SHEPPARTON & DISTRICT AMATEUR RADIO CLUB

Founded 1979 Incorporation No A6677 P.O. Box 692, Shepparton 3632

May 21

VK3RGV repeaters and transmitter operating frequencies Mt Wombat

53.725MHz (-1 MHz offset), In Service
146.65MHz (-600 kHz offset), In Service
438.2MHz (-7 MHz - offset -D-Star), In Service
438.650MHz (-7 MHz offset and 91.5 Hz tone access only), In Service
438.900MHz (-7 MHz offset- DMR repeater), In Service
439.775MHz (-5 MHz offset), In Service, IRLP (node #6990)
476.475 MHz (+750 kHz off set) CB Repeater WBT03 Channels 3- 33, In Service
VK3RDS, 438.7625 MHz (-7 MHz offset DMR repeater) Shepparton on test @ VK3YNV QTH

Access to most analogue repeaters is by sub-audible 123 Hz tone or noise/carrier mute (less sensitive).
Club informal on air get togethers - Wednesday evenings. All welcome. Club call sign VK3SOL:-
2mx repeater 8.00pm 146.650 MHz, 3.63 MHz SSB ± interference 8.30pm.
The vintage radio club have a sked at 11.00am Sunday on the 2 mx repeater.

Meetings the first Saturday of the month from 10 am for informal chats and technical talks. A BBQ follows (a gold coin donation). Business meeting 1 pm (except January when no meeting occurs) at Flexible Learning Centre, 18 Channel Road (250 metres from Archer Street), Shepparton. Variations in these times, days and location are normally notified in the preceding newsletter.

Website – www.sadarc.org or **www.sadarc.org.au** **Face book - www.facebook.com/sadarc.org**
Info for the page contact - Denny French on denny3782@gmail.com
Note: Want to get your licence? SADARC has examination assessors, contact the secretary for details.
The following repeaters do not belong to our club but provide good signals for many members.
Mount Major VK3RDU repeaters, TX, 146.850 MHz and 439.875 MHz 28/05/2021

DISCLAIMER: - No guarantee is given as to the accuracy of information in this newsletter.
Warning: - There is a danger of electrocution or injury when working on electrical/radio gear or working at heights doing antenna work. You do so at your own risk.

President: - Peter Rentsch	VK3AXI	peter@rentsch.com.au
Vice-President: - Barrie Halliday	VK3KBY	
Secretary: - Andy Ashley	VK3AJA	secretary@sadarc.org
Assistant Secretary: - Geoff Angus	VK3ZNA	
Treasurer: -Andy Ashley	VK3AJA	secretary@sadarc.org
Membership Sec: - Andy Ashley	VK3AJA	"
Webmaster: - Ray Gardner	VK3YNV	ray@etheira.net

Communications Managers (External Events):- Bruce (VK3PNG) & Darren (VK3HEN) Glasson
Tech. Committee: Geoff VK3ZNA, Ray VK3YNV, Josh Gardner & Rodney VK3UG – with power to co-opt.
Newsletter: - Rodney VK3UG (Editor) rodlynn6@bigpond.com , Andy VK3AJA (Distribution)

Vale.

It is with sadness that we acknowledge the passing of John Mullins VK3FJHM.
John died on the 1st of May. His funeral was conducted at St Francis Catholic Church, Hunter Street, Mansfield on the 10th May. Fortunately, Andy received this information on the 9th May and he promptly advised members of John's death and the arrangements for his funeral. I knew John and Helen from the halcyon days of 27 MHz CB and John stepped up to becoming an amateur and was heard on the Wednesday night on air get togethers from time to time, although not in recent times. Rest in peace John.

Presidents Report May 2021

Thank you to all those who made the effort to attend our last meeting. Attendance was down a little on previous meetings, but an enjoyable meeting and chin wag was held by all.

As I pen this report, we are slipping into another COVID 19 Stage 4 Lockdown. I would still like to hold our face-to-face meeting as arranged and if the authorities allow us we will. The Lockdown is supposed to finish next Wednesday night but who knows. **PLEASE CHECK THE SADARC WEBSITE PRIOR TO LEAVING SATURDAY IN CASE WE CHANGE TO AN ON-AIR MEETING.**

Continuing from my thoughts of last month of inspiring the young. I, like a lot of you have Grand Children in the under 10 age bracket. One of my Grand Children who lives in Melbourne whose name is Noah came to visit a couple of years ago when he was six. I, in my passion had purchased a small DIY kit to make a Christmas tree with flashing LED's. Noah and I soldered it all together and low and behold it did not work. Well, troubleshooting for six-year old's is a little difficult so I said I would check it out after they had gone home.

The next time Noah saw me he asked if I had fixed the problem. The answer was "no" even though I had spent hours on the thing making sure I had the polarity of the LED's correct and everything to my eyes was soldered OK.

Noah came to visit again a couple of weeks ago. One of the first things he asked was, have I fixed it yet. The answer was a sad "no".

No, I had not fixed it, but what surprised me was he was still interested. My little bit of failed DIY Kit had remained in his mind and he was intrigued enough to ask. My shack which is in our house also now creates lots of questions and on his last visit he and his younger Liam were most intrigued. I attempted to get them to talk to Denys, but they were both a bit Mic shy.

I feel even though the Christmas tree kit did not work it has piqued and interest in a couple of young brains.

Let's aspire to inspire before we expire!

Hopefully, we can all catch up in 10 days at our next meeting, if not then on air.

Cheers for now.

Peter Rentsch President

CLUB CALLANDER

5th June 2021 - Regular Meeting – Vision Centre BBQ all being well **(See main part of report)**
12th June 2021– Steam Rally Echuca (Check Bruce VK3PNG's report later in newsletter for details)
3rd July 2021 - Regular Meeting – Vision Centre BBQ

SADARC MEETING MINUTES APRIL 1st 2021 1:00pm

SADARC CLUB ROOMS

In attendance: VK3AJA Andy, VK3ZYZ Denys, VK3ELV Phil, VK3BPH Kevin, Stevo, VK3GSR Geoff, VK3ZNA Geoff, VK3KBY Barrie, VK3UG Rodney, VK3TJS Jacek, VK3GEK Graeme, VK3AFD Arthur, VK3TEX Les, VK3AXI Peter, Josh, VK3YNV Ray, VK3PNG Bruce, VK3EB Dallas.
Apologies: VK3HEN Darren, VK3FALN Alan, VK2RK Rob, VK3ASK Peter, VK3ZE Huntly.

In: emails re Wires-X repeater.
Out: Moved by Rodney, second Josh. All in favour.

Minutes last meeting; moved by Kevin, second by Denys. All in favour.
Amendment to Minutes last month, Peter moved motion should ready VK3ASK not VK3AXI
Moved by Geoff, second by Denys.

Reports:
Financial: Read by Andy, Moved by Barrie, Second Geoff. All in favour.
Technical: Ray spoke about Power supply for 7 MHz split repeater has been replaced. Large aluminium enclosure was liberated ex RA. Might be good for cavities. And some other equipment.
Geoff tested old antenna (70-2m) antenna and has provided some info. It tested all ok.

Moved by Ray, second by Arthur. All in favour.

General Business: Andy spoke about Mailchimp and will give login details to Rodney and Peter (president)
Moved Geoff, second by Les. All in favour.

Bruce: No steam rally this year, family fun day event instead. SADARC will have a stand. Bruce has spoken to Tim Re Yarrawonga canoe race 2 Members required at this stage, May need 10-12 members next year (March)

Arthur VK3AFD: Man behind the microphone this Month.
Arthur has nominated….. Kevin!

Meeting ended 2:16 pm

Editor's Ramblings

- Congratulations on your birthday Geoff VK3ZNA . He turned 79 on the 1/5/2021 – the day of our meeting. Almost by accident Geoff was presented with a bottle of wine. We trust you celebrated well Geoff.
- Ray VK3YNV advised us that he has been able to pick up surplus items from radio and TV stations which could be useful for cavity resonators etc.

- ArthurVK3AFD had the honour of giving his life story at the meeting. What a treat that was with the high lights and some lowlights but he came through it all. It is amazing what our members have done over the years. It is a really worthwhile segment at these meetings.
- Peter VK3AXI ran a quiz on radio related matters and several vied for first place getting all questions correct. So the prize of a bottle of wine was given to Geoff VK3ZNA - which turned out to be his birthday as mentioned above.
- **Coms Day .** We are hopeful that our coms day can go ahead in September – plan for it.
- **Newsletter.** Andy reports that a system called Mail chimp is the way we can handle our newsletters to hopefully overcome problems that can occur (and do) with the sending of information to multiple recipients. When this is implemented there should be fewer problems with members not receiving newsletters. The endeavour is to have the newsletter out a week before the coming meeting.
- **Repeaters.** All is going well. 6mx is working well but a boost in power would be great – when we get a chance. Ray VK3YNV reports that there is a size problem with a new power supply so another to fit the racks has been ordered. There is some move to get the VK3RDS repeater onto Geoff's tower along with a promised Fusion repeater. Could be a month or so down the track.
- **Club House antennas.** Geoff VK3ZNA has tested the 2mx/70cm antenna that we had at the Mooroopna Scut Hall and found it to be in good condition. The claimed gain on 2mx is 6db(i) and 9 db(i) on 70cm. He has also drawn up plans of the proposed installation on the TV pole on the building and Peter VK3ASK is looking into getting the approval from our landlords for the installation.
- **On Air Etiquette.** I was told recently that on one of our club HF net get togethers that we did not check that the frequency 3630 kHz was not in use. Club members continued to transmit over another group in Queensland who were annoyed and finally they moved to another frequency. I know that in some spots the noise level is high and we may not hear weaker stations further away. However, it behoves us to check with members in relatively noise free areas whether the frequency is clear.
- Rob VK2RK has a new club face book group up and running. It is active and you can join. It is https://www.facebook.com/groups/481867453084459

Communications report

by Bruce Glasson VK3PNG

Three members of SADARC Graeme VK3GEK, Darren VK3HEN and Bruce VK3PNG volunteered their time along with members from the SAREG club (Bendigo area) and others assisting with the communications in the running of the O'Keefe Marathon on Sunday May the Second. Kevin VK3CKC stated that as far as the radio communications were concerned full credit is due to the team for the effort that was put into making it all work so good.
The marathon was run along 42ks of the Bendigo to Heathcote O'Keefe Rail Trail. Along with the 42ks marathon section there were half marathon and relay events etc.

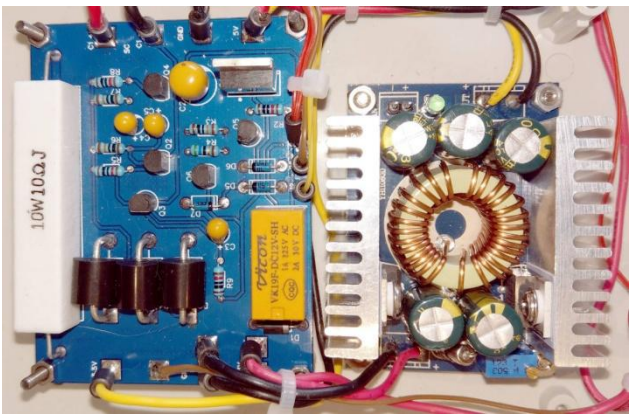
There will be no **Steam Rally in Echuca** this year on the Queen's birthday weekend owing to covid restrictions. Instead the organisers are holding a Family Fun Day on Saturday 12th. June from 10am to 5pm at Rotary Park, entry will be free. SADARC will be putting on a display on this day similar to the other years we attended. All members are welcome to attend.

Murray Quad. There will be no Murray Quad this year but the organisers stated there will be a small canoe event held near Yarrawonga in late November requiring only two radio operators to assist. Next March or April a larger canoe marathon could be run instead at Yarrawonga requiring around ten radio operators to assist.

Radio Communications Bruce VK3PNG and Darren VK3HEN.

At the O'Keefe Marathon May 2nd along the Bendigo to Heathcote O'Keefe Rail Trail.

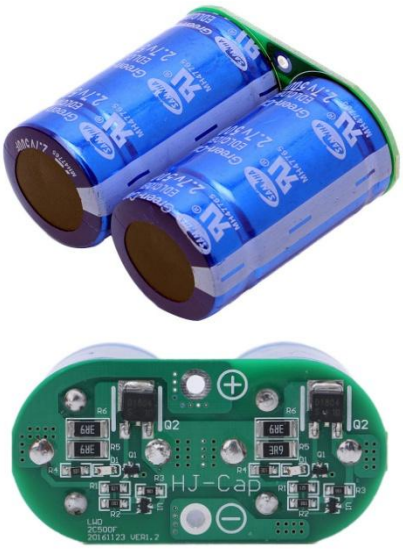
Raspberry Pi Power Supply



An issue confronting Raspberry Pi users, is SD card corruption due do improper system shutdown, ordinarily before removing power from the Raspberry Pi, one should execute the "**sudo shutdown -h**"

Simple routine can be incorporated into the system, sensing either an operator shutdown or a power failure.

In the case of a power failure, we need some reserve of energy, keeping the Raspberry Pi alive long enough to perform the shutdown procedure.

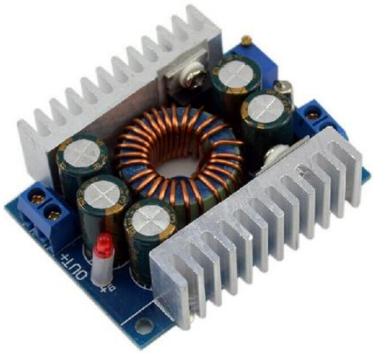


In designing the power supply, consideration was given to what kind of energy source would be most suitable, if using a battery the charging adds complexity to the circuit.

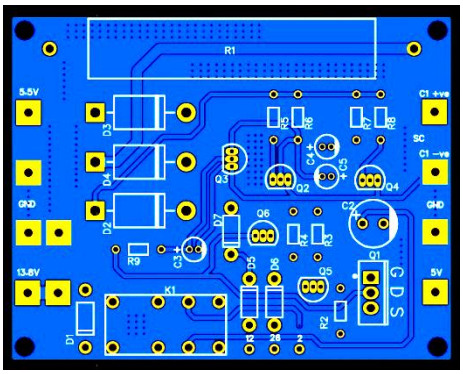
One device that provides a very simple charging method is a super capacitor only requiring a current limiting resistor.

The size of the capacitor in my application was largely driven by economics, it had to have sufficient capacity and include a charge balancing board, the cheapest I could find was the 250 Farad 5.4 Volts, providing an energy store of 1350 Coulombs, enough energy to power the Raspberry Pi during the shutdown.

Using a buck inverter is a good solution for a power source; this exhibits good regulation with high current capability. Many modules are on offer; however the selection had to meet the following criteria:
a/ Have sufficient current ability to charge the Super Capacitor.
b/ Have the lowest possible ripple noise.



Having tested several of them, I chose this module from eBay costing less than $10.00; it provides a regulated adjustable output of 5.0 Volts from a source of 13.8 volts or less, with a maximum current ability of 12 Amps. (WARNING before using this device, set the output voltage to 5 Volts)



Code to be installed into the Raspberry Pi for Power supply control:
1/ Power Fail Routine (Signal to Power Down)
2/ Heart Tick Routine (Maintain Power to the Raspberry Pi)
3/ Modification to boot/config.txt (Provide SD card activity signal)

Mod to config.txt
# Use external LED as SD ACT LED
dtoverlay=pi3-act-led,gpio=12

Signals required for the Power Supply Operation are:
a/ Power On/Off/Fail (B4)
b/ Heart Tick indicating Normal Running (B3)
c/ SD card Activity Normal running (B2)
The 500 mS Heart Tick signal of 3.3 Volts is applied to B3, this keeps the power supply turned on, delivering 5 Volts to the Raspberry Pi.
Power On/Off timing is achieved by the action of C2 and C3.

Shutdown Process

When a logic zero is applied to B4 (Power Off/Fail) The Raspberry Pi commences the shutdown process.
During this process the SD card activity signal is used to extend the ON time of the Power Supply, When the Heart Tick and SD card activity ceases, the timing capacitor C2 fully discharges, then the power to the Raspberry Pi is turned off.

Circuit Actions
The Power switching (On/Off) is performed by Q1, a P Channel FET
D1 Absorbs back EMF from the relay to protect any devices sharing the 13.8 Volt rail.
D3 and R1 form the Super Capacitor charging circuit.
D2 Power source from the Inverter.
D4 Power source from the super capacitor.
Q5 and Q6 are used for the control of Q1, if Q5 is off, Q1 is pinched off. (Power Off)
Q2 and Q4 form an astable switch, controlled by Q3, if Q3 is on (saturated), the astable is turned off.
Q6 is the charge controller to power-up and keep the power on if Heart Tick or SD activity is present.
The Relay serves as a power fail detector, choosing an electromechanical device solves problems with slow decay of input voltages, providing a solid signal indicating power failure.
Note that the Buck Inverter has a wide range of input voltage to maintain a regulated 5.5 Volt output, thus only when the voltage at the relay armature falls below the holding voltage, a power fail signal is sent to the Raspberry Pi.
Voltage variations taking place on the input of the regulator above the holding voltage of the relay will have no consequence to the regulated output or the functionality of the Raspberry Pi.

The circuit has to meet 3 conditions,
a/ Operator Power on/off
b/ Power fail
c/ Auto reboot if power is available but the Raspberry Pi is dormant requiring a power cycle to boot.
Note that if a shutdown command was issued, the inbuilt Raspberry Pi watchdog is disabled, so this can't be used to detect a dormant device, to restart the Raspberry Pi, the power must be cycled, initiating a boot process.

Circuit Operation
With the SW1 in the OFF condition a ground is applied to B4, this signal indicates that power is turned off by the Operator, also initiating a power down if the Raspberry Pi was running.

When SW1 is turned ON, The regulated 5.55 Volts from the buck inverter, is applied to C2, charging C2 instantaneously, this is possible because of the lag in the relay armature, at the same time the ground on B4 is removed. The charge in C2 with R3, causes Q5 to saturates, the FET is turned on, 5 Volts is now applied to the Raspberry Pi. The source of this voltage is via D2, making the cathode of D4 more positive than the anode, thus D4 is turned off, D3 and R1 are now charging the super capacitor.
The initial charge in C2 allows 20 seconds of operation, the activity signal of the SD card during the boot process, further adds to this charge extending the time, insuring a proper boot-up.
Once the Raspberry Pi has booted, the Heart Tick signal via B3 keeps charging C2 every Second for 500 mS. sustaining the power to the Raspberry Pi.

Now let’s consider a power-off situation, SW1 is turned off, the super capacitor is now supplying energy via D4, the ground applied to B4 initiates the Raspberry Pi shutdown procedure. The SD card activity is high during shutdown process, this pulses B2, toping up the charge in C2 via Q6,

extending the power on time.
When the Raspberry Pi goes dormant, the Heart Tick and SD card activity ceases, C2 discharges fully, Q5 turns off and the FET also turns off, the 5 Volts is now removed from the Raspberry Pi.

Now we consider the operation of the circuit during a power fail.
If the voltage falls below the holding voltage of the relay, the NC contact is made, this applies a ground to B4, signalling the Raspberry Pi to commence the shutdown procedure.
As long as the power remains off the system will shutdown as if the operator had turned SW1 off.

Auto Boot
The Auto Boot takes place when power is interrupted initiating the shutdown procedure, but power returns, resulting in a dormant Raspberry Pi. In this condition, C2 is discharging; the discharge time is approximately 1 minute. Once the 5 Volt to the Raspberry Pi falls to zero, C3 discharges taking approximately 200 mS to turn Q3 off, the astable Q2 and Q4 is now allowed to cycle, pulsing a charge into C2. This action causes the 5 Volts to the Raspberry Pi to be turned off and back on after 200 mS. initiating the boot process.

Action Times
Reboot: 1 minute 30seconds
Off to On: 1 minute 10 seconds
Switch Off: 5 seconds
Times will vary according to the services and task been performed by the Raspberry Pi

Concluding.
This power supply, takes care of power control or failure conditions, shutting down the Raspberry Pi in a safe manner, plus rebooting if power is present but the Raspberry Pi is shutdown

I can provide the C code for the control features of this power supply upon request.
Hope you find this useful.
73's
Robert Campiciano Circuit on the next page.