

WANSARC NEWS



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Western and Northern Suburbs Amateur Radio Club VK3AWS
Incorporated in Victoria A7611S

HOW MUCH RF CAN A BEAR BEAR?



John VK3FPRC has recently returned from the US of A and provided this gem to share with our readers. Bob Curry KC3VO has a bit of spare time one Sunday afternoon and decided to build a back pack system with a Linear Amplifier. Not just any ordinary linear, but one which can run 2 kilowatts!! That's right folks, 2 Kw. Now forgive me for asking the question, but if scientists are debating over the RF effects of mobile phones to your ear, is 2Kw radiating on your back and to your head going to cause any problems? Who knows, but Bob assures the amateur fraternity that this system will give you communications at 2Kw for around 15 minutes with its inbuilt Lithium battery. Of course at less power the battery will last a lot longer. Thanks to John, you can have a look for yourself at http://www.youtube.com/watch?v=Nxp_Nsa54_Q&feature=channel_page – ready, steady, COOK!!!

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Calendar for SEPTEMBER 2009

- **Friday September 4 2009**—It's a general meeting night with a twist. For those purchasing Desk Top Boxes to receive Digital ATV, Mick VK3CH and Don VK3HDX will tune the box for you!! Line up!!
- **Tuesday September 1, 8, 15, 22, 29** - CLUB VHF NET with re-broadcasts on 80 metres (3.647MHz) and 10 metres (28.470MHz), when available. Come on and join in and catch up with the latest member projects.

It

NEXT MEETING ACTIVITIES

FRIDAY SEPTEMBER 4, 2009 — General meeting followed by a frenzy of activity as those with orders for SD Boxes receive their goodies.

Mick VK3CH has kindly offered to set up some ATV equipment to allow those receiving their boxes to have them tuned for ATV. So avail yourself of the opportunity to have your gear tuned prior to taking it home with you.

Also a note from **Don VK3HDX** that 22 SD boxes have been ordered and Don would be very pleased to have 22 SD boxes picked up and paid for on the night. So if you have ordered an SD box, or two or three for that matter, please attend the club meeting to pick your order up with the appropriate remuneration passed to Don, or make arrangements for someone on your behalf to pick up and pay for the goods.

WANSARC thanks **Don VK3HDX** for his efforts in sourcing the SD Set top box equipment and to **Mick VK3CH** for his efforts to organize appropriate equipment for the tuning to occur on site. Thanks folks! As a result many more WANSARC members will have the opportunity to watch Digital ATV when it comes over the horizon.

SOME CORRESPONDENCE FROM A NEW MEMBER

Your Magazine producer and Secretary was very pleased to receive the following note from one of our new members, Frank VK3HFZ.....

Hi Mark,

I just wanted to let you and the club know that I made good use of the portable amateur radio unit I obtained from the club's auction last month.

Over the last two days I was on the search for missing minister Tim Holding near the summit of Mt Feathertop. I have been active in this type of role for many years and have assisted the Victoria Police on many searches in remote locations and rugged terrain. I have found that searchers constantly have poor communications between our search groups and search base where the search commanders are based. This search was no exception. Even with 3G phones on Telstra and Optus, CB radios and police SMR radios we still had patchy comms at several locations. Comms is important for sending up to date status reports on progress and new developments. Fortunately I was able to make use of the portable Yaesu unit I had obtained via the club's auction to establish comms back to base when other options were unreliable.

My thanks to the club for a pleasant welcome the first evening I turned up and for the opportunity to have this equipment offered.

*Regards,
Frank Zgoznik
VK3HFZ
Coburg North*

Frank—many thanks for your kind note to the club. It is always pleasing to have new members join our friendly ranks and for WANSARC to receive positive feedback. Congratulations to you and all of the search personnel for a wonderful search result. It was pleasing to hear that your newly acquired equipment worked well and just in that, the legacy of Bob VK3BU lives on.

Smart answer awards 2008 contributed by Geoff Eley VK3AVJ

6th place—It was meal time on a British Airways flight and the flight attendant asked a customer would they like some dinner? The front row passenger asked "What are my choices" to which the flight attendant replied "Yes or No?"

5th place— A flight attendant was placed at the Qantas departure gate to check tickets. As a man approached, she extended her hand for the ticket and he opened his trenchcoat and flashed at her. Without blinking an eyelid she said "Sir, I need your ticket not your stub!"

RESTORING THE HEATHKIT SB-200 by Don VK3HDX

The SB-200 from Heathkit is a 1200W PEP input linear amplifier, which will develop an output of approximately 600W PEP when operated on a 240VAC line. It made its debut in 1965, and covered the 80m-10m bands available at that time. The straight forward grounded-grid design, using two 572B triodes, has stood the test of time fairly well. This AMP has the unique reputation of being the DC3 of amateur linear amplifiers.



I had been looking for an amplifier project for some time and had been told by many if you can get an old SB-200 grab it, so on a work trip to the U.S. I went to a weekend hamfest in Tucson Arizona and there it was on a table looking a lot worse for wear - an SB-200, built in January 1972 by Gary K9RX and a nice job he did to. After some negotiating I walked away with my dirty old SB-200, off to the local UPS office where I purchased packing and a double box and shipped it to our office in LA, where we could be reunited later.



Now safely back in Australia, I unpacked my new/old toy and very carefully fired it up into a dummy load. With 50W drive it produced 350W PEP output, with 75W drive it produced 450W PEP. Not bad for a completely original 37 year old amp with no components replaced, apart from the tubes. Some of the capacitors in the power supply were looking a little sick, so I decided to restore it to its former glory.

There is a wealth of information on the internet on these amps and I'll acknowledge all those that helped me at the end of this article. After doing a week's reading I thought I was ready to begin.

There are a number of recommend mods to perform as follows,

1. **HV Glitch Resistor (10 Ohm, 10W glass)**

Purpose - This resistor protects the power supply capacitors, diodes, etc. in the event of a high-voltage "glitch". If anything inside the RF cage should short the +2400 volt bus, and this includes a tube short, bypass capacitor short, mechanical short, bug crawling in there, small piece of wire falling through the vent holes in the top of the amplifier etc. some components in your power supply may become damaged. This resistor attempts to limit this peak current. Since there is the possibility this resistor may self-destruct in protecting the power supply, it is mounted between two Lexan (TM) shields.

2. **Diode Protection for R12 (3 ea. 1N5408 Diodes in Series)**

Purpose - During a high-voltage event, a large current will flow through R12, possibly damaging it. If the resistor opens, a high-voltage pulse would also travel through the meter if set to the "plate" position. Three series diodes are added in parallel with R12 with anodes toward ground. These diodes will clamp the voltage developed across R12 to approximately 2.1 volts.

3. **New Value for C10 (.0025 uF, 10 kV)**

Purpose - Improved bypassing on 80 meters. The existing value for this capacitor is .001 uF at 3 kV. Increasing the value to .0025 uF decreases the reactance by 2.5 times. Less RF will leak back into the power supply.

4. **VHF Low-Q Suppressor Assembly (New PC1, PC2)**

Purpose - This new VHF suppressor assembly has more than twice the suppression capability of the old one. The coils are wound using 18 gauge Nichrome wire, and the resistors are 100 ohm 3 watt types. Also, notice that the coils all have their axis oriented 90 degrees from each other. This is so that coupling between coils is kept to a minimum. Built into this assembly is a fifth resistor which acts as a protection fuse.

RESTORING THE HEATHKIT SB-200 (continued)



This one-ohm resistor replaces the solid wire jumper from the RF choke AN to the 1000pf "door knob" capacitor at AP. The new suppressor assembly starts working at just above the 10 meter band. It actually has some effect on power output at 10 meters. You will probably notice a slight output drop at 10 meters from what you have come to expect.

This small loss of output at 10 meters is the price you pay to make the amplifier resistant to VHF oscillations. The resistors themselves may heat considerably in operating at 10 meters, and after some time, they will become discoloured. This is normal. Silver solder has been used in it's assembly. This type of solder is 50% stronger than regular 60-40 solder, and melts at a higher temperature.

I decided to perform all of these modifications, so it was on to the internet to order parts. After separating the case from the chassis, I removed the front panel, as you can see from the photos above it was pretty grubby, so I dropped the front panel and knobs into a bath of warm soapy water, looking at the case it was badly chipped, so after some discussions with others I decided to have it sandblasted, Twenty four hours later and \$20.00 poorer I had a completely bare case ready for painting. Back to the warm soapy water bath, all the knobs had come up a treat after rinsing and drying, but the front panel was still very dirty, (nicotine I think) so I gave it a spray with a light degreaser detergent and let it sit.

Back to the power supply, after removing the main supply board and examining the big electrolytic capacitors I could see that 2 had small leaks at the base, I remember reading that Harbach Electronics make a replacement power supply module kit with a soft start option. To quote Harbach " the soft start option limits inrush current during amplifier start-up by placing a small resistive load in series with the AC mains. The load is switched out of the circuit by the relays a few milliseconds later. The soft-start mounts inside the amplifier and safely limits inrush current to protect hard-to-find and costly-to-replace ON-OFF switches, tubes, filter capacitors and high voltage transformers." I ordered the kit with the soft start option and an option for a soft key relay to interface with today's modern transceivers.

Now back to the front panel, I went to check on the how it was going, It looked really clean, as I rinsed off the degreaser, the whole surface went with it,! Ahhhhh yes **everything. I was left with bare metal!** I was devastated, I just spent a bit of money ordering all the parts and now the front panel has been destroyed, what to do??? Back to the internet and the Heathkit users group. Once I explained my problem of course I got some wonderful advice, "yes the front panel is powder coated and breaks down over time and degreaser will remove it". Gee guys, tell me something I don't know! One helpful ham suggested I contact Martin in Missouri who might be able to help. Martin has the original Heathkit tools & dyes etc, as it turns out Martin has original front panels and can manufacture new ones.

Now how to delicately describe Martin? Martin won't deal outside of the US, however after much pleading, I was ready to give up when I sent him one last e-mail asking him if he would be home in 3 weeks as I was going to drop around and pick up a front panel while I was in the U.S. Well that worked as he agreed to ship me one. While I was waiting for parts to arrive it was time to give the internals a good clean. First out with the compressor to blow the years of accumulated dirt & dust out and then a good wash of all the coils switches relays etc with an electrical solvent & lube we use in the commercial transmitters at work. While cleaning, I noticed a lot of the internal wiring was well worn so I decided to replace this with some of the high quality wire we use in the DTB-T transmitters.

Next, the power supply and soft key kit arrived, so it was out with the soldering iron. The kit was a very professional job, easy to put together and used very high quality computer grade electrolytic capacitors.

RESTORING THE HEATHKIT SB-200 (continued)

Then it was time to build up the power supply and soft key kit - a very easy job. With my new cabling in hand, I set about making up the replacement internal looms. This took about a week's work, spending an hour or 2 a day.

I decided to have a break from the electronics, and started on painting the case. Again thanks to the Heathkit users group I was able to match the original case colour very well. Luckily from my radio controlled model days I still have my painting kit, so after a couple of coats of undercoat and a gentle rub back with wet 7 dry paper, it got four coats of heat proof paint, another gentle run back and it was looking pretty good, I gave it a week to harden then a nice cut & polish - I was very happy with the results.

While all this was happening all the rest of the parts had arrived for the VHF Low Q suppressor assembly and the other replacement caps etc. to complete the recommended modifications.

Now after 6 attempts at making this assembly I realised my silver soldering skills and equipment were not up to par, and turned to a friend Brian, who did it in one go Thanks Brian!

It was now time to reassemble the amp— in goes the new power supply board, all the additional caps, the new suppressor assembly and now the new looms. It took about a week to complete, I must have checked the wiring about 6 times! Now a couple of new 572b tubes and we are almost ready to go!



On reflection I decided to take it to work and get the guru's in the RF lab to have a look at it before I powered it up. After studying the schematic for some time and tracing my wiring they declared it ready for power.

The switch was thrown and we could hear the fan come on and the meter light up, no smoke as yet, so we moved a little closer - yes, the tubes were lit, this is promising, after checking a number of voltages which were all correct, it was time to apply some RF to the input. So with the output connected to a big dummy load a two tone signal was sent through one of our work transmitters set to 3.600Mhz. This yielded a 55 watt PEP signal at the output. After a lot of measurements the RF drive power was increased to 90W which yielded 625W PEP at the output of the amp with all the engineers commented on how clean the output signal was. After some small adjustments of the new suppressor coils it was agreed everything was fine. Time to put the case on, and declare the project finished.



While there were many frustrations along the way it feels great to have breathed new life into an old classic, and I learnt quite a lot I didn't know before, it's been a very rewarding experience, let's hope it continues to perform for another 37 years! And at left is the finished Amp in all its glory. *Special thanks to Robert Norgards KL7FM Tom Sowden KOGKD Richard L Measures AG6K Martin Tippin.*

**I hope this inspires some of you to grab an old piece of gear and have some fun - 73
DonVK3HDX**

August meeting highlights from John VK3FMPB

New blokes, old blokes, young blokes, new equipment, old equipment, even some cheap stuff and some expensive stuff. Sadly the catalyst for the auction was the passing of one of our esteemed members. Bob VK3BU. Our condolences to Norma and family. Silent key auctions are a chance to reflect on the life and times of a friend who will no longer be with us. His memory will live on in the equipment we took home.

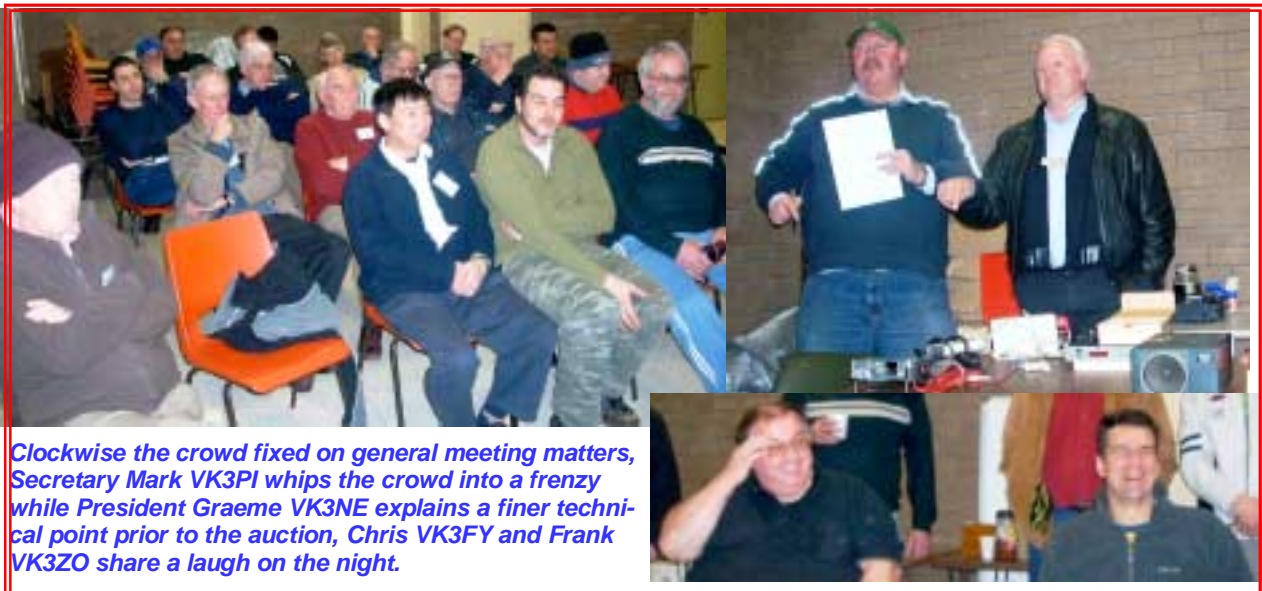
Bob had collected quite a lot of equipment over his life and many years in ham radio. The pile of stuff for auction actually required the use of 3 tables to display in the end and there was still plenty more as well. Radios, power transformers, speakers, antennae of various types, meters and other test equipment. Even a dummy load on a paint tin. There certainly was something to interest most people. In the end we raised somewhere in the vicinity of \$500, to be confirmed by Gordon VK3YOD, our Treasurer.

Other news at the meeting included the fact the we even managed to get an award for doing what we do best. Yapping our heads off. Oh, and shivering too.

Wayne 3VCL, Victor 3DKM and Johnno 3FMPB have scored 3rd place in the name of WANSARC in the winter UHF-VHF field day. On a cold day in a clandestine QTH they set up antennae and radio's (see the WANSARC August edition) and yapped and yapped all day. We had a lot of fun setting up and operating radios, eating, talking, shivering and winning points for WANSARC on the weekend of the 17/7/09. What were you doing at that time?

Next year hopefully we will have a larger turnout to help us enjoy the fun (and weather) of the Winter field day.

Lastly, we adjourned to our favourite pizza parlour after the meeting and enjoyed a lovely repast to finish the day off. I, for one, enjoyed that part most. **73 de Johnno VK3FMPB**



Clockwise the crowd fixed on general meeting matters, Secretary Mark VK3PI whips the crowd into a frenzy while President Graeme VK3NE explains a finer technical point prior to the auction, Chris VK3FY and Frank VK3ZO share a laugh on the night.

QUOTE OF THE RECESSION from Matt James

“This is worse than a divorce. I have lost half my money and I still have my wife!!”

WEATHER PREDICTION from Wayne VK3VCL

It was April and the Aboriginals in a remote part of Northern Australia asked their new elder if the coming winter was going to be cold or mild.

Since he was an elder in a modern community he had never been taught the old secrets. When he looked at the sky he couldn't tell what the winter was going to be like. Nevertheless, to be on the safe side, he told his tribe that the winter was indeed going to be cold and that the members of the tribe should collect firewood to be prepared.

But being a practical leader, after several days he had an idea. He walked out to the telephone booth on the highway, called the Bureau of Meteorology and asked, 'Is the coming winter in this area going to be cold?'

The meteorologist responded, 'It looks like this winter is going to be quite cold.'

So the elder went back to his people and told them to collect even more wood in order to be prepared.

A week later he called the Bureau of Meteorology again. 'Does it still look like it is going to be a very cold winter?'

The meteorologist again replied, 'Yes, it's going to be a very cold winter.'

The elder again went back to his community and ordered them to collect every scrap of firewood they could find.

Two weeks later the elder called the Bureau again. 'Are you absolutely sure that the winter is going to be very cold?' he asked.

'Absolutely,' the man replied. 'It's looking more and more like it is going to be one of the coldest winters ever.'

'How can you be so sure?' the elder asked.

The weatherman replied, *'Our satellites have reported that the Aboriginals in the north are collecting firewood like crazy, and that's always a sure sign.'*

PUN INTENDED from Dan VK3DWH

- I went to a seafood disco last week...and pulled a mussel.
- I went to buy some camouflage trousers the other day, but I couldn't find any.
- An invisible man marries an invisible woman. The kids were nothing to look at either.
- 'Doc, I can't stop singing 'The Green, Green Grass of Home.' 'That sounds like Tom Jones Syndrome.' 'Is it common?' 'Well, It's Not Unusual.'
- Two cannibals are eating a clown. One says to the other: 'Does this taste funny to you?'
- Two antennas met on a roof, fell in love and got married. The ceremony wasn't much, but the reception was excellent.
- What do you call a fish with no eyes? A fsh.
- A man woke up in a hospital after a serious accident. He shouted, 'Doctor, doctor, I can't feel my legs!'
The doctor replied, 'I know you can't - I've cut off your arms!'

**CLUB NET TUESDAYS 7.30PM
146.450MHz**

WANSARC CLUB PROFILE

History

The Western and Northern Suburbs Amateur Radio Club (WANSARC) was first formed in 1969 and since then has served the needs and interests of amateur radio operators, short wave listeners and those interested in hobby radio and electronics. The club is not gender specific, having both female and male members. Members come from all walks of life with a mix of experience, young and mature, novice and technical. The most important aspect of the club is the willingness of all members to share their knowledge for the benefit of others. Members mainly reside in the west and north of Melbourne; however membership is encouraged from all interested.

Meetings

FIRST Friday of each month except January at the Ern Rose Memorial Pavilion, SEAVER GROVE, RESERVOIR. (See map). 7.30pm local time start.

Talk in on 146.450MHz FM—call club station VK3AWS.

Benefits

Free technology and related presentations, sponsored construction activities, discounted (and sometimes free) equipment, network of like



minded radio and electronics enthusiasts, excellent club facilities and environment plus an informative monthly newsletter for members to post articles, news, classifieds for all radio, test equipment, etc, featuring Amateur Radio news from WANSARC, WIA, ACMA, Melbourne Clubs, VK and Worldwide.

Club Nets

146.450MHz FM each Tuesday evening commencing 7.30pm local time. Also monitor 28.470MHz on 10 metres USB.

More Information: Website: www.wansarc.org.au

Email: wansarc@wia.org.au



Don't forget the "club" meets on air regularly on 146.450MHz FM. And now rebroadcast 3674KHz and 28.470MHz USB.

Next meeting Friday September 4, 2009 AT the clubrooms 1930 hours SHARP Talk in 146.450MHz FM.

If not delivered within 7 days, please return to WANSARC, PO Box 336, Reservoir, 3073

Australia Post stamp here