



Highgate Park Recable

This issue

Air-Stream Highgate Park recently had a major cabling upgrade. The aim of the project was to replace the existing cabling which was built in 2002, which has passed its use by date. Because of this it was starting to cause intermittent outages to several connected sites. To solve this problem we decided it was best to run multiple dedicated runs of Ubiquiti Toughcable to each mast instead of two. This would allow all routing and PoE injection to be done from inside the building greatly reducing the complexity of upgrades and modifications in the future.

sites to be recabled and upgraded. Highgate upgrades have been on the cards for quite some time now, however due to the complexity of the site this was left until a large chunk of continuous time could be spent on site.

The Network Team looked into various options for the Highgate Park recable, some of which included differing topologies including the use of Fiber and various different switches/routers. Those involved with the planning phase then developed a project proposal (can be found on the Air-Stream Wiki) and submitted it for approval by the Network Team as a whole. After discussion and modification by the Network Team the proposal was then approved to proceed for funding approval by the Committee.

Air-Stream Highgate Park is one of the clubs oldest nodes originally built by members in 2002. The original cabling installation had 2 x ethernet cables to each mast. For many years this was adequate. Changes in the site topologies and the shift from Coax to PoE over the last few years have forced many

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Upcoming events

- 27/09 - ASLAN #35
- 29/10 - Members Meeting
- 08/11 - ASLAN #36
- 26/11 - Members Meeting
- 31/12 - Members Meeting
- 28/01 - Members Meeting

Have an event that should be listed here?
 Email committee@air-stream.org



Network Update

Highgate Park Sector Upgrade

Now that the recabling project at Highgate Park is complete the Network team is focusing on replacing the existing 2.4GHz sectors at the site with 5GHz sectors. The existing sectors died quite some time ago however have not had a significant impact on the network hence were not a priority. The Network team is currently in discussion after an initial proposal has been submitted and you can expect to see updates in the coming weeks as to a final decision.

Parkside Upgrade

The site of many of our members meetings is due for an upgrade. This site has been off the network for some time now due to the failed sectors at Highgate park. With the pending 5GHz upgrades at Highgate, Parkside will require a new backbone connection. Along with this a new omni which will allow better connectivity for the local area including the members meeting space.

Sheidow Park

Currently in the early stages of planning is a new potential core node in Sheidow Park. This site is currently in the very early stages of planning. This includes stumbling

and Host Site Access agreements being prepared. Once these are done a full project proposal will be developed by the team and submitted for approval by the committee.

Core Node DHCP Rollout - Can be removed
The Core Node DHCP rollout is still underway with only a few sites left to be implemented. The full progress of this can be seen on the Air-Stream Tracker.

Cement Hill Repairs

Cement Hill Re Cable and Repairs have been delayed due to time and resource constraints. Being one of Air-Streams highest risk sites there are only a few members suitably qualified to access this tower. Currently the majority of the site is back online with a simple router swap fixing many of the issues. However there is considerable damage to much of the cable on the mast and a dead radio at the top of the tower that will all need to be replaced. Currently there is no indication on when this work will be completed.

UniSA

A trial of a Ubiquiti NanoBeam is planned for UniSA with the delay being approvals for access. This trial is hoping to show the performance increase on high noise and

high bandwidth connections within the network. Gould Creek Rebuild - Can be removed if needed

To date no progress has been made on the rebuild of Gould Creek, as this is a low priority the Network Team have been focusing their efforts elsewhere.

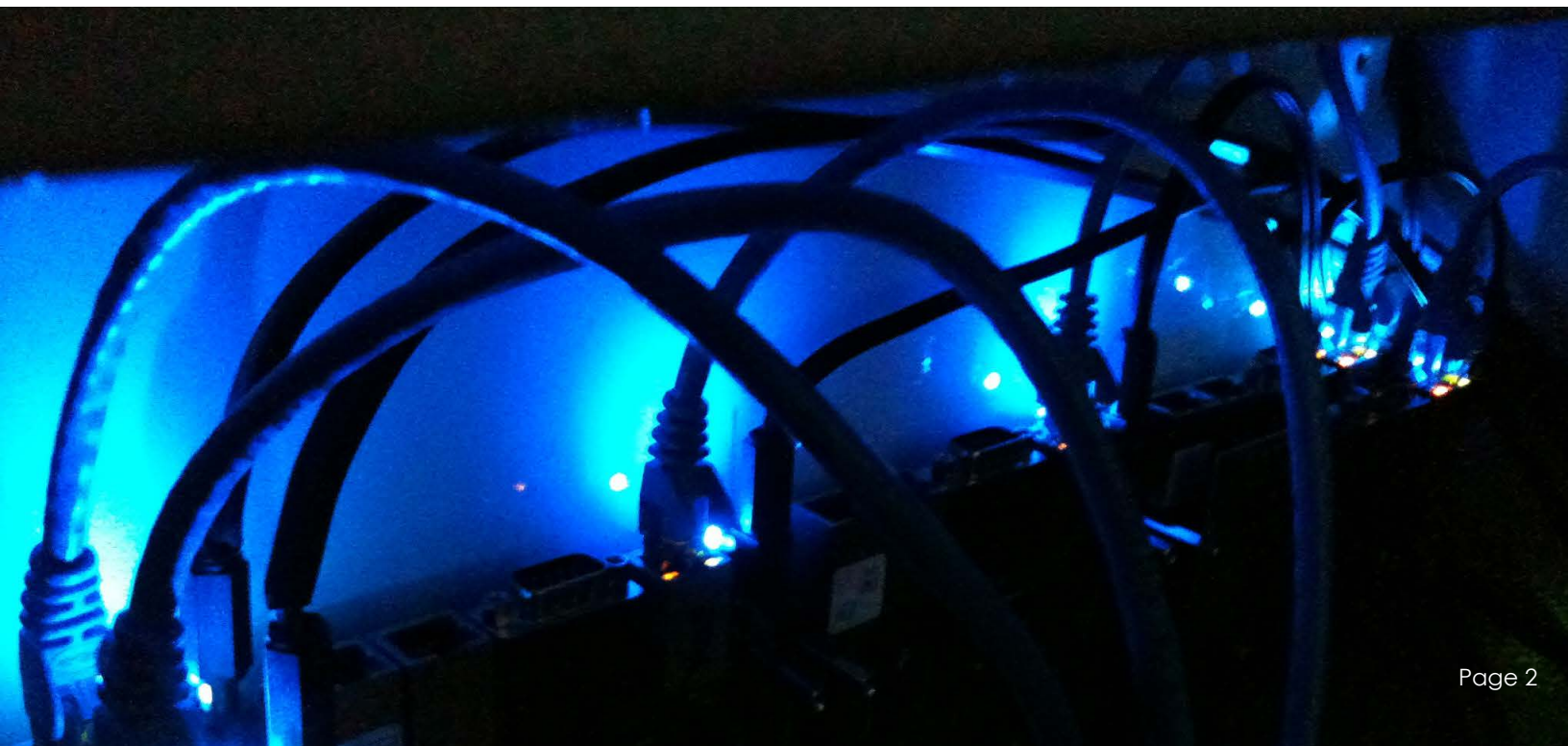
Suntrix-Hermitage

The Suntrix-Hermitage project is still being held up in the initial planning phases due to council restrictions. Currently there are meetings planned to determine the viability of Colocation with existing towers in the area. Failing that development approvals will be required for the installation of a new tower for sole use by Air-Stream. This project is slow going and requires a considerable amount of work. It is expected that we should see progress on this by the end of Q1 2015.

If you are interested in helping out the network team or committee on this or any other projects sent an email to:

network@air-stream.org or
committee@air-stream.org.

Many hands make light work and it takes all of us to keep the network running.



Highgate Park recable - Cont...

Continued from Page 1

the Committee reviewed the proposal and after determining that it was in the best interests of the network as a whole approved funding and the project was to proceed.

The upgrade consists of 5 x runs of Ubiquiti Toughcable to each mast (North-Eastern and South-Western) in 32mm conduit. In addition the indoor wall mounted box was removed and replaced with a 12RU communications rack. The outdoor wall boxes are still in place and now with the exception of one RB711 only house ethernet couplers.

This upgrade gives us great flexibility. As there is no need to run coax from the radio to the antenna anymore, all that is needed is a network cable from the wall mounted box to the antenna which has an inbuilt

radio. This gives us less chance of failure, lower maintenance costs and a quicker turnaround if something needs replacing.

In addition the allowing for future expansion the new layout allows for increased protection of the equipment mounted externally. The use of the Toughcable allows the external radios to be grounded back to the building earthing circuit, which should prevent buildup of charge on the external equipment thus preventing electrostatic discharges.

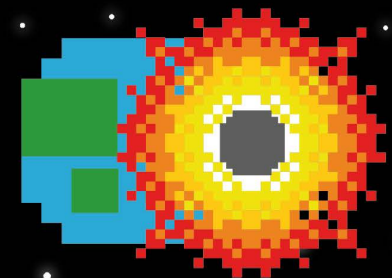
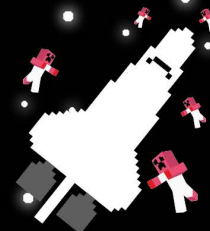
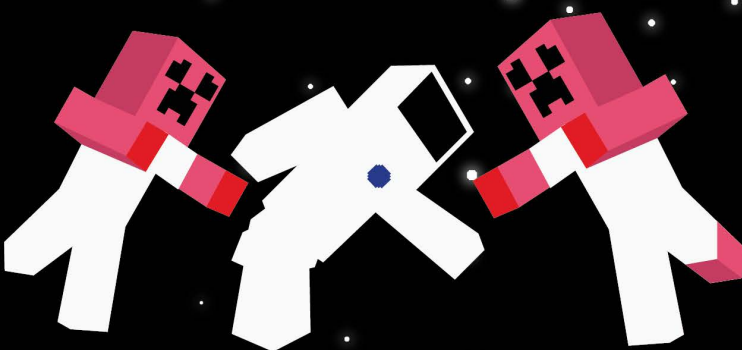
Even though it has taken us three days to complete, the hard work is now done. We have a great base to work with and because of this, anyone who needs to work on-site can see a clearly visible and labeled network topology. Thank you to Tony D, Geoff Woodberry, Michael Kellow and Dan Air for their efforts in getting this site ready for the future!



SUPPORTING COMMUNITY WIRELESS NETWORKING IN SA

COMPUTER LAN PARTY
SESSION #35
SAT 27 SEP 2014

44 AUDREY AVENUE, BLAIR ATHOL
VISIT AIR-STREAM.ORG/ASLAN35 OR FACEBOOK



Air-Stream Node Spotlight

The Node Spotlight is a chance for members to show off their site, here are a couple of interesting ones that are a little different from the normal Air-Stream installation.

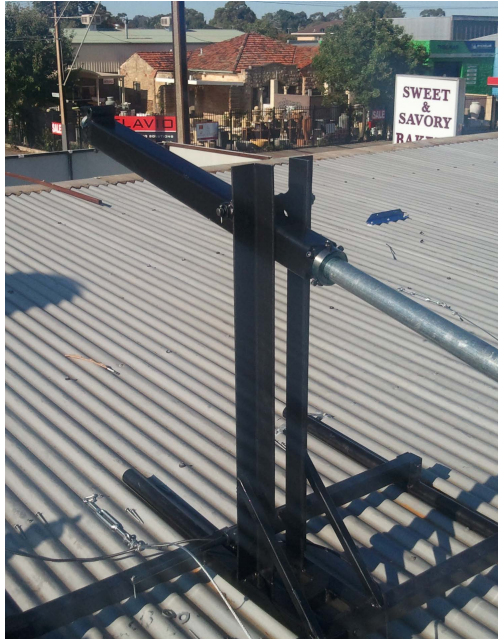


Woolsheds

Air-Stream Woolsheds is a site that many of you may never heard of or ever seen before, this is a site that is out in the Adelaide plains between Two Wells and Gawler.

Woolsheds is a site that was built in 2005. The tower consists of a converted 15m windmill which has in a former life been used for amateur radio. This site was used for testing and experimentation over the years and has seen some very long links in its time. At one stage it was connected to the Gulfview Heights omni over 40km away.

This site was a key test location when members started experimenting with long distance 802.11n and was a great learning resource used in the development of sites like Port Adelaide and Ingle Farm. Maybe one day this site will be online again.

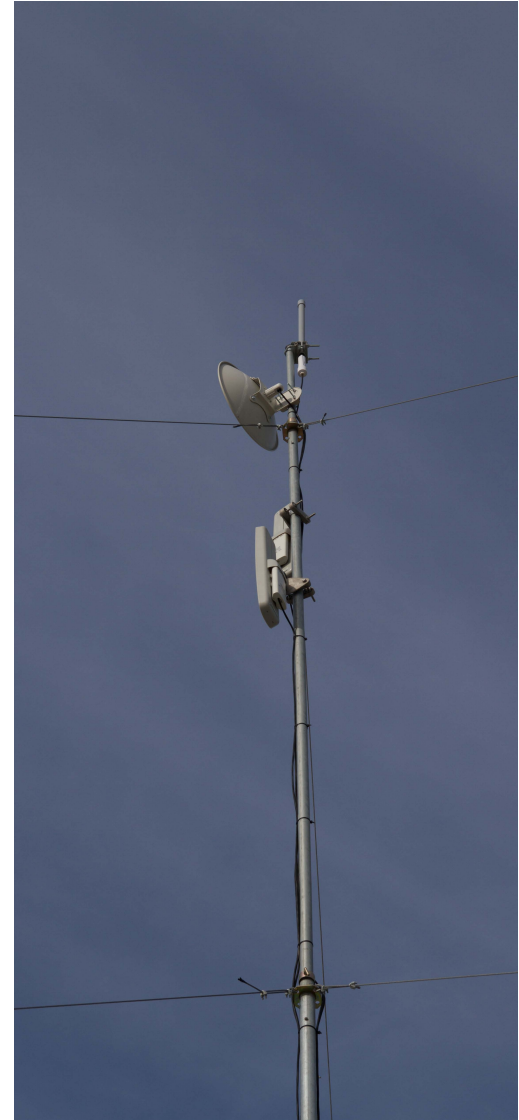


Hampstead Gardens

Hampstead Gardens is an Air-Stream Core node located on a small business in Hampstead Gardens. This site was built to provide Air-Stream access to the Hillcrest Community Center back when ASLAN was hosted there. For this site a custom non-penetrating roof mount was built which incorporated a tilt over system and would allow for the mast to be rotated inside its guide wires. This customised mount paved the way for the guide wire collars that many of our members masts are using today.

This site was one of the first Air-Stream sites to utilize 3D modelling to design the mounting and proved the effectiveness of using these tools within the build planning process.

Air-Stream Hampstead gardens is still in operation and is broadcasting using a 2.4GHz omni.



Lonsdale

Air-Stream Lonsdale is a core node located on the Surf Life Saving Lonsdale facility. This site was the first in collaborative sites with the SLS. This site is a simple build using a Telomast with non-penetrating roof mount and guide wires. The site is connected to a sector antenna at Cement Hill providing a solid backbone into the network. This site is ready for use by our southern members and will provide a stable and reliable connection. The site consists of a Ubiquiti Nanobridge and a Bullet M2 for the Omni.

Software Defined Radio



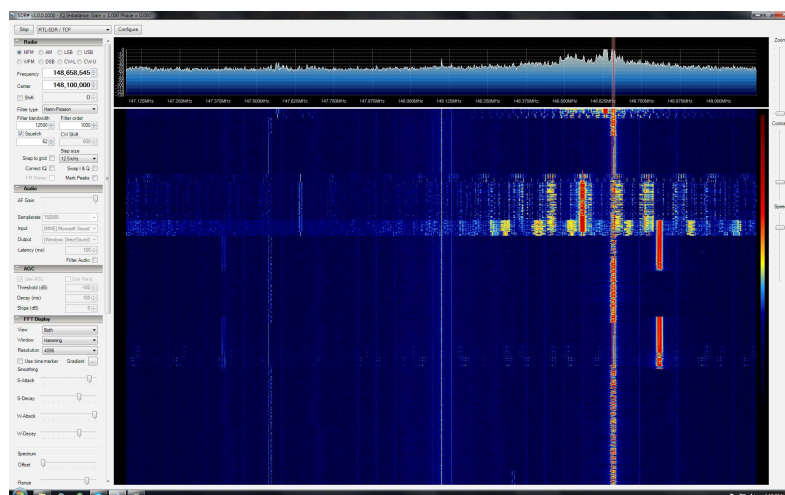
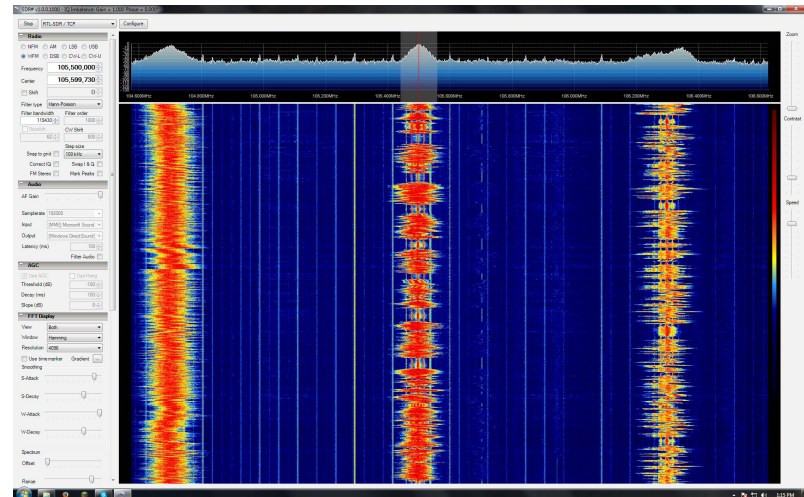
One can purchase purpose built hardware or a TV dongle as pictured at right for (in my case) \$20 off of eBay, even less from China. I run the device on a Debian box which has GNUradio compiled and installed. The images below are from a Win7 box running SDR# which is free software that can either drive the device directly or access across a network which is what I do. Makes for convenient antenna / cable / machine placement.

The dongle I have is based on the Elonics E4000 (tuner) and Realtek RTL2832U (demodulator), which "rtl_test -t" tells me: E4K range: 52 to 2204 MHz E4K L-band gap: 1103 to 1268 MHz. Oh, works fine as a TV as well though I have heard that the TV driver and the SDR# driver clash.

Right: TripleJ (centre) tuned in on 105.5MHz, you can "see" other FM radio stations either side in the so called waterfall which falls from top down. A simple click of the mouse tunes to that frequency.

I have two antennas on the roof, one cut for 137.5MHz (NOAA APT), the other 1090MHz for aircraft transponder reception.

SDR# has a favourites pane and I have just clicked on Parafield Airport's weather info channel. You can see the FM radio stations from above descending in the waterfall. Parafield Airport is the thin line highlighted in red at the top. You can also click, hold and drag the waterfall left or right retuning the radio - makes it easy to "mouse" around the spectrum looking for transmissions.



At Left: Pagers can be found around 140MHz. Again you can see the pager transmissions in the waterfall. SDR# does not decode them for you but does allow you to identify good frequencies to try decoding. Bandwidth defaults to 2MHz so everything from 140~142MHz shows up in the waterfall. Makes it really easy to find random transmissions. There is a Linux analogue of SDR# GQRX but I broke my install - got to fix that!



The Air-Stream committee consists of eight people voted in every year by the members at the Annual General Meeting. The committee is made up of people that are dedicated to progressing Air-Stream as a community and who manage the day to day administration of the organization on behalf of the members

It is often misunderstood what the committee actually does. The committee are the group of people that look after all aspects of administration of the club including, membership, equipment ordering, insurance, peering agreements, site access agreement, procedures and documentation as well as funding allocation.

What makes a good committee members? A committee members shall be a natural person who is focused on improving Air-Stream as a community and make decisions on behalf of the members as a whole.

The committee looks after all these and many more aspects of the club to keep it running and ensure it will continue operating into the future.

What about the network infrastructure? The committee does not directly manage the network. This is the role of the network team. The committee does however provide consultation and recommendations to the network team and has the final say when allocating funding to projects.

How does one become a committee member? Becoming a committee member is the easy part, all committee members are nominated by a fellow member and then the membership votes in their 8 committee members at the AGM. After the AGM the initial meeting (generally in January) the committee nominates the roles and specific responsibilities of the individual members.

Who is the “Committee?”

As a minimum there are three roles, Chairman, Treasurer and Secretary. Who is on the committee? The current committee members include:

- Troy Vodopivec (hat) - Chairman
- James Nobes (Stormshaker) - Treasurer
- Michael Kellow (nekron) - Secretary
- Sam Burney (Tanuki) - Network Coordinator
- Shawn Zeppel (DJ_HIP) - Membership Liaison
- Sam Greenwood (dragoon) - Procurement Officer
- Tony Dalmeyer (tomeyer) - Fund raising Officer
- Nathan Cooke (Firefox) - Training Adviser

These people were voted in by the members at the 2013 AGM and will hold their positions until the following AGM in November 2014.

The committee is comprised of people

with a diverse range of skills including IT managers, A Software Engineer, Mechatronic Engineer, Safety Officer and a business manager.

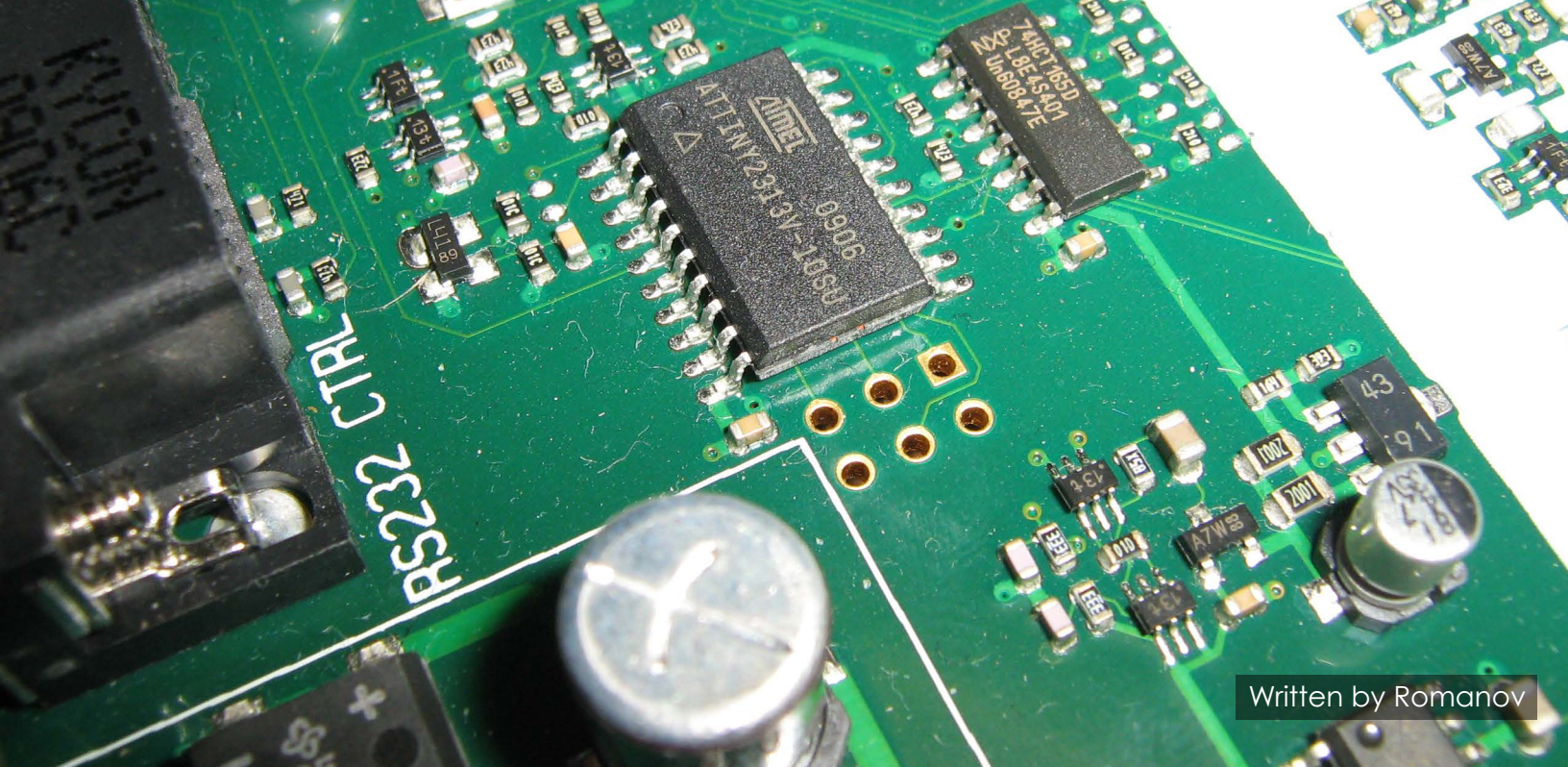
It is a common misconception that committee members need to have networking knowledge, often being detached from technical aspects of the network makes for better committee members.

All committee members share the same weight when making decisions as any other committee member. The various roles have no more power than any other role. A committee member has no more rights than any other member of the club.

The committee is here to serve the members and progress the club as whole.

If you have any questions or suggestions for the club in any aspect you can contact the committee by emailing us or by attending one of our monthly members





Written by Romanov

DC-DC UPS

Members of Air-Stream are currently involved in the design and prototyping of a lead-acid battery charge control system for deployment at remote sites, replacing the various commercial uninterruptible power supplies currently used.

Uninterruptible power supplies (UPS) are used to provide power to connected devices in the event that the upstream (AC mains or solar) becomes unavailable. Most designs are based around a set of lead acid batteries, charge controller and an DC->AC inverter. In the past, Air-Stream have relied on commercial-off-the-shelf (COTS) units built to domestic specification to provide backup power to remote sites but years of experience have revealed the following shortcomings:

1. The units are built for domestic environments, experience has shown that they cannot handle the high temperatures present at some sites (E.G. Cement Hill),
2. The units don't have any standardised form of mounting hardware and monitoring interface which can complicate installation and troubleshooting.
3. Not having a standardised unit impacts

on maintenance E.G. different battery dimensions.
4. Most units rely on a mains connection for failover and charge control preventing their usage on off-grid sites.

With this in mind, a new charge control system is being design to address these shortcomings of domestic UPSs:

- Designed for operating environments about 50 degrees Celcius.
- Modular DC-DC charge controller design that is input agnostic, input can be from an separate mains power supply or DC source (E.G. Solar) allowing for installation flexibility and the potential of truly off-grid sites.
- Scalability of the platform, a single instance of the unit can power smaller installations while multiple units can be cascaded to provide power to larger installations.
- Open frame design to allow for charging of batteries of multiple dimensions.
- Embedded ethernet interface to allow for remote monitoring of the system over the Air-Stream network.
- Standardised dimensions for ease of installation.

The design and implementation of the charge controller is part of a larger plan to ultimately split the application of the UPS over three broad areas instead of a single COTS box.

1. Mains or solar regulator provides inputs to the charge controller, these units will largely be COTS and can be specified for the site needs. Specifics of the site will determine most appropriate means of powering the charge controller.
2. The charge controller siphons power from the input to charge and maintain a bank of batteries, monitoring the state of the input voltage levels and passing current through to the power distribution stage, either from the main input or regulating the battery bank if the main input isn't available.
3. The power distribution stage distributes power to main active devices in the installation E.G. Power-over-Ethernet.

Para Hills 5 Repair

Air-Stream Para Hills 5 is now (mostly) back online. Significant damage was sustained at this site which required the replacement of routers, radios, PoE Injection and cabling.

What initially looked to be the results of a near strike have proven to be some of the strangest water ingress. There are generally two possibilities when you see burnt RJ45 connectors on Air-Stream masts, the results of either lightning or water. The most common of the two being water ingress, however in this case it looked more like lightning. The symptoms included burnt RJ45 connectors, Severely damaged contacts on both the RJ45 connector and socket and that sadly familiar smell of cooked electronics. What wasn't apparent at the initial inspection was any evidence of water ingress into the cabinet or cable

which has been observed at numerous sites over the years. This lead the team to suspect lightning. With it being immediately apparent there had not been a direct strike on the site the team suspected that there may have been a near strike. Near strikes present in a number of ways, including: burnt/damaged contacts and connections from large electrostatic discharges, strange behaviour routers from damaged components, a burnt smell from electronics and radios going offline or deaf with no apparent physical damage.

During the repair of the cabling the team noticed a dead giveaway that the damage was due to water ingress. Once the damaged connector was removed from the toughcable water started to flow out. This came as a shock to the team as there was no indication within the cabinet

that there had been any water or moisture ingress. After making this discovery the team decided the best course of action would be to replace the cable. During the replacement it was found that the cable had been damaged by birds which would explain how the water got inside the cable.

After the cable had been replaced it was found that several of the devices were not responding as they should. Thus have been replaced with the spares provided.

Thank you to Pazza, Machspeed and Blue18 for their work on this site and the time they have dedicated to the club on a site that does not directly affect any of them.





What is “Air-Stream?”

Air-Stream Wireless was established by a handful of dedicated wireless enthusiasts in 2001 and became an Incorporated Association in September 2002. It is the first and largest Community Wireless Network (CWN) in South Australia to successfully build a Wide Area Network (WAN) using wireless technologies.

With hundreds of active members the network now forms part of the largest community wireless network in Australia and is continuing to grow with the help of wireless enthusiasts and radio amateurs across Adelaide and Australia.

Our Mission:

Air-Stream Wireless is a non-profit community group who use Wireless LAN in combination with software and other technologies to deploy a Wide Area Network (WAN) that supports community participation, local content and communications.

Strategic Plan:

For this mission to become reality members of Air-Stream Wireless shall work together to achieve the following goals:

Maintain and develop Core Router Nodes, Network and Member management systems to ensure continuity and reliability for all members.

Continued to grow the network and promote the benefits of Community Wireless Networks in Australia.

Continue to provide education on the regulatory framework for running a Community Wireless Network such as the “Public Park Concept”

Provide an open platform for members, developers and other community groups to discuss and share information on the effective use of wireless technologies.

Develop tools that allow members to easily access distribute and create local content.

Deploy numerous free community hotspots in public spaces, to garner broader community awareness, participation and sponsorship for Air-Stream Wireless.

Promote the benefits of community participation, support the production and distribution of local content and communication systems.

Air-Stream Wireless supports Free and Open Source Software (FOSS) which is widely used across the network to host essential services such as the Members Database, DNS and Email which have all been developed voluntarily by members.

Similarly, the wireless equipment deployed uses a part of the radio spectrum which is also free to be used by anyone, provided the radiated power is kept down. Called the “Public Park Concept” it is relatively unregulated by the Australian Communications & Media Authority (ACMA) who allow all users the same rights regardless of who they are - business, telecommunications carriers, government departments or private citizens.

Have a suggestion?

Do you have a suggestion for AirZine? Are you interested in writing an article? Or even have some cool pictures that you think followers of Air-Stream may enjoy. We want to hear from you.

Currently there are a few dedicated members that prepare content for AirZine.

Doing this is a very time consuming process, we are currently on the look out for anyone that is interested in submitting content for upcoming issues. If you are interested in writing a regular column or providing regular content we would love to publish it.

Content is not just limited directly to Air-Stream related activities, we are interested

in all aspects of Wireless, including Amateur Radio, Electronics, Hardware Hacking, Linux and Open Source Software and many more fields.

If you are interested in contributing to AirZine.

Send us an email at:

committee@air-stream.org