A wonderful big reel to reel tape deck was set up in the hall with a PA system connected to it so we would all get the full effects of the sounds as they were recorded.

I will never forget how we

sat for over 2 hours that evening listening through the snap and crackle of not only the transmission from VOA, but also of the transmission from the moon surface.

If one listens to those transmissions today and compares them with the quality of audio that is produced today, one can only but marvel at the leaps and bounds that have taken place in technology as far as communication devices are concerned.

The reduction in size and weight has been mind boggling and when one looks at the inside of one of our old boat anchors and compares it to one of the latest Icom or Yaesu mobile rigs that can do 10 times more than the old valve compatriots, you can only but wonder at the thought

process and inspiration that have gone in to the manufacture of these fine radio's.

However, the new fangled plug and play radio's don't give half the thrill of tuning up one of these old beauties to give maximum fire in the wire and minimum reflected power. I am sure there are some of today's operators who would balk at the very thought of trying to tune one of these beasts, when all they have to do is switch on a modern rig and talk away. Each of these old radio's has its own character, whereas the modern plastic is what it really says, plastic. Cold to the touch.

My apologies if I have offended any of the "plastic" worshippers.

Best 73

De Andy ZS6ADY

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Wikipedia

A **capacitor** or **condenser** is a [passive electronic component](#) consisting of a pair of [conductors](#) separated by a [dielectric](#). When a [voltage potential difference](#) exists between the conductors, an [electric field](#) is present in the dielectric. This field stores [energy](#) and produces a mechanical force between the plates. The effect is greatest between wide, flat, parallel, narrowly separated conductors.

An ideal capacitor is characterized by a single constant value, [capacitance](#), which is measured in [farads](#). This is the ratio of the [electric charge](#) on each conductor to the potential difference between them. In practice, the dielectric between the plates passes a small amount of [leakage current](#). The conductors and leads introduce an [equivalent series resistance](#) and the dielectric has an electric field strength limit resulting in a [breakdown voltage](#).

The properties of capacitors in a circuit may determine the resonant frequency and [quality factor](#) of a [resonant circuit](#), power dissipation and operating frequency in a [digital logic](#) circuit, energy capacity in a high-power system, and many other important system characteristics

CW Net:

It was good to read on the SARL Forum of a few interested parties in CW and what they were doing to learn from scratch. Of course also interesting was the advice being given by a few of the “Old Hands”, namely, don’t even try transmitting until you have learned to read CW at a good pace.

Set yourself a target and once you have achieved that target, then start thinking about sending.

I always get quite a thrill out of hearing of new guys that want to start learning CW in order to get their ZS status and what is even more amazing is that it is quite an easy way to get there.

I was never quite the technical fundi, but I am sure that given the choice of doing CW or building a receiver or transmitter, I

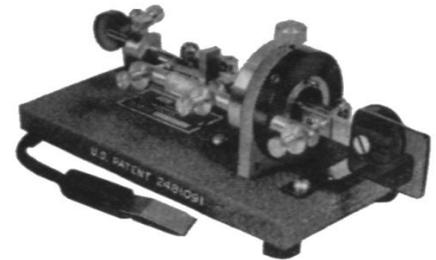
probably still would have taken the CW.

I say this from the few unfinished projects that I have undertaken any way.

Although I did not find it easy to learn CW, I still enjoyed doing it and really enjoyed reaching the 200 contacts I made on the mode.

The incentive of course was to reach the target in order to get the prize, full ZS status. If I remember correctly there was no other way to get there, so there was really no choice.

Anyway, today with all the restrictions removed and it has become a lot easier to get the coveted ZS call sign, I still admire those who have decide to learn the language and play with it. So what is the incentive now to do CW ? Surely it must still be to get the ZS and full amateur



A Dowkey Vibrator

status, or is there some other reasoning behind it ? Whatever the case, I hope we hear some of these guys on freq in the near future so that we can keep a fine tradition alive. That of the CW fist.

73

De ZS0AWA/CW ...--

SSB activity:

It seems that every time I put fingers to keyboard (no pen to paper anymore), I have a good old gripe about band conditions. Well not this time.

This month I just want to encourage all those who read this newsletter to come up on frequency, no matter what the conditions are like and join in at least one of the SSB net’s this month.

Poor old Willem is starting to feel quite neglected these days because of the poor turn out we have on the nets. I must assure you all that between 80m and 40m, we are covering just about every division that is there. If you

can’t hear the control station on 40m, then I am sure you will hear us 80m. The div 5 guys always get through on 80m when 40m is still not open to div 6. It may not be 9+ signals, but I assure you it is Q5.

Div 1 chaps also get through on 40m, maybe not too strong, but at least a signal that can be heard.

We have often said that the AWA has one of the largest memberships of any of the clubs in SA, but recently we are suffering from lack of enthusiasm.

I am sure that when you first joined up with the AWA there was a sound reason for it, so

now we are asking you to strengthen the ranks again and come up on those old valve rigs and put the ether to the test. Saturday mornings, 08:30 7070 or 3615. See you there.



Yaesu FT 200

AM:

So far this month we have at least 3 wonderful evenings on AM. We have found that 80m seems to fade out at around 18:30 to 19:00 in the evening, but then comes back strongly around 20:00 with S9 signals and almost full quieting on the carrier.

It’s really quite amazing how the band comes back and how strong signals are.

This obviously makes for some really good MF transmissions and quality is just so good, even from some of the rigs running at a nominal 25—30 watts.

Of course we are not supposed to be enjoying the MF’s, which are for test purposes of course, but who can listen to some of the music played and not enjoy it.

It makes no difference if you can transmit MF’s or not, and whether or not you have a pure AM rig or “plastic” AM, it’s just so enjoyable to hear signals of such quality being transmitted on a mode that is largely ignored by the majority of the amateur fraternity. A mode that actually caused amateur radio to happen and was

the reason so many people took to becoming amateur enthusiasts. It’s not to say it’s the only mode to use, that would be a dangerous statement, but it is still a wonderful mode to use.



Hallicrafters SX 140 Receiver

Sir Oliver Lodge

Introduction

Sir Oliver Joseph Lodge was one of the great pioneers in radio communication history, but very few people today have even heard of him. Lodge's discoveries in radio and electricity were revolutionary. They turned what was inconceivable in Victorian times into part of everyday life. His ideas have since been incorporated into millions of pieces of equipment working all over the world. Yet Lodge was more than a brilliant scientist. He was a professor of physics at 30, at the time an unheard of achievement, and later the first principal of Birmingham University College, an author of many books, a lecturer who attracted huge audiences, and a much-appreciated broadcaster.

He was born in Penkhull, Stoke on Trent, Staffordshire in 1851 and his father, also named Oliver Lodge, was a specialist clay and glaze manufacturer supplying the many potteries around Stoke on Trent. Lodge was not a brilliant scholar and left school at the age of 14 to work in his father's factory. This did not intrigue him although he set up a laboratory in his bedroom to tinker with various gadgets, which displeased his father, and some years later he went to live with an aunt in London. One can only



Sir Oliver Lodge and his wife in 1928

assume there was some friction between the two at the time. Whilst in London he happened to attend a lecture given to the public at University College which sparked his interest in scientific matters. He returned to Stoke on Trent at the age of 22 and attended Wedgwood Institute, Burslem, to further his education. In a few years he was admitted to University College in London and in 1875 obtained his bachelors degree in physics.

In 1877 he was awarded the Doctor of Science degree (now called PhD) and employed as a lecturer for several years. Lodge became assistant professor of [applied mathematics](#) at University College, London in 1879 and was appointed to the chair of physics. In 1881 he was appointed Professor of Physics at Liverpool University College, setting a precedent, as he was just 30 years old. He wrote his first book, *Elementary Mechanics*, at 26. Many years later, Lodge wrote in his autobiography: "*At an early age I decided that my main business was with the imponderables, the things that work secretly and have to be apprehended mentally.*" He spent 19 years as professor of experimental physics at the new Liverpool University College before his academic career reached its peak in 1900 when he was appointed the first principal of Birmingham University College.

Early Discoveries

Whilst at Liverpool, apart from his academic duties, he was busy experimenting with the transmission of radio waves along wire conductors. This was demonstrated in 1888. His great friend and scientific rival Heinrich Hertz in Germany worked on the transmission of radio waves through the ether. Lodge developed a new detector for radio waves, which he called a "coherer". This was based on the earlier experiments made by Edoard Branley in France. Lodge's version improved the detector, which consisted of finely ground metallic particles in a glass tube with electrodes, by the addition of a mechanical trembler that shook the particles after each reception of radio waves to stop them from sticking together. The new coherer exhibited a varying resistance when acted on by radio waves. This detector when used with a mirror galvanometer caused the spot of light to be moved on a projection screen. Lodge took out a world wide patent for his version of the coherer.

In 1894 at a meeting of the British Association for the Advancement of Science in Oxford, Lodge demonstrated in front of a packed lecture room the reception of Hertzian waves with the new coherer connected to an inker (as used for Morse telegraphy using wires) that produced marks on a piece of paper. This was the first recorded reception of *wireless telegraphy* anywhere in the world. This was almost exactly 1 year before Marconi performed the same demonstration in Italy. As well as the coherer, Lodge obtained patents in 1897 for the use of inductors and capacitors to adjust the frequency of wireless transmitters and receivers.

When Marconi arrived in England in February 1896 and demonstrated his wireless apparatus, Lodge saw that it infringed on his patents and he sued Marconi. The result of this protracted legal battle was that Lodge won the patent case and Marconi was liable for large damage payments. In order to appease Lodge the young Italian appointed Lodge as the official scientific advisor to the now prosperous Marconi Company. Marconi applied for and was granted a patent for wireless telegraphy on 2 June 1896 not being aware of Lodge's prior application for this new mode of communication. It was not until 1942 for Marconi's patent to be declared null and void by a court in the USA, after both he and Lodge were dead.

Later Discoveries

Lodge also experimented with what today we know as radio astronomy, although the science was only recognised in 1932 following Karl Jansky's discovery of extra-terrestrial signals in the USA. In Liverpool he set up an experiment to receive signals from the Sun. His contemporaries believed he was quite mad to consider such a possibility. He devised an ingenious method where his coherer was mounted behind a blackboard to exclude the light rays but allowing the longer radio waves to pass through. (Lodge had noted that the coherer was susceptible to strong sunlight falling on it and this predates the invention of photoelectric cells by almost 50 years). He was only proven to be correct in 1942 after his death by James Stanley Hey's observation of interference to the Army gun laying VHF radar systems during World War 2. Due to the secrecy surrounding this discovery Hey had to wait until 1946 before publishing his paper on this item. Lodge had correctly calculated that the Sun must be a strong source of electromagnetic radiation. Unfortunately his coherer and mirror galvanometer was not sensitive enough to detect the radio waves from the Sun and Liverpool city centre was a very noisy electrical environment, causing erratic measurements, so his experiment was deemed to be a failure.

One of the early beliefs amongst scientists working on Hertzian waves was the mysterious "ether" that was assumed to be responsible for the transmissions. Lodge although a believer in this unseen matter devised an experiment to prove its existence. His experiment however proved it was a figment of the imagination, and led to the dropping of this concept.

Still experimenting with electrical and magnetic devices Lodge next developed a vacuum tube (valve) which was not too successful. Not to be deterred he then invented the loudspeaker, which is still very much the same today as Lodge's early models. An aside concerns the spark plug he invented for the new automobiles. Until Lodge's spark plug a hot-bulb and a type of small blow-lamp performed the ignition of the combustible gas in the cylinder. Lodge ceded this patent to his sons Brodie and Alec and they started the Lodge Brothers manufacturing company, this changed its name to Lodge Plugs Ltd in 1903. Lodge and his sons became extremely wealthy due to this and supplied spark plugs all over the world for cars and aircraft engines.

Lodge also studied the electromagnetic waves caused by lightning discharges and how the waves propagate over long distances. He postulated that there was some invisible layer high above the Earth that allowed these "crashes" to be "reflected" and heard over a wide area. This was proven several years later by others and given the name "ionosphere" by Robert Watson-Watt. It is largely due to Lodge's research that Marconi had the idea that radio waves could travel across large distances, culminating in his transatlantic radio experiments.

He was from accounts a difficult person to work with and didn't suffer fools gladly. Once he had fixed his mind on an idea it was very often the case that he would work alone tirelessly on his new invention, often going without food or sleep for days, until he had perfected his design. Many of his academic colleagues disagreed with him on some new radical idea he had postulated and he would shut himself up in his private study or laboratory until he was satisfied he had the proof to support his idea. In many cases he was proved to be right and wasn't frightened to tell his colleagues they were wrong and he was right. However, as we have seen, sometimes the technical challenges he faced would only be overcome some years after his death by other researchers.

Later Years

In 1900 he left Liverpool and took up the chair of physics at Birmingham University and the post of Principal. Lodge was knighted in 1902 for his services to science. He was also admitted as a fellow of the Royal Society in 1902 and was its president for several years. Amongst his other achievements was the founding of the National Physical Laboratory, which fostered scientific research in England and propagation studies. One of the heads of this was Robert Alexander Watt (later Sir Watson-Watt) who continued Lodge's research into lightning discharges and propagation.

After retirement he developed an interest in para-normal events and with his long time friend Sir Arthur Conan Doyle, the author of Sherlock Holmes books, he conducted numerous seances and other experiments to try and communicate with souls who had passed on. This won him a different kind of following and inevitably some criticism from academic quarters. But Lodge, a practising Christian, never wavered from what he believed to be the truth. He wrote at the time: "*I am as convinced of continued existence on the other side of death as I am of existence here.*" Many people thought that Lodge's obsession with Spiritualism had much to do with the loss of his son Raymond, who was killed in 1915 in France during World War 1 and about whom Lodge wrote a poignant book. This son was one of a family of 12 children, 6 boys and 6 girls.

Lodge died on August 22 in 1940 at the grand age of 99 and was laid to rest in Penkhill Cemetery. If he was alive today he would be justifiably proud of the inventions which he made and which changed the lives of so many people.

The battle of the beams – part 2

In part 1 we covered some of the German and allied radio navigation and radar systems in use during the first half of World War 2. This part covers the art of “black radio” to confuse the civilian population of Germany and the occupied countries. During World War Two, Hitler’s Germany was the victim of what can only be described as a massive broadcasting confidence trick. Subtle anti-Nazi broadcasts were put on the air, conveying the impression that they originated from inside Germany or its occupied territory. The story begins back in the early 1930s and this period is concerned with how RCA came to build a massive AM medium wave broadcast transmitter.

In the early days of wireless (as radio was known at the time) one could either build a receiver from magazine articles catering for this new hobby, or for the more well off you could buy one ready built and tested. Unfortunately the second option was beyond the means of the average household. Magazine could be bought for a small sum and thousands of households built their own wireless receiver from the plans contained in them.



A Mr Jowel Crosley in the USA when asked by his young son for a wireless receiver as a birthday present in 1926 was appalled at the cost of a ready built one but was happy to pay 25c for a magazine with all the details to construct one. And construct one Mr Crosley did. It was a crystal set and pretty deaf unless a long antenna wire was used. Pretty soon the bug had bitten him hard and he went on to experiment and build more complicated receivers and then sell these to people in his area. He realised that he could undercut the big companies and make a comfortable living selling a budget priced wireless receiver to the masses. Crosley was an astute businessman and had previously sold refrigerators, washing machines, auto accessories and at one time automobiles and had amassed a tidy sum of money. He began to advertise his sets in magazines and on the local medium wave stations.



RCA (Radio Corporation of America) had a dog called “Nipper” sitting in front of a gramophone as their advertising symbol, a crib of His Master’s Voice (HMV) so Crosley invented “Bonzo” a dog listening on headphones; the Crosley receivers didn’t have a loud-speaker at the time! One of the popular models was the “Crosley Pup”, a single valve regenerative receiver again only with headphones. Crosley bought up another wireless company and so this manufacturing base and technical experience was a good foundation to expand on. Most medium wave stations at the time were low power and had limited coverage, Crosley figured that if the transmitter power could be jacked up then coverage would increase even with fairly deaf receivers.

So he built his own AM broadcast medium wave transmitter that delivered 500W and obtained a licence from the FCC to broadcast. Later he built a 5kW version and his coverage area grew bigger and bigger as his sales of wireless took off and with newer and more sensitive Crosley receivers his market base expanded almost exponentially. Pretty soon Crosley was a multi-millionaire and had the biggest chain of privately owned broadcast stations in the USA. He lusted for even more powerful transmitters and contracted RCA to build a 50kW transmitter. RCA were in the receiver market like Crosley and had little expertise in building transmitters at the time. RCA sub contracted the manufacture of parts to Western Electric, (the commercial side of Bell Telephone Laboratories), Westinghouse Electric and General Electric to build this monster transmitter. Soon it was on the air and gave almost complete coverage of North America. Other broadcasters had no option but to follow his lead and a new set of 50kW stations took to the air, mostly using RCA transmitters like Crosley’s first model. Running a high power station consumed lots of money, but the income from advertising more than covered this and huge sums of money changed hands.

Crosley later somehow managed to persuade the FCC that 50kW still wasn’t enough power and they gave in and granted him an experimental licence to use up to 500kW. Again RCA was asked to build this huge transmitter with parts from WE and GE. It was given the serial number RCA-1. It was eventually tweaked up to 600kW a few years after entering service and at a push would run up to 1MW for short periods. With the increased coverage Crosley’s advertising fees also jumped up and soon money was rolling in, in vast amounts.



Soon the FCC realised it had opened Pandora's Box by granting this high power licence to Crosley and tried to restrict him to 50kW. Every year legal battles raged between Crosley and the FCC and each time the FCC said no more extensions to the licence power, which was then set at 50kW, the maximum power any medium wave station could transmit.

WLW antenna tower

The antenna was a 747ft high, square section steel tower made by Blaw-Knox, which was a half wave bottom fed vertical radiator. It was installed in Mason, Ohio. A light aircraft flew into the tower some years later ripping off a wing but hardly denting the tower! The whole installation of transmitter, antenna, buildings and power plant cost in 1930's depression ridden America a cool \$900,000, as much as a NASA flight to the moon if inflated to 1960's scale. The diamond shaped guyed tower was pointed at the top and bottom and fat in the middle. The middle section was the width of a 4-storey house. It weighed 450 tons and rested on a ceramic ball 2 ft in diameter. The fat centre portion was needed to handle the 70A of RF current that flowed in that portion of the antenna. The antenna was guyed at the centre with steel bridge cables 4-inches in diameter. The antenna was fed by coaxial line made from copper water pipes. Its frequency was 700kHz and call sign was WLW, which the station announcer said stood for "Whole Lotta Watts" or "Worlds Largest Wireless" or simply "The Big One".

The new transmitter used the original RCA 50kW unmodulated transmitter as the driver and the output PA consisted of three 167kW modules connected in parallel and used high level anode modulated General Electric triodes. The PA modules each used 4 x 100kW valves in parallel push-pull running in Class-C making a total of 12 of these valves fed by a 450kW audio amplifier. The modulator used 8 GE triodes. The modulation transformers (two in total were used) each contained 750 gallons of transformer oil, weighed 16.5 tonnes each and stood 10ft high and 8ft square. The cost of just the valves for this monster was \$34,000. The PA and modulator valves (running in Class-B giving "upward modulation") were water-cooled, each standing 5 ft tall, the primary cooling water was produced by a distillery on site and fed the valves with pure distilled water. The secondary cooling water was normal water pumped through a heat exchanger and then fed into a lake.

This was built outside the transmitter house to look like an ornamental pond with water fountains spraying the hot water to cool it. This transmitter had no modulation limiter circuits, if a piece of music had a sudden loud passage the transmitter simply took in a deep breath and delivered, often well over 1MW carrier 100% modulated. Stories go that when music was played all the streetlights in Mason, Ohio blinked to the beat.

The cooling pond at WLW

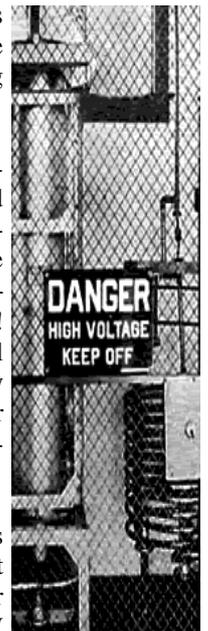


This transmitter had tremendous coverage not only in the USA but as far away as Britain, rumour has it a letter was received from Buckingham Palace complementing the station on such a loud signal. Other stories concerned people working on the neighbouring farms being bitten by the high voltage induced in the wire

fences, the neon signs in town that couldn't be turned off when the transmitter was running and of singing water downspouts and guttering. Pretty scary stuff!

The scale of the transmitter is mind boggling, the electricity supply had to be beefed up and a new 33kV 3-phase line put in just to satisfy the transmitter. The filament supply consumed 3,000A of DC alone and had it's own motor generator sets to feed it. The main HT rectifier bank supplied 20kV to the RF power amplifiers and modulators and consisted of 6 massive forced air-cooled mercury arc rectifiers, in a 3-phase bridge arrangement, each rectifier rated at 450A. The transmitter had dozens of blade switches that had to be operated in the correct sequence to power it up from cold. Get one of them wrong and there was a huge bang! Tales relate of melted copper straps in the PA when something went wrong, and it did quite often. With all this power about funny things happen and with lots of bangs and sparks to accompany it. The Ohio legendary lightning came visiting often, and when the lightning struck the tower the spark gap at the base of the tower carried on arcing until the transmitter was turned off. Other problems were fires started by high-induced currents in surrounding fence metalwork that set fire to the grass and trees.

Unfortunately what Crosley had done was to start a "power war" amongst the broadcasters and 15 others rushed to the FCC for an equivalent licence, and to RCA to build them a "big-arsed" transmitter. RCA built one more then the FCC decreed "That's it, no more than 50kW will be licensed". This second transmitter RCA-2 was modified from the RCA-1 design to cure some of the problems found, incorporating the 50kW driver into it and was destined to go to radio station WJZ in New Jersey but the FCC 50kW limit caused the deal to be cancelled.





This second transmitter lay at RCA for several years, without a buyer, gathering dust. A deal was initially struck with China but it fell through, other deals similarly came to nothing. Then World War 2 broke out in late 1939 in Europe and people had other things to worry about. (After the war ended in 1946, the WLW transmitter RCA-1 was bought and used by the US Government as part of the Voice of America chain of transmitters (VOA) as it was the only transmitter that gave complete north America coverage on medium wave for national emergencies. It was finally closed down in the 1990s due to lack of funding).

The British intelligence service in 1939 learnt about the transmitter that RCA couldn't sell and thought of a good use for it. It took little effort to convince the new Prime Minister, Winston Churchill, that it could be used as a spoof transmitter against the Germans. So the next day the purchase price of 112,000 pounds was approved and RCA got ready to strip and ship to England. But before this happened a radio engineer from the intelligence services was sent to RCA to learn how to operate this monster. He was there for 2 months and during that period several important modifications were made.

Firstly, the power was bumped up to 600kW continuously rated and facilities to change frequencies with lightning speed by remote control were incorporated. Traditional medium wave transmitters were fixed tuned and to change the frequency was a long and complicated, not to mention often a dangerous, operation. The transmitter when modified could jump to a new frequency in less than 2s. Another modification was a rapid "on-air" switching method so the transmitter could be brought online to replace a transmission that had just ended. This switch-on time was just 12 hundredths of a second giving an indiscernible (seamless) change over.

A site was selected near Crowborough, Sussex for this monster on a 70 acre site in Ashdown Forest. (A site previously selected and work started on was objected to by the RAF as the tall towers would be hazardous to aircraft, so the site was abandoned with half a hole already dug). A team of Canadian Army road engineers dug a hole 60 ft deep and 100 ft square and then built a double storey building in this hole with a 6ft thick reinforced concrete bomb proof roof slab, just below ground level. When finished the slab was covered with soil and quick growing trees planted on the land. In this underground shelter the transmitter was assembled. When it was finished it was given the code name "Aspidistra", after a popular comic song by the Lancashire female singer Gracie Fields "The biggest Aspidistra in the world", because it was at the time the most powerful medium wave transmitter in the world. The total amount budgeted was 165,000 pounds for the whole project. In today's money that is an awful lot, a small car at the time could be purchased new for about 100 pounds. The transmitter had its own underground diesel generator so it was immune to national grid failures.

(Aspidistra is the name of a plant, the common name being the Cast Iron plant, a popular indoor decorative pot plant with large grey leaves of the Edwardian era often to be seen in living rooms at the time).

The antenna towers were 300 ft tall and three were set up in a line to beam the signal into mainland Europe. Aspidistra lay dormant for about the next two years until the time was right for it to come into service. The BBC eventually heard about this monster transmitter, they had been deliberately kept out of the loop because of the extreme secrecy surrounding the whole covert operation. The BBC raised objections and eventually a compromise was reached that it could use Aspidistra as a transmitter for its European service, but the intelligence service had first option to its use.

The British intelligence division known as Special Operations 1 (SO-1) worked out a scheme for broadcasting on enemy wavelengths with great power and diversity. This scheme was conceived as a more viable alternative to the direct jamming of enemy broadcasts. This was initially considered but eventually rejected as counter-productive, given that the enemy had more transmitters at its disposal (for instance, in all his occupied territories) and would undoubtedly use these to win a 'jamming war'.

The alternative and more original SO-1 scheme looked like becoming a reality in 1941 when the Political Warfare Executive (the successor of SO-1, formed by the merger of the latter with another intelligence branch) came up with some ideas to disrupt the Germans plans. Head of the operations was a Fleet Street journalist named Sefton Delmer, former Berlin correspondent for the "Daily Express" newspaper who had been born in Berlin where his father, an Australian, was a university professor of English.

The first modus operandi used went like this:

During allied night bombing raids into Germany the German medium wave transmitter in the city about to be bombed would go off the air, so the RAF couldn't use it to home onto, not that they needed such a simple method as they now had Oboe. Monitoring stations in England recorded for several months all of these stations and worked out their normal schedules. Soon thousands of hours of recordings were compiled on large glass gramophone disks, running into tens of thousand of disks all catalogued and kept ready for the day when "Big Bertha", as it was also known by the operators, would be activated.

As soon as a transmitter went off the air, because of the approach of the bombers, Big Bertha sprang into life and carried on the same type of broadcast as was being transmitted a few seconds before. Then little snippets of false information would be broadcast to the listeners, who did not realise they were no longer listening to the real transmitter but Aspidistra in England. This slick operation obviously needed inside information of the allied bombing targets for the night and when the bombers would be within range of its target. A top-secret piece of information to be in possession of and only entrusted to the highest security cleared personnel in the Aspidistra team.

Later Aspidistra was set up as a spoof transmitter that was announced as being a clandestine operation in German occupied France. The Germans went nuts trying to find this transmitter, but all the time it was Aspidistra in England. These broadcasts didn't actually criticise or denigrate Hitler and his team but let out small and subtle pieces of misinformation to get the listeners asking themselves questions about the Nazi role in Europe. This slow but increasingly demoralising method was very successful as more listeners began to question the Nazi motives. The biggest audience was amongst the German troops who actually preferred the spoof transmissions to the official ones being broadcast.

An intelligence-gathering network was kept very busy to get up to date information. One ploy was to act as if listeners had been sending in postcards to the station requesting certain music to be played, or greeting messages to be sent to loved ones in the armed forces. The female announcers would send, for example, "Greetings to Corporal Schmitt of the submarine U-29 based in Hamburg" telling him his newly born son was a bouncing blonde haired boy. The sending of postcards with details of military deployment was strictly forbidden and the German Secret Police (SS) spent many fruitless days trying to find Corporal Schmitt, who of course never existed. If there were a Corporal Schmitt who fitted the description by some fortunate chance, then he would be very surprised to find he was the father of a new borne boy, which he had no knowledge about! He could only assume his wife had been having an affair in his absence. Of course the SS often found someone who could be the real culprit but refused to admit to it and they made his life very uncomfortable. All this was to demoralise the troops even more.

Another ploy was to take off air transmission from a German transmitter not affected by the bombing and feed this out on Aspidistra for the city about to be bombed, causing total confusion to the German broadcast personnel who had just turned off the transmitter. As the bombers track was known in advance, almost to the exact minute, Aspidistra could hop all over the medium wave band taking over the next transmitter to go off the air with ease.

Another method used was to record speeches by Hitler and others high in the Nazi regime and then carefully edit these by inserting subtle changes altering the meaning of the speech. These were then rebroadcast exactly as the German transmitter closed down for the night, but with the German listeners still tuned in. Amongst the team of Aspidistra were several Germans captured and held in PoW camps that offered their services for a better life than prison. One male was an expert in mimicking Goebels, the German propaganda minister, another could imitate Hitler so well it was uncanny. A female member was a cabaret artist in peacetime that could imitate the German female newsreaders so well it was impossible to tell the difference. She was a German Jew whose entire family had been exterminated in the gas chambers in Poland, she having a lucky escape to Britain.

During the allied night bombing raids the airborne and British based jammers described in part 1 to confuse the Luftwaffe RT transmissions on VHF were countered by the Germans broadcasting different types of music on the medium wave transmitters so the German pilots could get some intelligence. A piece of jazz music might mean the target was Cologne, a waltz might mean Berlin etc and all the night fighters rushed towards this city. A certain piece of marching music meant the bombing raid was over and they could return to base. Aspidistra transmitted this type of music with regularity and caused many Luftwaffe pilots to break off attacks long before the bombers were in the vicinity. By deducing which type of music meant what was a powerful tool of deception used with great effect.

Towards the end of the war, after the allied D-Day landings in France, with the allied troops rapidly advancing and the enemy troops now in disarray, Aspidistra was also used to good effect, one last time. The German official broadcasts were telling the civilians to stay at home and off the roads so that the army troops would not be hindered in their retreat. Aspidistra switched this around telling the population that free transport would be at certain railway stations to take them to safety. Every man, woman and child was permitted to take only 5kg of possessions and to utilise any pram, cart or bicycle they could find to get to the stations. Of course no trains ever arrived at the stations mentioned and tens of thousands of civilians milling around caused absolute chaos and disruption to troop services. Tempers flared amongst the civilian population and the German troops guarding the stations were set upon by angry mobs when no trains arrived, their weapons captured and then they were shot by the angry mobs. Dirty tactics, but that is war.

After the war ended Aspidistra abruptly went off the air never to return. The underground station was demolished and the towers felled to go to the scrap-yard. An era had ended.

In part 3 we will cover the cavity magnetron and the development of centimetric radar used later in the war (John ZS5JF)



32V-3

Basically, the new Collins 32V-3 is the same as its predecessor, the 32V-2: a VFO controlled, bandswitching, gang-tuned amateur transmitter rated at 150 watts input on c-w and 120 watts on phone. It differs mainly in its added provisions for reduction of television interference.

The cabinet of the 32V-3 has no lid, and for adequate ventilation has quarter-inch perforations instead of slots, thus eliminating two types of leakage paths. Even the hand-hold at each end is lined.

Two pull handles have been added for easy removal of the panel and chassis for servicing, after taking out four screws at each side. When firmly screwed in place, bare panel metal makes proper electrical contact with bare cabinet metal.

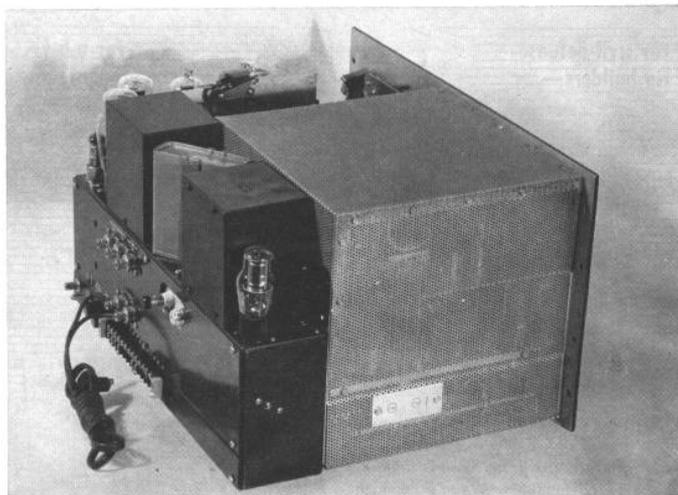
In addition to having the r-f shield-

ing used in the 32V-2, the entire r-f section of the 32V-3 has been completely enclosed in a second shield.

Low pass filters have been added in the following outgoing leads: both sides of the a-c power line; external antenna change-over relay; two in the receiver disabling circuit; two to each meter; at the microphone connector and at the key circuit.

The side-tone oscillator and the receiver muting circuit have been eliminated due to the excessive cost of additional filtering.

Though it is unsafe to make delivery promises in these uncertain times, our production schedule calls for the beginning of shipments of 32V-3 transmitters in September (of this year), and we expect to meet that schedule if there is no worsening in the world situation. Price to be announced.



ROAD BLOCKS AGAINST TVI

This view of the Collins 32V-3 chassis will give you an idea of the shielding and filtering which have been added to reduce the possibility of television interference on all amateur bands.

The entire r-f section has been completely enclosed in an outer shield of perforated metal which permits adequate ventilation while blocking radiation of troublesome harmonics. This is in addition to the r-f shielding used in the 32V-2.

Low pass filters in the following outgoing leads are visible at the back of the chassis: both sides of the a-c power line and (above) the antenna relay line and both sides of the receiver disabling circuit. Additional low pass filters, not visible, are installed at the microphone connector and the key circuit, and one in each lead to each of the two meters.

See the September issue of this publication for a description of cabinet construction.

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COLLINS RADIO COMPANY, Cedar Rapids, Iowa
11 West 42nd Street, NEW YORK 18 2700 West Olive Avenue, BURBANK

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The Collins 32V-3 which was released into production in 1952

Don's Technical Tip

Article 8. Noise and Microphonics

Tubes can be a source of steady noise, a heavy hiss. (Shusssshh)

The only way to deal with this is to replace the suspected tube with another, if you have located and replaced the faulty tube then either your received or transmitted signals should improve markedly.

Occasionally a tube becomes "Microphonic" and this results in a slowly increasing howl, the only way to stop this is to reduce the gain or even turn the set off. Some sets are particularly prone to this condition.

Sometimes there is no cure, but changing the tubes can be tried and even using an external speaker may cure the problem.

Normally the faulty tube can be located by gently tapping the tubes and you will hear when you get to the faulty valve.

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**Antique Wireless Association
of Southern Africa**

Mission Statement

Our aim is to facilitate, generate and maintain an interest in the location, acquisition, repair and use of yester-days radio transmitters and receivers. 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.

Notices:**Swop/Sale:**

The following items for sale from a deceased estate. These items are all available from Andy ZS6ADY.

1. Leader 1020—20Mhz Oscilloscope R1200 onco



2. Siemens signal generator R500

