SHEPPARTON & DISTRICT AMATEUR RADIO CLUB

Repeaters: VK3RGV 2m - 70cm - Packet.
Freq: 146.650 - 439.775 - Packet 147.575

Founded 1979

Incorporation No. A6677
P.O Box 692 Shepparton 3632

REPEATERS VK3RGV 2m & 70cm	President:- Peter Rentsch	VK3FPSR
VK3RGV B D-Star	Vice President:- Phil Dwyer	VK3ELV
2m IRLP Node # 6992	Secretary:- Darren Glasson	VK3HEN
CLUB CALL SIGN VK3SOL	Treasurer:- Greg Keegan	VK3PXA

Presidents Report April 2013.

To begin, let me thank all those who attended the last meeting. It was a good meeting that was followed by an excellent guest speaker. Peter Freeman VK3PF spoke to us about the SOTA program, what it is and how we can participate. Peter has sent me a copy of his presentation so if anybody is interested in it can they please contact me and I will forward them a copy. Thank you Peter for the effort you put into your presentation and we look forward to hearing you out there activating a peak.

On a personal note, thank you to all those that contacted me after the recent tornado in Koonoomoo, my QTH. We lost our spouting, a small shed, all my antennas, BBQ/Gazebo area, fencing and lots of trees. The clean-up is still progressing and will be for probably 12 months before we can get it all back to relative tidiness. Thanks to those who offered help and the phone calls of concern.

Prior to our May meeting we will be having a working bee at the hall at Mooroopna. We need to tidy up upstairs at the hall, go through all the papers that are there and cull what is not necessary. Our biggest task for the morning will be to check out the Clubs Antennas that are located at the hall. Both the dipole and the antenna on the pole need to be checked out and confirm there suitability for use. We will have a cherry picker there for the day to get us up high enough to work on the antennas, so come along at 10.00am and help. This will be followed by a BBQ at 11.30am and then the Club Meeting at 1.00pm at which Mark Tell from ACMA will be our guest speaker.

Once we have all the antennas working correctly we then can use the equipment we have for its purpose it was intended. Greg, VK3POP is keen for the Club to get involved in Contesting and I support Greg wholeheartedly in his endeavours to do this. I feel that we have a great facility with some excellent equipment all going to waste. Why not use it? My other reason for my support of Greg is that it creates a great atmosphere within the Club. We are a group of people with Amateur Radio in common; let's have some fun and fellowship with like-minded people doing what we enjoy.

So to recap, the plan for Saturday 4th May is as follows:

10.00am - working bee to tidy and check Antennas at the Guide Hall

11.30am – BBQ Lunch

1.00pm – Club Meeting

2.00pm – Mark Tell from ACMA – Guest Speaker

A big day is planned but with willing volunteers all these tasks will be accomplished successfully.

That's it for this month and I look forward to seeing as many of you as possible at the next meeting.

Peter – VK3FPSR
President - SADARC

Minutes of SADARC April 6th,

Meeting opened at club rooms 13.05

Present/
vk3pop,vk3pxj,vk3cop,vk3mac,vk3kby,vk3ov,vk3dsf,vk3faln,vk3ug,vk3elv,vk3eb,vk3chv,vk3hmb,vk3ech,vk3pf,vk3hen.

Previous Minutes moved as correct.

Correspondence,
Inward QSL cards most handed out on the day.
PO Box bill.

Outward mail nil

Technical report,
Rodney Reports that all repeaters are working well, 6 meter working better than expected.

General Business,
Pat (3ov) will make a tentative booking for hall for the ham fest. John(3pxj) put up the suggestion of another venue for the club to meet. Motion to purchase another antenna for 6mtr repeater was raised all approved and the motion was carried. Also pricing of a cherry picker was raised to retrieve the beam, also fixing the beam so the club could get involved in contesting which raised the question of any extra cost to the club to be at the hall on extra days.
It was also mentioned that the Vintage radio club and SADARC have there xmas break up at the same time and place. All approved of this.
Darren to send sympathy card to Gwen Dobson re(SK Allan vk3ayd).Five club members attended Allan's Funeral.
There will be a 10.00 am start at the club meeting next month to do some repairs with a BBQ on the day.

Meeting closed 14.05.

Vk3hen,Darren.

TECHNICAL COMMITTEE REPORT – April 2013 (20/4/2013)

70cm D-Star Repeater

The repeater is not operational at this stage and it has been out of service for around five months. Matters are in hand to get a quote from Icom for the repair of the D-Star repeater. The repeater is currently at Toby's place. Once we have some idea on what is involved in the repair and the cost the club can make a decision on the next move.

The internet was dis-connected from the repeater late last year as the club voted not to continue to spend $600 per year on the internet connection, although the club would consider a more reasonable fee. If anyone has ideas on how a reasonable cost internet connection can be obtained please advise the club committee of the results of your investigations.

70cm Analogue Repeater

The repeater is working well with between 2 and 3 dB improvement in signals with the newly installed antenna. The X-50 antenna has been replaced by a higher gain antenna which has been installed on a three metre mast on the North East corner of the hut (see picture). The X-50 is now a spare for either 70 cm or 2 metres. If your signals have been scratchy in the past they should now be much better, so give the repeater a try. Maybe we as a club should concentrate on using a particular repeater for a month or so, so we know what each one is capable. The 70cm repeater isn't used a lot because people say no one is on the repeater, so they don't use it. This is a self fulfilling prophecy. There is no excuse not to use this repeater now the performance has been enhanced.

2 metre Analogue Repeater

The two metre repeater continues to provide good performance throughout the club's area, this being the prime communications medium for club members. The mains fail tone alert has been reinstalled.

6 metre Analogue Repeater

On 3/4/2013 the new upgraded repeater Phil VK3ELV has been working on was installed to replace the existing repeater. The old repeater is still on site and can be pressed into service if need be. Ray has a spare 2 metre repeater at his place. The new repeater has improved the transmitted signal by around 4 to 5 dB over the original repeater signals back in early 2012. The receiver has at least a 4 to 5 dB improvement in its sensitivity too, and this will improve further when the refurbished receiver cavities are installed. The repeater is useable mobile down to at least Broadford on the Hume Highway and can be used in Wangaratta with low power. The purchase of the additional antenna has been approved and when installed the work on the repeater will have been completed.

The improvement from when the original repeater was installed is significant and users will enjoy even better performance when the additional antenna is installed. Amateurs from adjoining areas will be able to use this repeater with relative ease.

Miscellaneous

The remainder of the central hut mast is to be removed from inside the hut. A general clean up around the site and checking of coaxial and 12 volt DC cables is to take place. The cold standby power supply will be built over the next month or two. The antenna systems at the meeting hall are to be checked. It is likely that the antennas at the club rooms will be overhauled on the next meeting day before the meeting.

When

Additional work on Mt Wombat will occur when the new six metre antenna arrives and the weather is suitable for work on site. There are a number of housekeeping jobs to be completed on site. We will invite members to assist us nearer the time.

Below is a précis of the work projected to be done into the future. The whole site is gradually being upgraded to provide better service to our members.

- Checking all the lattice mast cables and connections – some are to be shortened. (A general tidy up)
- Install the recently refurbished six metre receiver cavities. (Improved sensitivity for the receiver)
- Purchase and install another folded dipole to use with the current six metre antenna on the main mast. (This will improve the six metre repeater performance by 3 dB. The antenna capture area will then be similar to the two metre antenna.)
- Repair remainder of lightning damage in hut. See above. (Safety, but not urgent)
- Tidy and label all DC cables and Coaxial Cables in the hut. (Easier to work in the hut)
- Possibly purchase and install a DSP module in the two metre repeater, cost around $160. (It will give better quality audio with weak input signals)
- Possibly purchase and install a DSP module in the 70 cm analog repeater, cost around $160. (It will give better quality audio with weak input signals)
- Build a 20 amp cold stand-by power supply. (Back up should main supply fail)
- Return D-Star to service. (Been out of commission for around five months, information being sought to get it up and running again) See notes above.
- General tidy up around the site. Check door locks. Complete an inventory of equipment and spares.
- Check the antenna mast and antennas at the club station. (Some concern about the safety of the wooden mast and the performance of some antennas) Who has a key to the compound?

Rodney Champness VK3UG on behalf of the technical committee, Ray VK3RW, Phil VK3ELV and Geoff VK3ZNA.

Rodney and Phil preparing the 70 cm antenna on one of the tilt-over masts.(VK3UG and VK3ELV)

Phil with the antennas on the top of the Hut. (VK3ELV)

12 VOLT POWER CABLES FOR MOBILE AND HOME OPERATION

Older installations

How do you supply 12 volts (13.8 volts preferred) to your mobile station? Over many years a number of amateurs have taken the easy way out and put a cigarette lighter plug on the power lead of their set and plugged it into the cigarette lighter. This worked with sets like the ubiquitous Icom IC22S which drew between two and three amps on transmit. As a result the voltage drop in the power leads was not excessive, and there may have been something like 13 volts at the set with 14 volts at the battery.

Can we still use the cigarette lighter socket with the newer transceivers? No, not if you want them to work properly. Note modern transceivers may have over five times the output power of the earlier IC22S, which means they will draw around five times the current, and the cigarette lighter sockets are only rated at 10 amps. With five times the current drawn, the voltage drop will be five times that observed when using an IC22S, so potentially the voltage to the set may be as low as nine volts, if all the cables from the battery are left the same size. It won't be this low as the set will draw less current with lower voltage to it and the voltage may be 11 volts. This is still quite low and the set will not perform as it should and the output will be low, if it performs at all with this voltage. As an example if a set has 10 watts output with a voltage of 14 volts at the set so what will its output be with 11 volts? I am assuming that the set output will drop in accordance with the inverse square law, which most do down to a certain critical voltage. The calculation is like this: - 10 (watts) x 11^2 volts (= 121) ÷ 14^2 volts (= 196) = 6 watts (approximately) with 11 volts at the set.

Upgrading your mobile power cabling

Consider some newer and more powerful sets which have outputs of up to 100 watts on FM, SSB and CW. These sets draw around the 20 amp mark, so the cigarette lighter socket is definitely a no no. Many diagrams for installation of radios whether in vehicles or at home show positive and negative leads coming from the battery/power supply to the set. This is necessary where the negative of the supply isn't to an earth (such as the vehicle chassis) that is common to the transceiver and the power supply. Where the vehicle frame is at battery negative it is unnecessary to run a negative lead from the battery, as the negative lead at the set is usually attached to the set case. The set case also has an earth terminal that should be taken to vehicle frame or to an earth bus in the shack by a short lead. The set is also earthed through the coaxial cable shield.

I run a short heavy lead from a polarised power socket near the set to the frame of the vehicle and also earth the set chassis through the earth terminal on the set via a short lead to the vehicle. The coaxial cable does not carry much current through its braid when the set is installed this way.

The layout of vehicles these days does not allow for installing radios where you would like to because of restricted space, hence most larger mobile sets have detachable control heads. The control head may be in some convenient operating location in the front seat area but the radio itself may be in the boot. How much cable will you need to run from the battery to the radio? The average

vehicle is around five metres long but you will need to allow at least another couple of metres for twists and turns that the cable will need to take to get where it needs to go. Just looking at the Altronics, Jaycar or WES catalogues it can be seen that a variety of cables are available to supply power to our sets. Consider we are looking to the future and will be using a 100 watt transceiver at some time, what cable should you use? Using the Jaycar catalogue for convenience, it can be seen that the nearest cable size to 20 amps is a 25 amp rated cable. This should be more than adequate you would think. We need to allow for a short negative lead to vehicle chassis of around one metre and the voltage drop in the flexible cable from the set to the power socket. I shorten the twin lead supplied with the sets to the minimum that is necessary to access the power sources comfortably. The negative lead will have minimal voltage drop as the cross section of the vehicle means that there is virtually no drop in voltage from front to back of the vehicle. How much voltage drop will there be in the eight metres of cable I would expect to use in this installation? The 25 amp cable's resistance is 0.0059 ohms per metre. That is virtually nothing I think you would agree. Now watch the calculations and you'll see there is a noticeable voltage drop at 20 amps. 100 watt mobiles are rated to draw between 20 and 25 amps when transmitting at maximum power. Using an IC7000 transmitter as an example it draws 22 amps at 100 watts output. So the calculations are as follows:- 22 (amps) x 0.0059 (ohms resistance per metre) x 8 (metres length) = 1.0 volt drop. The output of the transmitter is rated I believe with 13.8 volts to the transceiver, so with 12.8 volts the output is down to around 86 watts. When you stop your vehicle the battery voltage drops quite dramatically to around 12.6 plus a voltage drop in the cabling of around 0.9 volts (set is drawing less current) equals 11.7 volts and theoretically the power drops to around 72 watts. I believe it is noticeably less than this as Icom gear has a reputation of not liking low voltage to the transmitters.

Some of the latest vehicles have smart alternators and their output voltage is initially round the 14 volt mark and this drops to around 12.6 volts after the battery has been charged for a while. Your output power then drops rather noticeably and the particularly in this instance only minimal voltage drop can be tolerated if your set is to work reasonably well. I use heavier cable than that used in this discussion, I use 60 amp rated cable and with this, the voltage drop in the cable would be around 0.44 volts which is at the high end of a reasonable compromise between voltage drop and cost. My cable run is only six metres and the voltage drop is 0.33 volts. I use 100 amp rated cable in some circumstances.

It may be necessary with more vehicles using smart alternators to consider one of the DC to DC inverters that will convert input voltages between eight and 16 volts to a regulated 13.8 volts at up to 30 amps. These provide 13.8 volts at the transmitters under all conditions. With the engine stopped full power would still be available, but watch you don't flatten your vehicle battery. Note, if 20 amps is being supplied to the transmitter and the input voltage is say 10 volts and allowing for the efficiency of the inverter and the voltage step up, the current drain may be of the order of 32.5 amps at 85% inverter efficiency. Some cause RF interference so they should only be run whilst transmitting. I use one of these in our caravan where voltage drop is even more critical and current drains are higher.

A few things to remember

Remember if you do have to use a negative and a positive lead to the set as there isn't a low resistance connection between the set and the power supply frames you will need to make allowance for the fact that the voltage drop will be double that just calculated (resistance of the negative lead as well as the positive lead) and it will be worth considering using 100 amp rated cable to keep the voltage drop to an acceptable level. The thing to remember it is not the amount of current that the cable can carry in these instances; it is the voltage drop over the run that you have to use at the rated output power of the transmitter. If you have more than one piece of equipment running on the same supply line at the same time its current drain must also be taken into account. Remember also to fit a thermal circuit breaker or a fusible link in the lead to the radio near to the battery. Some of these are not high quality or the terminals have not been done up tightly so excessive voltage drops can occur here. I've had trouble in this area from time to time. Measure the voltage drop across the length of the cables and connections. I have made up a thin hook up wire sized cable around 10 metres long with crocodile clips on both ends. I clip one end onto the battery terminal and the other to one terminal of the multimeter and the other probe lead from the multimeter goes to the end of the cable near the transmitter and when it is drawing current the voltage drop is read. Also remember to protect cables where they go through the firewall etc.

Here's to full power from your rigs.

Rodney Champness VK3UG

Thanks to all who contributed to this month's newsletter. I would like to see more people contribute to the newsletter to continue to make it a great read for all our club members.

Please post any articles to lestatar@bigpond.com

Thanks and 73 for the month of April 2013 from your Editor, Les VK3TEX.