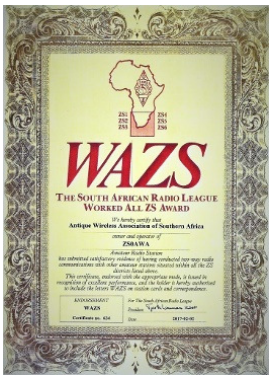
Antique Wireless Association of Southern Africa Newsletter

 # 191 **June 2022**



Inside this issue:

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Reflections:

In days of yore, when the AWA Valve QSO party was first started, the sounds of many valve rigs could be heard from one side of the country to the other. These days it's the Semi-conductor rigs that are taking the honours.

I somehow cannot help but express my disappointment that we have to give first, second and third place awards to, not only non-members of the AWA, but to guys using transistor rigs. Not that they don't deserve them, because they do. After all, they were there and pulled in the contacts, and scored the points.

Someone using a hybrid rig, scoring just more than half the points of the transistor rig, could walk away with top honours. In fact I proved this by using my FT102, I scored 50 contacts to the winners 68, and still earned 100 points. Had I been in the contest instead of running the ZS0AWA station, I would have won.

Yes I'm whinging. I just feel it's so unfair, but then that's me.

I do realise of course there are many who don't like doing any kind of contests, no matter what they are for. Some do not like the idea of sitting for an hour or two calling "CQ" and waiting for someone to hear you and give you a signal report. I get that. But to stretch the legs on your valve radio and actually have a QSO and not a change of numbers only, makes it quite different.

Some of us are quite impressed when you call CQ and you go back to find out it's an all valve rig, built in 1948 and refurbished by yourself, back to life from junk status. Then that is what makes it worth while.

How can you not get a kick out of that ?

My greatest joy was to use my Collins 32V-3 on AM nights and hear the reports that came in using a 75A-4 receiver. What a combination.

On Saturday mornings with the AWA net, I was using a Collins S line to do the relay on 80m and using a Collins KWM2 to pick from 40m. I didn't have to use them as I had more modern radio's to work with, but it was the thrill of using these pre 1960 radio's on the net that did it for me.

But then, maybe I am a bit whacky. What's the old saying, you don't have to be crazy….?

I love to hear when Ludwig, now ZS5CN comes back to a call. Inevitably he will be using some exotic rig rom WW1 that chirps like crazy and drifts all over the place on CW. But it is amazing to know how old it is and what it has taken to restore and get it going again.

Nostalgia….the stuff dreams are made of.

Long may your valves burn brightly and lighten your life.

Best 73

DE Andy ZS6ADY

Wikipedia

Solar Storms

Solar storms of different types are caused by disturbances on the Sun, most often from coronal mass ejections (CMEs) and solar flares from active regions, or, less often, from coronal holes. Minor to active solar storms (i.e. storming restricted to higher latitudes) may occur under elevated background solar wind conditions when the interplanetary magnetic field (IMF) orientation is southward, toward the Earth (which also leads to much stronger storming conditions from CME-related sources) Active stars produce disturbances in space weather and, if strong enough, in their own space climate. Science studies such phenomena with the field of heliophysics, which is an interdisciplinary combination of solar physics and planetary science.

In the Solar System, the Sun can produce intense geomagnetic and energetic particle storms capable of causing severe damage to technology. It can result in large scale power outages, disruption or blackouts of radio communications (including GPS), damage or destruction of submarine communications cables, and temporary to permanent disabling of satellites and other electronics. Intense solar storms may also be hazardous to high-latitude, high-altitude aviation and to human spaceflight. Geomagnetic storms are the cause of aurora. The most significant known solar storm, across the most parameters, occurred in September 1859 and is known as the "Carrington event". The damage from the most potent solar storms is capable of existentially threatening the stability of modern human civilization, although proper preparedness and mitigation can substantially reduce the hazards.

Proxy data from Earth, as well as analysis of stars similar to the Sun, suggest that the Sun may be also capable of producing so called superflares, which are as much as 1000x stronger than any flares in the historical record. Other research, like models of solar flares and statistics of extreme solar events reconstructed using cosmogenic isotope data in terrestrial archives, indicate otherwise. The discrepancy is not yet resolved and may be related to a biased statistic of the stellar population of solar analogs.

An Introduction to Operating on 160m

Carl Luetzelschwab K9LA k9la@arrl.net

[this is the web version of the article that appeared in the November 2006 issue of CQ]

Operating on 160 meters has always been a challenge.

Two of the biggest challenges are the physical size of efficient antennas and noise when receiving. The purpose of this article is to provide appropriate information to address these two challenges, along with general information about other issues necessary to get your feet wet on topband (also known as the Gentleman's Band).

A Short History of 160m The 160m band has been around for a long time. In the First Edition of the Radio Amateurs Handbook (1926, published by the ARRL), Amateurs had an allocation from 150 meters to 200 meters in wavelength (that ís 2 MHz down to 1.5 MHz). Due to AM broadcast stations and other services, the 160m band was eventually narrowed up to 1.8 to 2.0 MHz. Because of LORAN issues (LORAN is a radio location service), there have been power and frequency restrictions over the years. For example, during my early years in Amateur Radio in northwest Indiana (early 1960s) I could only operate from 1800 to 1825 KHz with a maximum power of 200 W during the day and 50 W during the night. There were similar restrictions in other areas of the country. Nowadays those of us in the US can operate anywhere from 1.8 to 2.0 MHz at up to 1500 W PEP output. Of course you should always strive to use the minimum power to make the QSO.

The first order of business for an introduction to 160m is to look at the band plan for 160m ñ what frequencies should we use for CW, what frequencies should we use for SSB, what frequencies should we use for AM, etc. 160m Band Plan Unlike our HF bands, the FCC (Federal Communications Commission) does not regulate 160m with respect to band segmentation by mode. Legally any mode can operate anywhere. But obviously this could cause (and has caused) conflicts.

To impart order to this issue, a Gentleman's Agreement band plan was developed by an ARRL Ad Hoc committee with input from users of 160m. The recommended band plan is shown in Table 1. You are strongly encouraged to adhere to this plan. A little cooperation among fellow Amateurs can go a long way!

1.800 - 2.000 CW
1.800 - 1.810 Digital Modes
1.810 CW QRP
1.843-2.000 SSB, SSTV and other wideband modes
1.910 SSB QRP
1.995 - 2.000 Experimental
1.999 - 2.000 Beacons

Table 1 ñ 160m Band Plan

With the band plan outlined, a couple comments on where 'common' activities take place is in order. Rag chewing on 160m starts around 1.843 MHz and extends all the way up to 2.0 MHz. There's a lot of spectrum above 1.9 MHz that is relatively lightly used, so you might want to consider moving up there for your rag chewing activities. AM aficionados hang out around 1.885 MHz, and it's an enjoyable side hobby to fix up old radios and put them on the air (I can vouch for this through my efforts with my Viking Ranger II and Drake 2B with a homebrew converter). Finally, most DXing on 160m outside of contests is done on CW in the lower 35 KHz or so of the band. If you want to work DX on 160m, knowing code is almost a must due to CW's inherent weak signal advantage over SSB and the CW bandwidth letting in less noise (more on this latter aspect in a bit).

Since LSB (lower side band) is normally used on 160m, note that 1.843 MHz refers to the carrier frequency for LSB. The intent here is to keep the side bands at 1.840 MHz and above (since the bandwidth of an SSB signal is about 3 KHz). And there is no segmentation by license class—General, Advanced, and Extra class licenses have equal access to the entire band.

When Is 160m Good ?

Now that we know where we should operate in the 160m band, the next issue to address is when should we operate, that is, when is 160m good ?

If your interest is only for local QSOs (rag chewing, nets, etc), then 160m is good anytime, day or night, summer or winter. And where we are in a solar cycle won't matter either.

If your interest in 160m is DXing, then there are times, seasons, and phases of a sunspot cycle when 160m is best. Due to excessive daytime D region absorption, 160m is useful for DXing when the path is in darkness or very near darkness. Because of geomagnetic field activity considerations, 160m is best during the winter months and from solar minimum to a couple years thereafter. The latter portion of the previous sentence says now is the time to get on 160m if you're pursuing DXCC or WAZ. We are at solar minimum between Cycles 23 and 24, and the next couple of winter seasons (2006-2007 2007-2008, and possibly 2008-2009) should offer excellent opportunities for the DX minded.

Simple Transmitting Antennas

As stated in the introduction to this article, the first biggest challenge for operating on 160m is the physical size of an efficient transmitting antenna. The length of a half wavelength dipole at 1.85 MHz is approximately 253 feet (each side would be about 127 feet). That's quite a bit of a horizontal span for those on small lots.

An easy way to overcome this horizontal span requirement is to make the dipole into an inverted-vee. For example, the top of a 50 foot tower or 50 foot support could be used as the centre point for the inverted-vee. The sloping portion of each side of the inverted-vee could be approximately 70 feet, with the remaining 57 feet running horizontal to the ground and even snaked around a bit to fit the lot. Figure 1 shows this configuration. This would make an excellent antenna for local activity on 160m (but don't be surprised if you work DX with it, (the ionosphere can be the great equalizer among different stations).

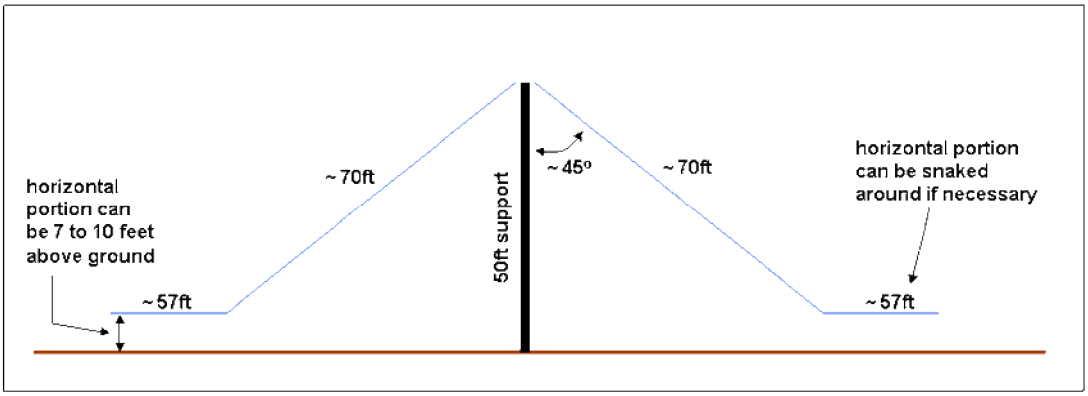

Figure 1 – Inverted-Vee Installation

If your interest is DXing, generally you'll want an antenna that puts more of its energy at the lower elevation angles. Perhaps the simplest antenna to fit this bill is the inverted-L. The total radiator length needed would only be about 127 feet, as this is essentially a vertical antenna operated against ground. A tree could be used to support the vertical portion of the inverted-L, with the remaining length (127 feet minus the vertical portion) sloping down to a convenient support. Figure 2 shows this configuration using a tree for the support. Either buried radials, radials lying on the ground, or elevated radials could be used to provide the ground image for this antenna.

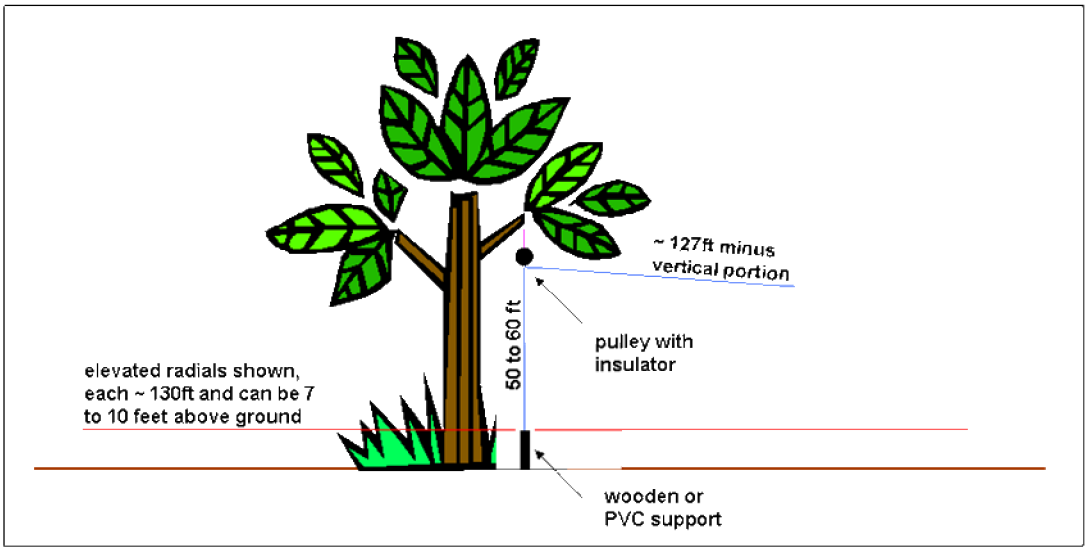

Figure 2 – Inverted-L Installation

Noise

The second biggest challenge noted in the opening paragraph (mostly affecting those interested in DXing) is noise and is noise and its impact on the ability to hear weak signals. There are two sources of noise that make receiving on 160m difficult: man-made noise (machinery, appliances, lights, and so forth) and atmospheric noise (static from lightning discharges propagating into your QTH). Figure 3 shows the magnitude of the noise problem (from data in the International Telecommunications Union document Rec.ITU-R P.372-7)

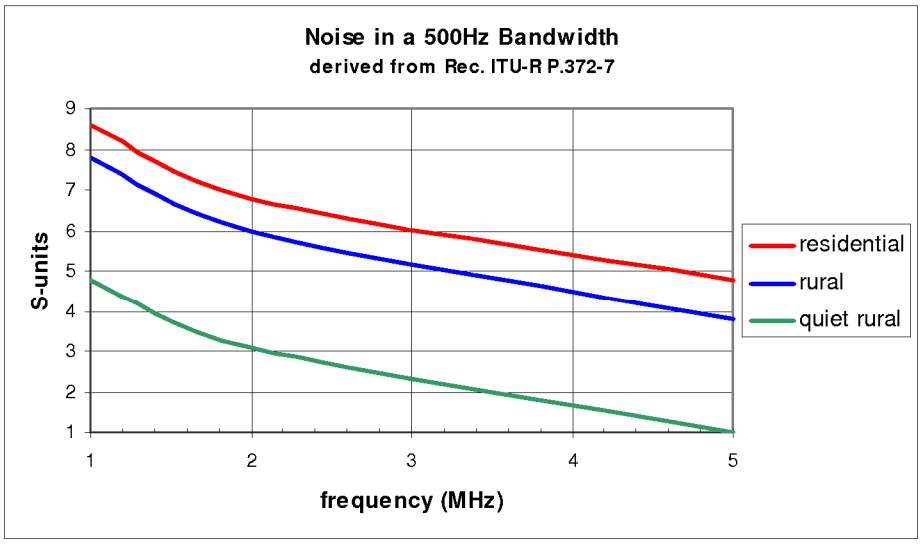

Figure 3 – Expected Noise Levels

The three curves in Figure 3 are the expected noise from a short monopole antenna in a CW bandwidth (500Hz) in terms of S-units for three noise environments: residential, rural, and quiet rural. This plot should be used as a ballpark guideline, as your mileage may vary according to your specific local conditions. I would expect the noise received by the inverted-L in Figure 2 to roughly agree with the short monopole data in Figure 3, with the inverted-vee of Figure 1 maybe a bit better due to some directivity (see the next section). For the data in Figure 3, I assumed S9 was -73 dBm (50 microvolts) and an S- unit was 5 dB (based on my measurements, this is typical of current receivers).

In a residential area, the expected noise on 160m in a CW bandwidth is around S7. Wow! Even moving to a rural area only knocks this down to S6. Heading out into the country puts the noise at S3. That S3 value is the level of noise in a CW bandwidth on my OMNI VI Plus using my inverted-L.

The S3 value doesn't sound like much, but remember that the noise floor of a modern receiver is around -130 dBm. Using a signal generator, the S3 value on my OMNI VI translates to about -103 dBm. Thus I am giving up almost 30 dB of hear-ability, which is the difference between my external noise level and my receiver's noise floor when using my inverted-L for receive.

Be aware that the data in Figure 3 assumes you don't have a particularly troublesome local man-made noise source that masks everything else (for example, a noisy utility line). If you do, then you have your work cut out to eliminate it. On a personal note, the most interesting noise source I've had to find and resolve was an electric blanket used by our neighbours to keep their cat warm.

Simple Receiving Antennas

When you first start out on 160m, you'll probably use your transmit antenna for receive. As you progress with your 160m activities, you may need to work weaker signals that are at or even below the noise level resulting from using your transmit antenna.

This is where low-noise receiving antennas come into play. Regardless of the category of the low-noise antenna, they all work on the same principle - increase the directivity of the antenna (make front-to-back and front-to-side ratios larger) to reduce the total amount of noise being received from around the compass. This assumes the arriving noise is not a localized source as mentioned in the previous section. And if there is a noise source in the direction you want to receive, you have a real problem.

The improvement in 'hear-ability' for a given low-noise receiving antenna will generally follow the narrowness of the pattern - a narrower pattern will let less noise into your receiver and lower your noise level, and thus will thus allow you to hear closer to your receiver's noise floor. From this consideration, we can make a first-order list of how effective some of the common low-noise receiving antennas will be. In order of least effective to most effective, they are:

Short Beverage (80m long)
Elongated terminated loops (EWE, Flag, K9AY, etc)
Standard Beverage (160m long)
4-Square (quarter wavelength spacing)
Long Beverage (300m long)

Remember that new layers of DX may be heard with noise reductions of as little as 3 dB. So don't rule out the antennas in the first two categories. Even though they are small, they will probably fit on almost any lot. And they might just make the differ-

ence for you in making a QSO.

If your only problem is that of a troublesome localized noise source mentioned earlier that defies elimination, consider using a small loop antenna to null out that direction.

Propagation and Predictions

If we look at worldwide electron densities, we'll see that the ionosphere always has enough ionization to refract 160m back to Earth for multi-hop propagation ñ even during the dead of night at solar minimum. Thus the problem on 160m is not with the MUF (maximum usable frequency) ñ it's with the amount of absorption and the resulting signal strength. This was the basic premise mentioned previously in the 'When Is 160m Good ?' section - due to absorption, the best place for 160m RF is in the dark ionosphere.

Now if you've used propagation predictions on our HF bands, you've probably noticed that most of them do not include 160m. There's a very good reason for this - it's because of the impact of the Earth's magnetic field on three basic propagation parameters. With 160m being so close to the electron gyro-frequency, the magnitude of the magnetic field and the direction of propagation with respect to the direction of the magnetic field modify the amount of absorption incurred, the amount of refraction incurred, and the polarization of the wave(s). This can get very complicated very quickly over long paths, and the proper way to address this rigorously is with full-blown ray tracing software.

Over the years there have been several studies by 160m enthusiasts to come up with a simple method to predict whether 160m is going to be good on a given night. These studies have usually been based on solar flux and K or A indices. These efforts have not met with much success, as they do not consider all the variables that appear to be involved with propagation on 160m - especially events that happen in the lower ionosphere to enable ducting mechanisms and reduce absorption. In general a quiet geomagnetic field seems to be a requisite, but it doesn't appear to be the only requisite.

This all comes down to two simple pieces of advice with respect to propagation on 160m:

1. Use the excellent mapping feature in many of our propagation prediction programs to determine the best times for 160m propagation over the desired path with respect to darkness along the path. Pay particular attention to sunrise and sunset times at your QTH and at the other end of the path for possible signal strength enhancements.

2. Get on the band to check it out in real-time. Watching PackerCluster spots also helps to get a real-time assessment.

Worldwide Allocations

If your goal on 160m is to work DX, then it would be helpful to know where all the DX entities can operate on 160m. An up-to-date list of these allocations can be found at www.qsl.net/n1eu/topband/160FreqAlloc.xls.

Aids for 160m Operating

The side bar accompanying this article lists several sources of information to learn more about 160m ñ from more effective transmitting antennas (better than those described earlier) to low-noise receiving antennas (like those mentioned earlier) to the intricacies of propagation on 160m to planned DXpeditions to general topics. If you have the desire to go deeper into any of theses areas, check out those references.

Summary

As mentioned several times in this article, 160m is also known as the Gentleman's Band. The current users of 160m would like it to stay that way. So regardless of your operating preference (rag chewer, DXer, contester, digital enthusiast, QRPer, or whatever) please strive to uphold the reputation of 160m. The advice and solutions offered in this article probably won't get you to the Top of the DXCC Honor Roll on 160m. But they will allow you to sample the challenge and adventure of 160m. Where you go from there is up to you.

(The SARL Topband QSO party runs from 22:01 UTC on 7 June to 21:59 UTC on Sunday 12 June 2022. The exchange is a RS or RST report and your 4-character grid square (e.g., KG30) and you are welcome to ragchew! Why not try and join in)

RESULTS OF THE VALVE QSO PARTY
7th AND 8th MAY2022

The first leg of the AWA Valve QSO Party was held on 7th and 8th of May.

For the AM QSO Party, only 2 logs were submitted from the 29 participants.

1st Ludwig Combrinck, ZS5CN - 54 points
2nd Johan van Zyl, ZS4DZ - 11 points

For the SSB QSO Party, 8 logs were submitted from the 78 participants.

1st Chris Avenant, ZS6CPA - 60 points
2nd Maryka Nel ZS3MN – 49 points
3rd Johan van Zyl, ZS4DZ - 43 points

The ZS0AWA station scored 24 points in AM QSO Party and 100 points in SSB QSO Party.
It was disappointing to see the lack of valve radios used in the contest, but congratulations to the high scorers.
Thanks to all who took part.

THURSDAY, JUNE 16, 2022 AT 7 AM – 2 PM

VOORTREKKERMONUMENT ANTIEKMARK

JAZZING UP AN OLD PYE TYPE PCR

By George Latsky

This old PYE type PCR military wireless receiver dates back to WW2 and 1944 when it was first built by PYE Ltd. of Cambridge, England.

Some models were built under contract by Philips Lamps Ltd, London and also by Invicta Ltd.

This receiver is a semi communications set, lacking a BFO and was used as an invasion receiver and for Forces entertainment in Military canteens. Also as a receiver for Dutch, Danish and French underground operatives. It is a sensitive and selective superheterodyne receiver with the following valve line up :

HF amplifier EF39, Converter/mixer ECH35, IF 2x EF39 valves, Detector AVC EBC33 and audio output either EL32 or 6V6 G/6K6 G : 6 valves/tubes in toto.

The author's one was a wreck given him by a radio fundi in Durban. It was only a rust free chassis and front panel. A new case, or rather a steel box was made by the Vredendal Land-bou-Korp, and sprayed a dark military green.

New knobs were fitted. A hole was cut in the front panel to accommodate a p/m speaker and a signal cowl in miniature was installed to house the tuning indicator/magic eye, being an EM34. At night it receives LM/828 radio signals transmitted from Klipheuvel, WC on MW and the signal closes the eye completely.....nearly 300km from the 20 kW transmitter.

In contrast to the Marconi type R1155 ex RAF receiver, this PYE set is easy to service with a large, strong ,open steel chassis with easily accessible components, not cramped like the R1155.
The two sets are much of a muchness and anyone who has not owned an R1155 and/or a PCR has not yet lived !

The IF frequency is 465 kHz and this amplifier is very selective and easy to align.

A toggle switch is fitted to the panel to switch the eye on or off, cutting the filament supply, thus saving the eye from fading. A low HT voltage of between 160 and 200 v also helps prolong the green fluorescent colour of the eye.

Ventilation is most important. Have you ever seen a cooked power transformer fitted by a misguided soul in a PCR, yes, cooked, with a nasty burnt smell all due to lack of ventilation ?

My PCR has a row of 8x 10mm ventilation holes in three places : back plate right at top edge of the panel and a similar row below on the base plate immediately behind the front panel and another along the bottom edge of the base plate. This ensures adequate ventilation and air flow. The set is mounted on four rubber feet allowing free air flow from below.

The PCR has 3 tuning ranges : the MW band 1 marked in Metres : 200 to 550 and to SW bands tuning up to 23mHz.

The first thing to do in jazzing up the old set is to replace ALL the paper and electrolytic capacitors with new ones of at least 600 working volts. Leave the trimmets and mica capacitors strictly alone !

New Look front panel : left to right : fuse holder, red neon pilot light, volume, tone. Replace the tone two position rotary switch marked hi/lo with a 50k Ohm linear pot.

Fit a large black tuning knob and matching smaller control knobs. The magic eye cowl is sprayed matt black inside and out. Change the Ant trimmer control to become a clarifier/band spread/fine tuner.

Connect a lead from the oscillator t/c gang stator connection in series with a capacitor of 2.5 to 5 pf silver mica or moulded mica with the ex ae

trimmer which in fact is a JB type C804 20pf variable capacitor.

The tuning control has a flywheel and has very high reduction ratio, easing tuning in elusive SW positions.....which these days are ,woe is me, very rare.

Build in a mains power supply and use an inductor/choke of 60mA an EZ35/6X5 G rectifier valve/tube. The mains transformer should have a primary for 230V and a HT of 250V plus a 6.3V winding @ 4 A The rectifier valve/tube is designed to operate on the same 6.3V line as the other valves/tubes.

In the original set the valves/tubes are wired in series/parallel to operate from 12.6 V. Rewire the valve sockets using chassis

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ZAP ! AN ELECTRIFYING EXPERIENCE !

Capt. L G Latsky

Rumble, rumble, bang, bang ! : Thunder in Namaqualand, how rare ? Lying reading on the bed beside my trusty old PCR 3 wireless set, I hurriedly and fortuitously disconnect the long wire aerial from the PCR, dropping the lead -in onto the floor between the bed and the set and continue reading with my back turned to the receiver, nestling on a small bedside table. The end of the disconnected lead-in is hopefully safely lying on the floor between bed and PCR.

SUDDENLY : CRASH ! BANG ! CRACK ! RUMBLE ! and with a terrifying CRACK and FLASH a blue ball of static electricity about 3 feet in dia. suddenly illuminates the room and a blue spark of about eighteen inches jumps from the end of the lead-in on the floor to the metal box of my PCR.....ZAP ! The charge is quickly dissipated as the metal box is earthed though a 3 core mains lead and it drains to earth through the metal conduit of the wall plug.

What a fright ! Mental images of Ole Sparkey, the electric chair, at Sing Sing prison flash through my mind and I am reminded of a news item on Radio Nederland's SW transmission of mellow memory :
"Verlede Zomer was er erge donderweer over Groenigen geweest : twee mannen waaren dood gebliksem !"
How fortunate that I escaped electrocution ,that I too was not “bliksemed” dead ! It was as if the lightning taunted me with : "Yes, I'm gonna gooi you, old George, a lekker skrik" !

THE CURE :
An effective lightning switch.

Mount a porcelain knife switch on a piece of board, mount a spark gap on a ribbed porcelain stand off insulator to which the aerial lead-in is connected by means of a brass wing nut and a rare gas static discharge cartridge between two stand offs, also mounted on the board. The knife switch and the rare gas discharge tube are connected in parallel and a sturdy earth bus bar is screwed onto the bottom edge of the switchboard, and all earth connections are made with thick copper earthing strips connected to the bus bar. Mount a brass terminal onto the bus bar to connect to the earth spike with a thick copper earthing lead.

The lead out to the receiver is made with very thin, insulated copper wire which goes to a pair of ribbed porcelain stand off insulators between which an old "ceramic stick" Dubilier 10 k Ohm resistor is mounted....this does not affect reception, but it provides a high resistance path for any stray static electric charge and it acts as an effective blocker.

Lightning tends to always follow the line of least resistance, so the whole earthing system on the switchboard is there to lead any harmful static charges safely to earth.
Mount the switchboard onto the wall outside the room where the receiver is housed. Hammer an earth spike of at least a metre into damp earth near the switchboard and with an impending electric storm, just switch the aerial to earth.

DO NOT fiddle with the lightning switch during a thunder storm !

Happy MW and SW listening in safety !

+ Gas discharge tube : Military/Naval surplus type CV980

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Visit our Website:
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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