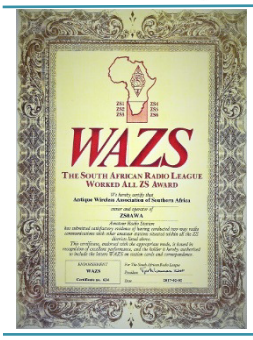
Newsletter

The Antique Wireless Association of Southern Africa

 # 150

January 2019

A Member of the SARL



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AWA Committee:

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* Technical Advisor—Rad ZS6RAD
* Secretary/PRO—Andy ZS6ADY
* KZN—Don ZS5DR
* Historian—Oliver ZS6OG
* Member—Jacques ZS6JPS

Reflections:

As we head into another year, I wonder how many will look back on the past year and see it as an opportunity to look for areas of strength and build on them.

So the bands have not been that great, but then its not the first time that we have been through conditions like this. Maybe there are some first timers, new hams, that only got their licences this past year and are asking themselves why they ever did it. Let me say from the offset, it does get better.

My first year in amateur radio happened on a high. One could literally use a piece of wet shoe string and get fantastic results. No matter what you strung up, it worked, and worked well.

When the cycle went down, I had to really look at finding better antennas than those I had strung up willy nilly and had to find things that would work.

I believe that a low sunspot cycle really is the time when you have to put in to practice the things you learned about, and many more that you have to learn. Once you are able to make it work in a minimum, when the maximum comes, you really are well prepared.

There are those in the AWA that have experienced a few minimum cycles and have learned how to cope with them. These are the guys that you hear on frequency every Saturday morning. Making communications work for them.

These are the guys that are not deterred by a band that has closed, they will find another one to work in.

This is taking a negative and turning it into a positive.

I love amateur radio and its because of that I will do my utmost to make it work. I am sure I am not he only one so it doesn't help me bragging about it. I'm not the first and I definitely will not be the last.

What's even more amazing to me is even although there have been so many changes in technology and the radios we use have become so fancy and advanced, without that basic piece of wire in the sky, we cannot get descent communications.

The changes to our antenna systems have not been as advanced as the changes in technology to our radios. But without a good antenna, the radio is worth nothing.

Here's to the New Year and may 2019 be a successful communication year for you all.

Best 73

DE Andy ZS6ADY

WIKIPEDIA

Modes of communication:

Independent sideband (ISB) is an AM single sideband mode which is used with some AM radio transmissions. Normally each sideband carries identical information, but ISB modulates two different input signals — one on the upper sideband, the other on the lower sideband. This is used in some kinds of AM stereo (sometimes known as the Kahn system), but is generally otherwise prohibited in the U.S. by the FCC.

ISB is a compromise between double sideband (DSB) and single sideband (SSB) — the other is vestigial sideband (VSB). If the sidebands are out of phase with each other, then phase modulation (PM) of the carrier occurs. AM and PM together then create quadrature amplitude modulation (QAM). ISB may or may not have the carrier suppressed.

Suppressed-carrier ISB was employed in point-to-point (usually overseas) radiotelephony and radioteletype by shortwave (HF). In military use, ISB usually referred to a close pair of FSK radioteletype channels which could be demodulated by a single receiver, and employed in fleet broadcast, point-to-point, and between larger vessels and shore stations on HF and UHF.

HF Happenings:

German Special event stations

DF13BLN, DF13BUD, DF13DEJU, DF13MUC, DF13PAR and DF13STO will be active from 1 January to 30 June to celebrate the 100th anniversary of the maiden flight of the Junkers F 13, the world's first all-metal passenger aircraft that opened a new era in the history of aviation. All QSOs will be confirmed automatically via the bureau. A website where to find information about the event and the award is under construction at http://juf13.de/.

Switzerland

The Swiss national radio society Union Schweizerischer Kurzwellen Amateure (USKA) will celebrate its 90th anniversary in 2019. Throughout the whole year, HB9-stations may use the prefix HB90 together with their suffix; and HB3-stations likewise the prefix HB30. https://www.uska.ch/

African DX

Contacts with stations on the African continent count towards the SARL's All Africa Award (www.sarl.org.za/public/awards/awards.asp)

Senegal, 6W. Willy, ON4AVT, will once again be active as 6W/ON4AVT from Mbour, Senegal, between 20 February and 30 March 2019. Activity will be on 40, 20 and 10 metres using CW, SSB, PSK31 and PSK63. Equipment is a Yaesu FT-891 transceiver into a Buddipole antenna. This time Willy will also take an end-fed for 3 bands (40, 20 and 10 m). QSL via his home callsign.

Ghana, 9G (update). Last week we mentioned that Matt, IZ4YGS, is active as 9G5GS from Sanzule, West Takoradi (Western Region), Ghana. Matt informed OPDX of the following [edited]: "I'm travelling to Ghana almost every month for work reasons and it will be so throughout 2019. I would like to be on-air from 80 to 6 m, but it will take some time to be operational on all bands. I will start with an FT-891 and wire antennas, SSB and FT8, mainly in the evening after work. Amateur radio will not be my main activity in Ghana, but I will do my best to let everybody have fun." QSL via IZ4YGS, direct or eQSL.

African Islands

IOTA frequencies

CW: 28 040 24 920 21 040 18 098 14 040 10 114 7 030 3 530 kHz

SSB: 28 560 28 460 24 950 21 260 18 128 14 260 7 055 3 760 kHz

Lampedusa Island, IG9. Drago, S59A, will be active as IG9/S59A from Lampedusa Island (AF-019) between 21 and 31 January 2019. Activity will be on 160 to 10 metres and this will include the CQ WW DX 160 m CW Contest (25 to 27 January) as a Multi-Op entry. QSL via his home call sign.

Ofcom makes Radio Amateur G5 plus 3 letter calls available

Ofcom have recently started issuing G5 and 3 letter call signs to radio amateurs. In the last century, from 1966 until 1981, G5 and 3 letter calls were issued to foreign citizens as Reciprocal licences: G5AAA-G5DZZ were used for Class A's and permitted operation on HF bands and G5NAA-G5ZZZ were used for Class B's and permitted operation on 144 MHz and above.

From 1981 reciprocal call signs no longer had a separate Prefix, instead they were issued from the standard Class A (G4) and Class B (G6) call blocks.

In this century Ofcom has, when requested, reissued a few of the old G5 and 3 letter callsigns to their previous holders, but recently Ofcom have started issuing new calls from the G5 block.

One of the beneficiaries has been the G-QRP Club, which is devoted to Low Power operation. That club now have the call sign G5LOW, see http://www.gqrp.com/callsign.htm

It has been reported on Twitter that an Intermediate holder who passed their RSGB Advanced in December has now got a G5 call sign https://twitter.com/M0TZR/status/1077240135027183621

Calendar:

31 - Festival of Lights, Nieu-Bethesda;
The end of the2018 YOTA Month, the 2018 CQ DX Marathon and the ARRL Grid Chase.

Destroy your copy of the 2018 Contest Manual! Download the 2019 manual.

January 2019

1 – New Year's Day; start of the 2019 Worked Zone 38 Award; the CQ DX Marathon and the Canadian National Parks on the Air.
2 – Minstrel Carnival, Cape Town
5 - Pretoria ARC Flea Market
5 and 6 - ARRL RTTY/FT8 Roundup
9 - Provincial schools open
12 and 13 - Hunting Lions in the Air
15 - Highway ARC Monthly Meeting
16 - National Rooibos Day
17 to 21 - Wolfkop Weekender, Citrusdal
18 to 20 - PEARS VHF/UHF contest
19 and 20 – N3TC Drak Challenge, Underberg
21 - May RAE registration opens
25 - Closing date for February Radio ZS
26 - Summer QRP contest; Delheim's Harvest Festival, Stellenbosch; International Day of Commemoration in Memory of the Victims of the Holocaust
26 and 27 - BARTG RTTY Contest
31 - Closing date for Nominations for Council, SARL Awards and AGM motions

On the subject of Morse code.

I got my ticket in the UK in 1966 at the tender age of nearly 16. In those days a Morse test was required at 12 wpm done at a local radio station. The RAE was a breeze for me (passed on Friday May 13 1966) but the Morse test was another story. I battled and hated it. As with all tests it was best to book it beforehand even though I was not up to speed. The dreaded day approached. Fortunately my examiner was a VERY nice man and realising I was sick with nerves sent me my test text (for the third time) at a slow and steady 8 wpm. This I just managed to pass!

I am ashamed to admit that as soon as I arrived home I took my old clunker Morse key and ceremonially hurled it with all my strength towards the bottom of the garden. In those days we did not need to log a certain number of CW QSO's before getting an A license. Fortunately England and South Africa had a reciprocal licensing agreement so I was able to slip in without ever picking up a key again.

But the main topic of this story is the rather comical happening in the process of my learning Morse code. I used to find slow practice stations and sit there trying to copy, usually only getting a small percentage of the text sent. This resulted in screeds of capitalised mumbo jumbo of letters and numbers with no comprehensibility at all.

I was lucky to go to a so-called "public" school called Hardye's school in Dorchester (Dorchester was Thomas Hardy's "Casterbridge" from his writings). Thomas Hardye was a keen patron of our school but in fact the school had been previously named after Admiral Hardy (Nelson's alleged recipient of Nelson's last words "kiss me Hardy"). Anyway we had a really excellent Headmaster – a Mr Hambleton - a dear chap dedicated to his task of opening his pupil's eyes to more than the three R's.

One day my mother received a surprise phone call from Mr Hambleton where he explained that he suspected that I was taking Cocaine!! TAKING COCAINE IN HIS SCHOOL IN 1966! You can imagine my mother's shock and distress at this suggestion. Headmaster Hambleton went on to elucidate his reasoning.

He had recently attended a course on drugs in schools. (Yes even back in 1966). He explained that he had been looking through some of the exercise books in pupils lockers and in mine he found screeds of gibberish in the back of my exercise books and according to his course this was a typical manifestation of people in an advanced state of cocaine addiction. Now, fortunately, my mother had been a Morse operator on the railways during the war and knowing I was practicing, quickly put two and two together. So I did not get expelled or even caned.

My mother had operated a "single needle" Morse station where a needle would click left or right depicting a dash or dot. At the other end of the cable my father-to-be was doing the same. It is alleged that he "chatted up" my mother using code in the night hours and that they had fallen in love even before they met. Think what my Casanova dad could have achieved today with modern dating sites, WhatsApp and email!

But now I regret not keeping up with CW since I find it hard to keep an interesting conversation going for long using phone. Like many Brits I have an innate inability to speak other languages. This was true for French (just scraped an O-level) and Latin (failed) at school, Afrikaans in South Africa (after 43 years) and the language of Morse. I have tried - and was making some progress - with the article "Learn CW (Morse Code) as a language" by Duane Ausherman – (published in Radio ZS, March 18). This made a lot of sense to me. Unfortunately I have a lot going on right now but hope to take up the challenge again one day. Perhaps someone can donate me a key to replace the hurriedly discarded one back in 1966.

By the way, my English call sign was G3WDJ – "Golf - three –Whiskey – Delta - Juliette" – what a mouthful. Worse in CW – and plenty reason alone to pack up and come to ZS land in 1975.

Max ZS1LV

CV Numbering System

The three armed services before WW2 used a variety of different valves. Another large user were the General Post Office. Each service had their own part numbering system and when WW2 broke out this presented a logistical problem. In addition the US Signal Corps had their own numbering system and they used similar part naming but for completely different valves. For example, the US Signal Corps prefixed a valve number with VT, being short for "*Vacuum Tube*" and after was a 3 or 4 digit number, eg VT-100. The British Army used a different system, for example ARP-4 was an "*Army Receiving Pentode – type 4*". The British Navy used another system using the letters NT, NR and NS etc. NT was short for "*Navy Transmitting*" and NR stood for "*Navy Receiving*". The Royal Air Force had yet another system, largely based on the GPO naming system, and VT stood for "*Valve-Transmitting*" and VR stood for "*Valve-Receiving*". To make matters worse the Air Ministry had yet another system using "*AM*" numbers.

This caused confusion and so it was decided to scrap the original systems and to replace it with a more logical system. The Ministry of Supply drew up a new system which is still in use today. The AM system was scrapped as the RAF already had its own system!

This became the "***Common Valve***" (CV) numbering system and it was introduced in early 1941. In this system a listing of valves was drawn up of common and special valves and each one was assigned a CV number. As under the BVA type numbering system each manufacturer was forced to use a different part number this solved a lot of supply problems. For example the CV1037 is the Royal Air Force VR37, the Navy NR31 and the Army AR17, all being the same valve.

By perusing the CV listing we can see some of the popular valves and when they were introduced into the British military service. A low CV number denotes it was introduced early in the listing. For example, the 813 valve is CV-26 and the CV-124 is the 807 made by Cossor in America. The Mullard part number is the QV05-25, STC used the 5B/250A part number and Cossor also had a factory in America making it under the 807 part number. We know from RCA literature that the 807 went into production in 1936 and the 813 in 1938.

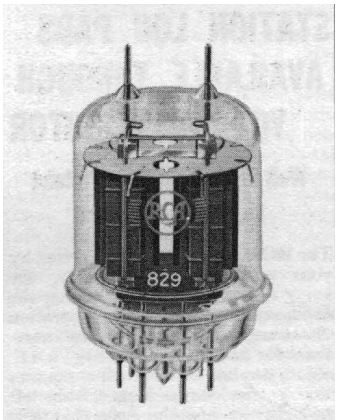
The 807 is a VT100A under the US Signal Corps and the 813 is the VT144.

Another low number is the CV-32 which is the 866 mercury arc rectifier valve made by several manufacturers either in the USA or Britain.

By using the CV listing we can determine when a valve was accepted into the listing, a low number shows it was listed earlier than a higher number. Before a valve could be accepted it had to go through a certification process where a number of samples were tested against the manufacturers claimed performance and reliability testing carried out. In some cases problems arose and this explains why some valves in the early CV listing seem to be out of sequence compared to the date of introduction to the commercial market.

The QQV06-40 valve

An interesting fact established from this perusal is who invented the 5894 dual tetrode valve. Many claim it was RCA but that is incorrect. CV424 is the Mullard part number QQV06-40, it is also the MOV type TT25. These two British companies were the first manufacturers until much later. This dates the valve to after 1941 when accepted but not the actual date of first manufacture, which could be several years earlier.



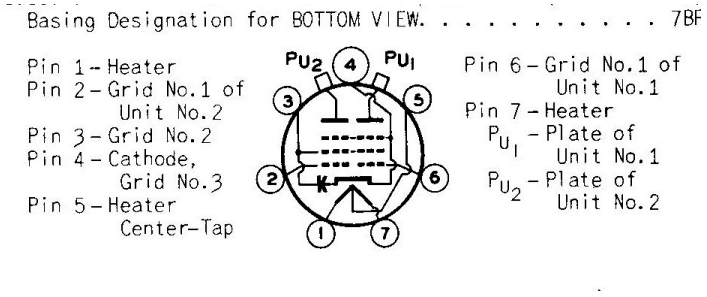
New P-P Beam Power RCA-829 takes 120 watts at the handy plate voltage of 500 volts. Goes all the way to 1½ meters. Only 4 5/16" high and 2⅜" in diameter.

RCA advert March 1940

The 829 appears in the CV listing under CV632 along with a large number of other 800 series and other valves made originally by RCA. The CV numbers for these run from CV534 to CV932, the 832 is CV634. (The 807 re-appears as CV1060 and again as CV1572 superseding the earlier CV124).

The Air Ministry decided that a locally made valve was a better option and Mullard designed the QQV06-40 for this application. One unusual feature of the QQV06-40 is its massive cathode compared to a normal valve. This was to ensure adequate anode current during pulsed operation. The later QQV03-20 was intended to be a pulsed uhf valve but the war ended before it was put into production, it is in fact a half sized QQV06-40, everything is scaled to 50% in height.

Today hardly anyone knows its original intended service application as pulsed operation wasn't listed in the data sheets after the war ended. Neither did RCA give any hint that the 829 and 832 were really designed as radar valves, possibly to not alert the Germans to its real intended use. We can see tell-tale clues in the RCA data sheets for their valves as one application circuit shows the classic self-excited push-pull oscillator widely used by British and American radar pulsed transmitters at the time. In the 829 and the 832 is a peculiar low value capacitor as part of the valve construction, this was required to ensure the valve was unstable when used as a push-pull supply pulsed oscillator.



RCA data for the 829 and 832 pin out details.

The capacitor between pin 3 and 4 is only 35pF, to ensure the device is unstable when used as a push-pull oscillator. For normal amplifier operation an additional capacitor is required from pin 3 to ground of a much larger value. The Mullard QQV0-640 and QQV03-20 do not have this added.

Telefunken in their 1964 data sheet do have pulse operation details as well as linear operation for single sided band with both halves strapped in parallel. The QQE06-40/5894 is rated at 1.6kW peak pulse power and an anode peak current of 5A for short pulse duty. For hf ssb operation the QQV06-40 was a popular alternative to the 6146, it being virtually identical in characteristics and occupied less volume. One 5894 replaced two 6146s, being cheaper than the 6146.

The 5894 does not appear in RCA literature until 1956, well after the war ended. RCA was granted the rights to manufacture by Philips/Mullard and Amperex (Philips N America) and English Electric Valves (EEV) also made the 5894. In the CV listing a note states that *"CV424 is superseded by CV2797"*, when the 5894 was included as the newer version. If the CV2797 entry is perused it gives the following types:

5894A (Am),
QQV06-40 (Mul) ,
5894/C178A (EEV),
TT25 (MOV)

Variants of the QQV06-40
The original valve had a similar filament design as the American 829 with a dual 6.3V filament which could be wired in series or parallel. This allowed operation from a 6.3V or 12.6V filament supply. Another version was the QQZ06-40. This used a different filament design which allowed "*Quick-Heating*" in less than 1 second. These were widely used in mobile radio applications were the lower current drawn during receive periods was a benefit.

A larger version was also introduced, the QQV07-50, it being a slightly taller version with a higher anode voltage and anode dissipation. This better suited the continuous carrier frequency modulated transmitters which were becoming popular. When the transmitter is an AM type the stress on the valve is lower as it only has to develop maximum power on the peak of the modulation, the FM types develop full power all the time.

Valve renumbering
Later the QQV06-40 was renamed as the QQE06-40. This came about because the European valve manufacturers changed the letters used for denoting the various parts in the new Pan-European numbering system.
The original definitions were developed by Mullard/Philips where a Q denotes an RF Tetrode. QQ denotes it has two valves in one envelope. The letter V denotes the cathode type; V denoting it is a "*thoriated tungsten indirectly heated type*". The 06 denotes the maximum anode voltage in kilo-Volts, 06 being 0.6kV (600V) and the 40 denotes the total anode dissipation in watts. Being a dual valve it is 20W per anode. Later the letter E replaced the V in the older type listing. So a QQV06-40 and 5894/QQE06-40 are essentially the same part.

Later still the Pan-European valve numbering system changed again to something less friendly. The advantage of the older system is that one could glean some information about the valve from the part number. For example, the RCA 6146 under the Mullard system was the QV06-20. This told you it was a single RF tetrode with a maximum anode voltage of 600V and an anode dissipation of 20 watts. The new system used a YL prefix and a 4-digit number.

History of famous valve manufacturers

This article is about the famous household names of mostly British valve companies. The "*cross-connection*" of these with other famous companies spawned a whole new set of names and production facilities.

Mullard Valves

This company was formed in 1920 by Captain Stanley R Mullard who had previously owned the *Z Lamp Company* making incandescent lamps and later valves for the British Admiralty.

Mullard was a well respected designer and in 1923 he entered into an agreement with Philips in Holland were they shared design and research as well as the manufacture of valves for various applications. Wireless receivers saw an large increase in demand for many different types of valves and working together they invented many new valves. In 1924 Philips bought a 50% stake in Mullard and in 1927 the remainder of the shares so Mullard became a Philips owned company, but continued using the Mullard trade name.

During the years between 1927 to 1940 Mullard continued making valves branded in the their name and Philips valves bore their name. In May 1940 the Germans invaded Holland and the Philips family fled to America taking with them most of the money. Philips factories in Holland were then turned over to making equipment for the occupying forces. At the time Philips were the only European company making magnetrons, but these were not high power devices like the Randall and Boote cavity magnetron designed in 1941. Mullard continued until 1988 when the last factory was closed down. In the latter part of its existence it also made transistors. In 2007 an American company owned by Mike Mathews "*New SensorCompany*" bought the name Mullard and these were made in Russia by the new company under the Sovtek name as well as Tungsol branded products when the naming rights were also purchased. Later Sovtek also purchased the naming rights of Genalex from the defunct MOV company which ceased production in 1980.

Philips – North America

The Philips family on arriving in America formed a new company called *North American Philips Company*. This largely replicated the products they had been making in Holland as well as valves developed by Mullard in the UK. In 1946 Philips had returned to Holland after the end of World War 2 and rebuilt the factories that had been bombed flat by the RAF during the war. The Philips empire flourished and new products were introduced to the market as television was introduced. (Mullard similarly entered the television manufacturing market). In 1984 Philips bought a 33% stake in the German Grundig company and the full shares of MagnaVox Corporation in the USA. After WW2 Philips set up several new companies in Europe and other parts of the world. Mullard continued in Britain and Valvo was set up in West Germany. In America the Amperex company was purchased and built Mullard and Philips valves for the North American market. In France the Miniwatt-Dario company was bought as well as a facility in Belgium.

GEC Companies

The British General Electric Company had several valve manufacturing companies who made a wide variety of different valves for radio and television as well as specialised divisions serving the military applications. The *Marconi-Osram Valve* company (MOV) was founded in the early 1930s and had an arrangement with RCA in America to cross-licence valve manufacture. Another company was *English Electric Valves* (EEV) who made the same valves but often under a different part number. This all changed after WW2 when the British and later European valve manufacturers adopted a new numbering system.

Another MOV trade name was *Genalex* who after WW2 made high quality audio and radio frequency valves such as the 12AX7 series as well as the KT66 and KT88. In common with most other British valve manufacturers during WW2 GEC valve companies made American valves as well as giving their designs to the US companies as part of the Lend-Lease agreement between Britain and the USA.

Standard Telephones and Cables

Like GEC the STC empire spread over the world and it was formed in 1883 in London as the *International Western Electric Company*. This was a British wing of the USA Western Electric company, (part of Bell Telephones), and initially made incandescent lamps. In 1925 it was bought by ITT and changed the name to STC. In 1933 STC set up a new British valve company *Brimar*. The name stands for **Bri**tish **M**anufactured **A**merican **R**adio (valves).

Popular American valves were made in Britain under licenses from several American companies such as TungSol, RCA, Westinghouse etc. During and after WW2 STC also made vital valves for the war effort in America, Canada and Australia in factories far removed from enemy bombing. The RCA 807 was first supplied to the British military being made in a STC factory in America, because RCA did not have the capacity to supply the valves.

Cossor Valves

Alfred Charles Cossor (1861-1922) founded a small scientific glassware business in Clerkenwell (London) in about 1890. Alfred Cossor was a craftsman and his business produced specialist instruments including Crookes tubes and X-ray tubes. In 1902 the first British examples of Braun cathode ray tubes were made by them. With the advent of Fleming's experiments into diodes in 1904, specialist glassblowers were required to make the different samples. Cossor was believed to have been involved in the manufacture of some units. This was their claim to being the oldest valve makers in the world.

AC Cossor as a private company appeared in 1908. In 1918 with a rise in business, in part with war requirements, the company moved to Highbury to a plant known as the *'Aberdeen Works*'. It was here that the valve business was concentrated.

During the Great War Cossor was heavily involved with valve manufacture. After this time they made a wide range of valves for receivers and a limited range of valves for transmitters.

The early Cossor valves, the P1 and P2 that went into production in 1922, had parabolic anodes with fan shaped grids and arched filaments. It is thought that this design was originated to avoid the Marconi patent for the cylindrical grid and anode.

In 1924 Cossor introduced their Wuncell range of valves. These were the first British designed valves to feature an oxide coated filament. Sadly, the oxide coating did not demonstrate good reliability. Cossor introduced their Point One range in late 1926 this consisted of: Det & LF, HF, HF & Det, LF, Plain Top, RC and Red Top. Also introduced were the Stentor Two, Stentor Four and Stentor Six reflecting the three standard filament voltages of the time.
MOV had a shareholding and board representation within Cossor, and, therefore, were aware of the companies activities and developments. In return Cossor had access to the MOV patents from about 1927. Cossor replaced its Point One and Stentor ranges in 1927 and introduced the diamond label proclaiming 'New Process' perhaps a benefit from access to MOV technology.

In 1930 Cossor introduced the first British RF pentode, the MS/PenA. The anode impedance was low and was not widely used, but it predated the main introduction of the RF pentode by three years. Cossor became a public company in 1938, and reorganised in 1945. In that reorganisation, *Electronic Tubes Ltd* was formed as a subsidiary. The final chapter of this famous name was that EMI acquired a controlling interest in the business in 1949.

Cossor continued to manufacture and market domestic radio and TV sets for several years after they had abandoned mass-production of consumer valves. They simply bought suitable valves from other manufacturers and re-

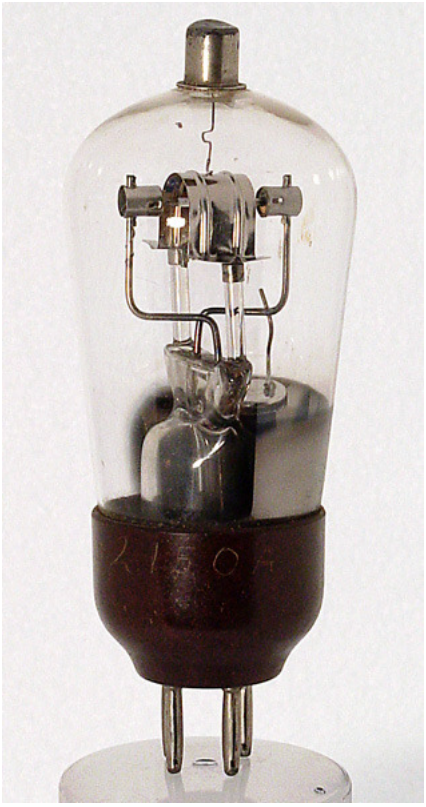
marked them with the Cossor label before supplying them in sets or to the trade. Cossor were members of the *British Valve Association* (BVA) cartel and one of the rules was that members should not poach each others' type numbers.

Each BVA brand therefore had to use its own unique type numbers even where the valves themselves were identical. However, there was (at that time) no rule against using American type numbers provided the valves concerned were interchangeable with their American counterparts. During the 1930s they did much pioneering work in designing oscilloscopes and the CRTs for them. They also designed and made EHT rectifiers such as the SU2150A for use in CRT power supplies. Because the Cossor works tended to employ skilled glass-blowers rather than just factory girls, and because they were designing for a very limited market, the Cossor EHT rectifiers were designed to be hand made. Although appearing to be primitive they were electrically robust and entirely successful in their intended application. Cossor were intimately involved with the development of the GL-1 gun laying radar system for the British Army and had engineers at Bawdsey Manor alongside the Chain Home research team. A lot of the oscilloscope displays used in Chain Home and later systems were supplied by Cossor as well as the original CRT used in the Daventry experiment, which proved the method of reflecting radio waves off an aircraft.

Cossor supplied almost all the service oscilloscopes supplied to the British Services (especially the Navy) before WW2. During the war the increased demand for service oscilloscopes exceeded Cossor's manufacturing capacity so some of the work was farmed out.

Both Mullard and MOV manufactured supposed equivalents to the SU2150A but in each case the valves were redesigned to suit factory production methods. The results were not excellent, having relatively short lives and being easily damaged when EHT faults occurred.

The Navy insisted on the real thing and since they went on using Cossor oscilloscopes into the 1970s, long after Cossor ceased to make its own valves, the Naval Stores organization purchased and hoarded very large numbers of spare valves, including SU2150As.



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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 yesterdays 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—3615
Saturday 07:00 (05:00 UTC) —Western Cape SSB Net— 3630
Saturday 08:30 (06:30 UTC)— National SSB Net— 7140; Sandton repeater 145.700
Echolink—ZS0AWA-L; ZS6STN-R
Relay on 3615 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—3615, band conditions permitting.