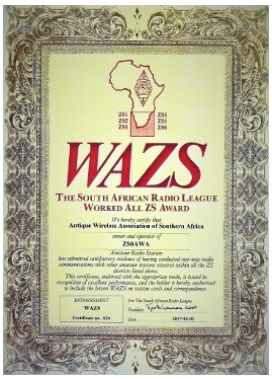
Antique Wireless Association of Southern Africa Newsletter

192 July 2022



Inside this issue:

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* Acting VicePresident—John ZS1WJ
* Technical Advisor—Rad ZS6RAD
* Secretary/PRO—Andy ZS6ADY
* KZN—Don ZS5DR
* WC—John ZS1WJ

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Reflections:

The main thing on most peoples minds these days is the Eishkom situation and how it affects each and every one of us. I don't think there are too many who are completely off the grid yet, although it seems to be the way to go these days.

When I think of the old power guzzling valve radio's that we all love so much, compared to the latest radios' that nearly all run off 12v power supplies, or batteries, it kind of makes one think about how big and wide this circle has turned.

These days, we all want to store as much energy as we can to enable us to use as much as we can, without it costing an arm and a leg. The price of electricity has sky rocketed, as has fossil fuel and now we will all be trying our best to conserve as much as we can to keep the costs as low as possible and still be able to enjoy our hobby.

Personally I have found that using a battery standby system with an inverter, has given me the ability to use my radios when the grid is down, but it is no where near where it needs to be if I want to keep using the rigs I have. Especially now with the amount of downtime being experienced. Charging batteries off the existing power grid is certainly not the answer to anything.

Am I living in a dream world thinking I can keep these beasts powered up when I should really be looking at downsizing to smaller lighter, non gas guzzling pieces of equipment.

If I did do that, then I would feel that I am betraying the concepts of the AWA and what it stands for. (This is a personal opinion and not aimed at any other). But again, that's just me.

As it is I have certainly downsized my shack from a good number of totally valve operated 110v radios that needed a transformer to reduce the power ratings, to hybrids that now only use valves in the finals. But I don't think I could ever get rid of them totally. Call me a traditionalist if you like.

I think there will always be a place in my life for valve operated radios and no matter how or where our power grid takes us, there will always be a yearning to use them.

So it's really a case of get going on real solar, charge up the systems and keep the steam going. May be a problem operating after dark, but then there are not that many around then anyway. Maybe that's where I can use the 12v light voltage rigs on digital frequencies. Go totally modern.

Change is coming and I hope as many as possible can get prepared for it as we can. If you want to get rid of your valve rigs, I'm sure there will always be willing takers out there who will oblige.

Count me in !!

Best 73

DE Andy ZS6ADY

Wikipedia

Solar Flares:

A **solar flare** is an intense localized eruption of electromagnetic radiation in the Sun's atmosphere.
Flares occur in active regions and are often, but not always, accompanied by coronal mass ejections, solar particle events, and other solar phenomena. The occurrence of solar flares varies with the 11-year solar cycle.
Solar flares are thought to occur when stored magnetic energy in the Sun's atmosphere accelerates charged particles in the surrounding plasma. This results in the emission of electromagnetic radiation across the electromagnetic spectrum.
High-energy electromagnetic radiation from solar flares is absorbed by the daylight side of Earth's upper atmosphere, in particular the ionosphere, and does not reach the surface. This absorption can temporarily increase the ionization of the ionosphere which may interfere with short-wave radio communication. The prediction of solar flares is an active area of research.

Flares also occur on other stars, where the term stellar flare applies.

Confused About S-Units?
April 1966 Popular Electronics

S-units—are probably not familiar at all to non-Hams since they refer to receiver signal levels (the "S" stands for "signal"). It is a relative unit of measure rather than absolute. Technically, the dBm unit of power is also a relative unit, but it is referenced to a fixed power level of 1 milliwatt - traceable back to primary standards at NIST or any other country's standards keeper. By contrast, the S-unit - at least originally - is relative to the strongest useable signal level at a particular receiver's input. An indication of S9 meant a maximum signal level was present at the input based in part on the receiver's dynamic range at a certain frequency. Each S−level step indicated a signal decrease of 5 to 6 dB below the previous S−level, again depending on the manufacturer's preference. As you might expect, confusion ensued. Nowadays there is an unofficial but generally adopted definition of S9 through S1, beginning at -73 dBm for S9, and then a 6−dB step size down to S1 level of (8 x −6 dB = −48 dB) = −121 dBm. It applies across the specified receive band(s), independent of frequency. Author Marshall Lincoln reviews S-units and S-meter circuits.

Some answers to why an S9 signal is sometimes not even S7 much less 10 dB over

By Marshall Lincoln

It might happen like this. Joe Ham, W0XYZ, is chewing the rag with his buddies on the air, and they get to comparing signal reports. Bob, who lives about a mile away, says Joe's signal is 10 dB over S9. Sam, who lives clear across town, says Joe is pounding in at 30 dB over S9, and Ed, just down the block, says Joe's signal is just S9. Which one of these guys is wrong, or has a bum receiver?

Maybe none of them. Or, maybe all of them!

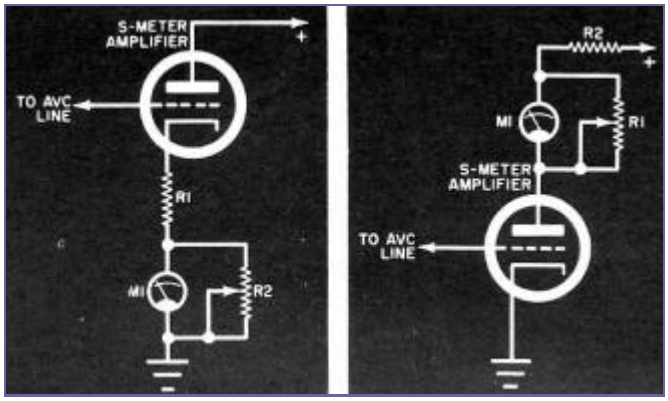
The reason is that even if these guys lived side by side and were using the same model of receiver and the same type of antenna, they still might not get the same readings! Using different receivers and different antennas, they definitely will get different readings.

How come? It's just that an S-meter (signal strength meter on the receiver) doesn't really measure actual signal strength. But, it does indicate the relative strength of signals getting into the receiver. This means that a signal is shown to be stronger, weaker, or the same strength as another signal, without a definitive measurement of the actual strength of either signal.

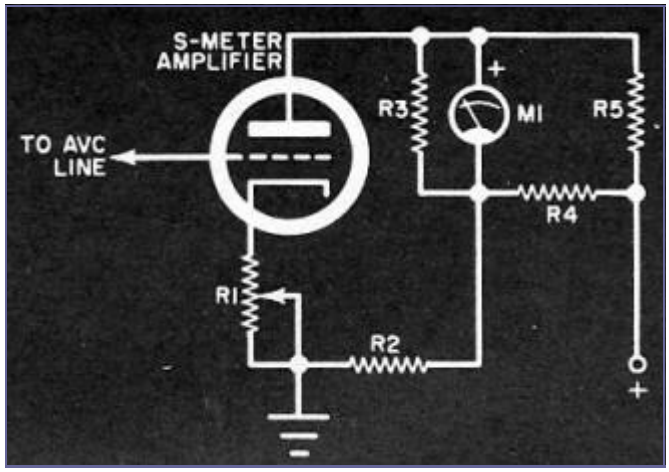
AA signal which deflects your S-meter to S7 is two S-units weaker at the input to your receiver than one which deflects the meter to S9. Since most manufacturers calibrate S-meters so that one S-unit represents either 5 or 6 dB change in signal strength, the S9 signal is 10 to 12 dB stronger than the S7 signal at your receiver.

Calibration Variations. An important variable which causes S-meter reports to be inconsistent is the fact that receiver manufacturers do not have a common calibration standard. Also, each manufacturer has his own calibration method. Plus, variations in components may cause S-meters in two receivers of the same make and model to perform differently.

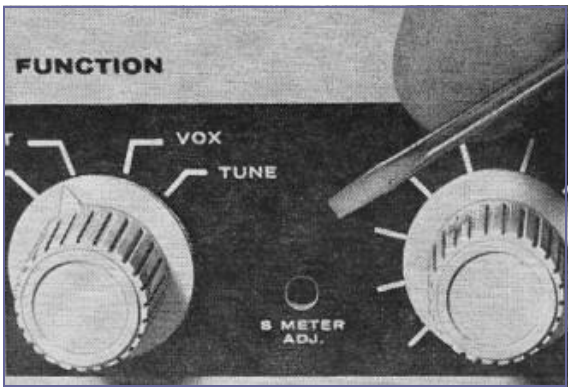
The folks at the National Radio Co., for example, calibrate S-meters so that S9 indicates approximately 50 microvolts input signal to the receiver. This company told the author that, "strictly speaking, the decibel readings over S9 should be in a nonlinear scale, but ours are put into a linear scale for simplified reading and for averaging purposes."



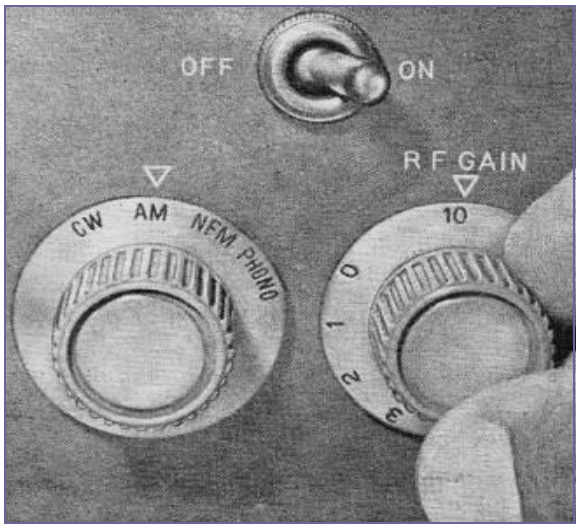
The only difference between these two S-meter circuits is the position of the meter. In both cases the meter reads backward - increasing signal strength means less current.



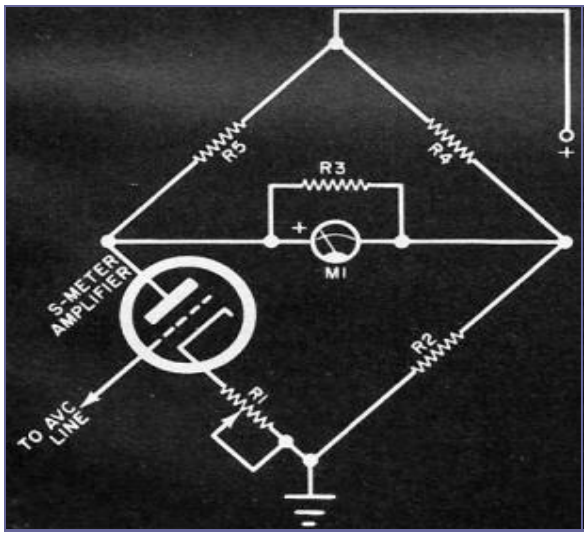
To make the meter read forward - increase in strength means more current - the meter circuit must be revised as shown here.



Hidden away on every communications receiver is the S-meter adjustment. If this adjustment is not properly set by the operator, the S-meter is always off.



Most S-meter readings are at the mercy of the r.f. gain control setting. In practically every communications receiver, the control must be full on.



This diagram shows the bridge circuit of a forward-reading S-meter in its more familiar presentation.

Swan Electronics Corporation says that its meters are calibrated to read S9 with an input signal strength of 100 microvolts at 50 ohms at 14 mc. The S-units are spaced at 6-decibel intervals. This company cautions that "production variations, particularly in tube characteristics, will cause considerable change in these figures ..."

The R. L. Drake Co. uses a 50-microvolt input signal at the antenna terminals to determine the S9 point. Calibration is at 50 ohms impedance, but each S-unit equals 5 dB!

Hallicrafters also uses 50 microvolts at the antenna terminals of the receiver to set S9, and makes each S-unit equal approximately 6 dB. Measurements are made at 50 ohms impedance at 5 mc. The company adds: "This approximation will have a variation of plus or minus 5 dB on a new receiver, and, as the tubes age, the variations may be still greater."

The standard for S-meters at Collins Radio Co. is approximately 100 microvolts at 50 ohms through a 6 dB pad for S9. This may vary, says the firm, from about 90 to about 115 microvolts, depending upon adjustments in the i.f. section of the receiver.

More Woes. As if there aren't enough variables in the S-meter situation already, let's see what else can affect S-meter readings. How about the S-meter adjustment pot on your receiver - how long has it been since you checked to see if it was set properly? This potentiometer is adjusted to produce a zero reading on the S-meter scale under certain conditions - generally with the antenna terminal shorted to ground, or with the r.f. gain control set at minimum, or both. Check the manual for your receiver for the exact procedure. You may find that your S-meter has been off by several S-units, because of tube and component aging.

While you're looking in the manual, check to see what the manufacturer has to say about the setting of the r.f. gain control during receiver operation - this can have an effect on S-meter readings. Generally, the r.f. gain control must be in the maximum gain position for the S-meter to read according to the manufacturer's specs. With the r.f. gain reduced, a stronger input signal will be required to produce a given S-meter reading. However, even with the r.f. gain reduced, you still can use the S-meter for relative indications just as you would with full r.f. gain, as long as all readings are made with the same setting of the r.f. gain control. Change this setting and you change the meter indication.

How about the condition of the S-meter amplifier tube? When it gets weak, the meter indications are affected, even though overall receiver performance doesn't change. So don't overlook this tube whenever you check your receiver tubes.

How S-Meter Circuit Works. Generally, the S-meter is connected, through an amplifier tube, into the a.v.c. line. When a.v.c. voltage increases, as it will when a stronger signal comes into the receiver, the meter reads upscale.

Two typical S-meter circuits used in communications receivers are shown on p. 55. Essentially they are the same, except that one circuit has the S-meter, usually a 0-1 milliammeter, in the cathode circuit, while the other has the meter in the plate circuit.

The amount of current flowing through the S-meter amplifier tube, and hence through the meter itself, is determined by the a.v.c. voltage, which is applied to the tube's grid as well as to the r.f. and i.f. stages controlled by a.v.c. action. A strong signal produces a larger negative voltage on the a.v.c. line than a weak signal, and reduces the current flow through the S-meter amplifier tube. In this case the S-meter will read backwards - strong signals will be indicated on the left end of the scale and weak signals on the right end of the scale.

One way to make the meter indicate increasing signal strength as the meter needle deflects from left to right is to

use a special meter built backwards from the conventional meters - one in which the needle rests normally on the right end of the scale, and moves to the left as current through the meter increases. Another way to achieve the same result is to use a conventional meter. but mount it on the receiver panel upside down, while inverting the meter scale so it is read right side up. This explains why some receiver S-meters are pivoted at the top of the meter face, and why others, although pivoted at the bottom, deflect to the right when you turn off the receiver.

A more elaborate, but forward-reading S-meter circuit is also shown to the bottom right. This is essentially a bridge circuit (see familiar version below) where R4 and R5 are equal in value. The other legs in the bridge are R2 and the equivalent of tube resistance plus the zero-adjust

potentiometer R1. The pot is adjusted for zero reading on the meter (balancing the bridge) with no a.v.c. voltage present. Application of a.v.c. reduces the amount of current flowing through the tube, thus increasing the tube resistance and unbalancing the bridge, causing the meter needle to deflect upward.

Regardless of the kind of circuit your S-meter has, always remember to use it as an indicator of relative signal strength in the receiver, and nothing more, except for tuning and alignment of the receiver and transmitter. When you tell a guy that his signal is 30 dB over S9, you are actually indicating how well his signal is getting through your rig.

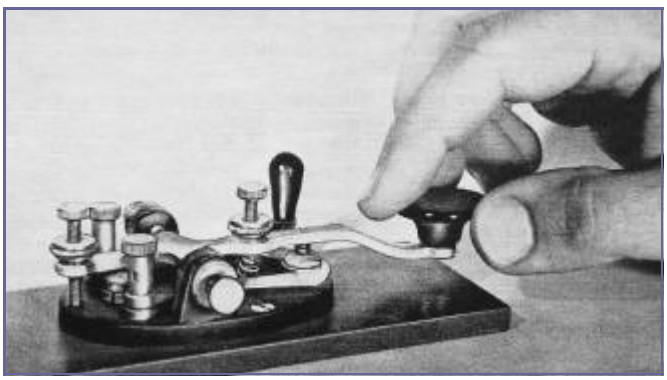
How to Break the 10-Words-Per-Minute Code Barrier

July 1974 Popular Electronics

When you think about it, the speed at which a human being is able to accurately copy Morse code is limited by the same kinds of processes that limit the speed at which binary data can be sent between electronic transceivers (modems). Noise introduced into the signal at both the transmitting and receiving ends or in the transmission path connecting the two, degrades the ability of the receiver (electronic and human) to discern between a "1" and a "0." It can take the form of electrical or audio interference and distortion. Phase noise in the electronic realm is sort of the equivalent of an irregular sending human hand that cannot maintain equal dwell times for dits and dahs, thus making the recognition of characters error-prone. The operational speed of circuitry on an electronic assembly can also limit the speed at which Morse code can be copied similar to how a particular person's gray matter can limit his comprehension speed. One Navy lieutenant in the article stated, "There may be a certain type of individual who can copy fast code and a certain type who can't." Of course upon reading that line I immediately thought of the joke declaring, "There are 10 types of people in this world: Those who understand binary and those who do not." To apply that here, the title could equivalently be interpreted as, "How to Break the 2-Words-Per-Minute Code Barrier."

How to Break the 10-Words-Per-Minute Code Barrier

By Richard Humphrey



Lucky is the radio amateur who doesn't "plateau out" somewhere around ten words-per-minute when he's learning code. There may be a fortunate few who march right up to 20 or 30 wpm without a break, but most of us make it to 10 wpm literally in a matter of days, then struggle for many months to get up to 15 wpm solid copy so we can be sure of hacking 13 wpm when we go up for our General. Once definitely past the 10 wpm "hump," progress is seldom a problem.

Hams aren't the only ones bothered by the CW plateau. The Navy, Army, Coast Guard, and Air Force all have their difficulties in getting their radio-operator trainees off the 10 wpm dime. When asked if the Army had a problem, Colonel A.J. Sullivan in Washington said: "Yes we do. Approximately 60% of trainees reach a hump somewhere between 10 and 13 words-a-minute. Our goal is to raise them to 15," he said, "and often we're able to get them to go as high as 25 and 30 words-a-minute." Col. Sullivan went on to explain how the Army did it. "The first way is to have the student and instructor analyze error patterns and then determine remedial patterns to correct them in the student.

"The second way," he continued, "is to analyze individual rhythm patterns and make recommendations to improve these. The third thing is to try and get these students to copy 'behind' one or two characters so that they might be able to comprehend a whole word instead of a letter at a time."

A spokesman for the U.S. Navy, Lt. Tim Mennuti, echoed Col. Sullivan. "It takes three weeks to peak out," he said, "at which point the average person has reached 12 to 14 words-per-minute." Mennuti added, "The problem is that over 14 words-per-minute there are no breaks between letters." It appears the Navy considers the "hump" serious since we understand the training program is undergoing considerable revision.

Everyone interviewed agreed on one of two positions: either (a) the plateau was caused by reaching a speed where you had to stop copying letters and start copying words or (b) the "letter-to-word" transition was a coincidence and the reason for the "hump" had to be found elsewhere. The Navy seems to favor the latter view. "Apparently," said Mennuti, "there's some psychology connected with this thing that we didn't have before. What we're finding out," he explained, "is there may be a certain type of individual who can copy fast code and a certain type who can't."

Strangely, two things which might be expected to have had an effect on an almost auditory process such as learning CW seem not to have affected it at all: the increasing use of audio-visual aids in teaching and the tremendous impact of television on those who have been coming into the military. The generation which has been studying code for the past several years are, say the experts, "picture" oriented rather than "word" oriented. One might expect that hams and others cramming code today would be having more trouble. But Col. Sullivan says the percent of those hitting the "hump" hasn't changed "in the last 20 years."

Psychologists and authorities in the business of teaching brought up the point when they were interviewed that getting past the 10 wpm plateau wasn't a "learning" problem but a "fluency" problem. Obviously, they said, if you can copy and send ten words-a-minute, you know the code. The point was also made that gaining fluency in code might be similar to gaining fluency in a foreign language. If you learn a foreign language by "reading" it - in high school or college, for instance - you will usually have tremendous difficulty in speaking (or understanding) the language fluently. You will find that you translate from the foreign tongue into your own language, absorb the information, form an answer, in your own language, translate the answer into the foreign language, and then say it. To gain any fluency whatsoever you must think in the foreign language.

But how do you "think in code?"

Here, the experts and authorities as well as military instructors and radio amateurs are more-or-less in agreement. Number one on everyone's bugaboo list: don't sit down and learn the code before you start listening to it! Many hams fall into this bottomless pit. The CW trainee in the military has usually been sitting there for three hours with the cans on his head listening to taped copy before someone tells him what it is he's doing. Even so, six out of ten plateau out somewhere around 10 wpm, according to the Army. The attrition rate among radio amateurs must be tremendous. One instructor put the problem this way:

"When you find yourself hearing dah-dit-dah-dit and saying 'Aha, that's a C' and then writing it down, you're in big trouble. It's got to be instantaneous," he said. "You hear it, you write it. No translating!"

The way you transcribe CW may also have a direct bearing on the 10 wpm hump. Without exception, everybody agrees that the best way is to use a typewriter. For two reasons. First, the mental attitude you have when you learn to touch type is quite similar to what it should be in learning code. You're not translating. You learn by rote that the right forefinger goes there and the left forefinger goes here for this letter or that letter. You're not falling into the bad habit of reading a letter, looking for it on the keyboard, then hitting it.

Second, copying by hand in capitals will limit your speed to around 15 wpm. Long-hand script will only take you to 25 wpm or so. The only thing limiting your code speed when using touch typing is your typing speed. A 40-wpm typing speed is only fair. A 40-wpm speed in copying code is very good. (It's undoubtedly no coincidence that of the Air Force's 630 hour CW course, 435 hours are devoted to "touch typing and transcribing International Morse code with a typewriter.")

The various tapes and records on the market to teach you the code undoubtedly have some value. The unanimous comment from radio amateurs is that they'll memorize each tape or record after a few playings and once this has happened the recording is useless. Tapes work out fine for the military because they can afford thousands-of-hours of it so there's little chance of copy memorization. Hams usually aren't so affluent.

What to do if you "studied" the code before you began listening to it? You can try the Army's recommendation of "copying behind" to try to progress from letter copying to word copying. Or you can try the method used by a former Navy Chief Radio Electrician.

"My hump was around nine-a-minute," he says. "It made me mad. I just kept at it. I copied until my eyes fell out. I even copied Russian and Spanish code, though I didn't understand it. Later, aboard ship, they tested me on taped copy and I made 9 words-a-minute.

To many would-be hams, all this insistence on an "antiquated" form of communications is ridiculous. With FM, SSB, facsimile, and other things to come in the future, they may be right. But CW is still the simplest form of long-range communications. Because when you are using CW, you can cut through QRM with modest power, a minimum number of components with simple antenna, and troubleshooting and repairs can be made with almost no training. CW is a unique ease of the Old Gray Mare being just as good as she "used to be."

THEFT IN THE PARSONAGE !

By George Latsky

The year is 1947 and the writer is 8 years old and his elder brother is 14. So Chris says "I'm going to build you a one valve radio George, but we need coil wire and a piece of broomstick for a coil former."

The theft in the St. Stephen's parsonage was most certainly not a burglary, but an inside job ! So even in a parsonage the chiaroscuro side of life is depicted : light and shade !

We obtained the wire from Mr Adler's Acme Garage, Tamboers Kloof, Cape Town, in the form of an old ignition coil from which Chris unwound some of the thicker primary winding for the coil.

At that stage we were very indigent, Dad being a poor Parson of an impoverished congregation, we could not afford to buy a tuning capacitor, so had to make do with a coil wound on a 6" piece of broomstick with a metal strip and knob as wiper, so doing tuning in MW stations. In those days the SABC radiated from Klipheuvel using an old Marconi 5 kW MW transmitter. This was before the 500' MW mast radiator was erected at Brackenfell fired by a 20kW Marconi transmitter.

Now for a coil : we needed a 6" piece of broomstick. The answer : we must steal it and abstract it from Mother's broom. So one afternoon while Mother was taking a siesta, we two conspirators furtively sneaked into the pantry, grabbed the broom and at a secret venue, Chris sawed off 6" of the broomstick for the coil. Alas, the top end of the stick had a rounded head, so Chris hastily detached the stick from the business end, sawed off the 6" and replaced the broomstick !

Mother was a very tempestuous person, an English speaking Boshoff, a clan known for violent tempers and scary fits of extreme rage....so we had to be very careful. We got our coil former without being detected ! Mother was very short, about 5'2" tall and did not notice her slightly shortened broomstick....Dad again was Eli the second ,a kindly, soft hearted easy going Father to us.

Now we two conspirators ,the perpetrator, Chris, and his sidekick-accomplice, George, could breathe freely again, although smitten by qualms of conscience, cognizant of the Commandment : "Thou shalt not steal," but we two brothers, modern day Hofni and Phineas, kept our pose and were undetected, the naughty, recalcitrant young thieves !

Chris built the OVO breadboard style on a little plank from a tomato box and the set was soon constructed. It actually worked, but we were too poor to buy a type 30 battery triode, so we used a type 27 AC triode as grid leak detector, sine reaction. It ate batteries : we used 2x size D flashlight/ torch cells giving 3V,but as the valve consumed 1.75A filament current, the cells only fired it for about 1 h. The heavy current drew the 3V down to roughly 2.2 V, but the OVO actually worked quite well using a longwire aerial, good earth and earphones.

Now to describe the set : the coil is wound on a 6" piece of broomstick, about 85 turns of No. 22 swg enamel copper wire. The wiper is a strip of springy metal with a small knob affixed to it with a cheese head bolt. The head soon scrapes an oval path over the coil, scraping a clean path for tuning the coil. One end of the coil is earthed, the other goes to the aerial and the wiper goes to grid via a 250pf moulded mica capacitor, bridged by a 1mOhm grid leak resistor. The valve/tube, type 27 or 56, is mounted on an inverted paxolin UX5 -pin holder/socket. Note with inversion, the pin connections are reversed ! There is a HF filter : HF choke of 2.5mH and beyond it a 300pf moulded mica capacitor to earth. The filter keeps the HF from going to the earphones. All external connections are made to ex GPO flat connector plates serving as terminals for : LT 2.5V, HT of 9 to 45V,

Phones, Aerial and Earth. The breadboard plank can be lightly oiled with raw linseed oil or varnished.

Note that PVC covered wire was only available from around 1948,so here we used cotton covered hook-up wire. HT is decoupled by a 0.05mf paper capacitor, mounted across the HT terminals.

Happy listening on your " Latsky Brothers Broomstick Special " OVO MW Wireless Set !

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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 07:00 (05:00 UTC) —Western Cape SSB Net— 3.640; Every afternoon from 17:00—3.640
Saturday 08:30 (06:30 UTC)— National SSB Net— 7.125; Sandton repeater 145.700
Echolink—ZS0AWA-L
Relay on 10.125 and 14.135 (Try all and see what suits you)
Saturday 14:00 (12:00 UTC)— CW Net—7025

AWASA Telegram group:

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