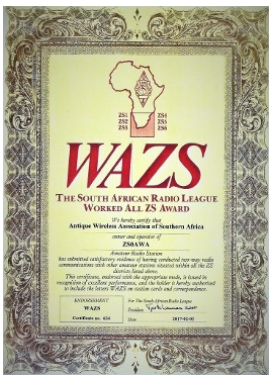
Antique Wireless Association of Southern Africa Newsletter

223 February 2025

Johnson Viking I

The Johnson Viking I transmitter kit cost $209.50 in 1949. That price did NOT include the tubes. Input is 150 watts according to the ad in the 1950 Radio Amateur's Handbook. According to the 1951 ads, it is "conservatively rated at 100 watts AM phone output and 115 watts CW". It covers the ham bands from 160 to 10 meters. The final RF amp tube is a Raytheon 4D32. It is a very tough tube that is not heavily loaded in the Viking. Few transmitters use the tube which was once considered expensive. A few years ago, a large number of these tubes were released from Air Force surplus and the price is now more reasonable. The transmitter also uses push-pull 807 tubes for modulators running class AB2. Three 6AU6 tubes are used as RF oscillator, audio preamp and audio driver. A 6AQ5 is used as buffer. Rectifiers are 6AL5 for bias, a 5Z4 for LV B+, and a pair of 5R4 for HV B+. Continuous final tank tuning is provided by a rotary inductor geared in tandem with a variable capacitor for all bands 80 through 10 with a switched inductor added for 160 meters.

The Viking is a very conservatively made transmitter with high quality Johnson porcelain components and that neat continuous-tune final tank. Johnson later came out with an upgrade kit to shield the meter and other RF openings, but TV interference is much less of an issue now than in the early 1950s. It is a very desirable transmitter that should see considerable further usage.



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Chris's Musings

I read the following on one of the groups to which I belong. *"Hi Bruce, I hope you manage to get a G3 [callsign] and if you do so, you will need to get the matching equipment, i.e. 807 in the final"*

To which Bruce replied: *"Actually, I might go for a pair of 807s (parallel or push-pull?) or an 813 with a pair of ultra-linear KT88s providing high-level plate and screen modulation with output via a Pi-tank and a ladder-line feeder. Pity I don't have that massive transformer anymore to make an 800V PSU. Oh - and I must build that 9 Mc/s phasing SSB exciter featured in the Short-Wave Magazine.*

It was great fun, and the technical involvement in building from scratch or modifying ex WD kit provided plenty to talk about on the air. Sadly, that's almost gone now, and many QSOs don't seem to go far beyond 5/9 and 73. The gap seems to have been filled with ever more contesting. I've heard it said that we've just become appliance operators. Sic transit....

Sound familiar? Ever since the availability of factory made amateur radio equipment home brewers have bemoaned operators who don't build their own and have disparagingly referred to them as appliance operators. But let us remind ourselves that Amateur Radio encompasses a wide range of activities which include home brew, experimentation, restoration, antenna building, rag chewing and contesting. To each his own!

The Antique Wireless Association of South Africa is in many ways a 'one of kind'. Our Saturday morning nets are pretty unique because of the wide ranging participation and broad range of discussions. And, importantly it is not just a *nostalgia fest*!

The Cambridge dictionary defines Antique as: *something made in an earlier period that is collected because it is beautiful, rare, old or of high quality.*

The art of wireless communication is 175 years old. It was in 1849 that Heinrich Hertz demonstrated the transmission of electromagnetic waves through space. In 1896, Guglielmo Marconi transmitted signals over long distances using radio waves. Nikola Tesla was the first to use electrical transmitters to transmit messages in free space. The modern-day mobile phone was developed in the 1960s. The history of wireless telegraphy is littered with examples of important technological breakthroughs that influenced how we think about telecommunications today. And in the 21st century Software Defined Radio is the name of the game.

So, whether your interest is in 'old' in the sense of pre-1900, pre-1960, pre-2000 or just yesterday, what we as Radio Amateurs have, is collectable because it is valuable.

It is not only old equipment, but it is our accumulated knowledge, expertise and experience. We have a duty to share this and pass it on!

73 de: Chris Turner, ZS6GM

Reflections:

I think I need to report that I achieved my goals for getting my tower up with antenna's installed.

The tower at 8m, after the sandblasters lost the top section, has another 4m pole inserted to the rotator, 1m inside the top tower section with the 3 element tri-bander at 10m and the dual band VHF/UHF J pole right at the top.

The multiband inverted V peak sits at 8m off the side of the tower.

All tests have proved that the antenna's are all working fine and great improvement in comms with a few Dx CW contacts being made using the beam.

This tower has followed me from my days in Lime Acres where my ham career began and has been erected in four different locations. The rotator direction indicator is a bit worse for wear from all the years of use. But as long as I know more or less where it's pointing, that is the main thing.

My next goal is to build a multiband hex beam, but I am not going to put any time constraint on that one. That would replace the 3 element Yagi. Maybe by next year January it will be there.

Band conditions, as many have noticed, have been not so good, but yet there are contacts to be made out there one way or another.

The local 40m group does well at 16h00 SAST and there is usually a good attendance from KZN and GP, with a few other stray stations joining in.

There is also a few very early risers who meet in the mornings on 40m while conditions are still good.

Gone are the days when one could call CQ almost any time of the day and get a reply from someone who had a radio on.

In my early days of CW, one could give a call and know that you would get a reply at almost any time. Today it's difficult to get anyone on CW, never mind on SSB. The norm is to put out a message on WhatsApp, if you're on a group, to see if there is someone willing to chat with you. How the times have changed.

I really feel for the new Hams that are getting their licenses these days and are coming up on air. I think many of them have listened to stories of how one can communicate with the world on Amateur Radio, only to get their licenses and find out that the bands are dead.

I am sure many of them have been indoctrinated by many of us older guys who have had the privilege of going through excellent solar cyles where one could use a wet shoe string and get anywhere you wanted. Now they shrug their shoulders and have to be happy with band conditions that are far from good.

Yet they are there and are willing to struggle through a lot of QRM and QSB to make a few QSO's so that they can also have bragging rights. Isn't ham radio just wonderful ?

I am sure though that the "Newbies" are still appreciative of the fact they have managed to pass the RAE and become fully fledged Radio Amateurs, ready to get out there and be heard throughout the world.

Many will tackle the bands by the horns while others will become local news agents, and I don't mean that in any derogatory way. We need to keep the bands occupied to not stand a chance of them being lost to other vendors eagerly seeking to broaden their bandwidth.

Ham radio has such a wide field of activity and I think every operator will find the niche that he wants to fit into. Some will just want to become DXCC honours ops while others will be quite happy operating local stations only. As my friend Rad always says, "its whatever blows your hair back".

It is good to see that a few newbies have taken to listening in on the AWA Saturday net. Maybe some of them will take an interest in the collectibles as well. We can only hope.

As a ,atter of interest, for those who cannot join us on a Saturday morning, a recording of the net is made every Saturday and a link to the audio is posted on the website.

So when you really don't know what to do with yourself on a cold wintery evening, log in to the website, www.awasa.org.za, and look on the tabs at the top of the page for "Net Audio Files" and spend some time listening to the interesting topics discussed by our Guru's. Leave a note for us in the Guest book so we know who was there.

Best 73

Andy ZS6ADY

Can You Read Me Now

The RST code - more than just a signal report

Communication is a two-sided affair. When you send out a CQ you can't know how it is being received by another station far out across the ether. This problem became evident early on in radio. Once a signal leaves the antenna it moves from the clean and orderly environment inside your station to the wild and woolly wilderness of the ionosphere. Signals lose strength as they travel, become mixed with all sorts of eoise and our fickle friend the ionosphere can cause all kinds of mischief.

Early in ham radio a number of schemes were devised for a receiving station to quantify how well they were hearing an incoming signal. By the 1930s this makeshift system resulted in what one writer described as "a mixture of plain language questions, QSA, Rand T reports, and international abbreviations.'"

It was in October of 1934 that Arthur Braaten, W2BSR, proposed the RST system (see sidebar) as a simple, less confusing and more accurate method for reporting the usability of a received signal." His system consisted of three elements: readability, strength and tone.

A Measure of Understanding

One of the problems with earlier systems was confusion between how readable a signal was and its strength. The readability part of the RST code is used to define how understandable a signal is, not how strong it is. Readability is meant to describe to the transmitting station how well the receiving operator can understand what he is saying. It is not a matter of signal strength.

"How so," you ask? "If I'm receiving a 20-over signal it should be perfectly readable." It might not be readable if your neighbor's air conditioner is coming in 40-over. If the signal you are receiving is an Rl or R2, then you can't complete the contact regardless of how strong it is.

Signal strength is the second element of the RST system. Using nine steps it describes conditions from "Faint, barely perceptible" to "Extremely strong." The difference between an Rl and an Sl signal is worth considering. We have all been cruising a band, head-

phones on, listening intently for a certain DXpedition or special event when we come upon a frequency and stop short. You close your eyes and concentrate. You know you hear a signal. It's there down below the rush and rumble of the noise, the faintest trace of organization in the chaos.

From a readability standpoint this signal doesn't exist. Even though you are sure there is a signal there, you can't make out even the slightest scrap of information about it. From the signal strength standpoint, the signal is

51. You know it's there; there just isn't enough of it. Again an 51 or 52 signal is too weak to permit you to complete a basic contact.

"Then why have them at all?" you ask.

Well, Rand 5 values of 1 and 2 are useful in situations such as a net, roundtable or scheduled contact. Let's say you contact a DX station on 20 CW and arrange to meet on 40 phone. Down on 40 you can just barely make him out, an R5 21 signal. When you return to 20 meters you report this back to the DX, which lets him know that 40 meters isn't open to your area from his location.

Crystal Clear or For the Birds

The third element is tone. This is used for CW to describe how "clean" the Morse dits and dahs are. Tone is not that meaningful today using modern transmitters. But for those who like to "roll their own," or who like to operate using vintage equipment, the tone of the CW note can vary widely and values below T7 can indicate a problem.

What about digital? The RST code was developed long before the digital modes arrived. Some digital operators have proposed a new system for digital contacts, the RSQ system, replacing T (tone) with Q (quality). For more information go to www.rsq-info, net.

The RST system can provide you and the hams you contact with a useful description of the quality of the communications channel between you. For this reason, don't just parrot a "59" or 5NN" report. Take the time to listen and give an honest assessment of the quality of a signal. Be aware that the RST report you receive is telling you much about the usability of that frequency for whatever type of contact you wish to make, whether it is a long ragchew or a quick meteor scatter.

The RST System

Readability

1 Unreadable

2 Barely readable, occasional words distinguishable.

3 Readable with considerable difficulty.

4 Readable with practically no difficulty.

5 Perfectly readable.

Signal Strength

1 Faint signals, barely perceptible. 2 Very weak signals.

3 Weak signals.

4 Fair signals.

5 Fairly good signals. 6 Good signals.

7 Moderately strong signals. 8 Strong signals.

9 Extremely strong signals.

Tone. (CW only)

1 Sixty cycle ac or less, very rough and broad.

2 Very rough ac, very harsh and broad.

3 Rough ac tone, rectified but not filtered.

4 Rough note, some trace of filtering. 5 Filtered rectified ac but strongly ripple-modulated.

6 Filtered tone, definite trace of ripple modulation.

7 Near pure tone, trace of ripple modulation.

8 Near perfect tone, slight trace of modulation.

9 Perfect tone, no trace of ripple or modulation of any kind. If the signal has the characteristic steadiness of crystal control, add the letter X. If there is a chirp add the letter

"C" and for a click, add "K."

Carl & Jerry: Improvising
February 1960 Popular Electronics

Whoa! John T. Frye really outdid himself in dreaming up a Rube Goldberg electronics contraption in this 1960 "Improvising" episode of his Carl and Jerry technodrama series in *Popular Electronics* magazine. I have wondered whether he actually proves these concepts by building what he describes the boys doing; it wouldn't surprise me if he did. Even if the devices are purely theoretical, the description of the thought process and method of practice is impressive. This being the beginning of the snow season in the northern realm, the story's setting in a crippling snow storm is timely. It was potentially a life-or-death situation, which triggered the classic "necessity is the mother of invention" reaction. As fantastic as the action is, the fact is there are thousands of people in the world who really are capable of performing in that manner. I know a couple guys I am pretty sure fall into that category (I'm not one of them - heavy sigh).

By John T. Frye W9EGV

"Boy! It's slick as glass out there!" Jerry exclaimed as he peered through the ice-coated windows of the bus in which he and his chum, Carl, were returning from a shopping trip to Center City. "And look at what the ice is doing to those telephone and power lines. I doubt if you could find a 500 -foot length of either all in one piece."

"Yeah," Carl said in a low voice as he shut off the news broadcast he had been listening to on his transistor radio; "and a howling blizzard that caught the weather forecasters flat-footed is following up the ice storm. It's blanketing this whole section of the country-"

"Folks!" the bus driver said suddenly, without taking his eyes off the glazed road along which the bus was creeping. "We're going to tie up at the next farmhouse. The road passes through a game preserve in the middle of a swamp along here, and there won't be another house for five miles. With driving conditions getting worse by the minute, we'd never make it. It's growing dark, and we'd be foolish to take a chance on being stranded all night in a ditch in this storm."

As he finished speaking, a dimly lighted window loomed out of the dusk on the right side of the road; and there was a sniffing sound as the driver began lightly touching the air brakes. The road through the swamp was built up on top of a high grade, and the house was some eight or ten feet below the crown of the road. A black-topped drive led from the highway across a culvert and into a garage beside the house. The garage doors were open, and the car that evidently belonged in it was lying on its side in the deep ditch at the end of the culvert.

The driver eased the huge bus to a stop on the highway opposite the house. At that instant a bareheaded man came running from the house and scrambled and clawed his way up the icy incline to the bus.

"Am I ever glad to see you!" he exclaimed to the driver as the latter opened the door of the bus. "My boy's taken bad sick, and when I tried to get my car up on the road to take him to the doctor, it slid off into the ditch. The telephone and electricity have been out for hours. If a couple of you will help carry him out-"

"We stopped here because we couldn't go any farther," the driver explained gently. "We wanted to take shelter with you until the storm lets up."

The man's shoulders slumped as he turned towards the house. "Come on in," he said lifelessly. "You're welcome, but I've got to get help for my boy."

As Carl and Jerry and the driver helped the three women passengers down the slippery incline, the sleet suddenly changed to snow; and the huge flakes came so thick and fast as to be almost smothering. But inside the living room, dimly lit with an emergency coal-oil lamp, a cheery fire in a large stove made everything warm and cozy. On a couch behind the stove a boy about Carl and Jerry's age was writhing and moaning in pain. A white-faced woman was sitting beside the couch and trying to keep cold cloths on the boy's head.

The youngest of the three women bus passengers walked over and touched the woman on the shoulder. "Could I look at your son ?" she asked. "I'm a registered nurse." The woman got up from her chair quickly, and the nurse sat down and began to talk to the boy in that determinedly cheerful tone which is the trademark of the professional healer. At the same time her fingers were gently probing his abdominal area. Suddenly he jerked convulsively and cried out in pain.

"See if he can swallow these, but don't give him any water or anything else," the nurse said as she took a couple of tablets from a vial in her purse and handed them to the woman; then she walked out into the kitchen where the men had gathered.

"I'm almost certain he has acute appendicitis," she replied to their questioning looks. "The fever, nausea, and tenderness at the spot in his abdomen we call 'McBurney's point' are classic symptoms. He says he began feel-

ing bad this forenoon, and usually an infected appendix should be removed no later than twenty-four hours after the pain starts; but the sooner he gets to a hospital where they can run a blood count and make other checks, the better it will he for him. Those pain tablets should give him a little relief, and we'll use cold applications to slow things down. The rest is up to you."

"I'll try to make it alone to the next house and get help," the bus driver said, buttoning his jacket and starting for the door. Carl and Jerry followed the others out on the front porch to see him take off. A howling wind was driving the blinding snow almost parallel to the ground, and the flakes were so thick that the outline of the bus, only seventy-five feet away, could barely be made out.

The driver turned on the lights, started the motor, and began easing power to the Diesels. At first the bus refused to budge; then suddenly the rear wheels started to spin and the rear of the bus slewed around into the driveway. Slowly, in spite of everything the driver could do, the huge vehicle slid backward down the incline until the rear of the bus came against a rock garden built in front of the house. There it stopped, with the front wheels on the road and the headlights boring up into the whirling snowflakes.

"I'm sorry," the driver said to the boy's father. "I didn't think it would work, but I had to try. How about a couple of us trying it on foot?"

As if in answer, a voice from the transistor radio in Carl's hand said: "Attention everyone in the storm area. Do not go outside. Stay indoors. This is the worst storm in years. Winds are gusting up to sixty miles an hour, piling the snow into enormous drifts. Even walking is impossible. Do not, I repeat, do not leave a place of safety for any reason."

"Sir, do you have a radio in your car?" Jerry suddenly asked the boy's father.

"Yes, but why?"

"My friend here and I are radio hams. If you'll let us, I believe we can make a transmitter out of your radio and summon help. We'd like to try."

"Go ahead. Doing anything is better than just sitting here. I suppose you want the radio out of the car."

"Yes, and the battery, too. While you fellows help Carl get them out, I'll try to move the tuning range of Carl's transistor receiver into the 75 -meter ham band."

"How you gonna do that?" Carl asked as he handed over his receiver.

"By taking turns off both the oscillator coil and the tuned loopstick antenna," Jerry answered. "If the transistor used as an oscillator will just keep going up around four megacycles, this should work."

The man got some tools from his garage, and the three of them started to work on the car. Jerry went back into the house and sat down at the table beside the coal-oil lamp. With a pair of tweezers borrowed from one of the women, he fished out the end of the oscillator coil winding he wanted and began carefully stripping off turns. Every few turns he stopped and reconnected the end of the shortened winding, then checked to see how far a broadcast station originally received at 1600 kilocycles had moved down the dial. As this station grew weaker, he took turns off the loop winding to peak it back up. Finally the station was coming in at 540 kc. on the dial, and now when he tuned down to the other end of the dial he could hear some weak amateur stations. By further trimming of the antenna coil and peaking up the trimmer capacitors, he raised the volume of the ham signals until they could just be understood.

At this point the men, plastered with snow and chilled to the bone, came in lugging the car battery and the radio.

"Good old Hank is monitoring the state 'fone net' frequency as he always does when there's a chance of a communications emergency," Jerry reported to Carl as the latter held his blood-red hands towards the warmth of the stove. "If we can put out any signal at all, he'll hear it."

Hank was a bed-fast amateur in the boys' home town who was noted 'both for his technical knowledge and for his operating excellence. Any time that there was an emergency on the ham bands, day or night, Hank could be depended on to be in there with his keen ears and powerful signal.

"Hey, we're in luck!" Jerry exclaimed as he removed the top cover from the receiver. "This thing uses push-pull tubes in the output stage. That means we can use one of the power tubes as a self-excited oscillator and the other as a modulator. Am I glad now I just finished reading an article on early tube transmitters! If I can only remember the circuits-"

"You can and you will," Carl said with conviction. "You can't remember a three-item grocery list for your mother, but I don't think you ever forgot a single line of a circuit diagram in your whole life."

"Let's see, now," Jerry mused as he sketched a rough diagram on the back of an envelope. "I think we'll tie the plate and screen of our oscillator tube together and make a triode of it for the sake of simplicity. One section of this tuning capacitor riveted to the chassis can tune the tank circuit, which means that one end of the tank coil must be grounded. That's okay if we use this modified Hartley circuit. The cathode goes to a tap near the grounded end of the tank coil. The other end of the coil goes through a small capacitor to the grid, and a five- or ten-thousand-ohm grid leak goes from grid to ground. The plate is at ground potential as far as r.f. is concerned, and we'll tie it right to the plate of this other output tube serving as a modulator. That will let us use

'Heising modulation.'"

"What are you going to use for a mike? You can't use the speaker without a transformer to match its low impedance into a grid, and you're already using the output transformer."

"I'm going to use the carbon mike in the telephone handset."

"You still need a mike transformer."

"Not when I use the mike for the cathode resistor of my first audio stage so as to make a grounded-grid amplifier of it," Jerry corrected.

A wood chisel heated in the stove served as a soldering iron as the two boys made the circuit changes outlined. A thin copper tubing gas line found in the garage was formed into a tank coil of some twenty well-spaced turns about two and a half inches in diameter. This coil was simply allowed to lie on the wooden table top, and leads from the tuning capacitor and the oscillator cathode were run to it. Tubes not needed were removed from the receiver to save power. A dial lamp soldered across a single turn of wire served as an oscillation indicator, and this lighted brilliantly when held near the tank coil of the hay-wire transmitter; furthermore, it flashed encouragingly when the mike was tapped.

Ice was broken off a 120-foot length of the downed telephone line in front of the house, and one end, of this ,was connected directly to a turn of the tank coil about one-third of the way down from the "hot" end. The other end was run out the window and attached with a plastic napkin ring for an insulator to a telephone pole that was still standing. The transmitter was tuned to the frequency on which Hank and the other net members were talking by checking with the transistor receiver.

When all was ready, Jerry turned on the switch and gave Hank's call several times, signed his own, and said. "Emergency traffic!" When the makeshift transmitter was cut off, Hank's alert voice came from the little transistor receiver: "Station calling with emergency traffic, go ahead. You're not very strong, and you have about as much frequency modulation as you do amplitude modulation, but I think I can read you. Other stations copy along."

Quickly Jerry outlined their situation. Hank gave him a "Roger" and told him to stand by. After a few minutes that seemed like hours to the group whose tense faces were lighted by the coal-oil lamp, Hank was back: "The state police are going to send out their 'copter to pick up the boy. The storm is dying down, and they think they can make it if they can just find you. Do you have any lights with which you can signal ?"

"The headlamps of the bus!" the driver exclaimed. "They're pointed up in the air!"

This information was relayed, and it was arranged that a portion of the highway just south of the bus should be cleared for a landing spot for the helicopter. Everyone, even the women, went out into the slackening snow storm to help scrape and shovel the deep-piled snow from the road. They were barely finished when the throbbing . sound of the whirlybird came from the sky, and in a matter of moments it settled gently down on the road. The sick boy was carried out on the couch and transferred to the aircraft, and it lifted up into the cone of light from the bus headlamps and flew swiftly toward a waiting hospital.

Everyone went back into the house sat tensely around the little butchered-up transistor receiver. Daylight was just breaking over the snow-smothered landscape when Hank's sleepy drawl came from the speaker:

"All is well. The boy has just come down from surgery and is fine. The appendix had mot burst, and there were no complications. A snowplow, followed by a wrecker, is on the way out to you. Give me an okay, and then please take that alleged transmitter off the air. I don't think I've had to copy a signal that lousy since I first got my license thirty years ago!"

"Roger and out!" Jerry said with a grin as he patted. the improvised transmitter affectionately; "I'd say, pretty is as pretty does!"

CONTACT US:

WA/Telegram +27824484368
email: andyzs6ady@vodamail.co.za
www.awasa.org.za

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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 —7.140; Every afternoon during the week from 17:00—7.140
Saturday 08:30 (06:30 UTC)— National SSB Net— 7.125;
Echolink—ZS0AWA-L; ZS6STN-R
Sandton repeater—145.700
Kempton Park Repeater—145.6625
Relay on 10.125 and 14.135 (Try all and see what suits you)
Saturday 14:00 (12:00 UTC)— CW Net—7025; 14:20 10.115/14125

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 the Telegram App first. …..+27824484368

ZS100SARL

ZS100SARL special call sign to celebrate the 100th anniversary of the SARL. This call sign will be used on SSB, CW, FT8, RTTY throughout the year.

If you are wanting to get a special QSL, look out for the call and log it on QRZ.com or the SARLQSL Service.
