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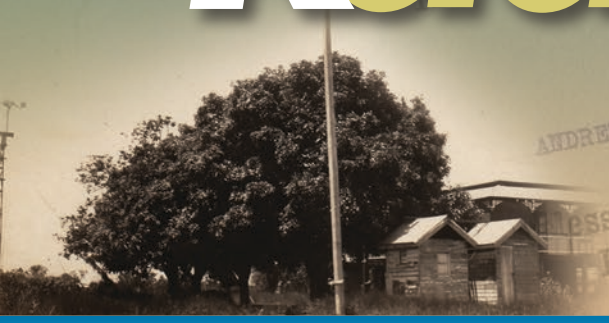
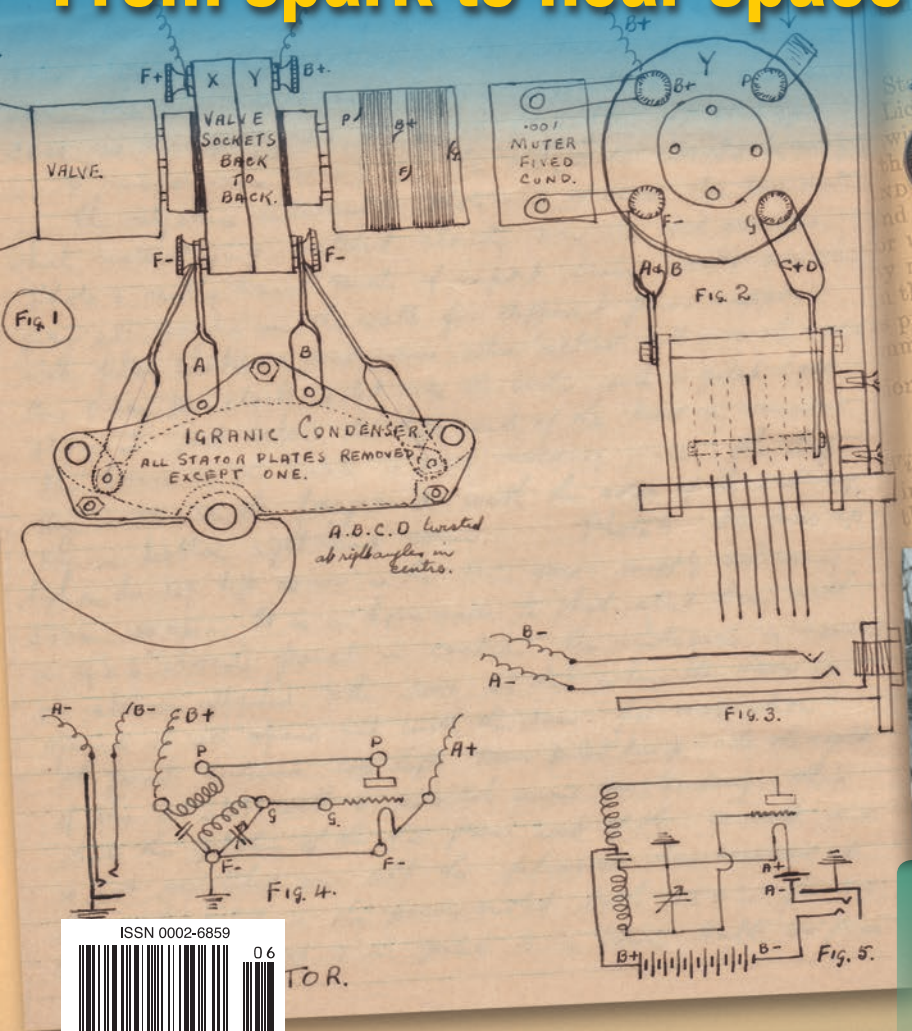
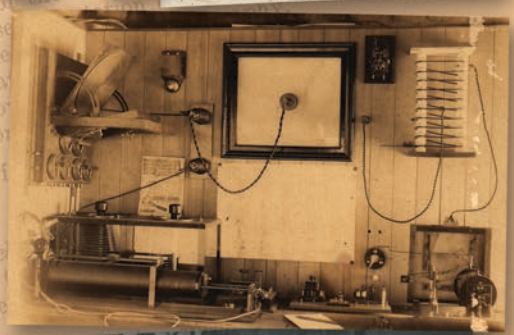


From spark to near space





- Review: Magnetic loop antenna
- Peryton mystery solved
- Lake Boga flies again

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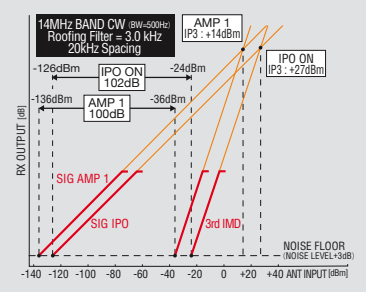

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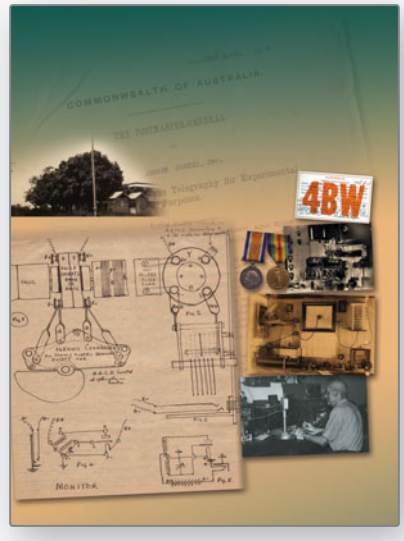

This month's cover

From spark to near space: In this month's issue we look at an early experimenter from Queensland Andy Couper Jnr who built and operated spark station XQM. See the story starting on page 22. At the other extreme, we hear of the near space activities of the MARTG with small balloons – see the story beginning on page 10 and photos on the inside back cover.

General

Columns

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are welcome and will be considered for publication. Articles attached to email are especially welcome. The WIA cannot be responsible for loss or damage to any material. Information on house style is available from the Editor.

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Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Member of the International Amateur Radio Union

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Editorial

Peter Freeman VK3PF

The WIA AGM and Conference

The annual WIA AGM and Conference has just been held. I managed to make it this year, thanks to taking a couple of days of annual leave to make the timing work reasonably.

I headed east down the Princes Highway on Thursday morning, making a very short diversion off the main bitumen to find a spot to set up a portable station in the Lake Tyers State Park VKFF-761. This was one of the Parks recently added to the Reference list for the World Wide Flora and Fauna scheme. I operated for about 45 minutes, mainly on 40 m. I called for about 10 minutes on 15 m without any responses, so returned to 40 m. There were few callers around on this weekday in the middle of the day – I worked only 12 stations over the operation. I decided to pack up and head further east.

Once I reached Orbost, I headed south and then east to Cape Conran to set up close to the Cape. Cape Conran Coastal Park is another of the new WWFF references. I set up and started on 40 m SSB. My fourth contact spotted me on the ParksnPeaks website and this resulted in more callers. After about 50 minutes, I had 18 contacts in the log on 40 m and I decided to try 20 m SSB. The usual preferred operating frequency for Parks operators was unusable, so I searched around for a clear frequency, working a couple of EU stations when I came across them. I started calling on a clear frequency higher up the band. After about seven minutes, I worked a Russian station who must have spotted me on the cluster network – shortly after the contact I was swamped with a wall of callers replying to my CQ. I was busy for almost an hour with the EU dogpile, working 55 stations in 57 minutes. That gave me 73 stations worked, comfortably more than the 44 required to qualify the Park for WWFF.

I packed up and back to the Highway and drove to Nimmitabel to stay with a friend for the night.

Friday morning was an early start and I drove through Cooma and up the Boboyan Road, parked the car and climbed up to the SOTA summit Boboyan Range VK1/AC-044, also located in the Namadgi National Park VKFF-377 – an activation that would count for more than one award scheme. I worked 32 unique stations over the next two hours or so, by which time I needed to pack up and head back to the car – I had a meeting to attend in Canberra.

The drive north to Canberra offered some excellent views of the mountains to the west, many of them SOTA summits. I was only a few minutes late for the meeting of the Technical Advisory Committee, which discussed issues surrounding band plans. See the announcement in the News column.

After the meeting concluded, the informal social gathering commenced at the same venue, so there was lots of interaction with other amateurs over a drink or two and a nice meal.

Saturday was taken up by the relatively brief Annual General Meeting, the Open Forum and the afternoon Conference session. At the Open Forum, several awards were announced.

Continued on page 16

WIA comment

Phil Wait VK2ASD

Out from under the umbrella!

Late last year I found myself walking through Hong Kong in the middle of the pro-democracy demonstrations, coined the "Umbrella Revolution", where more than 100,000 student protesters were attempting to force Beijing to revisit a decision by the National People's Congress. Since the time of the handover from British administration in 1997, Hong Kong has operated under a "one country two systems" policy, which maintained its capitalist economic system and guaranteed the rights and freedoms of its people for at least 50 years. The decision by the NPC effectively gave Beijing control over the selection of candidates for Hong Kong's Chief Executive, thus eroding Hong Kong's democratic freedoms.

The struggle played out on social media and became an international public relations nightmare for Beijing, reviving memories of Tiananmen Square some 25 years earlier.

Also in Hong Kong at the time was Micha Benoliel, a 42 year old French born entrepreneur and CEO of a Silicon Valley start-up company "Open Garden" which had just released the Smartphone app "Firechat", which allows smart phones to use their Bluetooth transceivers to form an ad-hoc mesh wireless network, passing messages to each other by bouncing from phone to phone, completely independently from the telecommunications networks.

To tech savvy protesters, Firechat offered a way to stay connected and organised, even if the authorities were to shut down the networks, and in a short time the app was downloaded several hundred thousand times with millions of messages being passed between protesters.

Key east-west arterial routes in the districts of Admiralty, Causeway Bay and Mong Kok were closed for over 70 days and, although there were violent incidences, I thought the authorities showed some restraint and avoided a repeat the disastrous events of 25 years earlier.

All that time sitting in Hong Kong's clogged traffic got me thinking: In a mesh network, digital wireless transceivers called nodes become arranged in a self-healing mesh and pass messages to each other based on an automatically configurable routing table. Sometimes called a "web without the world wide web", messages can be passed seamlessly from one node to any other without anyone really knowing (or caring) how they got there. Gateway devices can link isolated mesh networks together using telecommunications networks, satellite, or maybe even HF radio links.

So, it wouldn't be too far-fetched to think that amateurs could build-out a wide-area mesh network themselves, so amateur radio related messages and small files could be passed around using simple low-cost equipment and small antennas. The applications for emergency communications are obvious, and the technology itself is interesting and leading edge. The more people that use it the better it gets.

Some amateurs are already doing this: Glenn KD5MFW, David AD5OO, Bob WB5AOH and Rick NG5V have formed a system called Hamnet, in their words *"a high speed, self-discovering, self-configuring, fault tolerant, wireless computer network that can run for days from a fully charged car battery, or indefinitely with the addition of a modest solar array or other supplemental power source. The focus is on emergency communications". http://www.broadband-hamnet.org/*

Their system uses Linksys wireless routers and operates on channels 1-6 of the 2.4 GHz ISM band, which overlaps with the upper portion of the 13 cm amateur radio band – but maybe something at a lower frequency, providing greater range albeit with lower data speeds, could be more interesting. Just think if every amateur had a small low-cost, solar-powered, 6-metre mesh transceiver on their roof with a Bluetooth or Wi-Fi link down to their computer. Text messages, small files and news items, could be passed around between radio amateurs and the whole system would be available for emergency traffic if and when required.

Crazy idea... maybe, and there are probably better ones, but I wanted to start readers thinking about the possibilities.

Last year the WIA part-financed the GPS beacon locking project which was initiated and administered by Alan Devlin VK3XPD. Being a keen VHF/UHF/microwave operator with significant experience in weak-signal operation and the pursuit of distance records, Alan was very aware of the advantages of GPS-locking transmitters and receivers to enable very narrow band communications techniques.

Continued on page 16

WIA news

Norfolk Island proposed as venue for 2016 AGM – strong interest

A proposal to hold the 2016 WIA annual general meeting on Norfolk Island was presented at the annual dinner held in Canberra last Saturday night, 10 May.

Directors Robert Broomhead VK3DN and Fred Swainston VK3DAC led the audience through a short video and PowerPoint presentation of the proposal, which gained an enthusiastic response from members and guests when a show of hands was requested to gauge the potential level of interest.

To the surprise of some WIA Board members, about three quarters of the audience put up their hands when asked the question 'who wants to go?', and 66 people later added their names to a list indicating they would like to attend.

The WIA has established a tradition of combining the AGM with a weekend of activities of particular interest to radio amateurs. The first was in Parkes NSW in 2007 featuring a tour of "the dish". Destinations since have included Broken Hill in 2008, Churchill in Victoria's Gippsland in 2009, the 2010 Centenary AGM in Canberra with a tour of Dick Smith's private aircraft museum nearby, Darwin in 2011, Mildura in 2012, Perth in 2013 and Mooloolaba on Queensland's Sunshine Coast in 2014.

The Norfolk Island proposal continues this tradition, with a "one out of the box" opportunity for attendees to engage in an erstwhile DXpedition "en masse", and perhaps Worldwide Flora and Fauna award or SOTA operations. Norfolk Island also offers a wide range of non-amateur activities, such as bird watching, bush walking, swimming, diving, fishing, philately and guided tours.

But it's not a "done deal".

At this stage, to continue to judge the level of support, the Board is seeking further expressions of interest from anyone who would like to attend. Like all WIA AGM weekends, this is not a 'members only' event, while only members can vote at the brief official AGM proceedings we invite and encourage both members and non-members alike to come and join in a most exciting weekend event.

Further details are available on the WIA website.

2 m and 70 cm draft band plan proposals

At the WIA AGM, work on finalising a draft of the new 2 m and 70 cm band plans was concluded. The draft has identified solutions to the issues faced in Australia on the 2 m and 70 cm bands today such as repeater channel capacity on the east coast, LIPD interference on 70 cm, idle legacy mode sub-band allocations and the unification of band segments to remove confusion for amateur operators particularly around 145-145.4 MHz. The design of the draft band plan also gave particular focus on providing for an orderly move towards digital voice modes over the next 10-15 years. All of this is achieved while allowing existing fixed licensees (repeaters) to continue operating on their old frequencies for as long as they wish.

Details of the plan will soon be made available for your feedback via the WIA website. Feedback can be provided via the WIA National Office. It is intended to close feedback and finalise the new band plans and the implementation procedures before the **Callbook** is published this year (mid-August). More details will follow on the website in June and will appear in the July edition of *Amateur Radio* magazine.

Amateur radio in maritime rescue

The importance of amateur radio to the community in times of crisis and emergency has again been shown through the rescue of a yacht skipper 130 km east of Esperance off the Western Australian coast. On board the stricken yacht "Vector" was 68-year old Peter Cook VK6BJC, on a trip to Adelaide of about 2800 km when on Monday May 4, broke a mast, activated an Emergency Positioning Indicating Radio Beacon (EPIRB), set off flares and made distress calls on both Marine HF and the 40 metre amateur radio bands.

In the story researched and written by Andrew Smith VK6AS for NewsWest, the yacht had been washed against rocks. The Australian Maritime Safety Authority (AMSA) reached the scene by helicopter that landed on the rock. Andrew VK6AS said that Peter was able to walk to the helicopter and flown to Esperance, where he was checked out medically and reunited with family.

The event was very newsworthy, but despite extensive reporting the role played by amateur radio was

not highlighted. The NewsWest broadcast, thanks to the work of Andrew VK6AS who uncovered the full story on the rescue by speaking to Peter VK6BJC and others.

In his research, stormy weather was forecast and the yacht anchored overnight in Goose Island Bay in the Recherche Archipelago of Southern Western Australia. However, the winds picked up strongly to start dragging the anchor and after a four hour struggle against the elements, the motor gave out and the vessel was washed over rocks and sustained damage.

Western Australian radio amateurs Ian VK6TWJ, John VK6FABC, Chris VK6JI and Richard VK6HRC all heard a faint Mayday call, answered and receive no reply. About 10 minutes later Peter VK6BJC was loud enough to get his current position. It was left to Michael VK6TX to immediately give all of those details to the Water Police. This was the first time the maritime disaster alert had reached the authorities.

Emergency procedures swung into action, with Ian VK6DW, the skipper's brother phoned by the AMSA as the first person on their calling list. The pair had regular morning and evening radio "skeds". In a quick call then on 40 metres he was told that the yacht would have to be abandoned within minutes. This message was relayed to AMSA together with an accurate position for the rescue.

Peter VK6BJC told NewsWest that "between the Water Police and AMSA, my rescue was outstanding and seemingly without issue". He continued: "Amateur radio made the communication by me on Vector possible with quite a number of people listening in and helping out". Ian VK6DW also added: "Ham radio allowed me to let Peter know that help was on the way and to pass on some very helpful advice at what was a very stressful time. It also made sure that the information relayed in both directions was accurate".

The family is very grateful to all that helped prevent what could have been a tragedy.

Licence conditions remake – WIA responds

In March, the Australian Communications and Media Authority (ACMA) issued a Consultation paper concerning its proposed remake of the current Amateur licence conditions determination (LCD), which "sunsets" on 1 October 2015. At the same time, the ACMA published its draft amendment to the Amateur LCD and the related class licence for overseas amateurs visiting Australia.

The ACMA's intention with the remake was to 'tidy up' these two documents and reissue them ". . . largely in their current form so that their ongoing effect is preserved." Hence, no significant changes were proposed, with the exception of new conditions for the 3.3-3.6 GHz band (9 cm), where advanced licensees would be precluded from segments at 3400-3425 MHz and 3492.5-3542.5 MHz in certain geographic areas to provide apparatus licensing of fixed wireless services for the National Broadband Network (NBN). Unfortunately, as no licenses for this were issued when the draft LCD remake was published, no details of the geographic areas where amateur operation would be prohibited could be included.

The WIA's comments on the proposals focus on issues involving the 600 m band, the 6 m band and the 9 cm band. Regarding the 600 m band, the WIA suggests removal of the exclusion zone around Exmouth in WA as there is no longer a licensed navigation beacon there, and a reduction of the exclusion zone for the Timor navigation beacon as, at the permitted amateur power levels this would enable Alice Springs amateurs to use the band. In addition, the submission suggests that the permitted bandwidth allowed on the 600 m band be set at 2.7 kHz (rather than kept at 2.1 kHz) as this would enable the widely available SSB suppressed carrier mode (which most commercial transceivers use) while excluding AM.

For the 6 m band, the WIA noted the removal of references to channel 0 being replaced with reference to not interfering with a primary service for the 50-52 MHz band in the spectrum plan. There are currently no primary service licensees here. The Institute continues to pursue primary access for 50-52 MHz.

The Institute's comments concerning the 3400-3425 MHz and 3492.5-3542.5 MHz arrangements goes into some detail, particularly highlighting concerns with the geographic extent of the exclusion zones, with a view to preserving use of 3400-3410 MHz as widely as possible across Australia.

It understood that this isn't "the last gasp" for reform of the amateur licence conditions. Following discussions arising from the WIA's July 2014 submission to the ACMA on amateur licence reform, we anticipate that the LCD remake will proceed and, later, the ACMA (or its heirs and successors) will entertain an extended review and conduct a public consultation process.

Visiting VK meets TRAC

The enduring Turkey-Australian friendship borne out of the WWI conflict at Gallipoli 100 years ago, has resulted in a special presentation by the Telsiz ve Radyo Amatörleri Cemiyeti (TRAC).

June Sim VK4SJ, visiting Gallipoli with her family for the ANZAC Day services on the former battlefield of her late father, was meet by TRAC officials including its President Aziz Sasa TA1E. June VK4SJ said: *"After a personal and moving occasion, finally we were able to catch up with Aziz. The family and I had dinner and spent several pleasant hours in his company."*

During the evening Sue accepted a Certificate of Participation and a medal given by TRAC. *"Aziz TA1E is a very knowledgeable and pleasant gentleman. We did our best to try and persuade him to pay us a visit in Australia in the near future,"* said June. Now that the trip of a lifetime is over, the importance and memories of that pilgrimage will last forever.

VI3ANZAC at the Flying Boat Museum

Jim Linton VK3PC

Photo 1: Catalina Flying Boat Museum and the new ANZAC memorial in the foreground.

Lake Boga in north-western Victoria was the initially secret RAAF No.1 Flying Boat Repair Depot for the maintenance and repair of many flying boats effectively used in WWII.

It has been fully restored, thanks to the Lake Boga Lions Club with its fundraising efforts plus the mustering of volunteer help with the project including aircraft restoration.

Financial aid came from the Lake Boga Water Ski Club, the Federal Government Nation Building Economic Stimulus Plan, the Victorian Government Small Town Development Fund, and the Swan Hill Rural City Council.

All of that effort over a very long time enabled construction of a hangar and a restored bunker using plans, making it a fine museum – the Home of the Catalina *http://www.flyingboat.org.au/*

There are hanger-based displays of equipment and vehicles, including a restored flyboat, the original A24-30 Catalina to show the type and size of aircraft used as patrol bombers during WWII. The museum has a theatrette telling the war-time story with narrated archival footage as it was being built and throughout its operation.

Original activities on the site were administration, airframe repair, electroplating, engine and hydraulics, metal work, photography, stores, armament repair, propeller testing, machining, crew rooms, and a control tower.

At its peak there were 39 Officers, 802 Airmen and 102 WAAAFs at the depot. It had large volumes of work with 416 aircraft serviced, repaired, restored, rebuilt or overhauled. These included Catalina, Dornier, Sikorsky KingFisher, Sunderland, Walrus and Martin Mariner.

In five years there were more than 1050 aircraft arrivals/departures and an estimated 800 test flights, including those from the

USA and the Netherlands. The base closed in November 1947.

Accessed from outside is an underground Communications Bunker, like it used to be, and a couple of visitors have likened it to the Churchill War Rooms they saw in London.

In wartime it was a centre of signals and cipher activity, keeping in touch with aircraft movements and other secret work. Housed are communications equipment, a telephone exchange, and sleeping quarters – much as it was during wartime.

It was hidden underground from view, and encased in a thick concrete for added security protection should it be bombed.

Amateur radio was invited on ANZAC Day 2014 to be part of the Communications Bunker. A permanent dipole was erected and Thomas Brownstein VK3EO from Swan Hill has been transmitting from there on some long weekends.

The museum was an ideal location to activate VI3ANZAC and the planning plus equipment with personnel took at least four months.

It was primarily an Amateur Radio Victoria venture but had enormous help from the Sunraysia Radio Group and Swan Hill operators.

With two stations it had overwhelming success in joining the ANZAC 100 program that included ANZAC-suffixed stations throughout Australia, in New Zealand and commemorative events in Turkey, Belgium and elsewhere.

VI3ANZAC began at 1000 hours AEST on Saturday April 25, with a re-play of the commemorative broadcast from the Catalina Flying Boat Museum Communications Bunker to kick off its activation.

The mainstay at the bunker was Rex James VK3OF who used 40 m to make some 150 contacts on Saturday morning, before taking a break.

Despite a local noise level, thought to be caused by nearby display lighting, stations were calling sometimes in a dog-pile.

Noel Ferguson VK3FI, who was doing the logging, said: *"Rex VK3OF continued to pull stations out of the noise for a couple of hours before taking his first break.*

Photo 2: A very busy Rex VK3OF on the mike working a pile-up while Noel VK3FI logs.

Photo 3: The tractor mounted log periodic beam for DX.

He then continued later on Saturday and again on the Sunday, to end up with many stations in the log, more than twice the contacts of the DX station.

One thing for sure, it was a mighty effort by Rex to work so many stations under those conditions."

The 40 m band was alive with huge numbers of VKs calling simply to make the VI3ANZAC contact.

Located outside and adjacent was the motor-home of Garry Briant VK3KYF and wife Sue was the main DX station.

It fed a log periodic beam that had been purchased for the occasion just days before. Held up by a forklift attached to a tractor, the beam had the mandatory exclusion zone taped off, and was rotated using the arm-strong method.

The station effectively used the 20 m, 15 m and 10 m bands. It worked into Europe, Japan, South Korea, New Zealand, Puerto Rico, USA and Canada. One of the highlights on 15 m was a contact with TC100KT at Canakkale in Turkey, with reports of 5 x 5 both ways. TC100KT was pretty close to Gallipoli, in the same strait, but further south at the narrowest point of the Dardanelles.

"That contact came as the band propagation was at its end. Being able to work into Turkey on that occasion is something I wanted to do, and really an achievement to be cherished," said Thomas VK3EO.

Another highlight was when Jim VK3PC took over and worked a string of American stations, including his friend Dave K1ZZ on 10 m.

A lot of interest was shown in VI3ANZAC that had brief details to read out with its purpose and location. The callers were reminded about the eQSL system that had been adopted, and to look on both qrz.com and the WIA website for the latest information.

Among those who responded on air were those who knew about the flying boats during WWII and had visited the museum.

All other ANZAC-suffixed callsigns, including ZL100ANZAC were worked. Both stations had logged a total of 400 stations before closing. Most were on SSB, with some PSK31 contacts.

A team of operators kept VI3ANZAC on air. Foundation licence holders had a learning experience as they took part in station set-up, logging and

Photo 4: L-R: Garry VK3KYF and Thomas VK3EO working some DX.

operating. Many had their first taste of real DX.

The local news media, Mildura Independent, The Guardian Swan Hill, and WIN TV News, ran stories after being approached by Thomas VK3EO.

The Communications Bunker was the focus for the public with many including officials visiting it after the ANZAC Day memorial service and consecration of the new cenotaph. Many were given the WIA Calling CQ pamphlet.

The cenotaph, funded by the Lake Boga Lions Club with assistance from the Masonic Lodge, and was completed just in time for ANZAC Day.

A BBQ lunch was provided on both days, on Saturday by the Lake Boga Sea Scouts, and Sunday by Arthur Miller, a soon to be revived radio amateur who travelled from Mildura to be part of the action.

A formal dinner was held at the Swan Hill Club on Saturday night. As part of the formalities, Doug Lofts VK3ZOX was presented with a "Certificate of Appreciation" for the work he has done with the Swan Hill repeater over many decades.

Among the others involved were Murray Loag VK3FMRL, Mat Craig VK3FORD, Andrew Manning VK3FABE, Ray Smith VK3HSR, and Norm McMillan VK3XCI with wife Bernadette.

Amateur radio group has its head in the clouds

The Melbourne Amateur Radio and Technology Group

The Melbourne Amateur Radio and Technology Group flies two high altitude balloons as part of the annual Global Space Balloon Challenge. Using amateur radio digital modes, they received some good pictures of near space, but for the group the story does not stop there.

In April this year the Melbourne Amateur Radio and Technology Group (MARTG) took part with 291 other teams in 47 countries in the Global Space Balloon Challenge (GSBC) – an event where "People around the world can simultaneously fly high altitude balloons celebrating an age where anyone can reach the edge of space." The purpose of the event is to promote community, education and innovation in a way "where everyone can learn from each other and build on each other's accomplishments." To the members of the MARTG it all sounded simple enough. Why not give it a try, they thought? What could go possibly wrong?

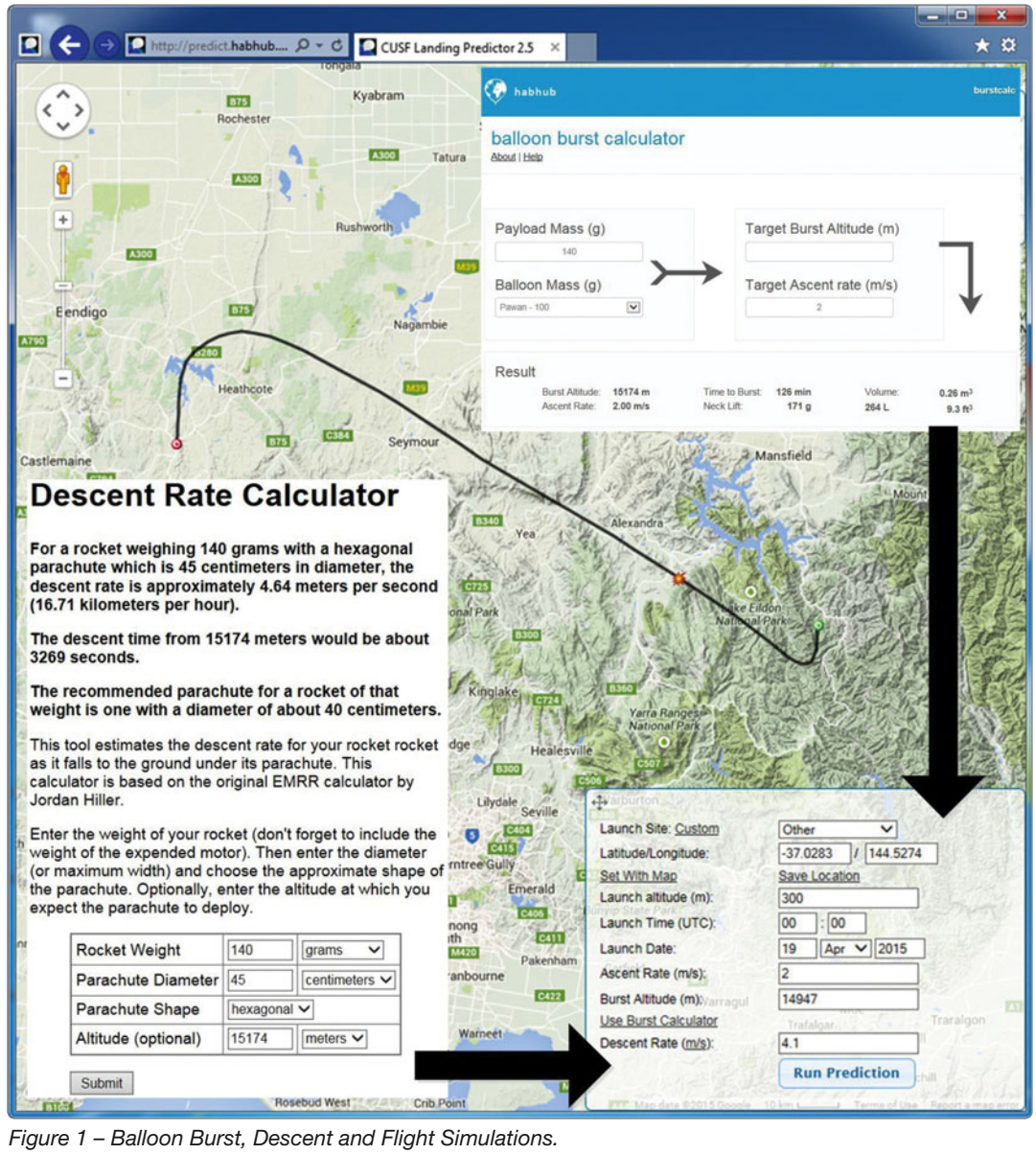


Figure 1 – Balloon Burst, Descent and Flight Simulations.

So how does one "fly" a high altitude balloon, you may ask? Well the process is relatively straightforward on paper: An electronics package (called a payload) is attached to large balloon which is filled with helium. The balloon floats up into the sky and the payload transmits measurements (called telemetry) back to ground receiving stations (called trackers). Of course eventually the balloon bursts because up there in the rarefied atmosphere it gets too big to hold all that helium inside. Then what? Well as you know what goes up must come down: So it falls back to earth, its decent rate being slowed to safe limits by a small parachute.

The ground receiving stations are supposed to keep a track of the balloon's position and altitude at all times and relay this information to servers on the Internet so that everyone will know exactly where it lands - in theory at least!

The next obvious question for the MARTG was "Why just launch one balloon when we can launch two?" Exactly! So to maximize the objectives of the challenge they decided to enter two quite different balloon payloads. Each one was developed independently, doubling the effort of course, so that the experience, challenges and results could be shared, analysed, compared and appreciated all the more. The idea was to launch the two balloons from the same location, track them and see where they both landed. To enable the possibility of payload recovery (and finishing the BBQ lunch and getting back home in time for dinner) all agreed that a quick 2-hour flight time was in order.

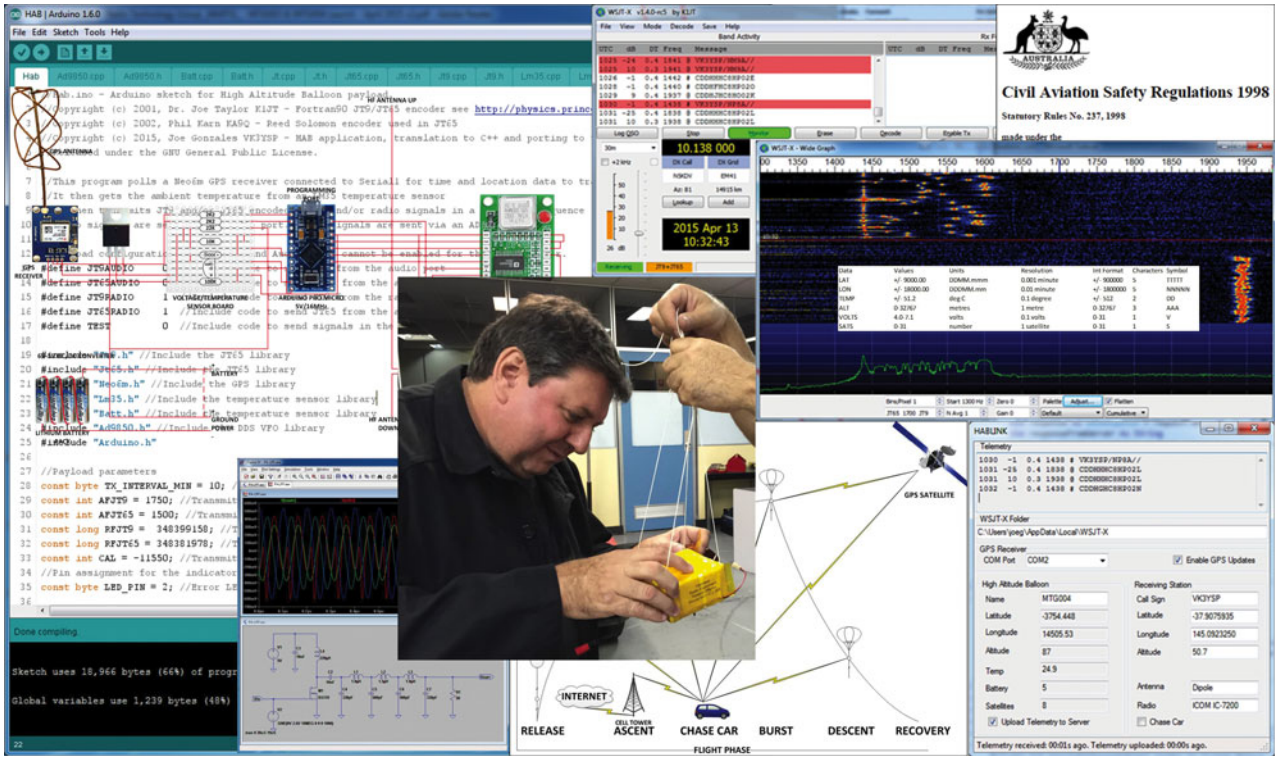
Now modern high altitude ballooning is not just a hit and miss activity. No, everything can be simulated on-line using computers. With this sort of technology it is a wonder why anyone actually launches anything. Again the process is simple: Get on-line, choose a balloon type and size, enter the payload mass, select a desired ascent rate and the exact balloon burst altitude is displayed. Of course that just works for going up. For coming down you'll need the parachute simulator: Choose a parachute size and shape, enter the payload mass, again, and out comes the predicted descent rate. Then there's the flight predictor: It knows all about the prevailing winds at different altitudes. Just enter the launch location and all the information above, again, and it will tell you the street address of the landing site. You can play around with these numbers all you like until you get the flight time you want. Perfect. So now the MARTG had their flight profile locked in: No problems so far.

Ah, that is all except maybe the problem of getting the Airservices Australia's approval to launch the high altitude balloons in accordance with CASA regulations. It seems the application had in fact been filled out, sent in and received and everything was actually in order. It was just that the approval part hadn't arrived. Suffice to say that when the "Notice To Airmen" advising the launch of two high altitude balloons was finally issued, the MARTG collectively breathed a very large sigh of relief.

While all this was going on the two payloads were being developed; one completely from scratch as it happened. This part was quite technical, apparently, as per the "T" in MARTG: The first balloon, designated MTG003, would carry aloft a colour camera payload capable of sending both images and telemetry back to earth using BPSK1000F and BPSK63F on 70 cm FM. The second, MTG004, would send telemetry only, but it would use alternating JT65 and JT9 on 30 m USB. All the fancy digital modes selected use forward error correction coding for high reliability. It proved to be a critical factor in the end.

Now, the payloads need to know where they are so they can relay this information to the trackers

Figure 2 - Technical stuff going on at MARTG.



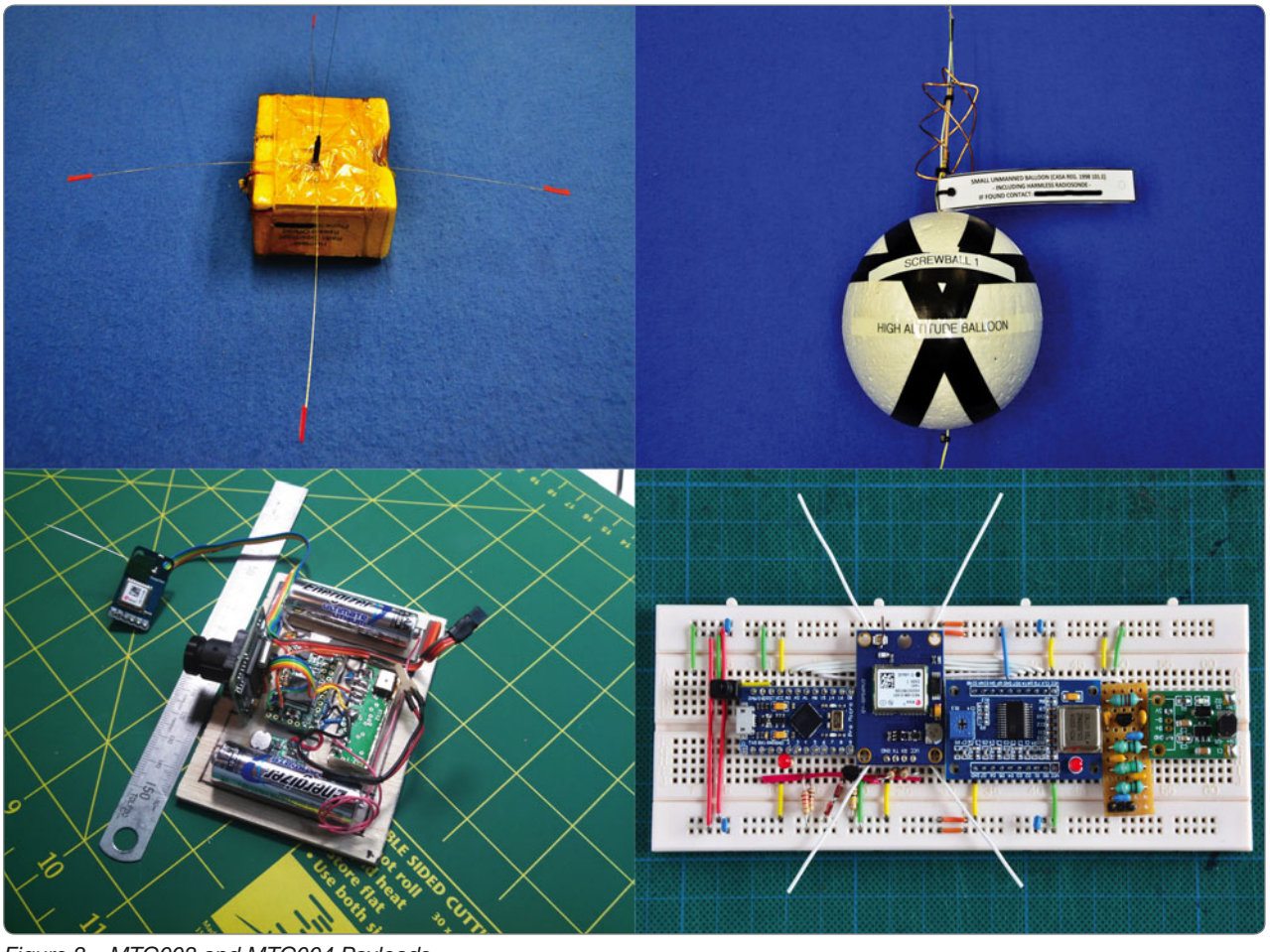


Figure 3 – MTG003 and MTG004 Payloads.

on the ground (who don't actually track anything, they just listen). Consequently, each payload has to have its own GPS module. And you have to get special GPS modules that work to 50 km for high altitude ballooning. And you have to remember to turn on this extended-altitude feature or it won't work a jot above 12 km. That's obvious, really.

Next, the payloads need to have a little on-board computer to make everything work. Both use tiny Arduino™ compatible modules – different types, of course. The computers read the GPS data, internal temperature and the battery voltage. They encode this information and send it to a transmitter module at regular intervals. MTG003 uses a 25 mW UHF FM module and MTG004 uses a 50 mW HF SSB module. All this payload electronics is powered by lithium batteries, which are chosen for their performance in the sub-zero temperatures encountered at high altitudes. The latter also being the reason why the payloads are housed in polystyrene foam blocks: One square and one round.

You would expect the ground receiving stations to be straightforward, but here again it gets a bit technical and every setup was a little bit different, introducing its own set of problems. Each listener has to receive the weak telemetry signals from the balloons. They have to decode it and send it to a server on the Internet. That means mobile antennas, receivers, GPS again, computers, software and a mobile broadband Internet connection. Two different programs, DL-FLDIGI and WSJT-X, are used for decoding and uploading. Then one server, called HABITAT, accepts the telemetry data and sends it to another server, called HABHUB, which displays the location of the balloons and the listeners together on a world map. It conveniently shows the balloon's existing and predicted flight paths. Both servers are kindly operated by the UKHAS group.

Now the servers have to be configured for each balloon prior to the launch. You have to lodge a Payload Configuration Document and a Flight Document and then you have to get the Flight Document approved by UKHAS. And you wouldn't want to forget that last step would you?

Launch day finally arrived. The MARTG launch crew was up early driving to a remote location near Bendigo, Victoria, chosen specially for its… flatness. Balloons don't always go straight up apparently and it is not good if they crash into or get

Figure 4 - MARTG Mission Control.

shielded by nearby mountains. The weather was freezing and windy… 35 km/h winds predicted. But that wouldn't affect the launch, would it? Meanwhile MARTG Mission Control, back in Melbourne, was oblivious to the weather conditions and was coordinating a dozen or so participating stations on 40 m over a hot mug of coffee.

Figure 5 – The MARTG Launch Team and The Launch.

On site, over a protective ground mat and with latex gloves on, the launch team carefully filled the two 1.6 m latex balloons with gas. Precise and critical lift calibration measurements, involving suspending an equivalent payload mass from the neck of the inflated balloon and observing its gentle lift characteristics, were summarily abandoned due to the gale-force winds - A small hiccup, only, nothing to worry about. At the same time another group was chasing a payload tumbling down the paddock after the wind had caught its parachute - It could happen to anyone. In fact it wasn't really official until the MARTG safety officer remarked: "Gee it's windy today."

So then it was time for the actual launch. It is interesting to note at this point how the phrase "let go" can be misinterpreted under these tense conditions. But, never-the-less, both balloons lifted gracefully into the sky "in exactly the same way as a brick doesn't." Back on the ground and not quite sure what to do next, the MARTG launch team settled into adjusting antennas, radios, computers and seriously tracking two separate balloons. It was a good time to install and configure windows applications for the first time, restart locked up computers and ask questions like "what does this button do?" But soon, all reported favourably: "They're going up." Although this was just confirmation of what everyone already knew; it was important that the technology knew it too. Everything had worked out perfectly and nothing had gone wrong…

But, not for long! At exactly 12 km altitude, MTG004 went silent. No signal. Not a peep. What was wrong? Was it too cold? Not likely, with all that polystyrene, the electronics had reached an alarming 53°C on the ground before launch. The last temperature data indicated a balmy 37°C. Was it the battery voltage? No that was OK too.

It was simply a mystery and bitterly disappointing. It must have crashed near the last reported position. An MARTG chase car was dispatched to investigate; maybe the signal could be picked up closer to the crash site, if it even survived that is.

Then, the disappointment suddenly turned to joy: Everyone cheered as MTG003 hit an altitude of 20 km: A new record for the MARTG. That's more than 65,000 feet. "Now it's coming down." Someone said. "Yes, it's burst." said another. Again, an MARTG recovery team headed off for the predicted landing site. But that was hours away now by car. Did someone miss a step? And it was so important to get close to the landing site and get the very last GPS fix or the payload might be lost forever. Nothing could be done. The MARTG trackers all watched as MTG003 descended. It had just dropped down below 12 km, when a miracle occurred.

The MTG004 recovery team was now driving around its last reported position. There was no signal, as before. They started driving further east along the predicted flight path. But the roads didn't line up and they were going all over the place. Then, as clear as anything, a strong JT65 transmission, bang on frequency… Now it takes a minute for a JT65 signal to be decoded. The suspense was unbearable. When it was finally decoded as an MTG004 telemetry frame, everyone saw it on the map. "It's alive!" It had just descended below 12 km. Immediately, both recovery teams were on the road headed for Lake Eildon, the predicted landing site for both payloads.

Knowing that neither recovery team would make it there in time for the landing was simply devastating. It was a major error in planning; not heading off sooner. The payloads could crash and they'd never find them. But then: A mobile phone call from an amateur radio buddy. It was his wedding anniversary. "Congratulations." He's gone away for the weekend. "That's nice." He's staying near Eildon! "You're kidding me?" And he's got his 817 with him. "Brilliant!" Half an hour later he calls back: "I can hear a strong signal on 434.650. And there is some JT65 on 10.139." Both payloads have survived the landing! When the recovery teams arrive they can decode the landing coordinates. That is if the batteries held out until they got there. It was only then they noticed that the wind had died down and it was quite warm. The MTG004 electronics would be now be critically overheating in the afternoon sun.

But luck was with them: 10 km away from Eildon the JT65 signal from MTG004 was strong enough to decode. Its precise landing site was now on the map. It had landed only 500 m from the lake, on a spur with treacherous slopes on either side. There was a dirt track along the spur – that was convenient. In fact when they found it, it was just sitting there in the middle of the track -fully operational. There was no damage what so ever... a piece of cake.

MTG003 on the other hand was down by the river on private property. How to approach this one, they wondered? "Ah hello, Mr. Farmer, yes a high altitude balloon payload of ours has crashed landed on your property. It's transmitting these pictures of your back yard, err, and we'd like to get it back, please." While they were still wondering what to say, the property owner drove up. "Yeah sure." He said. "Do you guys need a lift down there?" MTG003 had landed softly on some grass and was transmitting pleasant pictures of trees, grass, and cowpats - fully recovered. No damage… a piece of cake.

It was interesting how both balloons had followed the same path and landed only 7.5 km from each other. It was amazing that

Figure 6 - Recovery of MTG003 and MTG004.

Figure 7 - The view from MTG003.

MTG003 had gone to 20 km altitude. Maybe MTG004 had got there too, but they'll never know. The burst prediction was a bit out because the balloon lift couldn't be accurately set in the strong wind. It was within limits for the reported ascent rate, though. But the flight prediction was pretty good. They had both landed, conveniently, 20 km short of the originally predicted site which was located in totally inaccessible bush land.

The MARTG team headed triumphantly back to Melbourne. It was an amazing, rollercoaster day of emotions, successes and failures. So many things could have gone horribly wrong: The launch could have been called off due to bad weather. The lack of server flight document approval did not affect the tracking. The telemetry failure of MTG004 did not affect its recovery. And so many things just worked: Mission Control coordinated the day's events smoothly. There was just enough helium to launch both balloons. Getting some unexpected help in the right place at the right time to recover the payloads was incredible. The pictures returned by MTG003 were simply perfect. There were so many good ones without even a single error!

So who or what is the MARTG? It's not a club; it's a select group of amateurs with common interests.

Figure 8 - Who or what is the MARTG?

It doesn't have a president or a constitution. Its members meet each week to decide what the group will do next. They bring along their own projects to demonstrate new technologies and inspire new ideas. Some bring food and drinks. Everyone has a story or a joke to tell. Their backgrounds and collective skills are impressive: Some can design, some can build, some can code and some can organize. There's the guy who provides the meeting room, workshop, equipment, tools and utilities for free - the guy who can fix anything and rework SMDs. One who does web design, photography and videos. Another who knew someone who donated the helium. The list goes on. High altitude ballooning and the GSBC is just one example of this multifaceted group's activities. Reaching 20 km altitude is pretty impressive, but the group wants to go higher still and to be able to talk to the balloon - who knows why exactly?

And what after that?

Well, the MARTG is already working on its own CubeSat™: It's a complete micro satellite launch package, donated by a member of the team, with the aim of putting the group and amateur radio into a low earth orbit! It seems like the sky is no longer the limit for the MARTG.

Editorial

Continued from page 2

After the end of the afternoon Conference sessions, I invited Paul VK5PAS to join me on a trip to Mount Ainslie VK1/AC-040 for quick activation. We both made the required minimum four contacts in short time, thanks to some of the locals and Gerard VK2IO/1. It was then back to the venue for the Dinner.

Sunday was spent travelling home, but with a couple of stops for radio, of course! First stop was Livingstone Hill VK2/SM-093. The hope was to make contact with Andrew VK3ARR/ HL1ZIH activating a SOTA summit near Seoul. Andrew was on 10 m and a couple of the stations in Melbourne managed to make contacts. Unfortunately, I only heard short segments of signal from Andrew, so was unsuccessful. I did qualify the summit, including some summit to summit contacts.

I returned to the car and resumed the journey south. As I was approaching the Victoria/ NSW border, one could see clear evidence of recent rain, as had been predicted by the Bureau of Meteorology. I decided to abandon my initial plans to activate a couple of Parks and headed back to Lake Tyers State Park for a second activation.

Once set up, I tuned up on 20 m, immediately making a chaser contact with Bob VK5FO/p on a SOTA summit. After finding a clear frequency, I started calling after spotting myself on ParksnPeaks. The Europeans are certainly keen chasers/hunters of stations operating in WWFF entities – I worked 54 stations in 45 minutes. I then changed to 40 m to work 18 stations before packing up and resuming the journey home.

Overall, it was a very worthwhile trip: two Parks qualified for WWFF, one Park qualified for VKFF, three SOTA summits activated – all new Uniques for me – and lots of discussions about many things radio related. The travelling was tiring, but that is the price one must pay.

My next question to ponder: Can I get away to attend the next AGM? The proposed venue looks very attractive!

Until next month,

Cheers,

Peter VK3PF

WIA comment

Continued from page 3

Alan also knew that many privately owned amateur stations were GPS-locked, but beacons – the very things intended to support weak signal operation by providing a propagation indicator and a frequency reference – were not.

In Alan's words, *"as an active amateur radio enthusiast, I want our beacon network upgraded to GPS-locking for the benefit of all amateur radio operators in Australia..."* and he proposed that he and the WIA should share the cost of the Beacon upgrade, to a total of $5000, half provided by himself and half paid by the WIA. That project, which acted as a test-case for a new type of WIA special purpose grant, is now largely completed.

The WIA will soon be calling for submissions for the second round of WIA special purpose grants. Maybe you or your club have a good idea that would benefit amateur radio, and you need a little financial help to develop it. Whether it's as adventurous as developing a wide-area amateur mesh network, or something a little more down to earth, if it could assist the development of amateur radio in Australia we need to know about it. So, if you have a good idea, let it out from under the umbrella and share it.

Watch out in the coming months for more information about the new WIA Special Purpose Grants, and a call for submissions.

Phil Wait VK2ASD

WIA President

Review of reciprocal licencing arrangements

A review of reciprocal licencing arrangements has commenced due to possible changes in overseas amateur radio qualification requirements and their relationship to Australian amateur radio qualification requirements. This may result in a short delay in the processing of reciprocal licencing applications. Further information will appear on the WIA website when available.

The repeater you have when you don't have a repeater

John Edwards VK4IE

It was two days before Cycle Queensland where our WICEN group was providing safety communications for a 9-day bicycle ride from Agnes Waters to Coolum. Sadly, our dedicated 84 year old repeater operator felt the need for urgent medical attention and called the Ambulance. With days in hospital ahead for Al (fortunately non-life-threatening) the group was left without a portable repeater. Several alternative systems were safe back in Brisbane!

Fortunately for the first seven of the nine days the Bundaberg Radio Club kindly allowed us to use their fixed repeaters at Watalgan (439.775 - 5 MHz), The Hummock (147.800 -0.6 MHz), and Goonaneman (146.800 -0.6 MHz). These provided mostly good coverage from Agnes Waters to Woolooga, north west of Gympie.

Unfortunately, simplex would not be adequate for the 80+ km day from Widgee to Cooroy, so a solution was needed.

A stocktake showed the following equipment was available:

- Yaesu FT-8800 dual band mobile
- Alinco DR-605 dual band mobile
- 2 lengths approx. 12 metres of RG213 single shield coax cable
- Diamond X200 dual band colinear antenna
- Several 'flower pot' dual band antennas
- 9-metre pneumatic mast
- Limited other bits of hardware, mounting brackets, etc.

Being unsure that sufficient vertical separation could be obtained with the equipment available to eliminate RX desensing by the TX, or to reduce TX noise on the RX frequency, a wider split than 600 kHz was considered.

Photo 1: Complete antenna system.

Searching online ACMA licence data and WIA repeater listings suggested a 1.575 MHz split could be used without creating interference to existing stations within the area.

Why not use horizontal separation? With one mast and one battery available, with a solar panel for charging, this was not considered a practical option.

As a test, the equipment was assembled for trial on a hill in Brooyar Forest the day before it was needed. The antennas were mounted directly in line vertically with feed points about 1 metre apart, with the Diamond colinear on top, and the 'flower pot' hanging down beside the mast. Not the best for the TX antenna, but that was the best that could be done. To minimise coupling between the feed cables, they were kept about 350 mm apart, attached by cable ties to wooden dowels every 1 to 1.5 metres.

Audio feed from the RX to the TX was by UHF link, with the frequency chosen to be not at the third harmonic of one of the VHF frequencies used, and not used in the area by fixed repeaters. (Both radios have crossband VHF/UHF repeat capability.)

Did it work? Tests on Friday were encouraging with no signs of desensing, and results on Saturday between Widgee and Cooroy gave useable coverage along most of the route. And subsequent investigation showed that TX was probably operating on low power - about 5 watts!

After discussion with a colleague, once a type test officer for the Dept. of Communications (thanks Brian), rough measurements at home suggest the TX noise floor at an offset of 1.575 MHz was probably about 90 dB or more below carrier, so should not have been a problem. At the RX, desense seemed to occur with the TX level around 89 dB above the 12 dB SINAD level. The isolation between the antennas must have been therefore about 63 dB or more with the 5 watt TX. What isolation was achieved? As Rolls Royce would say, sufficient.

Photo 2: Antenna mounting and feeder detail.

Probably the most interesting part of the exercise was finding how to program the various makes and models of mobiles in use to achieve the non 600 kHz repeater split. A search of the internet was required to find handbooks for some of the mobiles (should always carry the operating manual for all radios on an exercise). All the mobiles except one allowed a memory storage of any combination of TX and RX frequency, but the procedure was sometimes a bit tricky to get right first attempt. For the other mobile, the standard 600 kHz spilt had to be changed to 1.575 MHz (potentially affecting all repeater use).

Would I do this again? No Way! Next time I'll pack the portable repeater and cavity diplexer in the car in case it is needed.

The boredom factor

John Kirk VK4TJ

Some folks reckon that my baby brother Brian V73TK has the best day gig on the planet – escorting scuba dive tourists to Bikini Atoll, the former nuclear test site, to dive the wrecks deliberately sunk there by the US Navy during test 'Baker'. Rated by many divers as 'the number one dive in the world', as dive master aboard the MV Windward he actually gets paid to do what he loves, while his passengers pay many thousands of dollars for the privilege of tagging along.

Photo 1: Brothers reunited. The author is on the left, brother Brian V73TK on the right.

Originally a trawler, the Australian-built MV Windward was later converted to be a pearling mother ship, working the oyster beds off Western Australia. With accommodation for twelve, air conditioning, and a walk-in refrigerator, it was a natural to be re-jigged as a dive tourism operator. Unfortunately, during delivery from Western Australia to the Marshall Islands, it came out second best in an argument with an Indonesian coral reef, suffering minor prop damage. While safety was never an issue, the damage was affecting top speed and fuel economy, so it's owner Indies Trader Marine Adventures Inc. made arrangements with a boatyard in Cairns to have it looked at in the off season. It made perfect sense to have the work done in Australia, as upgrades to the vessel's air conditioning system, all 240 VAC, 50 Hz, could be performed at the same time, using locally available material.

Baby brother jumped at the chance to crew on this epic 3,900 km journey largely, I think, because he had never been to Australia before, but partly, I'd like to think, because he had not seen his elder brother (me) for over 25 years! A veteran of many single-handed Pacific transits, he expressed the opinion that boredom was the biggest risk on the high seas. 'Wouldn't it be great', he mused, 'if the ship's Icom IC-M710 marine HF transceiver could be modified to include a few amateur frequencies? Unfortunately, I have looked into it, and it would seem to require specialised software and a programming cable not readily available in the Marshall Islands'.

Ha! Set me a challenge like that, and you had better get out of the way! With literally seconds left on the clock before departure time, I was able to email Brian 'the diode mod' instructions gleaned from an obscure Russian web site, tagged with a morose 'this sometimes works' caveat. 'Out of time' was Brian's terse reply. 'Will attempt the mod under way and advise'.

Attempt he did, but like the giant clams on the seabed below, the Icom steadfastly refused to render up its innards. Somewhere in its past life, it had taken a big gulp of seawater over the stern, and was corroded shut! Brian, in real life, is actually an underwater welder, and in moments like this, is prone to reverting to type. Out came a massive angle grinder and cold chisel. 'Just as well that the owner is not on board to see this' he muttered to himself as he attacked the case. The final score? Case 0, Welder 1. Slightly more delicate tools were dictated for the next phase, so Brian raided his shaving kit for a pair of toenail clippers, and performed 'the diode mod' on a pitching galley table with a four metre following swell providing turbo-assist and comic relief. The 'wet deck', aft, was certainly living up to its name this trip! I was later able to explain to Brian that 'opening up' a radio implies a completely different context in amateur radio circles, seldom involving flying molten metal or large power tools. That said, the mod worked a treat! Twenty metres was in fine form, serving up S9 signals from the moment we established our first contact until journey's end, several thousand kilometres later.

I took my duties as 'boredom factor antidote' fairly seriously,

sometimes chatting so long that Brian was forced to raid the galley for soothing refreshment for his raw throat. Our desultory QSOs began to take on a more serious tone, though, when it became apparent that MV Windward was headed straight into the track of tropical cyclone Ita! A mere fly-speck depression on the weather map when they departed Kwajalein, Ita had morphed into something far more serious, killing 17 people in the Solomon Islands, and now expected to make landfall on the same stretch of Queensland coast that MV Windward was destined for, packing eight metre seas and 300 km/h winds! Gulp! 100% guaranteed to alleviate oceanic boredom, but not in a way anyone on board could really embrace nor endorse.

Skipper Chris was receiving daily, even hourly weather updates from Australia's HF marine weather station VMC on either 12 or 16 MHz SSB, but they had left port unable to get their commercial WEFAX software to work on either of the Mac laptops on board, so were unable to access wave height/direction, projected wind speed or synoptic surface pressure charts. This landlubber was given a crash course in the interpretation of same over 20 metres, and became the eyes and ears of the crew for all things WX-related for the duration of the voyage.

Clearly, no one in their right mind takes on a category five tropical cyclone, so the plan was to assess the situation once Windward has threaded its way through the Solomon Islands, and sort of 'poked its nose' into the Coral Sea. Honiara, on Guadalcanal Island, was looking like a pretty good refuge, should they have to turn tail and run for it. A more immediate danger was at hand, however. Even tricked out as a dive boat, MV Windward still *looked* the part of a coastal trawler. A fair bit of fish catch thievery occurs in that corner of the globe, so one local long-liner, thoroughly convinced that MV Windward was out to steal his catch or his lines, or both, attempted to ram the vessel with a view to sinking it in mid-ocean with all hands! Fortunately, skipper Chris has had a fair bit of experience with this sort of thing, and adroitly deflected the ramming attempt before any real damage could be done, then high-tailed it out of the disputed zone. The Solomon Islands were suddenly looking a lot less attractive as a place to wait out a cyclone!

One of the services *not* provided by radio station VMC are indications of seismic tectonic plate activity, and resulting potential tsunamis. Thus, it fell to this landlubber once again to advise the crew that no less than three undersea earthquakes, all 5.5 on the Richter scale or higher, had been detected in their immediate area, and three corresponding tsunami alerts had been issued. Fortunately, all three alerts were quickly cancelled when the resulting waves failed to materialize, but not before AM radio stations within earshot of the Windward had had a field day with them.

The phone call that changed it all

There is a force of nature so vast, so all-encompassing that even cyclones quail before it. That force is 'bureaucracy'. What was to have been a fairly perfunctory 'tick and flick' visit from Aussie Customs, Quarantine and Immigration on arrival in Cairns suddenly morphed, with a single stroke of a government-issue ballpoint pen, into a quarantine 'dome tent' to be constructed over MV Windward for seven days, and a week-long Cairns vacation for two Brisbane-based drug-sniffer dogs . There would have been zero chance of MV Windward being back in the islands in time to meet its start-of-season charter commitments. No wiggle room, no 'get out of jail' (or, in this case, quarantine) card for vessels who set sail in good faith under the old regulations who might be already in transit. What to do?

After burning up the phone lines for the better part of a day, Windward's owner elected to divert for Port Moresby in nearby Papua New Guinea, where no such quarantine restrictions exist, and a competent boatyard, run by a German expat, was ready, willing and able to perform the work. Some measure of their desperation must have been apparent in the phone calls, however, as the price of the work was nearly double that which would have been charged in Australia. At least the cyclone issue was resolved, in a convoluted sort of way!

Papua New Guinea is by no means on anybody's top ten tourist 'must see' destinations. It has the unhappy honour of being the crime capital of the Pacific, as well as having over-achieving mosquitos that can infect you with malaria, dengue fever and Ross River fever, all with a single bite! Headhunting is still practiced by the hill tribes. If it weren't for the rich mineral resources, it wouldn't be on anybody's list, anywhere!

If you hadn't worked it out for yourselves, this is clearly no 'ham radio saves the day' piece. In fact, amateur radio's sole role thus far seems to have been to confirm that the dung heap in which you find yourself is both deeper, and larger in circumference, than you ever imagined! Thus, it fell to me to advise the crew that:

- Australia, in a move that was bound to ingratiate itself with its neighbours, had just ceased issuing 'on arrival' visas. 'So what' you say, 'they are no longer going there'.
- In a diplomatic tit-for-tat, Papua New Guinea ceased issuing 'on arrival' visas to Australians.

So Brian, travelling on a Canadian passport, would likely be embraced with open arms, but his three shipmates, all Aussies, would

Photo 2: The MV Windward' on the hard stand at Port Moresby.

be threatened with immediate deportation. This whole 'incredible journey' was beginning to resemble a bad remake of the Tom Hanks flick 'The Terminal', itself loosely based on the real life experiences of Mehran Karimi Nasseri, who spent 17 years in the departure lounge of Charles de Gaulle International Airport in a nightmarish 'can't go forward, can't go backwards' farcical diplomatic catch-22.

By this point, deportation from the pest-hole that is Port Moresby was sounding like a mighty fine option to MV Windward's Aussie deck crew, but of course, the captain must go down with his ship, so, miraculously, overnight, Windward's prop problems worsened to a point where invoking the 'force majeure' clause, as well as the unspoken hospitality of all nations (except Australia, apparently) to stricken ships at sea was not only prudent, but absolutely necessary to the well-being and safety of all aboard.

It also fell to me to advise the crew that Australian media were abuzz with news of heightened acts of piracy along the Papuan Peninsula, which MV Windward would have to traverse to reach their improvised new destination. 'Jah', confirmed the German boatyard owner, 'two incidents in two weeks'. 'This just keeps getting better by the minute', the crew thought.

The skipper prudently elected for a course well out to sea, below the optical horizon, with a hard 'helm to starboard' course correction directly abeam Port Moresby, which paid off, as no instances of piracy at all made it into the ship's log, apart from the afore-mentioned legalised piracy of the boatyard.

Once MV Windward was safely up on the hard stand at the boat yard, Brian happened to give a blinded off through-hull fitting a bit of a smack. It promptly fell off in his hand! If Windward had, in fact, had to endure cyclone Ita, this rusted fitting would almost certainly have been their undoing.

'Don't leave home without it' applies to WEFAX software as well as credit cards, Brian advises. He has vowed to spend his days in PNG as a sort of high-priced security guard aboard MV Windward, assuring that that which is nailed down stays nailed down, installing the fine freeware amateur radio software 'FLDIGI' which alleges to understand Macs.

So, it should abundantly clear from the above, that, in between acts of four metre following swells, intentional ramming, tsunami alerts (times three), cyclones, international diplomatic jousting, acts of God and piracy, potential deportation, and sudden holes appearing in the side of the vessel, boredom is a matter of serious concern on long ocean voyages, and must clearly be factored into one's plans. Amateur radio comes highly recommended as the appropriate antidote.

Photo 3: The MV Windward. Back at work.

Andrew Couper Jnr Spark Station "XQM"

Michael J. Charteris VK4QS ~ VK4-"XQM"

Spark Station "XQM"
Mareeba, North Queensland,
7th February ~ August 6th 1914

Andrew Couper Jnr (10th July 1897 ~ 7th July 1958) was a pre-World War I licensed Queensland amateur who served in the Great War of 1914 ~ 1920

I would like to acknowledge and thank Mr. Ron Goodhew VK4EMF for a good portion of the biographical details on Andy Couper Junior. Ron has undertaken a lot of hard work and research into Andy's life, and as such I am indeed indebted to him for his time and article "Northern Sparks'. My further research has been attained from Andy's WW1 Service record and other sources. *I have taken up the call sign VK4XQM on May 15th 2014, in honour of Andy Couper Jnr being a 1914 licensed Queensland amateur radio operator: 96 years to the day that Andy stepped ashore in Australia upon his return from the Great War.*

If by chance, anyone reading this article has any QSL cards from Andy Couper as 4BW, OA4BW, or VK4BW, and wishes to part with them, please contact me via QRZ.com, as I would dearly love to hear from you.

Photo 1: Andrew Couper XQM (RHS) and friend Marcus Brimms XQA (LHS) outside of Couper's shack c1914. (WIA Archive).

Andrew Couper was born on July 10th 1893, in Mareeba, North Queensland. His parents, Andrew and Agnes, owned the Vulcan Foundry, also in Mareeba. One imagines that with such a family business, that young Andrew jnr would have indeed been well educated. Such a speculation is well founded for as early as 1909, at the age of 16 yrs, Andy was involved with Wireless Experimenting, based on accounts of Old Timers in the Mareeba area. There is also documentary evidence from Andy himself, held by Ron Goodhew, that Andy was experimenting with Wireless whilst employed as a Shift Electrician at the Chillagoe Smelters in 1910. The experimenting was carried out at the room where he was boarding, after work one imagines. The year 1910 also saw the establishment of the Wireless Institute of Australia, as this new-fangled Wireless craze enveloped experimenters all over the country.

It would be some four long years before Andy officially received an Amateur Radio Experimental licence. So it was on January 31st 1914 that the Post Master General's Dept. received the sum of 1 Pound, 1 Shilling for a fee for a Radio Licence from Andrew Couper Jnr, Vulcan Foundry, Mareeba, Qld. Some months later in April 1914, the Department issued Andy with the call sign XQM. The meaning of which was "X" for Experimental,

Photo 2: XQM Spark Station early 1914. (WIA Archive).

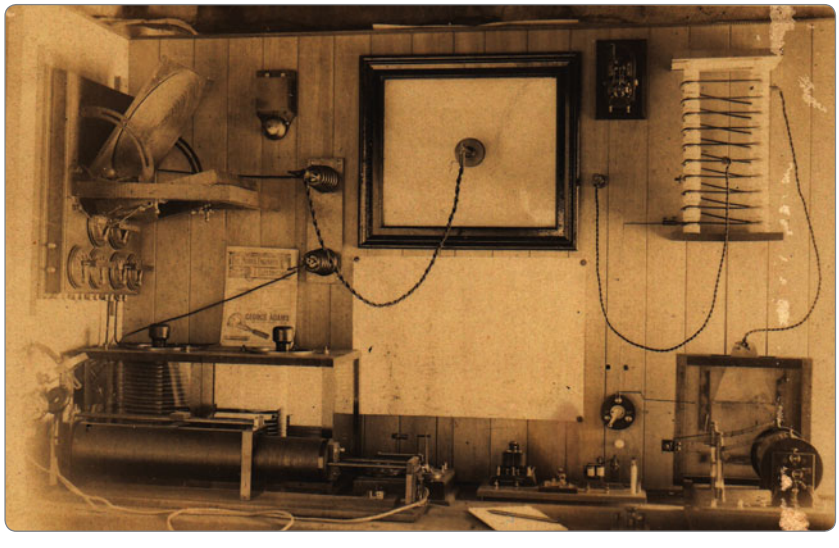


Photo 3: Andy Couper taken just before he went to WWI. (Ron Goodhew).

"Q" for Queensland, and "M" as the listing goes for alphabetical issue. Sometime earlier the Dept. also issued the call sign "XQA", to Andy's good friend and fellow Wireless Experimenter, Marcus Brims. In fact, Marcus Brims listed Andy Couper as the person to whom he wished to communicate by way of spark transmission.

Andy's station XQM consisted of an 8" (203 mm) helix Inductance, and a 0.002 Variable Condenser excited by a solid spark coil and gap. The power supply for this station was by way of battery power, being 8 Helleson dry cells. The transmitter was fed into a 100 foot (30.5 m) long wire, with the receiver using a Coherer detector. (This info thanks to "Halcyon Days" by Mr Alan Shawsmith VK4SS, SK). Being an electrician by trade, Andy's qualifications saw him build a home brew electric lighting plant that was backed up by Leclanche cells and Helleson dry cells.

For all the radio amateurs in Queensland, their reign of sparks into the ether survived until August 6th 1914. By then the war clouds were gathering all over Europe as gas lights were going out all on the eve of the Great War. August 6th saw the end of amateur radio in Australia as the Government issued a proclamation for all radio activity to cease due to the declaration of war.

The Australian Government offered England an initial 20,000 men under arms as well as its fledgling Royal Australian Navy, created in 1911. The Prime Minister pledged to fight to the last man and the last shilling against the German aggressor. Patriotism and a belief in fighting for the Mother Country swept through the nation. Everywhere there sprung up recruiting depots, while men travelled by whatever means necessary to join up. No-one wanted to miss out on this, the great adventure of a lifetime.

Andy Couper was no different. Being, a patriotic young man, he answered the call and offered himself for enlistment into the Australian Imperial Force in late 1914. Unbelievably he was rejected on medical grounds, as so many where for the slightest of reasons. Only the best and fittest, the flower of Australia's youth would be selected to be harvested on the rocky slopes and gullies of the bloody Gallipoli Peninsula. Andy, no doubt disappointed, returned to working as an Electrician in Chillagoe.

Then some eight months later on April 25th, 1915 the ANZACs landed at Ari Burnu on the Gallipoli Peninsular. Not France, as they had all thought would be their

Photo 4: WWI Service medals. (Author).

battleground, but Turkey, the former British friend, now ally to Germany. It was here at Gallipoli that more than 8,000 Australians paid the supreme sacrifice in the name of freedom. The papers of the day promoted gallantry, guts and victory and rightly so, there was that a plenty. The papers also listed the casualty reports for the many of whom would never return home to Australia, or their waiting families and loved ones.

The so called "Great Adventure" had now received a severe reality check and as wounded soldiers returned home to their families. The public's enthusiasm now waned to the point where recruitment levels fell seriously low. It was then decided to drop the standards ever so slightly to allow such men who had been initially rejected to now be gratefully accepted and enlisted. Despite seeing the wounded and broken returned men of his town return from the war, Andy was not deterred and applied again.

In many ways it almost took a greater consciousness to now enlist after having seen the realities of war and broken men first hand as they returned to try and rebuild their shattered lives.

This time it was with open arms that the Army enlisted him at Townsville on October 16th 1916. It was now 7225, Private Andrew Couper, 23 years of age, 5 ft11in (1.8 m) high, with dark brown hair, brown eyes and dark complexion who stepped forward in the khaki of the Australian Imperial Force. Andy was initially allocated to the 11th Depot Battalion, from his time of enlistment till November 6th 1916. From here Andy travelled by train to Enoggera in Brisbane to be officially signed up by a Lieutenant Saunders, on December 1st 1916. Private Couper was then allocated to the 18th Reinforcements of the 26th Batallion, AIF. For the next three months Andy underwent military training, including marching drill, Army command structure, as well as rifle and bayonet drill.

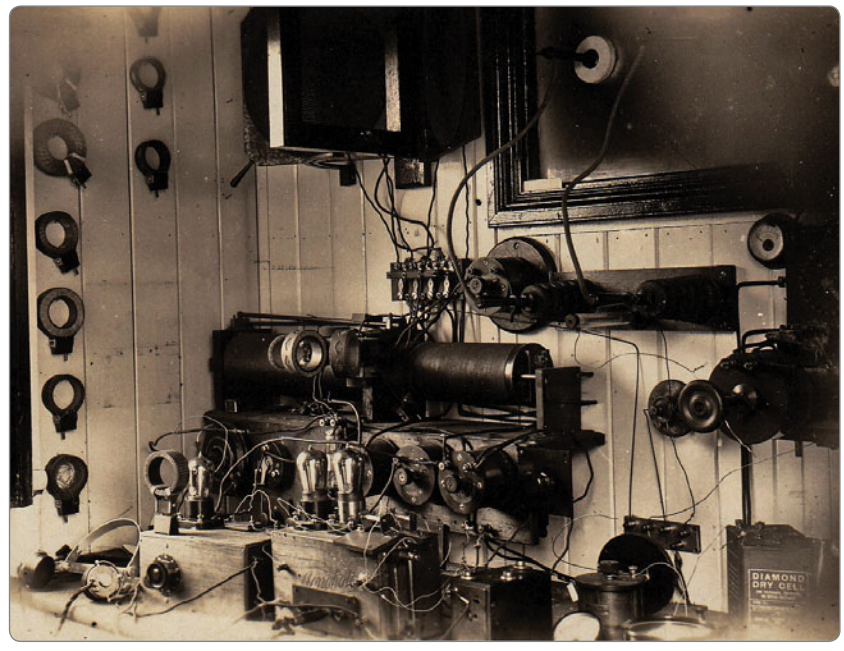


Photo 5: Part of Station 4BW early 1920s. (WIA Archive).

On January 19th 1917, Andy was further transferred to the 24th Reinforcements of the 15th Battalion. From here the reinforcements travelled to Sydney where they embarked aboard the SS Ayrshire on January 24th 1917, bound for England. For almost three months these gallant young volunteers of the Australian Imperial Force sailed the high seas to a fate many if any could never imagine on the fields of France and Flanders. After disembarking at Devonport, England on the 12th of April 1917, they marched into the 4th Training battalion, located at Codford Camp. The next three months was to see Private Couper undertake some of the most intensive battle training he had ever experienced in preparation for going to the Front. So it was on July 9th 1917, Private Couper and the men of the 4th training Battalion embarked at Southampton bound for France. Upon arrival the troops were allocated to camp and given two and a half weeks further training, including a little time to acclimatize to France. On July 27th 1917, Andy finally reached the front to be taken into the strength of 45th Battalion AIF.

Every moment for the past nine months since he had enlisted to fight had led up to this point for Andy. Now first-hand, he was to experience the mud, the trenches, the bombed out cities and towns. That was apart from the massive bombardments of the German artillery. Add to this the bombing and strafing by German aircraft, let alone the Zeppelins that droned the skies above. This of course went hand in hand with the killing, wounding and maiming of all around him on both sides.

Death lingered ever present along with the large rats and the stench of bodies of his fallen comrades. One can only try to imagine what his first impressions of this charnel madhouse called the Great War could have been. The average mortal might well have gone stark raving mad, but these gallant men stuck it day in day out, every bloody day of the war until they were either killed or wounded or the war ended. This is a very bland description gleaned from books and first-hand diary accounts of soldiers who endured this nightmare. The same soldiers mentally carried this nightmare for the rest of their lives apart from any physical wounds. For many it was

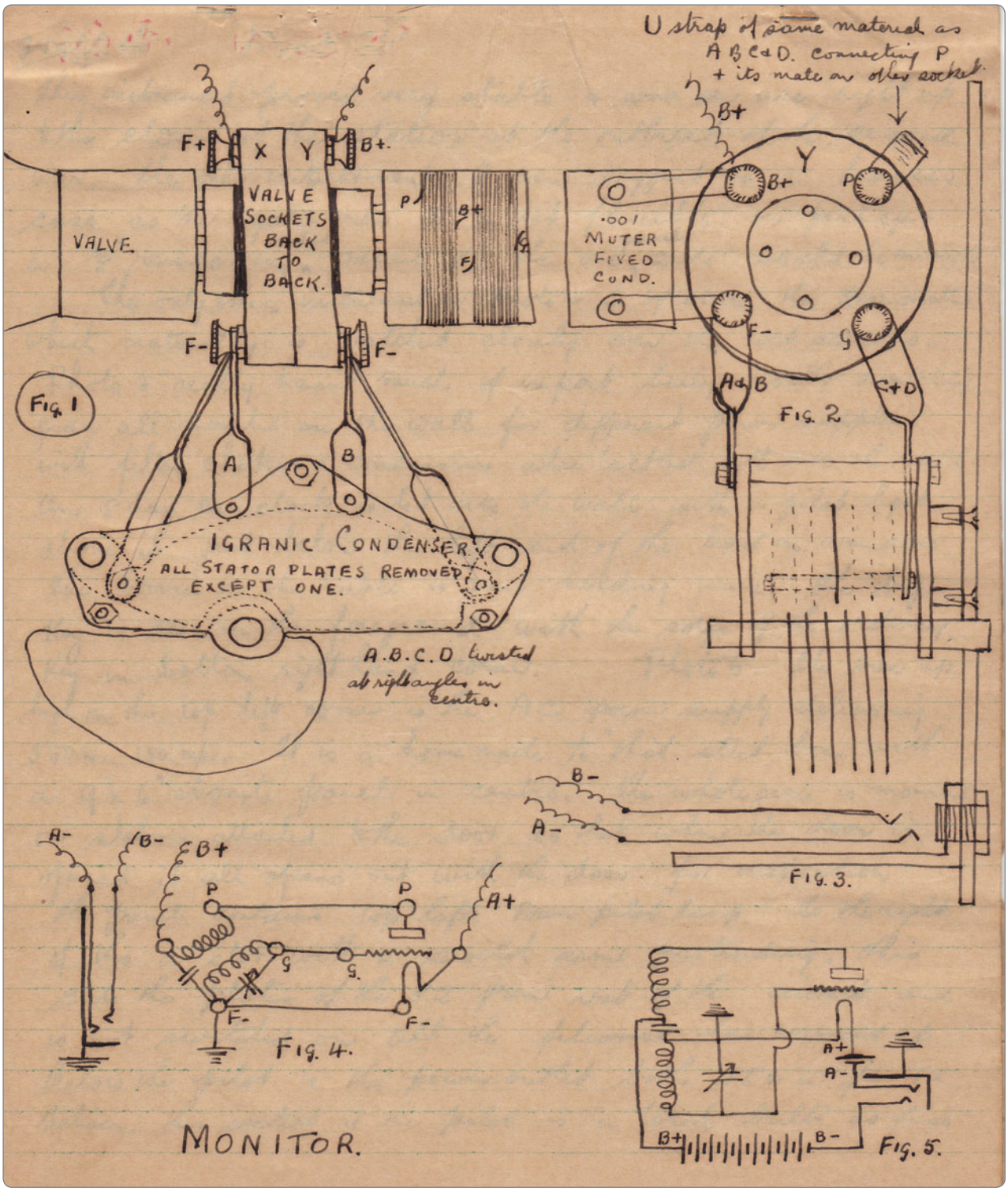


Photo 6: Sketch for Station Monitor by Andy Couper 4BW, 1928. (WIA Archive).

too much and suicide the only relief.

In July 1917, the 45th Battalion AIF was located around Ypres in Belgium, and by good timing, Andy and the reinforcements had arrived just in time for the kick-off of the **Third Battle of Ypres**, otherwise known as the **Battle of Passchendaele.** This was one of the greatest disasters of the Great War, where men fought from low ground to the German positions on high ground through knee to thigh deep mud. It covered the period from July 31st to November 10th

Photo 7: Home made wind generator mid 1930s. (WIA Archive).

1917. Private Couper's WW1 Army service papers "On Line", show that he joined the 45th Battalion in the field on July 27th 1917. He had been in the line for just twelve days before taking part in an attack on the German trenches.

From the very brief description given in his Army service papers, I dare speculate that the men of the 45th attacked the German lines. I reckon that at some point the attack was driven back and the order was given to retire, upon which the men of the 45th turned around and retraced their steps back to their own trenches, perhaps only 100 yards distant. It would more than likely seem that it was in fact on this return journey that Andy was shot in the back by the German troops opposing. The entry for August 8th 1917 states on his service papers quote, "*Private Wounded in action 8/8/17".* The following two entries read, "Private admitted Casualty Clearing Station, 8/8/17, then to the 4th Australian Field Ambulance, 8/8/17". Next on 23/8/17," Private admitted War Hospital with Shrapnel Wounds to the Back & Kidney, Serious, Northern Flanders". This was followed by, "Private embarked aboard Hospital Ship "Princess Elizabeth" for transfer to England (Gun Shot Wound to the Back 23/8/17". It does not get more descriptive than that and leaves plenty for the imagination, apart from the fact that he would have been covered in mud and blood and in a terrible amount of pain.

It was to be a gruelling four months that followed as Private Andrew Couper underwent surgery and recuperation. His family back in Australia were notified that their son had been seriously wounded in battle. A further series of telegrams from the Army to Andy's parents informed them of his steady progression back to health from his terrible wounds. Finally on January 21st 1918, Andy left hospital well enough to return to the Army at No 1 Command Depot, at Sutton Veny.

Ten days later on January 31st 1918, Private Couper gathered up his gear to return home to Australia aboard the Transport "A8" SS Osterley. A further ten weeks passed on the high seas before Andy stepped ashore in Sydney on April 15th 1918 as a Returned Soldier of the Great War. From Sydney he returned home to Mareeba by train to reunite with his family for the first time in sixteen months.

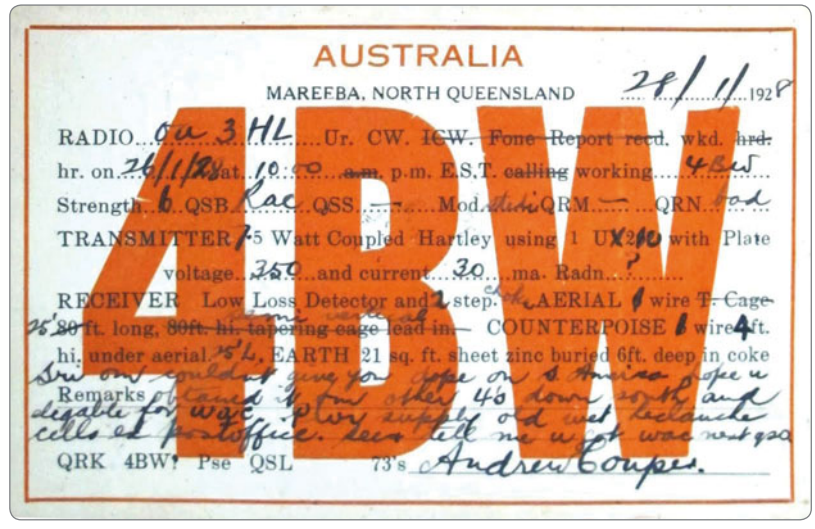
You the reader can surely imagine how relieved and excited his parents must have been, as many of the young men in the area never returned home from the war. Officially Andy was discharged a month later on May 17th 1918.

"Cairns Post, 26th July 1918, Page 4 article, "BACK TO MAREEBA", Lieut Percy Meredith is back in Mareeba and has been welcomed by many of his old friends. He and the other two Mareeba boys Andy Couper and Joe Masterson were in much evidence at Saturday's Red Cross Day. The D.O.B gave them a public welcome in the School of Arts on Wednesday night, at the same time farewelling Henry Lawrence and Roy McLeod. The evening was just an evening of joyful reunion for those who have returned war-worn, and a happy remembrance for the two departing boys to carry with them

Photo 8: VK4BW 1950s. (Ron Goodhew).

and look back to when they too are doing their bit". ("Trove Website")

For his gallant efforts against Germany during the Great War, Andy was later awarded in the 1920s, the British War Medal and the Allied Victory Medal. On November 11th 1918 this war to end all wars finally came to an end as the guns fell silent across Europe. Many who returned could not handle the nightmares and turned to alcohol to dull the memories. This inevitably led to the breakdown of the family unit that had existed before these young men went to war. Andrew Couper seems to have managed to hold it all together, and moved on from his war experiences to marry Mary Ryan, herself a widow. This union saw the birth of a baby girl to complete the family unit. Andy was a Christian gentleman who would help anyone. His involvement in his local church saw him conduct the Methodist Choir. If that was not enough for this WW1 veteran, Andy managed to find time to visit the local hospital every Sunday, saying a few words to every patient.


AUSTRALIA

MAREEBA, NORTH QUEENSLAND 26/1/1928

4BW

RADIO Cu 3 HL Ur. CW. ~~ICW. Fone Report recd.~~ wkd. ~~hrd.~~

hr. on 26/1/28 at 10:00 ~~a.m.~~ p.m. E.S.T. ~~calling~~ working 4BW

Strength 6 QSB Rac QSS — Mod. QRM — QRN Bad

TRANSMITTER 75 Watt Coupled Hartley using 1 UX210 with Plate

voltage 350 and current 30 ma. Radn.

RECEIVER Low Loss Detector and 2 step. AERIAL 1 wire ~~T. Cage~~ 25' ~~80~~ ft. long, ~~80ft. hi. tapering cage lead in~~ COUNTERPOISE 1 wire 4 ft.

hi. under aerial 25'L. EARTH 21 sq. ft. sheet zinc buried 6ft. deep in coke

Remarks [illegible]

QRK 4BW? Pse QSL 73's Andrew Couper.

Photo 9: 4BW 1928 QSL Card. (WIA QSL Collection).

In the early 1920s amateur radio was restored to the public. To partially quote from one of Andy's letters, *"On their return I was highly considered for the result of my labours, and the Sectional Engineer, (also an ardent ham), said it was time I applied for a licence again. At the time I did have thoughts of giving it away altogether as I had married in 1923, (Mary Ryan) & was getting a home together in another part of the town, and the station was still at the old home. However the engineer persuaded against dropping it & thus I applied again for a license and A.O.P.C Ticket No 71, dated 21-2-1925 started me off on the next leg of my Radio experiences. And now as I had been persuaded to carry on there was nothing for it but the*

Photo 9: 4BW 1928 QSL Card. (WIA QSL Collection).

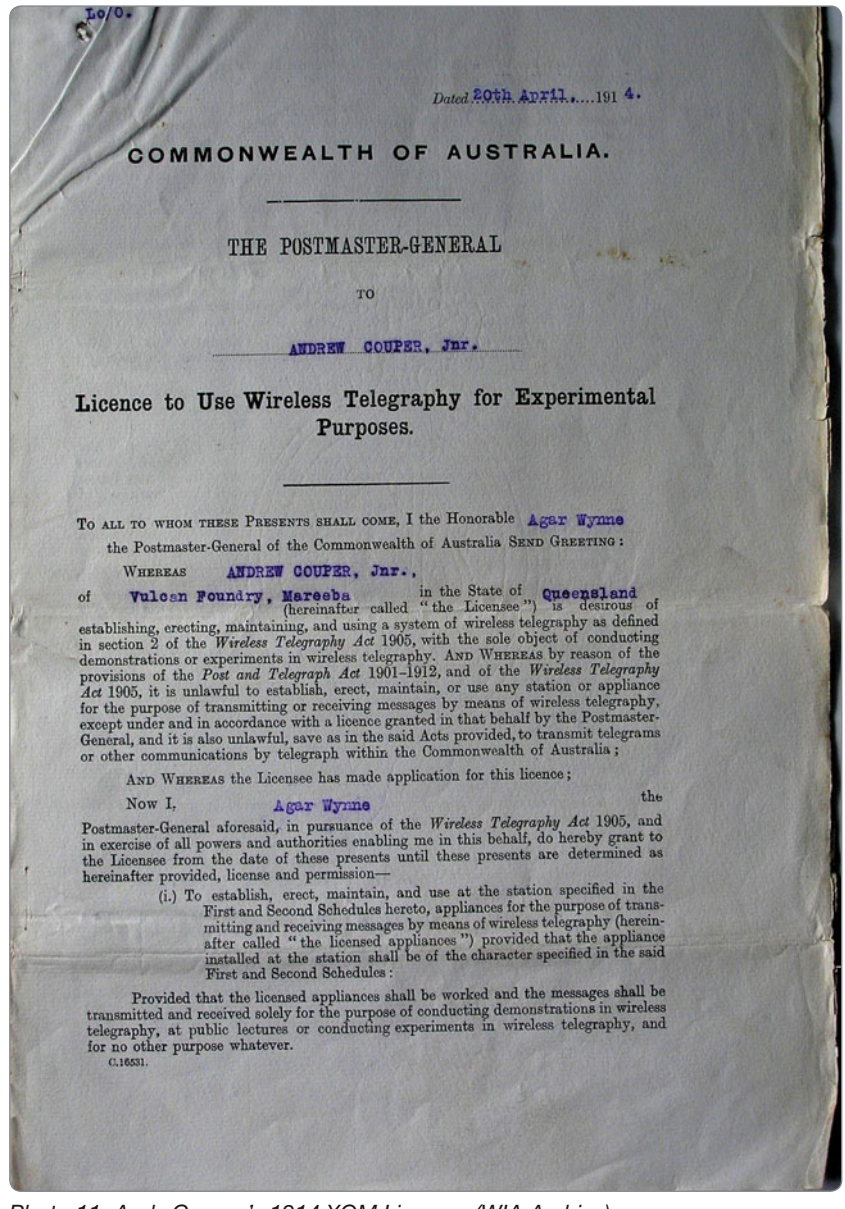
station would have to be shifted to my own backyard. As I was so busy at the time getting a home and property in order it proved a major operation and it was late in 1926 before I began to do anything over the air." Andy was issued with the call sign 4BW. By now a married man, Andy and Mary established a home adjacent to the old Mareeba show grounds, near the present hospital. The house, a high set classical Queenslander in what is now Dunlop Street, was sadly demolished around 1995. Beside the house were two building that could be mistaken as "dunnies", but in fact they housed Andy's radio station, while the other building contained some two hundred and fifty Leclanche cells. Of all things the inventiveness of Andy Couper saw these cells charged by way of the wind driven generator made from a Dodge starter motor. One of these so called "dunnies" had been Marcus Brims shack in 1914.

Some years later in 1927 disaster struck in North Queensland in the form of a devastating cyclone. All communications were cut, and Andy's antenna system was destroyed. Once again it was the patriotic and civic minded Andrew Couper who stepped forward to offer his services, and that of his amateur radio station.

Cairns Post, Feb 21st 1927: On Saturday morning the 12th instant, Mr Andy Couper, a radio experimenter here, offered his assistance, and was asked by the postal authorities if he could get in touch with any Brisbane station. Mr Couper's Wireless station mast had been blown down in the cyclone, but by working Saturday in spite of the rain he was able to get a portion of his mast and a temporary aerial rigged by 8 pm. A little later he was in communications with Mr. Leighton Gibson, and experimenter in Brisbane whose call sign 4AN, Mr Couper being 4BW. ("Trove Website")

Some 5000 words of press and official telegrams were transmitted between the two amateurs before official communications were fully re-established. The work these two amateurs did to restore communications between Brisbane and Mareeba was later publically acknowledged, and both men were heartily thanked for their efforts. When not operating his amateur station, Andy and his brother Charlie ran the local family owned business called Vulcan Foundry. The machines at the foundry were driven by a kerosene engine driving a horizontal shaft which in turn drove many things including a DC generator, long before power was connected to Mareeba in about 1936. The population of Mareeba were indebted to the foundry as it provided charging for their Wet Cells. Such was Andy's skill in radio and electricity.

During WW2, Andy Couper again gave fine service for his country. Not by way of the armed forces this time, but rather in the form of his many engineering skills and abilities. His services were availed of many times by the



Lo/O.

Dated 20th April....191 4.

COMMONWEALTH OF AUSTRALIA.

THE POSTMASTER-GENERAL

TO

ANDREW COUPER, Jnr.

Licence to Use Wireless Telegraphy for Experimental Purposes.

To all to whom these Presents shall come, I the Honorable Agar Wynne the Postmaster-General of the Commonwealth of Australia Send Greeting:

Whereas ANDREW COUPER, Jnr., of Vulcan Foundry, Mareeba in the State of Queensland (hereinafter called "the Licensee") is desirous of establishing, erecting, maintaining, and using a system of wireless telegraphy as defined in section 2 of the *Wireless Telegraphy Act* 1905, with the sole object of conducting demonstrations or experiments in wireless telegraphy. And Whereas by reason of the provisions of the *Post and Telegraph Act* 1901–1912, and of the *Wireless Telegraphy Act* 1905, it is unlawful to establish, erect, maintain, or use any station or appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy, except under and in accordance with a licence granted in that behalf by the Postmaster-General, and it is also unlawful, save as in the said Acts provided, to transmit telegrams or other communications by telegraph within the Commonwealth of Australia;

And Whereas the Licensee has made application for this licence;

Now I, Agar Wynne the Postmaster-General aforesaid, in pursuance of the *Wireless Telegraphy Act* 1905, and in exercise of all powers and authorities enabling me in this behalf, do hereby grant to the Licensee from the date of these presents until these presents are determined as hereinafter provided, license and permission—

(i.) To establish, erect, maintain, and use at the station specified in the First and Second Schedules hereto, appliances for the purpose of transmitting and receiving messages by means of wireless telegraphy (hereinafter called "the licensed appliances") provided that the appliance installed at the station shall be of the character specified in the said First and Second Schedules:

Provided that the licensed appliances shall be worked and the messages shall be transmitted and received solely for the purpose of conducting demonstrations in wireless telegraphy, at public lectures or conducting experiments in wireless telegraphy, and for no other purpose whatever.

C.16531.

Photo 11: Andy Couper's 1914 XQM Licence. (WIA Archive)

various troops stationed near and around Mareeba. On one particular occasion, the Americans sent one of their men from the large military hospital at Rocky Creek with a drawing of what they wanted. The item was a sensitive Thermometer to check the temperature of various drugs being used. Andy got to work on the Thermometer and produced it with accuracy to within half of a degree Fahrenheit. Such was the nature of this kind hearted Christian man that he would not charge for his work. Post WW2 Andrew Couper senior passed away, which saw Andy and his brother Charlie sell up the Foundry. Once again with his vast knowledge and engineering skills, Andy landed himself a position at the local hospital as a Radiographer, installing and operating the first and subsequent X-ray machines. Sadly Andy was badly burned in the early 1950s whilst working the X-ray machine, when a petrol blow-lamp he was using exploded.

Such was the vision and great scientific understanding of this man Andrew Couper Jnr, that he was indeed quoted as saying, "That one day a system of fixed satellites would be developed, enabling global communications of a type beyond the imagination of the average person at this time". On October 4th, 1957, prediction became reality as the Soviet Union launched Sputnik 1, the world's first artificial orbiting satellite. Sputnik was received by many amateurs here in Australia and around the world. I can only wonder if Andy Couper VK4BW heard it too on one of his receivers. What greater joy could there have been to see your prediction come true in your own lifetime, and be able to actually receive Sputnik 1's signals over a 22 day period before it crashed back to earth.

Sadly on July 7th 1958, just three days short of his 65th birthday, Queensland lost one of its most able sons when Andy Couper passed away. From Spark Station XQM in 1914 to VK4BW, this Life Member of the Wireless Institute of Australia, Queensland Branch, was a true wireless pathfinder. Andrew Couper left behind a legacy of good deeds and Christian fellowship to all who were fortunate enough to cross his path. His life spanned the birth of wireless to the creation of satellites in space.

References

- "Northern Sparks", by Mr. Ron Goodhew VK4EMF.
- WW1 Service Records of, 7225, Private Andrew Couper, Australian Imperial Force.
- TROVE Website: Cairns Post, 26th July 1918, Volume IV, by C.E.W. Bean.
- "Halcyon Days" by Alan Shawsmith VK4SS, SK.

About the author

- Ex- Royal Australian Navy Amateur Radio Operator VK4JDW whilst serving in the RAN
- *Mikevk4qs@gmail.com*

Product Review

INAC AH-1430 Loop Antenna

Reviewed by Peter Hartfield VK3PH

Photo 1: The loop backyard portable.

When I was asked by the editor if I had some time to review a magnetic loop antenna, I jumped at the opportunity. Where I'm located in Lysterfield Victoria on the edge of Melbourne's eastern suburbs, the noise floor on HF is generally prohibitive (S9+). I heard that loop antennas are just the thing for a lower noise threshold and they are also good value where you have limited space available (both positives at my location).

This loop was supplied by Frank Woolfe of Long Distance Telecommunications in Port Augusta South Australia. These products are sourced from INAC in Spain where they have a range of loops to suit different band and power requirements. Frank shipped me an INAC AH-1430 which is designed for the 20, 17, 15, 12 and 10 m bands (14 to 30 MHz).

When he advised me that the loop had shipped, I waited with careful anticipation. Within 2 days the box arrived, it was unpacked and I had it setup in the backyard on a portable aluminium tripod, see Photo 1. The package dimensions are 950 x 800 x 150 mm and the mass approximately 4.5 kg.

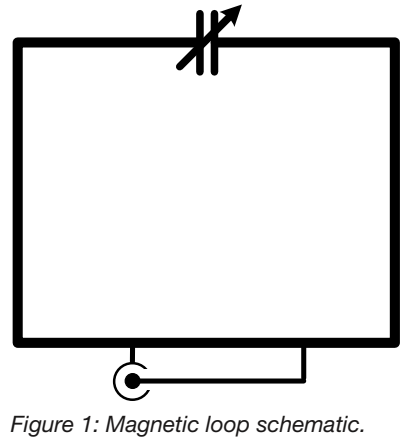


Figure 1: Magnetic loop schematic.

How loops work

Before I get into the analysis, it's prudent to provide a brief overview

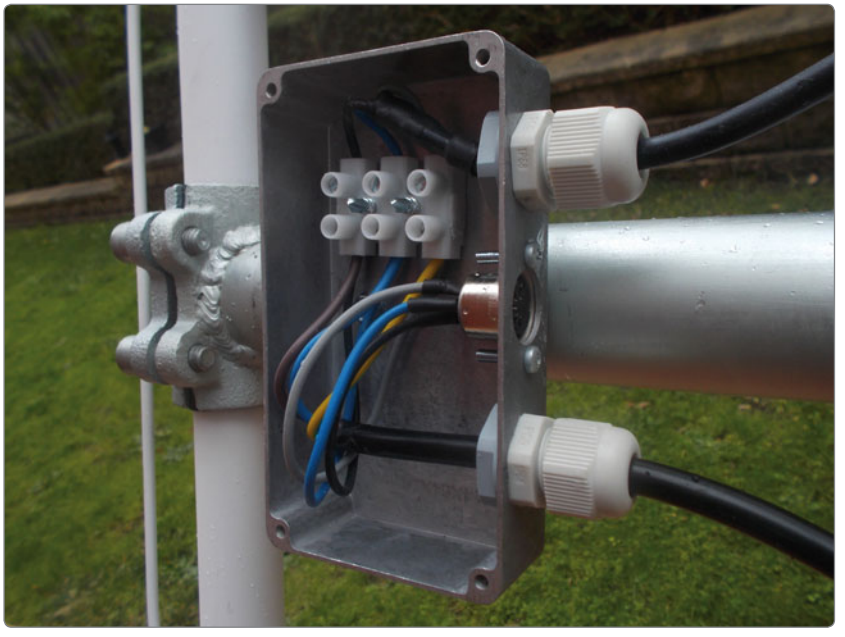


Photo 2: The connection box.

of how these loops work. A loop antenna is built using a loop of wire, tubing or other type of electrical conductor. There are two distinct types of loop design; the small loop (or magnetic loop) with a size much smaller than a wavelength and the resonant loop with a circumference approximately equal to the wavelength.

The shape and size of the magnetic loop is not particularly important although most are circular, hexagonal or square and less than one tenth of a wavelength in circumference. See Figure 1 for a schematic. The variable capacitor at the top of the loop is used for tuning and in the case of the AH-1430, is controlled by a remote servo-motor mounted inside the plastic coupler box. The coaxial feed-line is connected to the loop via a gamma matching rod.

The Q of this antenna is very high. This means that it can only operate efficiently over a narrow frequency range (5-10 kHz typical). Almost every time you change frequency, you will have to change the setting of the variable capacitor. This is done by peaking the capacitor for maximum received noise at the desired operating frequency. If the reflected power is high, the capacitor is tweaked until it's acceptable.

The vertically oriented antenna's figure 8 shaped radiation pattern maximum is in the plane of the loop with nulls at right angles to the plane of the loop. Vertical oriented loops function perfectly well close to ground level. When horizontally mounted, the antenna pattern is omnidirectional with nulls straight up and straight down. This orientation is very uncommon.

Construction

The INAC AH-1430 is constructed from aluminium, copper, steel and PVC plastic. The main loop is constructed from 20 mm copper tubing with a steel mounting bracket provided (with 40 mm clamping diameter). The variable capacitor and servo-motors are encased in a cylindrical PVC housing at the top of the loop. The tuning control cable is connected via a die-cast box and the cable to the servo-motors is run inside the copper pipe.

The coaxial feed-line is connected via a PL259 socket mounted at the base of the copper tube. The kit came with a 5 m control cable with 5 pin male DIN connectors on each end. This is sufficient for portable use however, for a more permanent installation a longer cable will be required. I wired a 3 conductor cable, 10 m in length into the control box via the plastic ferrule provided. INAC supplied a terminal block with 3 core cable connected to a 5 pin male DIN plug for this purpose.

The only issue I see with this design is that the 5 pin DIN socket on the connection box is exposed to the weather. I suggest that INAC should have provided a rubber seal to cover the DIN socket for a more permanent installation even though it's on the bottom of the box. See Photo 2.

The loop dimensions are 79 x 63 cm, an overall height of 98 cm with the mounting bracket installed. INAC provide the hex key required to install the bracket.

Specifications

The specifications for the loop vary depending on the model, the one I was provided (AH-1430) has the following electrical specifications (according to the manual):

Frequency range: 10.000 MHz to 29.900 MHz
Input impedance: 50 Ω
SWR: 1.2:1

Frequency	Power	Bandwidth (-3 dB)	Gain over Dipole
10 MHz	140 W (PEP)	60 kHz	-5.7 dB
16 MHz	140 W (PEP)	90 kHz	-3.8 dB
22 MHz	160 W (PEP)	120 kHz	-2.1 dB
24 MHz	180 W (PEP)	140 kHz	-1.8 dB
30 MHz	210 W (PEP)	160 kHz	-0.9 dB

The above conflicts with the specifications given on the INAC web site which say that the AH-1430 has the following electrical specifications:

Frequency range: 13.800 MHz to 30.000 MHz
Input impedance: 50 Ω
SWR: better than 1.5:1
Power: from 140 W to 210 W depending on the frequency
Gain: from -0.9 dB to -5.7 dB depending on the frequency

Manuals

I found the manuals a little difficult to read as some of the key points get lost in translation. They do however, provide the basic information you need to get the loop installed and working. There are two manuals; one for the loop and the other for the loop control unit.

The loop manual provides topics such as a description of the antenna, most notable features (including the specifications), where to place the antenna, how to adjust the antenna and standard warranty information.

The loop control unit manual provides the technical specifications (see below), circuit diagram, component layout diagram and discussion about various servo-motors.

The technical specifications for the loop controller are as follows:

Supply voltage: 9 to 15 VDC
Current: 1.5 A at 13.8 V
Fuse: 3 A
Main drive rotation: 270°
Operation time: 3 s from 0 to 180°
Servomotor rotation: 190°
Unit size: 70 (W) x 45 (H) x 125 (D) mm

Initial testing

The initial testing was performed with the loop mounted on an aluminium tripod in the backyard approximately 1.5 m off the ground (see Photo 1).

I used a YouKits FG-01 (1 to 60 MHz) antenna analyser to take the following measurements:

		Test 1		Test 2	
Frequency	**Band**	**SWR**	**Impedance**	**SWR**	**Impedance**
32.200 MHz		1.3:1	62 Ω	1.3:1	64 Ω
29.900 MHz	10 m	1.4:1	55 Ω	1.2:1	56 Ω
28.500 MHz	10 m	1.2:1	58 Ω	1.3:1	56 Ω
24.900 MHz	12 m	1.4:1	33 Ω	1.5:1	30 Ω
21.200 MHz	15 m	2.1:1	83 Ω	1.8:1	78 Ω
18.100 MHz	17 m	1.7:1	70 Ω	1.3:1	50 Ω
14.100 MHz	20 m	1.3:1	64 Ω	1.6:1	44 Ω
12.000 MHz		1.7:1	68 Ω	3.8:1	127 Ω

The SWR can generally be improved on most frequencies however, I found both the course and fine adjustment to be rather sensitive. The frequency range of the loop supplied is 12.000 to 32.200 MHz with an SWR of better than 1.5:1 achievable on all of the amateur bands (10, 12, 15, 17 and 20 m).

Photo 3: The 20 m band measurement.

Photo 4: The 10 m band measurement.

The bandwidth is very narrow on 14.000 MHz becoming broader as the frequency is increased to 30.000 MHz. See Photo 3 and Photo 4.

Incidentally, Frank reported the following results when he connected an INAC AH-1430 magnetic loop to his HP 8920B RF communications test set:

Frequency	Return loss	VSWR
14.100 MHz	15.00 dB	1.433
14.200 MHz	14.61 dB	1.457
14.300 MHz	13.47 dB	1.538
18.100 MHz	10.75 dB	1.817
21.100 MHz	36.26 dB	1.031
21.200 MHz	24.00 dB	1.135
21.300 MHz	19.17 dB	1.247
24.950 MHz	26.32 dB	1.102
28.100 MHz	12.27 dB	1.644
28.200 MHz	13.57 dB	1.531
29.000 MHz	17.74 dB	1.298
29.500 MHz	18.53 dB	1.269
30.000 MHz	18.50 dB	1.270

Installation

The next step was to install the loop on a mast in the backyard so that I could do some comparison with a dipole and a multi-band vertical. I dropped the loop into my light duty rotator and mounted the whole lot on top of a 6 m portable mast. See Photo 5.

This was a fairly easy proposition as the mast tilts over into the backyard. I connected 10 m of coax and 2 x 10 m of 3 core flex (one for the rotator controller and the other for the loop tuner). The loop tuning control cable was connected via the spare plastic ferule, see Photo 2 and at the other end via the adaptor provided (3 terminal block to 5 pin DIN connector – see Photo 6).

Then I set up a table out the back under the pergola to test the loop on air. The setup consists of rotator controller, Yaesu FT-857D, MFJ antenna tuner (really only to measure the forward and reflected power), the INAC loop tuner and 2 batteries (one for the loop and the other to power the radio), see Photo 7.

Photo 5: The loop mounted on a mast.

On air

I'm located in a fairly noisy area for HF although the first thing I noticed was that the base noise level was lower on the loop than either the dipole or the vertical. This was most pronounced on 20 m, about 1 to 2 S points below the conventional antennas. The difference was not so great on the higher bands. Now comparing signals is a little hard when DX is fading in and out however the signal to noise was noticeably better on the loop than on the dipole or vertical.

Rotating the antenna didn't seem to make much difference for the DX signals. There was some noticeable directionality when listening to local signals (they could be almost nulled-out by turning the loop). The noise is obviously emanating from every angle at my location as turning the loop had no impact on the noise floor.

Reports from stations in Europe on 20 m were 59 on all three antennas so it's reasonable to assume that the small compact loop antenna performs equally as well as a half wave dipole or vertical. I didn't get much of a chance to test it on the other bands as there weren't many openings at the time of testing.

Conclusion

I would certainly recommend one of these for anyone that has space restrictions or single source noise problems on HF at their location. I found the loop easy to install and operate, although the tuning unit was a little sensitive at times. Portable operation is a breeze as the loop fits neatly into the car boot

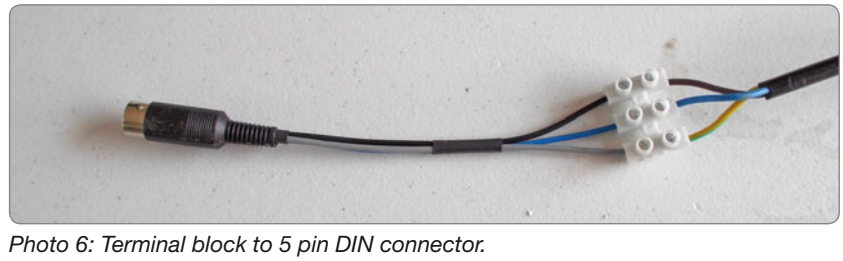


Photo 6: Terminal block to 5 pin DIN connector.

Photo 7: The portable on-air setup.

and will sit on top of a lightweight tripod without too much worry. The AH-1430 performs well on all amateur bands 20, 17, 15, 12 and 10 m (14 to 30 MHz).

The loop has a very narrow bandwidth on 20 m and almost certainly requires retuning if you change frequency. That's when the remote tuning control comes in handy. It has a much broader bandwidth on the 10 m band. The documentation is good (enough to get you started) and additional information can be found on the INAC web site.

The only problem now I have finished the review is that I have to send it back! Thanks to Frank Woolfe of Long Distance Telecommunications in Port Augusta South Australia for supplying the loop for review.

VK100ANZAC Activation in Western Australia in August

Bob Bristow VK6POP

WA Amateur Radio News Inc. (WAARN) will activate VK100ANZAC in early August to mark the August Offensive at Gallipoli, beginning on 6th August, through to 10th. WAARN produces a weekly Amateur Radio News Programme for the VK6 call area.

The August Offensive was the last major attempt made by the Allied forces at Gallipoli to break the stalemate that had persisted since the landings on 25 April 1915. The plan involved a series of thrusts being made out of the ANZAC position to seize high points along the Sari Bair range, which dominated the Gallipoli peninsula.

The activation will operate portable from a series of significant locations such as war memorials, historical sites, RSL premises and museums.

The five days of the activation will be punctuated with news bulletins that follow the progress of the August Offensive.

Although WAARN is the principal group behind this project, other clubs and individuals are encouraged to be involved.

Awards made at the 2015 Annual General Meeting & Open Forum

WIA

As is the usual case, several Awards were made at the Open Forum following the 2015 Annual General Meeting of the WIA in Canberra on Saturday 9 May 2015. The Awards relate to the 2014 calendar year.

Higginbotham Award for service to amateur radio was announced as going to **Bill Roper VK3BR** for his long service (60 years plus) to the WIA in various roles associated with the production of *Amateur Radio* magazine and long membership of the Publications Committee.

Al Shawsmith Award was announced to the joint authors of the article "The International Museums Weekend at the Melbourne Museum" published in the September 2014 issue of *Amateur Radio*, **Joe Gonzales VK3YSP** and **Julie Gonzales VK3FOWL**.

Amateur Radio Technical Award for the best technical article published in *Amateur Radio* in the calendar year was awarded to **Dale Hughes VK1DSH** for his article *"A networked, automatic and remotely controlled MF ATU"* published in the May 2014 issue of *Amateur Radio*.

Ron Wilkinson Award was announced as being awarded to **David Rowe VK5DGR** for achievement in developing the Codec2 patent-free, open source digital speech processor for amateur radio applications.

Chris Jones Award was was awarded to **Jim Linton VK3PC** for his provision of excellent publicity for the ANZAC commemoration, which has now gone world-wide, along with the continuing information provided throughout Australia.

President Phil Wait VK2ASD announced the creation by the Board of a new award, the **Technical Excellence Award**. The inaugural award recipients were announced as **Rex Moncur VK7MO** and **Derek Zeck VK6DZ** for outstanding achievement in establishing a new World DX Record for 10 GHz, exploiting tropospheric refraction across the Great Australian Bight to make contact over a distance of 2732 km.

President's Commendations

President Phil Wait VK2ASD announced several Presidential Commendations:

Paul Simmonds VK5PAS for outstanding achievement in the World-Wide Flora & Fauna amateur radio program, nationally and internationally, drawing attention to the importance of protecting nature, flora and fauna.

Peter Wolfenden VK3RV for outstanding contribution to the WIA's ANZAC Centenary Commemoration 2015 in researching and writing a series of articles on Australian amateurs' wartime service involvement, published in Amateur Radio magazine.

Allen Harvie VK3HRA for the development of the "ParksnPeaks" website, an online portal providing a major contribution to VK amateurs engaging in working from National and State Parks, Summits on the Air, the World Wide Flora & Fauna program and QRP activities.

Will McGhie VK6UU for outstanding dedication to scanning the issues of Amateur Radio magazine over the decades from the early 20th century to the present era and producing digital files, providing an invaluable historical and technical resource.

Ernie Walls VK3FM, in recognition of many years of service to the Publications Committee as both member and Secretary.

The WIA will ensure that recipients not present at the Open Forum will receive their certificates in the near future.

Silent Key

Joyce Isabel Batchler (nee Crowder) VK7YL

It is my sad duty to inform you that Joy Batchler formerly VK7YL became silent key on February 15, 2015 at the age of 99. Joy was Tasmania's first VK7 female amateur radio operator.

I was fortunate enough to interview Joy back in September 2008 in conjunction with the national ALARA Meet, which was in VK7 that year.

Joy got her licence in April 1936 – after talking with a girlfriend who said her uncle was a ham and he broadcasts on 200 m – this is when 7ZL closed down at 2 o'clock on a Sunday and then Jack Batchler VK7JB would take over and broadcast music. They trekked off from Sandy Bay to Quarry St in North Hobart and spend most of the night with Jack talking radio. They missed the midnight tram home and had to walk back home! Joy went off to the Tech College where Jack was a Morse trainer and Joy got her Radio Mechanics AOCP ticket in 1935.

Joy appears in the Mercury magazine of the time called "Woman's Realm" on Friday June 3, 1936 and the accompanying article was titled – "Hobart Girl Holds Distinctive Honour".

Joy was a teacher at Kindergarten and Fahan School for many years and Jack and Joy married in 1940.

The early 1960s saw Joy interviewed on TVT6: Joy on the program "Telewive's Time" on October 9 at 2 pm about her life as Tasmania's first and only female radio amateur.

Jack became Silent Key in 1979 and Joy lost interest in amateur radio.

Joy's favourite equipment was her first modulated transmitter with 205 valves and her favourite band was 20 m with both phone and CW. Joy's memorable contacts included a chappy in Cuba – a "G" British operator who they visited when they visited Cuba. Joy had a huge QSL card collection.

Joy remembered when there was only six female amateurs in VK in the 1930s and recalled: Madeleine Mackenzie (Mrs Mac) from VK4, Austin from VK3, Marjorie Hutchins from VK3, Betty Grable from VK5, and a VK6 female amateur. Joy was amazed and I think secretly proud when I said there were over 200 members of ALARA back in 2008.

Joy held an amateur radio licence from 1935 through to 1980 for 45 years and was a teacher, a wife, a mother and a radio pioneer in VK7.

Vale Joy.

Contributed by Justin VK7TW.

Erratum | The stealth antenna grows wings

(*AR* May 2015, page 12-14)

Our apologies to Ron Holmes VK5VH - we missed including the diagram showing the new configuration of the *Stealth Antenna* in the article in the last issue of the magazine. See Figure 2, which shows the new antenna configuration.

Editor.

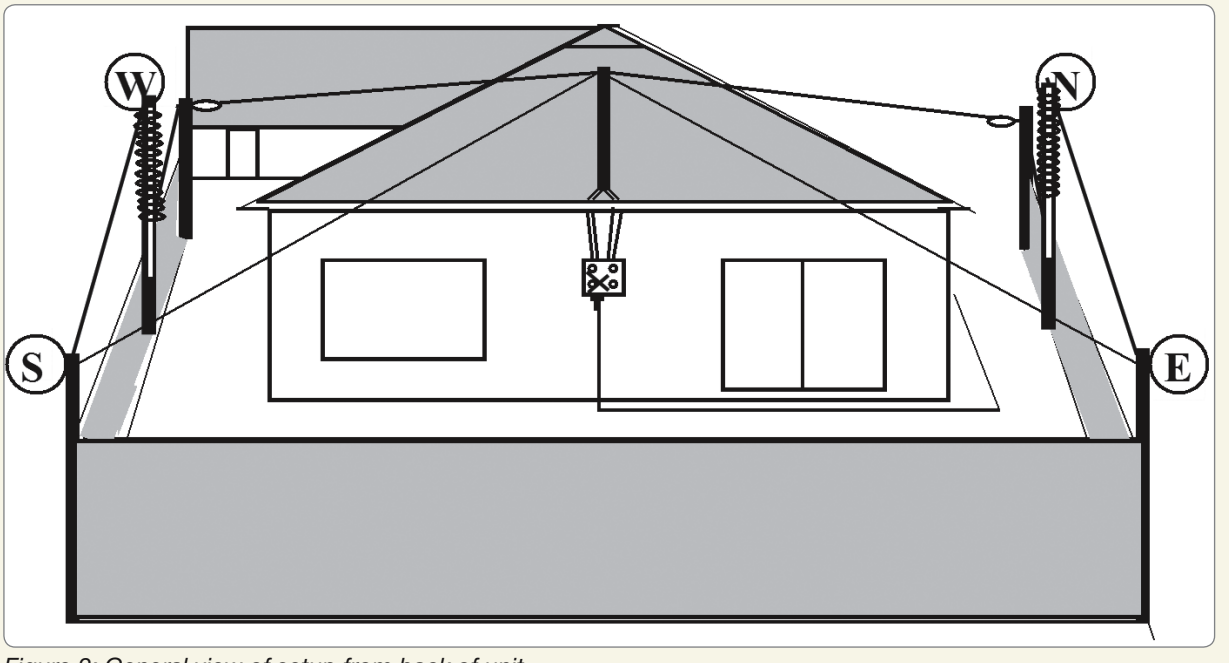


Figure 2: General view of setup from back of unit.

SOTA News

Allen Harvie VK3HRA

It was a month of poor weather but nevertheless we went out and activated summits and parks.

First of all two new goats this month:

Both Glenn and Kevin's SOTA journey began with a 3-day KRMNPA activation hike to South Point at Wilson's Promontory. In the hike party was Wayne VK3WAM who did a fantastic job of promoting the newly established SOTA association in VK3 to all. Afterwards Glenn and Kevin signed up to do a three day hike with Wayne to activate six summits in the Alpine National Park north of Licola. In fact, of the five amateurs that went hiking together at Wilson's Prom in April 2012, three are now SOTA Goats.

SOTA appealed to Glenn, as it seemed like a perfect combination of hiking, radio and navigation, something to get us out of the shack! Glenn has become quite the hiking gadget nut, trying to squeeze every gram out of the equipment carried as well as home brewing a lot of kit to take out on SOTA expeditions.

Kevin who was already into hiking, camping and four wheel drives and now SOTA had supplied a list of places to find a visit with a radio. A FT-817, LiPo batteries and home-made Buddipole vertical were quickly acquired and so armed, was off activating summits solo or in conjunction with Glenn.

Not content to be a fair weather only activator, there is always a bothy bag in his pack to keep the rain, hail and snow off. There have been winter activations by snow shoe to Mt Torbreck, Mt St Phillack and Talbot Peak.

The latest change to Kevin's SOTA adventures has been multi summit / multi day activations on a trail motorbike.

The SOTA bug has spread to Jodie, Kevin's wife. Whilst Jodie was waiting in the car for Kevin to return from Talbot Peak she was

Glenn VK3YY and Kevin VK3KAB both achieved 1000 activation points to claim SOTA Goat status.

looking at an FT-8900 thinking *"I would know where he was if only I had a licence for that thing"*, now Jodie is VK3FJAT and they have been activating summits together. As a result she has recently passed the 100 point mark.

Congratulation to both Glenn and Kevin on reaching Goat-hood and we look forward to more activations.

S2S Europe to Australia Saturday 25th April

Plans were made by Gerard VK2IO and Robin 9H4RH to promote S2S contacts between Europe and Australia and invite everyone to join in. April 25th was selected. Several operators decided to use the AX prefix and at least two special event stations (VK100ANZAC and VI6ANZAC) participated.

It was looking good with several stations from both sides committing to the day then the weather started to play up. In the week running up VK3 was wet with access to National Parks restricted earlier in the month due to weather but areas in VK2 had storms delivering hail, rain causing flash floods, which closed major roads, caused electrical blackouts and even some building collapses. Perth escaped the bad weather this time with periods described as 'perfect SOTA weather'.

Anyway not to be put off, wet weather gear was found, tents packed (the bothy bag was not going to cut it) and plans both advertised and 'B' were executed.

The weather didn't improve for Saturday. One storm in particular managed to upset Gerard VK2IO on VK2/CT-012 after passing though Nick VK2AOH was on VK2/CT-011 and had affected Andrew VK1DA on VK1/VC-040 before that.

Whilst 40 m was S9 noise, 20 m was open and there were SOTA stations everywhere. The QRM provided problems copying and signals were up and down with a lot of QSB, it was fun and that's what matters!

Whilst not all EU to VK S2S the reports indicate that players included HB9BIN on HB/BE-087, 2E0YYY and G7LAS on G/CE-004, YU1WC on YU/CS-043, AC1Z on W1/HA-029, VK2AFA/P on VK2/HU-093, 9H4RH/P on 9H/GO-001, VK3JBL on VK3/VC-016, AX2IO/P on VK2/CT-012, AX2IB/3 VK3/VE-165, VK100ANZAC (VK1DA) on VK1/AC-040, VI6ANZAC (VK6NU) on VK6/SW-039, G6GGP on G/CE-002, VK3HRA on VK3/VC-024, EA2BD on EA2/NV-119, VK2AFA/P on VK2/HU-093, OE5AUL/P and OE5YYN/P on OE/OO-118, OE5EEP/P on OE/OO-117, G0NMD on GW/NW-053, HA10SOTA/P on HA/KD-048 and DG3NEU/P on DM/BM-047.

Very much a bunch of keen enthusiasts!

Apologies if I missed anyone. Thanks to all the chasers for their patience and perseverance and to everyone who took part in what was, for me, great fun and a very memorable experience.

Keep May the 23rd free, as it appears we are likely to try it again...

A group of Australian amateurs activated Norfolk Island using the callsign VK9NT in late April. Chris VK3QB attempted to arrange access to Phillip Island and the as yet un-activated summit VK9/NO-002 Jacky Jacky. Unfortunately the weather conspired to foil the plan. Chris did make it to Mount Bates VK9/NO-001 and worked many stations around the world on CW and voice.

Allen VK3HRA.

Silent Key Norm Thornton VK4BNT

It is with great regret that we let you know that Norm Thornton VK4BNT passed away on the 13th March, 2015 at the age of 87.

He and XYL Shirley came to Gladstone in Central Queensland from Kununurra and Geraldton in the west in 2006. He was VK6ANT while in WA and previously VK6NST.

After the passing of Shirley in 2010, Norm moved into the Hibiscus Gardens Retirement Village in Gladstone where he led a very full and active life. He kept a small base station in his room and was frequently on air both on the local repeaters and a small amount of HF with his ancient and well-worn Kenwood TS-340. Norm and his family did a lot of travelling in remote Australia and he would often talk about his experiences in the bush with his Kenwood radio making some very interesting contacts both within Australia and the world wide radio community.

Those who regularly spoke with Norm on air (and socially) would have recognised his distinctive manner and voice. Norm was active with the local Island Sands Choir for a number of years and was even involved in acting on the stage right up to a couple of months prior to his death.

Norm will be sadly missed both within Amateur Radio circles and the wider community. He was involved for most of his life with Scouting, hence his activity with JOTA.

He was a great friend to a lot of people.

John VK4JWH
(Secretary Gladstone Amateur Radio Club)

Silent Key

Steve Benko VK2TSB

It is with deep regret that we record the passing of Steve Benko, VK2TSB, of Oak Flats in Wollongong.

Steve was only 51 when he and his partner, Michelle, tragically lost their lives while flying his microlight plane near Glen Innes, on Sunday April 12th 2015. Flying was a passion of Steve's, but his innate love of life made him passionate about so many things, from his self-owned business, Amateur Radio, music and especially his wonderful family.

Steve was a truly remarkable person. His generosity to others was second to none…..he would do anything for anybody. On many occasions this put him to some inconvenience, although you would never have known it, such was his cheerful disposition and generous nature. Steve loved helping people get things done and had a burning curiosity about what made things work, and how you could make them work better. He remained a little boy at heart, and retained a little boy's curiosity and thirst for knowledge to the end.

With respect to his contribution to Amateur Radio, as a licensed rigger he would regularly spend many hours at the top of tall towers, installing antennas and cables for the repeaters of the Illawarra Amateur Radio Society. Even when others were tiring after many hours of hard work, his infectious humour and enthusiastic nature would inspire everyone to finish off the job, even if it meant working well into the evening. Steve was also very safety-conscious, whether working at altitude or on any equipment which might be live or still connected to power. He was a fine example of competence and thoroughness to his fellow work colleagues and to the radio amateurs he assisted. His passing is a huge loss to the IARS.

Readers may unknowingly have met Steve at the recent Central Coast Field Day. He was the cheery fellow selling second-hand solar-panels off the back of his large trailer. Many who witnessed this were surprised at the low cost of the large panels but, as Steve told many of us, he was just happy to see them being of benefit to others - that was the type of man he was. At one stage, it could be said he was the most popular person at the Field Day, with so many solar-panels going to new homes.

Steve was the husband of the late Tracey (VK2FARM) and father of Jessica, Rachael and Jacob (VK2FIXX). Following the loss of Tracey some years ago, family and friends were delighted to see Steve find a new partner in Michelle. All hoped for a long and happy future together for them. Sadly, it was not to be, and his passing is a massive and grievous blow to his family, and a terrible shock to his many friends. Likewise for Michelle's family, who have lost not only Michelle, but also a partner who would have played a significant part in their lives in the normal course of events.

Steve's funeral was held at 9.30am on Wednesday 22nd April, at the Hansen and Cole Chapel at Kembla Grange. The chapel was absolutely full to capacity, mourners lining the walls once all the available seating was filled, and the entrance hall was backed up with still more people, a tribute to the diversity of his interests, the number of his friends and colleagues, and the esteem in which Steve was held by all who knew him.

Vale Steve Benko, VK2TSB. We will never forget you.

Submitted by Rob McKnight VK2MT & Ned McIntosh VK2AGV
Illawarra Amateur Radio Society

Participate

International Lighthouse Lightship Weekend | 15 - 16 August

VHF/UHF - An Expanding World

David Smith VK3HZ
e *vk3hz@wia.org.au*

Weak Signal

Beacon Upgrades

A number of teams around the country are putting effort into upgrading their beacons. Nearly all of the newly-refurbished sites are now frequency locked (mostly GPS-locked) and many incorporate newer keying modes.

Thanks to the efforts of Bert VK3TU, Chas VK3PY and others, the VK3RGL 2 m Beacon near Geelong on 144.530 MHz is now GPS-locked and sporting a new FSK ident. Bert writes:

Under normal conditions when the beacon and external reference are healthy, the ident cycle is: "VK3RGL MT ANAKIE QF22DC" (@ ~16 wpm) then 5 repeats of ~1 minute key down then "VK3RGL" (@ ~22 wpm) then entire cycle repeats.

In the event of a GPSDO problem, the beacon will send callsign with a diagnostic message every minute. The controller also monitors the TX synthesizer lock and will shut the TX down in the event of an unlocked condition.

It should also be noted that the controller is an Arduino without a real-time clock. To keep things simple, we don't decode the NMEA sentences either, so the times indicated above are approximate.

Power is 40 W at the TX into the splitter that feeds the original 2 antennas pointing NE and W. Frequency is as near as I can measure (with my antediluvian equipment) to 144.530 MHz key down with ~400 Hz negative FSK with key up.

The VK4RBB beacons in Brisbane have also been subjected to a major upgrade. Doug VK4OE writes:

To add to the flurry of similar announcements of recent times, I am happy to advise that, following a grand team effort at the beacon site, the recently upgraded VK4RBB beacon was put back on air after about three weeks absence.

This is not a one-frequency beacon - the current output frequencies of 432.440, 1296.440, 2403.440 and 5760.440 MHz are all now GPS locked in frequency and timed. And if we obtain ACMA approval for use of 3400.440 MHz, that capability is also ready to be activated.

Previously there had also been a 10368.440 MHz beacon signal, but that transmitter has temporarily been decommissioned until an extension of the upgrade project is completed which will see similarly GPS locked outputs on 10368.440 and 24048.440 MHz emanating from a mast-mounted amplifying box. The frequency generation stages needed to achieve these extra frequencies are already in place.

The reason for having GPS-derived accurate timing is that there are two modulation modes, CW with Morse ident, and JT4. All of the beacon outputs alternate between these two modes, changing each GPS-defined minute. This is all under the management of a ZL2BKC 'Multi-Beacon Controller' (MBC), and we owe a vote of thanks to Wayne ZL2BKC for all his development of the MBC and his help in getting the digital interface part of the 'show' on the road. The functioning of the MBC is impressive!

Other acknowledgements due are to Geoff VK4KJJ, Rex VK4REX, Bob VK4XV, Kevin VK4UH, Jason VK4YOL, Eric VK4NEF and Mick VK4NE. I have also been involved in constructing the original beacon hardware and recently interfacing it with the new beacon controller.

Any reports will be welcomed, and several have already been received from some listeners near and far. A point related to listening for VK4RBB is that, when it is transmitting its Morse ident and associated carrier, the actual frequency is right on the one nominated for the band in question, within ±1 Hz accuracy. Receiver dials will need to be set accordingly.

To add to what Doug has written, if you are listening to the beacon's JT4 ident, you need to select JT4D mode for the 70 cm beacon or JT4F for the others. Also, the JT4 signal is centred on the beacon's nominal carrier frequency of xxx.440 MHz, so you will need to tune your receiver down 1270 Hz to centre the signal (i.e. DF of zero) in WSJT10.

3.4 GHz band

As reported previously, the ACMA is proposing to restrict access to two segments of 25 MHz and 50 MHz bandwidth in the 9 cm band at 3.4 GHz, where spectrum access may be required by the National Broadband Network (NBN). These restrictions will affect geographic regions that have yet to be defined. One of these segments covers our current weak-signal operating segment at 3400 MHz.

Further to this, Doug VK4OE reports:

The Brisbane VHF Group has heard back from the ACMA following an application we had recently made that we may be granted an

exemption to the prevailing embargo on amateur radio transmissions in the 3400+ MHz area with a view to our VK4RBB beacon being allowed to operate there. We were unsuccessful, so that means that the beacon cannot operate on 3400.440 MHz.

Reading into the other statements from the ACMA's e-mail to the Group, it is clear that we are not far away in time from 3400+ MHz being taken away from us - a move not unexpected by many:

"The ACMA has also recently consulted on making changes to the Amateur LCD (see: http://www.acma.gov.au/theACMA/Consultations/Consultations/Current/remaking-amateur-lcd-and-overseas-visiting-amateurs-class-licence) as part of sunsetting. This includes preventing Amateurs from operating in certain areas within the 3400-3425 MHz and 3492.5-3542.5 MHz bands to protect future PTS licences. Until the outcome of the consultation process is known, no decision can be made. That is an exemption cannot be granted."

So, it appears that the writing is on the wall. Discussions have now turned to what we are to do if access to the weak signal area does become severely restricted.

In New Zealand, their 1 MHz wide narrow band allocation is from 3399 to 3400 MHz. It has been that way since they lost 3410 and above, including the old weak signal segment of 3456 MHz. In some ways, it would make sense to align with probably the only other country we are likely to work (terrestrially) on 3.4 GHz.

However, if 3.4 GHz becomes anything like as noisy as 2.4 GHz, a 1 MHz offset is unlikely to provide much isolation. Therefore, general consensus is that moving down to 3395 MHz might be more prudent. Many people use 70 cm as an IF on that band, and IF radios like the FT-817 are able to tune down that far. Also, a lot of modern transverters use a synthesised local oscillator that can be readily re-programmed for the lower frequency. A shift of 5 MHz is unlikely to require much, if any, retuning of filters or antennas. So, 3395 MHz is the proposal for the moment. However, watch this space.

Please send any Weak Signal reports to David VK3HZ at *vk3hz@wia.org.au*

Digital DX Modes

Rex Moncur VK7MO

Enhancement of JT4

I have been working with Joe K1JT and Charlie G3WDG on the enhancement of JT4 for both terrestrial and EME microwave operations. At this stage Joe is still optimizing the program and more testing is being done so this is advance notice of what should become available. The new version is based on WSJT-X which is intended to be the base for all future weak signal WSJT modes. Some of the new features are as follows:

WSJT-X uses a standard 48 kHz sampling arrangement divided down to 1200 Hz and thus avoids the problems that some computers have with approximating 11025 Hz. Thus the rate-in and rate-out adjustments are no longer required.

Sensitivity for single period decodes has been improved by about 0.5 dB. (Average decoding is not yet optimized but we expect an improvement here also).

Doppler correction can now be done on almost any radio that has CAT control.

Doppler correction is available for the full path or for constant frequency on the moon by clicking on a radio button. With a wide range of radios available it is expected that constant frequency on the moon will become the norm as this means you do not need to know the location of the other station to correct for Doppler and random operation is possible with Doppler control.

Averaging is now done automatically with no need for the operator to select periods for inclusion in the average.

A simple tick box allows one to switch between long form messages and single tone messages, which are about 6 dB more sensitive.

The standard single tone messages are 1000 Hz = Tune, 1250 Hz = send messages, 1500 Hz = RRR and 1750 Hz = 73.

Signal reports now work over a wider dynamic range for about -20 to -1 dB with no more limiting at around -12 dB.

Timing Tolerance can now be set around the EME delay or zero for Terrestrial with a click box.

Once we complete more testing and Joe does some more optimisation, the new version should be available on the WSJT web site by the next AR report and I will let you know how it goes.

Please send any Digital DX Modes reports to Rex VK7MO at *rmoncur@bigpond.net.au*

Meteor Scatter

Dr Kevin Johnston VK4UH

As this column is being prepared, just before the ANZAC weekend, the annual Lyrid Meteor Shower is just passing its peak. It is predicted to reach its maximum on April 23rd, this shower results from the debris left behind from Comet Thatcher C/1861 being drawn into the Earth's gravitational field. Although a Class 1 Major Meteor Shower, the predicted Zenith Hourly Rate (ZHR), an index of the frequency of visual meteor sightings, was only about 15-18/hour although this shower has peaked at up to 90/hour in previous years. The Lyrids this year have resulted in some enhancement

of meteor propagation which has been apparent for many days either side of the peak and including the normal weekend activity periods on 17-18 April. Stations worked from here over that weekend included VK3AMZ (QF22fe), VK2BLS (QF55kk), VK3HY (QF22pd), VK5PJ (PF95mk), VK3II (QF21rn) all on 144 MHz FSK441 and VK2BLS, VK5PJ and VK3HY on 50 MHz. The QSO limiting effect was probably the lack of stations on-air from the southern states rather than a lack of rocks. This was compounded of course by the effect of the Daylight Saving clock-change on 4 April in the south which effectively pushes the activity period an hour further into daylight. In VK4, where we still do not have Daylight Saving, we will remain well past dawn and hence the best MS conditions, when the activity period starts, for several more months yet.

The actual Lyrid peak has occurred during the working week this year which again has limited the number of stations on-air. I have been fortunate in having some leave during this week and have been activating both 2 m and 6 m FSK M/S. As expected the shower brought a number of massive hyperdense returns (burns), an example below extending over 15 seconds at +18 dB. See Figure 1.

I was also able to complete another fascinating QSO during the Lyrid shower to Wayne VK4WTN (QG64kr) on 21st April. Why interesting? Well this MS contact was over a distance of only 228 km due north representing my shortest QSO on this mode of propagation. Meteor Scatter contacts are generally considered "easy" over path lengths of about 500 – 1500 km. The frequency of meteor pings and received signal strengths generally fall off rapidly over paths outside this range. QSOs over distances shorter than 500 km become progressively more difficult primarily due to the high elevation angles of signals involved. This is only true however for "Forward Meteor Scatter". On this occasion both stations were beaming SOUTH and it is highly likely that this represents "Meteor Backscatter".

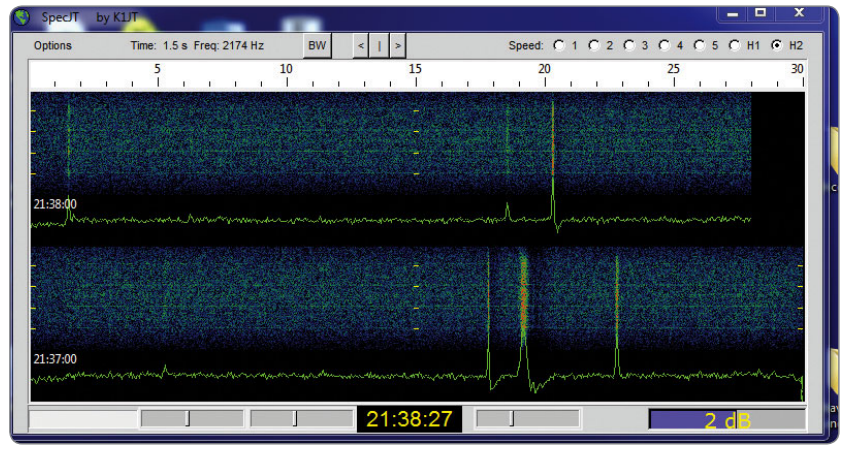


Figure 2: 50 MHz Meteor Backscatter pings received at VK4UH from VK4WTM 21/4/2015. Note evidence of continuous weak background FSK441.

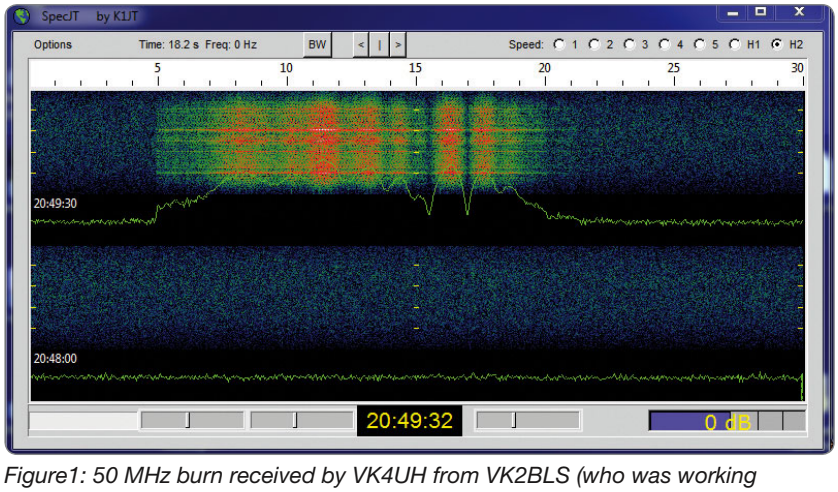


Figure1: 50 MHz burn received by VK4UH from VK2BLS (who was working VK7XX at the time and hence beaming South away from VK4).

Figures 2 and 3 on next page are records.

At that time I was able to receive strong S-4 signals from Wayne by beaming north towards his station. By beaming South however his FSK signals were very weak and well below the decode threshold of WSJT. Figure 2 shows numerous backscattered meteor pings, all of which were easily decoded, are clearly seen across both receive periods.

Further investigation with stations at even shorter distances suggest that Meteor Backscatter is a real effect although the signals received, as would be expected, are much weaker than with Forward Meteor Scatter. Figure 4 below shows signals received from VK4NE at a distance of only 38 km at 138 deg to my QTH, calling CQ to the South. Here my beam was rotated away to 210 deg to minimise the direct signal received. There is evidence in the recording of both Backscattered Meteor pings at 13 and 15 seconds, with sharp rise-times to high signal levels followed by an exponential decline, and also the characteristic "saw-tooth" flutter pattern of aircraft enhancement from 16 - 25 seconds, also likely backscattered, all superimposed on a continuous but weak direct FSK441 trace.

These recording appear to support the existence of Meteor

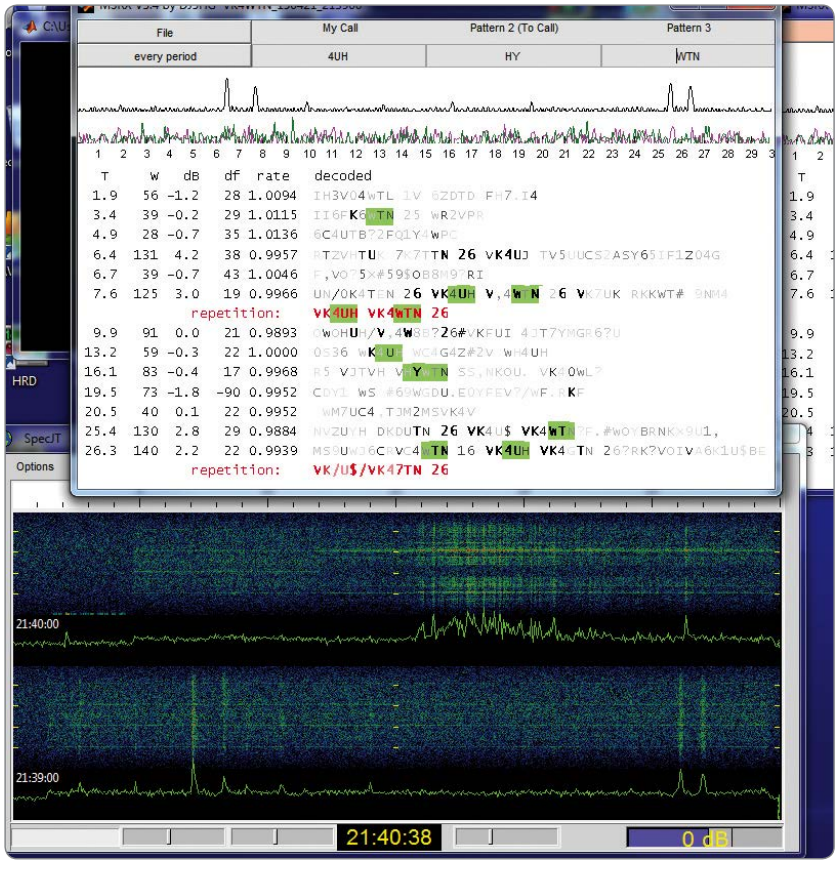


Figure 3: 50 MHz FSK441 signals received at VK4UH from VK4WTN 21.4.15. Lower period showing Meteor Backscatter pings and corresponding MSRX decodes. Upper period showing classical patterns of Aircraft Backscatter – all undecodable. Both periods superimposed on weak direct signals off the back of the beam.

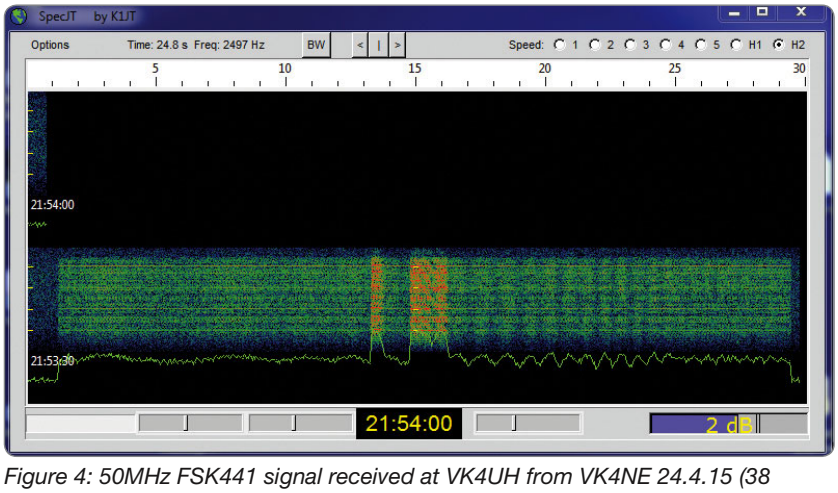


Figure 4: 50MHz FSK441 signal received at VK4UH from VK4NE 24.4.15 (38 km). Showing evidence of Meteor Backscatter pings and flutter characteristic of Aircraft reflections.

Backscatter at least on 50 MHz. Whether this is just a useless observation or of some practical value to us is debatable. There may well be circumstances however where Meteor Scatter can be used over short distances particularly where unfavourable intervening terrain limits direct contacts.

The next Major Meteor Shower will be the Eta Aquariids predicted to peak on May 6th. This is generally one of the best showers for the Meteor Scatter year. Put a note in the diary for that one.

Please send any reports, questions or enquiries about Meteor Scatter in general or the digital modes used to Kevin VK4UH at *vk4uh@wia.org.au*

Silent Key

Hamish Carnegie VK7FHAM

On a solemn note, a former member of the Cradle Coast Amateur Radio Club has passed away on December 30th 2014. Hamish Carnegie who was formerly VK7FHAM suffered a short illness and passed away at the age of 73.

While he was only licensed about six years ago and active on air for a short time before letting his licence lapse, he will be missed.

Vale Hamish.

Contributed by David Cleland VK7DC.

Spotlight on **SWLing**

Robin L Harwood VK7RH
e *vk7rh@wia.org.au*

Well, winter has finally arrived after a rather mild autumn. I am still plagued with hearing hassles and hopefully the insertion of a grommet will improve my hearing. I have been having considerable difficulty hearing speech and music, which has made monitoring difficult at times. Oddly though I can still read c/w and that is where I mainly concentrate. Interestingly the US Defense Department recently phased out Morse classes for the military, although I believe training continues for specific classifications. It has been pointed out that CW has not been eliminated in certain jurisdictions that are hostile to NATO.

Serbia is the latest international broadcaster that has decided to cease broadcasting via HF. You have until June 30th to hear it prior to the senders being switched off. Studios are in Belgrade, which was the former capital of Yugoslavia but the senders are located in Bosnia. Yugoslavia disappeared in the mid-90s and seven independent states emerged, Slovenia, Croatia, Serbia, Bosnia, Montenegro, Macedonia and lastly Kosovo. Croatia and Serbia were the only states to have shortwave and with the departure of Serbia, it is the end of an era after 80 years of shortwave broadcasts. Fortunately amateur activity is flourishing from each of the former Yugoslavian provinces: Macedonia is formally known as the Former Yugoslavian Republic of Macedonia, after Greece objected to the name of Macedonia.

The US and Cuba recently revived diplomatic relations and are in the process of normalising ties between the former protagonists. There has an ongoing radio war for over 50 years between the two. Radio Havana still targets the US and it is their primary focus. The 49 metre band is so dominated by Havana in English and I have heard up to five simultaneous channels around 0500.Washington naturally retaliated with Radio Marti, a Spanish language clandestine aimed at Cuba. It is on 24/7 and has been repeatedly jammed with white noise, which continues even when Radio Marti ceases transmitting. You can tell where Radio Marti is by the incessant white noise jamming. 6030 seems to be their main channel yet on Mondays it is absent although the jammers are still there!

Nepal had a devastating earthquake on 25th April, which resulted in thousands being killed and seriously injured. Kathmandu, the capital, seems to have borne the brunt of this natural disaster. Communications were severely disrupted and amateurs stepped into the void. I have heard a very well disciplined net operating on 14205. However there are the idiots who deliberately interfere with emergency communications. 14205 happens to be the DX window and monitors report that the main culprits seem to be from Europe.

You may recall that several years back, Sam VK2BVS, was operational from Somalia, particularly Puntland. This nation is known as the Horn of Africa and has been the scene of an ongoing civil war for 25 years. Puntland is in the north east and the north is known as Somaliland, which was a former British colony. Puntland was part of the Italian colony of Somalia. Hargeisa is the capital of Somaliland and is easily heard because it is on 7120 in the 40 metre amateur allocation. I believe it even has English programs. Puntland has recently acquired shortwave senders and has been logged testing on 13800. However the capital of Somalia, Mogadishu, has been the site of incessant warfare between factions including an Al Qaeda backed group, known as Al-Shabbab. The African Union has tried to fill a peace enforcement role without much success. Mogadishu is in the South and is not far from Kenya. The only broadcasting activity is apparently on FM. Somalia is classified as one of the failed states and has split along tribal and religious lines.

Well that is all for now. Stay warm this winter and good monitoring!

Robin VK7RH.

Participate

Winter VHF/UHF Field Day | 20-21 June

Contests

James Fleming VK4TJF/K8UP
e *vk4tjf@wia.org.au*

In this month of June there are two Australian contests that should really be fun to operate: the VK Shires Contest and the Winter VHF/UHF Field Day, one for HF and one for VHF/UHF.

The VK Shires Contest goes for 24 hours starting on Saturday 6th June at 0600 UTC. The object for us in Australia is to work as many different VK Shires and CQ zones as possible, while the rest of the world may only work VK Shires. There are no entry categories based on bands or power. It is likely that most of your contacts will be Australian. Now the first choice in categories is if you decide to become a Rover. This is a portable station that activates more than one Shire. The other categories are multi-operator or single operator. There is a single operator specifically for Foundation licensees and one for DX stations. Thus there are a total of six categories for the contest. For the exchange the DX stations give their CQ zones and the Australian stations supply their Shire abbreviations. Multipliers for the DX are the VK Shires and for the Australian stations the VK Shires and the CQ Zones. There are no categories for mode, thus it may be advantageous to work SSB and CW. Scoring is simple a point per QSO then multiply the total by the total of the multipliers.

So that was the raw information on the contest. My thoughts are that the contest is fairly egalitarian, as in doesn't matter how you operate everyone has a good opportunity to do well in the contest. It would also seem to me that the whole idea here is to have fun. This contest brings to mind many scenarios to achieve the real objective of having fun. I can see taking your car or Ute that is set up with mobile HF and being a Rover, or having a couple of camping sites waiting for you and your camper. You could be a DX chaser trying to get all the CQ zones. Some amateurs like the 40 and 80 metre bands and just have a dipole. The possibilities are many however one thing is common theme with all these operating styles is that you got to be in it to win it. Submitting the log is easy again with VK Contest Logger, if you're out portable just take your laptop with you. All VK Shire abbreviations are on a list located on the WIA website under contests along with the complete rules. So hope to hear you in the contest.

The next big Australian contest is the winter VHF/UHF Field Day, the dates are 20th and 21st June. Duration is **all call areas other than VK6** 0100 UTC Saturday to 0100 UTC Sunday and **in VK6 only** 0400 Saturday to 0400 Sunday. The categories are portable Single or Multi-op, 24 hours or 8 hours, and Home 24 hours or Rover 24 hours making a total of six sections. Mode can be FM or SSB. Contest exchange is your RST report, serial number and 6-digit Maidenhead locator. You can work stations on each band every three hours, however if they are a Rover and move to a new location you can work them immediately. Scoring for each band is 10 points for each 4 digit locator square plus 10 points for each locator square plus 1 point per contact multiplied by band multipliers 6 m x1, 2 m x 3, 70 cm x 5, 23 cm x 8, higher x 10. Again VK Contest Logger is the contesting logging software that is the easiest to use. The Rules were published in the May issue of *Amateur Radio.*

Enjoy the company of fellow club members and camping. Link up with other operators for some camping on a mountain top perhaps in a National Park. Bring your own station with a beam antenna and your favourite VHF/UHF radio. It seems that this contest encourages the ability to go portable quickly and efficiently, as in emergency communications.

Contest Calendar for June 2015 - July 2015

Month	Date	Starts at	Spans	Name	Mode
June	**6th - 7th**	**0600 UTC**	**24 hours**	**VK Shires contest**	**CW/SSB**
	13th - 14th	1200 UTC	24 hours	Portugal Day contest	CW/SSB
	20th – 21st	**0100 UTC**	**24 hours**	**Winter VHF/UHF Field Day**	**CW/SSB**
	20th – 21st	0000 UTC	48 hours	All Asian DX contest	CW
	27th - 28th	1200 UTC	24 hours	Ukrainian DX Digi contest	RTTY/PSK63
July	4th - 5th	1100 UTC	24 hours	DL-DX RTTY contest	RTTY
	11th - 12th	1200 UTC	24 hours	IARU HF World Championship	CW/SSB
	18th - 19th	1200 UTC	24 hours	DMC RTTY contest	RTTY
	25th - 26th	1200 UTC	24 hours	RSGB IOTA contest	CW/SSB

ALARA

Margaret Blight VK3FMAB – Publicity Officer

Acceptances are now arriving complete with deposits from members who will be attending the 40th Anniversary of ALARA. We are still hoping for many more to indicate their attendance. Please contact Jean VK3VIP on *jeanfisher@optusnet.com.au* Remember we need to confirm the final numbers in June 2015. The luncheon will be held on 25th July, 2015.

By the time this column is printed the ALARA Annual General Meeting will have taken place in May 2015 and new committee members will have been elected. As I did not stand for election this year, a new Publicity Officer will take over the role. So this will be my last column. I have enjoyed the past four years but feel it is time for some new blood and so am happy to hand over to Christine VK5CTY and wish her all the best in her new role.

Hunt for ALARA Founding Members

ALARA Historian, Jennifer Wardrop VK3WQ/VK5ANW needs your help!

ALARA Foundation Members are being especially welcomed to the Celebration of the 40th Anniversary of the Foundation of ALARA on July 25, 2015.

Our Founding President, Norma, now VK2YL and husband Frank O'Hare VK2AKG, will be attending with two of their daughters, as will Linda Luther VK7QP (formerly VK4VV) and Myrna Marnie VK5YW (the first Net Controller).

We are about to send out official invitations to other Founding Members for whom we have contact details, but there are several more for whom we do not.

Do you know the contact details of the founding members listed below? We have been able to access details on most other Foundation Members.

Jenny Roper YF/VK3YFF
Dr. Kate Duncan
Joan Poulter YF/VK3RA (this is now the callsign of the Macedon Ranges ARC)
Heather Bedson
Marilyn Meizis VK3AOI
Jean Truebridge

If you have **ANY** information please contact: **Jennifer Wardrop VK3WQ/VK5ANW ALARA Historian**
Email: *vk5anw@wia.org.au*
phone (03) 9744 2570
(mob) 0419 811 012 or post to P.O. Box 152, Sunbury, VIC. 3429, Australia.

John Moyle Field Day – Weekend Widow – Heidi VK3FHID

It all started several weeks earlier, where our club, Bendigo Amateur Radio & Electronics club, in central Victoria, decided to start to make arrangements for the John Moyle contest weekend.

The person, who usually took this contest in hand, Graeme VK3GRK was over committed with other things and dumped the J.M. contest arrangements in the lap of my hubby Mike VK3AHA, who has also too many irons in the fire, but hey what the heck, one more won't matter. But guess what??? Who was the Bunny that had to assist (with a million of other things on my plate) as I said before, what is another item to do?

Friday 20th March comes around and my home is a hive of activity, the laptop computer has the newest contest logger loaded and made sure it all works, the Garage door is open, antenna items, cables, poles, pegs, radios, Gazebo, camping equipment and anything else that can be thought of to make life more comfortable over the weekend is piled in the driveway and then the car is slowly loaded up. The camper van is hooked up loaded with fridge, bedding plenty of food to feed an army and plenty of fresh water. This is for OM. Mike VK3AHA.

Saturday morning arrives, I wake to radio noises from teams and single operators who are out testing their equipment, and then I arrange my drink bottle, try to find clothing suitable to wear bike riding. Midday comes; the first contact is made to the club portable station.

Monica VK3FMON, her hubby Kevin VK3CKC and I had decided

Photo 1: The ladies taking it all in - even Chloe was all ears.

we would arrange to go for a bike ride with our radios (bicycle mobile) and to see if I can still ride a bike after 50 years.

Ha, Ha, No, I won't tell you how I went riding a bike after 50 years. All I will say is I managed to get on the bike, even though I was a little wobbly to start with and I did manage to go for a little ride and gained more confidence and NO, I did not fall off.

Kevin VK3CKC made contact with a VK4 who was riding rail trails, so arrangements were discussed and made to further their riding experience around Bendigo over the weekend.

I spent the rest of the afternoon and evening recuperating, swilling down pain killers and every 3 hours making 2 m simplex contacts with whoever landed on the simplex channel I had the radio set on.

Contained on the kitchen bench were my laptop with Contest logger set up, 70 cm hand held, another hand held with dual frequencies, set on 2 local 2 m repeaters in case someone wanted to arrange simplex contacts, I had a VHF radio that I was making the simplex contacts with. No HF radios available as I do not do HF, I have problems hearing; unfortunately besides Mike had taken it to the portable site.

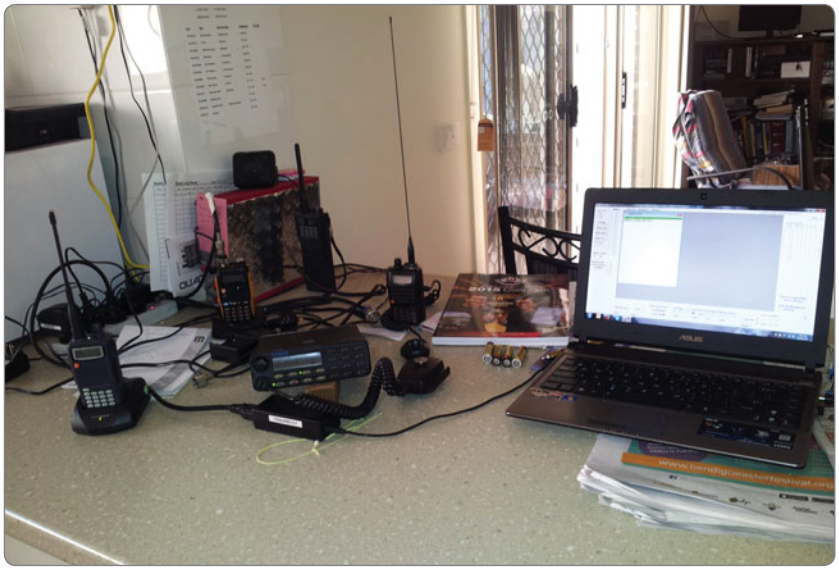
Photo 2: YLs with a couple of friends.

Bottom line is, my home looked like a bomb had hit it after the campervan was stripped and the car unloaded with all goods and sundry, the washing machine was going flat chat washing the smell of smoke from an open fire, out of bedding and clothing.

I hope this little tale has amused you and given a little insight as to how other ALARA members spent their J.M. weekend.

Heidi, I am sure everyone is very impressed that you managed to ride a bike and use a radio at the same time without falling off. Sounds like a typical ham weekend, you in one location and OM in another.

Photo 3: Heidi's radios.



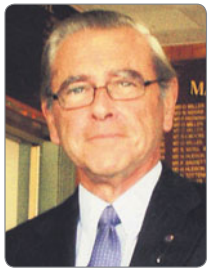
VK3 NEWS

On Sunday 29th March the EMDRC (Eastern Mountain District Radio Club) held its annual White Elephant Sale. As usual a good crowd participated. There were a number of ALARA members volunteering. There was an ALARA table set up just inside the door of the hall and refreshments were dispensed by ALARA ladies in the kitchen. It was interesting to meet people who had come from interstate having heard of the event. It was a good opportunity for catching up with friends and for the males, the chance to spot a bargain.

It was a pleasant surprise to receive a special invitation from the Gippsland Gate Radio & Electronics Club Inc. in our mail, content as follows:

"In recognition of ALARA's 40th Anniversary and the long-standing support which ALARA members have given our club, particularly during our hamfests, the Committee and members extend an invitation to ALARA members to join us at our Mid-Year lunch, which will be held at Arthur's Hotel, 790 Arthurs Seat Road, Arthur's Seat on Saturday 20th June.

We should be pleased to see as many ALARA members as possible who can join us on the day."



VK3news Geelong Amateur Radio Club

Tony Collis VK3JGC

Arduino Day 10th Anniversary

To celebrate the 10th anniversary of the Arduino Open Source Computer and related software, Lee VK3PK and Nik VK3TY organised a series of lectures on the numerous applications of the Arduino computer at the VK3ATL Club House in Storrer Street Geelong in conjunction with a local supplier JAYCAR.

Several Arduino based applications were demonstrated during the course of the day.

JAYCAR provided the door prize which was an Arduino starter kit. Lou VK3ALB along with Lee VK3PK presented JAYCAR's Steve Barrand with a certificate of Appreciation for the time and effort that he and Grant put in.

A sausage sizzle and soft drinks were freely available during the day for the 45 attendees that came from the Greater Geelong area and Melbourne.

The new GPS locked RGL Beacon

Subsequent to the Arduino open day Bert VK3TU, with expert programming assistance from Lee VK3PK, applied the Arduino processor to the upgrade of the GARC's new GPS locked VK3RGL beacon on 144.530 MHz located at Mt. Anakie. Peter VK3WK also participated in the actual installation and commissioning.

The previous VK3RGL 2 m beacon had set a high benchmark for durability, longevity and reliability, but it was aging. The offer from Alan Devlin and the WIA Grants scheme to contribute towards the cost of building a GPS locked beacon provided the impetus for exploring options for a replacement of the original Philips 828. It was however clear from the outset, that the expectations for the "next-gen" beacon would be high.

When a surplus RF Innovations 100 W multi-protocol paging transmitter became available, at around the time when the grants were announced, it provided some additional momentum for the project. The rest of the equipment, GPSDO reference and controller, were secured only a matter of a few weeks prior to the installation.

Additional benefits that the transmitter provided were that it was already equipped with facilities to operate from an external reference, employed DSP techniques to generate the FSK modulation from an external TTL keying source for a very clean output and provided some on-board diagnostics which made it an ideal candidate for use as a beacon transmitter. That it was essentially already designed for the 2 m band made it even more so because it was clear that very little in the way of modifications would be necessary to make it work. A little research to locate the supplier and source a copy of the control software was really all that was required to get the transmitter operating.

The external reference used for the project is a BG7TBL 10 MHz GPS disciplined oscillator (GPSDO). It provided a very stable and clean 10 MHz output that is used to lock the synthesizer from which all internal signals are generated in the RFI transmitter. In the event that the external reference fails, the transmitter has its own internal OCXO reference that is quite stable in its own right as well as an alarm output to indicate a loss of the external source which means it can continue to operate seamlessly in the event that the external reference is lost. One very minor modification made to the external reference was to add some simple buffering to the oven status and GPS Lock indicator LED drivers for use as external alarms.

The external controller/keyer is a fully "home-grown" affair built around an Arduino Uno board with some very simple external interfacing. The Arduino was chosen because of the wide knowledge base that already exists as well as its versatility and wide range of I/O options. The control part of the keyer looks at the state of the GPSDO alarms as well as the synthesizer and internal/external reference switch in the RFI transmitter. The alarms are used to modify the CW message sent by the keyer part of the controller/keyer and

Photo 1: Lou VK3ALB with Lee VK3PK and JAYCAR's Steve Barrand.

provide some remote diagnostics for the people who use the beacon as well as those who have to maintain it.

The CW keying part of the program is a well written piece of code made available to all by its author Mark T Vande Wettering, K6HX and has been used by people all over the world.

The external reference and controller/keyer are also supported with an independent back-up system to get through any short term (6 to 8 hours) power interruptions.

The antenna system used at Mt Anakie has not changed from the previous set-up and consists of two 3-element Yagis with one aimed to the North-East and another aimed due West. The antenna system will likely be revised slightly in the near future to improve signals into Adelaide.

When monitoring the RGL beacon, the keying cycle now consists of:

- When the controller sees all parameters as "normal" the beacon will key out: "VK3RGL MT ANAKIE QF22DC" (at approximately 16 wpm) followed by five repeats of 1 minute key-down then "VK3RGL" only (at approximately 22 wpm) before repeating the whole cycle again
- In the event that the GPSDO reports an oven temperature fail condition, the beacon message will change to:

"VK3RGL GPSDO OVEN FAIL" (at approximately 10 wpm) followed by 1 minute of key-down then repeats the cycle

- In the event that the GPSDO reports the loss of satellite lock, the beacon message will change to:

"VK3RGL GPSDO LOCK FAIL" (at approximately 10 wpm) followed by 1 minute of key-down then repeats the cycle.

- In the event that the RFI Transmitter reports the loss of the external reference signal, the beacon message will change to "VK3RGL EXT REF FAIL " (at approximately 10 wpm) followed by 1 minute key down, then repeats the cycle
- In the event that the RFI transmitter reports that the internal synthesiser has lost lock the controller will release the external PTT and stop the transmitter from transmitting

The above was adapted from information provided by Bert VK3TU regarding his first real microcontroller project in the process of learning "Arduino speak".

Building an Electronic Car

As part of the club presentation syllabus organised by Lou VK3ALB, a lecture was provided by David Rowe VK5DGR, a GARC member for the last 3 years, on DIY electronic vehicles. In this he was assisted by Dr. Michael Axtens with two vehicles provided by members of the Geelong Electric Vehicle Enthusiasts Group.

The presentation was fairly even handed on the plus and minuses of building and operating an electric car. The efficiency of an electric car in comparison to a petrol vehicle is in the order of 100km / litre. Licensing these home brew cars can cost around $1000 and it's unlikely that the RACV would carry replacement batteries, which is why hybrids are in vogue.

Some other factors associated with these vehicles:

Batteries can go dead just like gas tanks can go empty

This fact has resulted in some "range anxiety" issues when it is limited to 50 – 100 km on a charge. It is generally recommended that electric cars be plugged in overnight for a full charge, but charging stations are beginning to be put into place that would allow an electric car to become charged in as few as 20 minutes, though there is concern the "quick charge" doesn't last as long as an overnight charge.

Manufactured Electric cars tend to be smaller than conventional cars

The reason many cars are small is due to the low energy density of batteries and the tie in between weight and range; so conversion / rebuild of an existing internal combustion vehicle will accentuate this issue.

Electric cars however do have multiple benefits

They provide a quieter ride with significantly less air pollution. They are also less costly to operate, and maintenance is minimal. They are also more reliable since they have fewer parts. Whilst the idea of an electric car may seem relatively new, in reality, they have been around for nearly 150 years.

Tony Collis VK3JGC

Photo 2: One of the two vehicles on display outside the GARC club house.

VK2 news

Tim Mills VK2ZTM
e *vk2ztm@wia.org.au*

The 2015 **ARNSW AGM** was held on a wet Saturday morning in early May with 33 members in attendance at the VK2WI Dural site. The meeting was held in the Centenary Building. President Mathew VK2YAP opened the meeting at 1010 hours. After apologies and proxy distribution, a presentation was made to John Vetters VK2JV for over seven years of being the VK2WI News compiler, a position that John recently stood down from to have a break. This role has been taken over by Mathew VK2YAP who hopes that he will occupy for a shorter period. We do need others to come forward and assist.

Returning to the business at hand the meeting worked through the regular matters of an AGM like accepting the President's report, the other reports and annual accounts. ARNSW being a small company is now exempt from Audit requirements, only having to be reviewed on an annual basis. No election was required this year as the existing committee were the only applicants. Returning Officer Peter VK2EMU and alternate Returning Officer Eric VK2VE were both re-elected to the respective positions.

The meeting then came to a series of presentations from Clubs who were recipients of the 2014 Development Funds provided by ARNSW. The first was a video presentation from the mid north coast Oxley Region ARC who replaced a borrowed EchoLink installation with a dedicated club-owned system. Next was WICEN NSW who has constructed a compact repeater equipped trailer for field deployment. The Hornsby and District ARC set up equipment dedicated to a portable station system for field day and demonstration use rather than having to borrow member's equipment whenever something was on. The fourth club receiving a 2014 grant was Waverley ARS who established a D-STAR repeater system to cover the Sydney CBD and an APRS gateway on the edge of the CBD. The 2015 applications are currently being assessed.

In general business there was a report on the Library upgrade progress. The Home Brew Group were moving to a new evening meeting location. The installation of security cameras on the Dural site was explained along with brief reports on the Education, Trash & Treasure operation and Broadcast coverage, which includes a new relay being introduced on 17 metres.

The meeting concluded 70 minutes after the start with most members staying on for the BBQ lunch which ended with ice cream – now a standard requirement at Dural gatherings. A big thank you to all who braved the adverse weather to attend.

ARNSW has another in the Field Day series at the end of the month, Sunday the 28th June. The theme is expected to be how to test valves, semiconductors and co-ax in a series of three lectures. As usual - please register an interest in attending by an email to *fieldday@arnsw.org.au*

An important event this month is the annual Field Day of the **Oxley Region ARC** in the mid north coast town of Port Macquarie over the June holiday weekend, Saturday 6th and Sunday 7th. Note a change of venue only for this year to the Hastings Public School on the corner of Woniora Parkway and Hillcrest Avenue. Both days have the usual fox hunts. The annual dinner on Saturday night is at the Tacking Point Golf Club. Traders and disposals are on Sunday. Next year – 2016 – the Field Day returns to the Surf Club which is currently being renovated.

Clubs and groups are reminded that both these notes and the VK2WI News sessions are a source of letting others know about your events and activities. Give a couple of months' notice, where practical, to the email address at the top of this column or closer the event with a news item to VK2WI at *news@arnsw.org.au* It pays to inform.

No need to remind most readers that the **VK2WI News** network has extensive coverage by on site transmitters and remote repeater relays. A new relay has been recently provided by Markus VK2SK of Bathurst onto 17 metres – 18.125 MHz USB. Reports are welcomed either direct to Markus or the ARNSW email for reports *callbacks@arnsw.org.au*

The **ARNSW** Radio and Home Brew Group have a meeting on the first Tuesday evening each month. For the past four years this has been hosted by Seppo VK2SMA at his QTH. With a recent change in Seppo's work pattern the gathering has moved QTH to that of Eric VK2VE and Megan VK2FGGL at Denistone. There is a net on the third Tuesday evening, repeater 7000 in Sydney and then HF on 80 and 40 metres and a bi-monthly meeting after the Trash & Treasure at the VK2WI site.

73 – Tim VK2ZTM.

Plan ahead

Oxley Region ARC Field Day – Port Macquarie | 6-7 June

VK6news

Keith Bainbridge
e *vk6rk@wia.org.au*

I think "winter is coming" to coin a phrase from Game of Thrones! It seems a lot of my contributors have gone into hibernation this month :)

It's very thin on the ground, so I will start off with some sad news.

Mirek VK6DXI went Silent Key on April 16th. It was such a shock as many of us had been talking with him at HARGfest a couple of days before. Mirek was a founder of the VK Contest Club and as a member of the VK6 branch we would have regular meetings for dinner whenever Mirek was in the country. His job took him around the world and wherever he was he would try to operate in a contest or just work some DX. He had a remote station located near Toodyay and would operate it from wherever he was if the internet connection was good enough. He was a dear friend and will be sadly missed by his wife, son and daughter and the radio community in general.

Vale Mirek VK6DXI.

Now to the south west and news from the **Bunbury Radio Club**

Over to Norm VK6GOM

Attendance at our meetings continues to grow with eighteen members attending the April meeting. The feature of the meeting was a talk by Ian VK6MIB on the history, politics and technology surrounding the GPS system. Ian is a software guru and previously worked on GPS controlled agricultural machinery, so he is quite expert in the subject.

Alek VK6AP kindly brought two boxes of bits and bobs to the meeting, which were eagerly turned over by members. It's a good way to transfer junk from one QTH to another. Dicko was quite concerned that it might be left at his place if it wasn't taken up.

Photo 1: A crowd of enthusiasts at HARGfest.

A number of licence assessments, sponsored by the club were performed on 18 April at the Western Power training centre. There were two standard, one Advanced and five Foundation applicants. Again, it is interesting to see that the number of Foundation applicants continues at a steady pace. The next thing, of course, is to see that they upgrade.

We are still exploring the possibility of putting a 70 cm repeater (with IRLP) at Collie. While we have the gear and the club is committed to this project there are still many steps in the process that must be dealt with. With the movement of Barry VK6WF to the east coast, the repeater at Kelliberrin, VK6RKN, has been taken off the air.

Finally the construction of the future club room proceeds apace. The walls have been rendered, ceilings are in, power is in place and the next step is to paint the inside ceiling. With luck we could be in there by July this year.

The club executive is currently working on a schedule of activities for the next financial year. Including items such as foxhunts, club station award, HF contest and visits to interesting facilities.

Any South West based amateur (or anyone interested in radio or electronics) is more than welcome to join and participate in our activities. The annual fee is only $25.00. Those wishing to join can contact the Club via our Secretary, Brian Andrews, on 0403 975 953 or *vk6brc@wia.org.au*

Thanks for the latest Norm.

There was plenty of activity to report on from the hills, so over to Bill.

News from **HARG** - The Hills Amateur Radio Group.

HARGfest 2015 was a great success. This year it was held at The Lesmurdie Hall which proved to be a very popular venue. Parking and access was easy and the covered outdoor eating and chatting areas worked well. We had a record 170 amateurs through the door (150 last year) plus three or four children. Sellers occupied a record 30 tables in the spacious hall, nearly double the 18 tables we had last year. All of the other clubs took extra tables this year, so a very big thank-you to them. We made a record profit which will help in replacing our stolen equipment.

Sellers participating were TET-Emtron, WA VHF Group, NCRG, WARG, SOTA, WIA, WIA QSL Bureau, Fritz VK6UZ, Steve VK6SJ, Richard VK6BMW, Steve VK6VZ, Glenn VK6IQ, Gary VK2BLC, Nick Govier with the Estate of VK6ZD and Richard Burden. Thank you all for supporting HARGfest.

The major raffle winners were Lance VK6LR who won the Yaesu FT-7900R Mobile and Christine VK6ZLZ who won the Yaesu FT-60R Hand Held. Both of those radios were donated by Ian Garnett VK6LCT of Timberden Plant Hire in Toodyay. The Iroda Gas Soldering Iron donated by Altronics was won by Bill VK6WJ. The two door prizes of Balun Kits donated by TET-Emtron were won by Alasdair VK6KIF and Wayne VK6EH. Please support our generous donors as often as you can. Next year we intend to have a larger number of prizes so that there are not so many sad faces in the room after the raffle is completed :).

The food stall was ably run by the very hardworking Ray VK6ZRW, Allan VK6AN, Alan VK6PWD, Ian VK6DW and Johnno VK6FJON. We are sorry that we ran out of hamburgers towards the end. Next year we will buy more hamburger patties. Thanks also to Ron VK6HRB, his XYL Dot and Richard's XYL Lyn who ran the Tea and Coffee area. Lyn's slices were very popular.

Thanks also to Andrew VK6WAM and Christie VK6XCJ who manned the registration table and Steve VK6IR and Marty VK6RC who helped set up the tables.

Others involved were our Secretary Richard VK6BMW, Treasurer Cliff VK6LZ, President Miles VK6MAB, Vice President Martin VK6ZMS, Technical Officer Craig VK6FLAM and me - Bill VK6WJ, who attempted to coordinate the whole thing. If anyone has any suggestions for an even better HARGfest next year, please contact *secretary@harg.org.au* We will run HARGfest 2016 in April next year. In the meantime please support the NCRG Hamfest on Sunday 9th August this year.

Photo 2: Catching up with mates at HARGfest.

HARG Meetings are held twice a month at the club rooms near the corner of Brady and Sanderson Roads in Lesmurdie. The Social and Practical meeting is held on the second Saturday of the month and the General Meeting, often with a technical talk, on the last Saturday of the month. Doors open at 12:30 pm for a barbecue lunch and the meeting starts at 2:00 pm. Everyone is welcome.

More information at *www.harg.org.au*

Cheers and 73 until next time from Bill VK6WJ, Publicity Manager for HARG.

It was an excellent event Bill, well done to HARG and we look forward to it again next year.

Finally it's the **NCRG** spot for this month.

Firstly a reminder about **Hamfest 2015**

The venue is the same as the past several years, the Cyril Jackson Rec Centre in Fisher St Ashfield 6054.

It's on the 2nd Sunday in August: the 9th, NOT the first Sunday as it has been for the past several years. We are trying to get the event away from the Avon Descent which takes place on the first Sunday of August. Start time is 9:00 am for Buyers and 7:30 am for Sellers and the raffle will be drawn around 1:00 pm.

Admission is $5 and there will once again be no charge for tables.

The usual excellent food and soft drinks will be available and there are also several new irons in the fire regarding displays etc.

I look forward to seeing ALL VK6 amateurs on the day!

The club is planning a big effort at Hamfest this year, hopefully with very useful NEW equipment for sale the help out the local amateurs given our lack of a retail output here in Perth and of course we will invite

the traders from the Eastern States to attend, but we won't hold our breath: (So you will have to be there to find out what we will be offering, but rest assured it will be stuff you will want to buy :)

Please note we will be holding the Homebrew Contest once again so get those projects completed.

At the club itself we have had visitors from Japan and the UK, and were complimented on our setup. Also visiting was Peter Parker VK3YE: he took a video to prove it. It was a pity it was in the dark but it was still interesting.

I don't have the You-Tube link but I'm sure it will be easy to find.

The tower work is progressing slower than we would have liked but we only have a couple of hours on a Sunday morning so any progress is good I reckon. The club trailer tower is almost completed and ready to go over the pits so that will be a big asset for the future.

If you are planning to visit us, we meet every Sunday morning from approx. 8:30 am till around 11:30 am at the club (ncrg.org.au for directions). The first Sunday in the month is a short business meeting from 9:30 am then a BBQ breakfast. We also meet on the 2nd and 4th Tuesdays in the month at 7:30 pm for a chat and maybe a spot of operating etc.

Please come along, you will be most welcome.

That's all folks till next month when I hope a few more dormant contributors will show their face again :)

73 de Keith VK6RK *vk6rk@wia.org.au*

AMSAT-VK

AMSAT Co-ordinator
Paul Paradigm VK2TXT
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Group Moderator
Judy Williams VK2TJU
email: ***secretary@amsat-vk.org***

Website:
www.amsat-vk.org

Group site:
group.amsat-vk.org

About AMSAT-VK

AMSAT-VK is a group of Australian amateur radio operators who share a common interest in building, launching and communicating with each other through non-commercial amateur radio satellites. Many of our members also have an interest in other space based communications, including listening to and communicating with the International Space Station, Earth-Moon-Earth (EME), monitoring weather (WX) satellites and other spacecraft. AMSAT-VK is the primary point of contact for those interested in becoming involved in amateur radio satellite operations. If you are interested in learning more about satellite operations or just wish to become a member of AMSAT-Australia, please see our website.

AMSAT-VK monthly net
Australian National Satellite net

The net takes place on the 2nd Tuesday of each month at 8.30 pm eastern time, that is 0930 Z or 1030 Z depending on daylight saving. Check-in starts 10 minutes prior to the start time. The AMSAT-VK net has been running for many years with the aim of allowing amateur radio operators who are operating or have an interest in working in the satellite mode, to make contact with others in order to share their experiences and to catch up on pertinent news. The format also facilitates other aspects like making 'skeds' and for a general 'off-bird' chat. In addition to the EchoLink conference, the net will also be available via RF on the following repeaters and links.

In New South Wales
VK2RBM Blue Mountains repeater on 147.050 MHz

In Queensland
VK4RIL Laidley repeater on 147.700 MHz
VK4RRC Redcliffe 146.925 MHz IRLP node 6404, EchoLink node 44666

In South Australia
VK5TRM, Loxton on 147.175 MHz
VK5RSC, Mt Terrible on 439.825 MHz IRLP node 6278, EchoLink node 399996

In Tasmania
VK7RTV Gawler 6 metre repeater 53.775 MHz IRLP node 6124
VK7RTV Gawler 2 metre repeater 146.775 MHz IRLP node 6616

In the Northern Territory
VK8MA Katherine 146.700 MHz FM

Operators may join the net via the above repeaters or by connecting to EchoLink on either the AMSAT or VK3JED conferences. Past experience has shown that the VK3JED server offers clearer audio. The net is also available via IRLP reflector number 9558. We are keen to have the net carried by other EchoLink or IRLP enabled repeaters and links in order to improve coverage. If you are interested in carrying our net on your system, please contact Paul via email. Frequencies and nodes can change without much notice. Details are put on the AMSAT-VK group site.

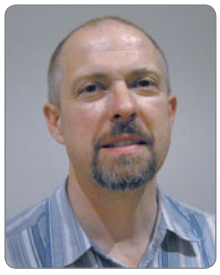
Become involved

Amateur satellite operating is one of the most interesting and rewarding modes in our hobby. The birds are relatively easy to access and require very little hardware investment to get started. You can gain access to the FM 'repeaters in the sky' with just a dual band handheld operating on 2 m and 70 cm. These easy-to-use and popular FM satellites will give hams national communications and handheld access into New Zealand at various times through the day and night. Currently only SO-50 is available.

Should you wish to join AMSAT-VK, details are available on the web site or sign-up at our group site as above. Membership is free and you will be made very welcome.

Participate

GIPPSTECH 2015	11 - 12 July
HAMFEST Gippsland Gate Radio & Electronics Club	18 July
High Plains Winter Expedition Group	11 - 14 August
Remembrance Day Contest	15 - 16 August



VK7news

Justin Giles-Clark VK7TW
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DXpedition News

Allen VK7AN and David VK7YUM visited Norfolk Island (VK9N) for 10 days in late March and activated SOTA summit VK9/NO-001 and IOTA/OC005. Call signs used were VK9N/VK7AN and VK9N/VK7YUM. Equipment used was an Icom IC-706MkIIG and 6-40 metre OCF dipole. Allen focussed on SSB and David on Digital. The SOTA activation was Mt Pitt (VK9/NO-001) at 321 m. The station was setup next to the old World War II radar station relics and many contacts were made. Thanks to John Anderson VK9JA and Ray Sills VK9NMZ for their local hospitality and assistance. Thanks to Allen and David for the report and photos.

VK7 Repeater News

The big news in VK7 was the air lift of the new VK7RMD repeater tower and facilities onto Mt Duncan on 11 April 2015. Over the last 18 months Dion VK7DB and his team of helpers has built a new tower, shed, antennas, and other infrastructure to replace the aging VK7RMD. All equipment was delivered to the Purton Flats, which is located two kilometres south east from Mt Duncan. The tower was lifted into place with all antennas and Heliax connected along with a new site shed, equipment, one kilowatt of solar panels and a new solar panel frame. All up

Photo 1: VK9N/VK7AN handling the DX pileup – the smile says it all! (Photo courtesy of David VK9N/VK7YUM.)

Photo 2: Helicopter lift of the new VK7RMD tower (Photo courtesy of Peter VK7PD.)

Photo 3: From LtoR: The VK7RMD Installation Crew. (Photo courtesy of Dion VK7DB.)

the lifts took about 30 minutes of flying time including the removal of superfluous material back to Purton Flats for pickup. The new solar panels are performing well and coverage reports show significant improvement. Thanks to all involved on the day and leading up to this momentous day especially Dion Thanks to Dave VK7DC for the report.

Cradle Coast Amateur Radio Club

Congratulations to Lucas VK7FLSB, David VK7FDAB and Michael VK7FJJA who all passed their Standard licence assessments. Thanks go to Peter VK7PD who assisted in the exam process. CCARC held their first evening social/technical meeting on 25 March with some great show and tell. Dion VK7DB with the VK7RMD 6 m folded dipole, David VK7FDAB showed footage from his quad-copter of the new Mt Duncan site - *https://www.youtube.com/watch?v=6lOdWcFedK4*

Steve VK7LA showed his receiver with inbuilt spectrum analyser and Eric VK7EK brought along his copper tubing J-Pole antenna. Thanks to all who participated. CCARC members also helped out with safety communications for the March Kentish Endurance Riders club event.

Northern Tasmanian Amateur Radio Club

NTARC provided communications along with RFID tracking for the North East Equine Endurance Club (NEEEC) Equine Endurance Event at Santarena Park over the Easter weekend. There were 40, 80, 120 and 240 km rides over the weekend with 148 riders involved. Thanks go to Norm VK7KTN & XYL Lorraine, Ken VK7KKV and XYL Bet, Wayne & Meg Hodge, Idris VK7ZIR, Andre VK7ZAB, Alvin VK7ADQ, Stuart VK7FEAT, Peter Sulzberg and Yvonne VK7FYMX.

NTARC's April meeting was a BBQ meeting followed by a presentation by Steve VK7BI, with his talk on his visit to Gallipoli and Troy. The slides showing Anzac Cove, The Dardanelles, the Australian, New Zealand and Turkish War Memorials were very relevant given the ANZAC Centenary. Thanks Steve.

WICEN Tasmania (South)

The week of the 27 April to 2 May saw the running of the tarmac rally around Tasmania called Targa Tasmania. The WICEN Tasmania (South) crew along with other helpers were involved in road closure duties, installing and removing of radio gear, repeaters, manning SOS points and many other "impromptu" duties as required. Thanks go to Ken VK7DY & XYL Wendy VK7FWJS, Clayton VK7ZCR, Michael VK7MRS, Rod,

VK7TRF, Gavin VK7HGO, Peter VK7TPE, Tom VK7FTWS, Leon VK7ZLM, Ron VK7ZRO and Roger VK7ARN. Apologies to anyone missed and thanks to Gavin VK7HGO for the report.

Radio and Electronics Association of Southern Tasmania

The REAST activity for April was a presentation and follow-up workshop on inverted V linked dipoles. The author took the audience through the theory, modelling, uses and construction techniques for these light, portable, tuned (no-ATU required) and cheap antennas. From the presentation night we progressed to a full workshop of home brewers who put the kits together for an antenna of up to eight frequencies of their choice. There was frenetic activity cutting wire, stringing the segments together, soldering on the alligator clips, cutting the RG174 coax, crimping connectors, and that was just before lunch! We got time to tune and few of them on the construction day and later in the week.

The REAST DATV nights have included Paul VK7PAH with the iPad application called SSTV Pad from Black Cat Systems, Alan VK7KAJ with some interesting USB voltage and current indicators, the author with SOTA activations of Mt Field East, Legges Tor and Mt Barrow, antenna modelling with MMANA, uploading SOTA logs using the spreadsheet templates, video format converters, LED auto replacement globes and flasher units. Our videos have included technical archive film of the rebuilding of the Tasman Bridge, ANZAC related videos and videos thanks to Noel VK3FI.

Photo 4: Linked dipole antenna workshop. (Photo courtesy of Justin VK7TW.)

Guy Fletcher Gridsquares Table at 12 April 2015

David Smith VK3HZ

144 MHz	Terrestrial		
VK2FLR	Mike	120	
VK3NX	Charlie	107	
VK2KU	Guy	102	
VK3HZ	David	93	
VK3PF	Peter	90	
VK2ZT	Steve	88	SSB
VK5AKK	Phil	87	SSB
VK3PY	Chas	82	SSB
VK2DVZ	Ross	80	SSB
VK2ZAB	Gordon	78	SSB
VK3BDL	Mike	77	SSB
VK2AMS	Mark	75	
VK3BJM	Barry	70	SSB
VK3QM	David	69	SSB
VK7MO	Rex	69	
VK3AKK	Ken	64	SSB
VK2TK	John	62	
VK3HY	Gavin	61	
VK3WRE	Ralph	60	SSB
VK3PF	Peter	56	SSB
VK3KH	Michael	55	SSB
VK4CDI	Phil	53	
VK2MER	Kirk	52	SSB
VK3ZLS	Les	51	SSB
VK7MO	Rex	49	SSB
VK4CDI	Phil	48	SSB
VK7MO	Rex	48	Digi
ZL3TY	Bob	46	
VK2TG	Bob	40	SSB
VK3EJ	Gordon	40	SSB
VK3PF	Peter	40	Digi
VK3UH	Ken	40	
VK2TK	John	35	SSB
VK3ZUX	Denis	33	SSB
VK3DXE	Alan	32	
VK1DA/p	Andrew	31	
VK1WJ	Waldis	31	
VK3DXE	Alan	31	SSB
VK1WJ	Waldis	28	Digi
VK2TK	John	27	Digi
VK3KH	Michael	26	Digi
VK4CDI	Phil	26	Digi
VK3ES	Andy	24	SSB
VK4EME	Allan	23	
VK3ALB/p	GARC Team	22	SSB
VK6KZ	Wally	20	
VK2ZT	Steve	19	Digi
VK4EME	Allan	19	SSB
VK3AL	Alan	18	SSB
VK2DVZ	Ross	17	Digi
VK2AMS	Mark	16	Digi
VK6KZ/p	Wally	16	
ZL3TY	Bob	15	Digi
VK4EME	Allan	13	Digi
VK5APN	Wayne	13	
ZL1UJG	Kevin	10	Digi
VK3MEG	Steve	9	SSB
VK1WJ	Waldis	7	SSB
VK5APN	Wayne	7	Digi
VK5APN	Wayne	7	SSB
ZL3TY	Bob	7	CW
VK1WJ	Waldis	5	CW
VK3DXE	Alan	5	Digi
ZL1UJG	Kevin	5	SSB
VK3DXE	Alan	4	CW
VK3QM	David	1	Digi
VK4QG	Allan	1	SSB

144 MHz	EME		
VK2KU	Guy	494	
VK2KU	Guy	480	Digi
ZL3TY	Bob	424	
VK3AXH	Ian	390	Digi
VK4CDI	Phil	342	Digi
VK5APN	Wayne	253	
VK5APN	Wayne	248	Digi
VK7MO	Rex	157	Digi
VK2DVZ	Ross	127	Digi
VK2FLR	Mike	120	
VK3BJM	Barry	111	Digi
VK3KH	Michael	62	Digi
VK2KU	Guy	44	CW
VK2ZT	Steve	28	Digi
VK3HZ	David	19	
VK5APN	Wayne	17	CW
VK3DXE	Alan	16	Digi
VK3NX	Charlie	5	CW
VK4EME	Allan	5	Digi
VK3AXH	Ian	4	CW
VK2DVZ	Ross	2	CW
VK3AXH	Ian	1	SSB

432 MHz	Terrestrial		
VK2ZAB	Gordon	57	SSB
VK3PY	Chas	53	SSB
VK3QM	David	52	SSB
VK3NX	Charlie	50	SSB
VK3HZ	David	42	
VK3ZLS	Les	40	SSB
VK3BJM	Barry	39	SSB
VK5AKK	Phil	39	SSB
VK2KU	Guy	38	
VK2ZT	Steve	38	SSB
VK3BDL	Mike	37	SSB
VK3AKK	Ken	36	SSB
VK2DVZ	Ross	35	SSB
VK3WRE	Ralph	34	SSB
VK3PF	Peter	32	
VK3PF	Peter	30	SSB
VK1DA/p	Andrew	24	
VK3KH	Michael	22	SSB
VK7MO	Rex	22	
VK3ES	Andy	21	SSB
VK7MO	Rex	21	SSB
VK2AMS	Mark	20	
VK2TK	John	18	
VK3ALB/p	GARC	18	SSB
VK4CDI	Phil	18	
VK2TK	John	17	SSB
VK4CDI	Phil	17	SSB
VK3HY	Gavin	16	
VK3ZUX	Denis	15	SSB
VK2MER	Kirk	13	SSB
VK6KZ	Wally	13	
VK2TG	Bob	12	SSB
VK3AL	Alan	10	SSB
VK3KH	Michael	8	Digi
VK3UH	Ken	8	
VK4CDI	Phil	8	Digi
VK6KZ/p	Wally	8	
VK7MO	Rex	8	Digi
ZL3TY	Bob	8	
VK2DVZ	Ross	7	Digi
VK4EME	Allan	6	SSB
VK1WJ	Waldis	5	SSB
VK2ZT	Steve	4	Digi
VK3PF	Peter	4	Digi
VK3PY	Chas	4	Digi
VK3QM	David	4	Digi

VK2AMS	Mark	3	Digi
VK3DXE	Alan	3	SSB
VK3MEG	Steve	3	SSB
VK4QG	Allan	3	SSB
VK2TK	John	1	Digi

432 MHz EME			
VK4EME	Allan	91	
VK4EME	Allan	86	Digi
VK4CDI	Phil	60	
VK4CDI	Phil	60	Digi
VK4EME	Allan	13	CW
VK7MO	Rex	10	
VK7MO	Rex	9	Digi
VK3NX	Charlie	5	CW
VK3AXH	Ian	4	Digi
VK3HZ	David	4	
VK3KH	Michael	3	Digi
VK3NX	Charlie	3	Digi
VK2ZT	Steve	2	Digi
ZL3TY	Bob	2	Digi
VK4CDI	Phil	1	CW

1296 MHz Terrestrial			
VK3PY	Chas	42	SSB
VK3QM	David	42	SSB
VK3NX	Charlie	40	SSB
VK2ZAB	Gordon	29	SSB
VK3AKK	Ken	29	SSB
VK2DVZ	Ross	27	SSB
VK3ZLS	Les	26	SSB
VK5AKK	Phil	26	SSB
VK2KU	Guy	25	
VK3BJM	Barry	23	SSB
VK3PF	Peter	22	
VK3BDL	Mike	21	SSB
VK3WRE	Ralph	21	SSB
VK3PF	Peter	20	SSB
VK3HZ	David	19	
VK3KWA	John	19	
VK3KH	Michael	17	SSB
VK2ZT	Steve	16	SSB
VK3ALB/p	GARC	16	SSB
VK3ES	Andy	13	SSB
VK7MO	Rex	12	SSB
VK1DA/p	Andrew	10	
VK2TK	John	10	SSB
VK2AMS	Mark	9	
VK3HY	Gavin	8	
VK3AL	Alan	7	SSB
VK3UH	Ken	7	
VK2MER	Kirk	6	SSB
VK3ZUX	Denis	5	SSB

VK4CDI	Phil	5	
VK4CDI	Phil	5	SSB
VK6KZ/p	Wally	5	
VK2DVZ	Ross	4	Digi
VK3KH	Michael	4	Digi
VK6KZ	Wally	4	
VK2TG	Bob	3	SSB
VK4EME	Allan	3	SSB
VK7MO	Rex	3	Digi
VK3PF	Peter	2	Digi
VK3QM	David	2	Digi
VK4CDI	Phil	2	Digi
VK2ZT	Steve	1	Digi
ZL3TY	Bob	1	SSB

1296 MHz EME			
VK4CDI	Phil	113	
VK4CDI	Phil	99	Digi
VK3NX	Charlie	67	CW
VK4CDI	Phil	51	CW
VK2AMS	Mark	44	Digi
VK7MO	Rex	41	
VK3AXH	Ian	39	Digi
VK2DVZ	Ross	37	Digi
VK7MO	Rex	36	Digi
VK4CDI	Phil	6	SSB
VK3NX	Charlie	4	SSB
VK2MER	Kirk	3	Digi
VK3AXH	Ian	3	CW
VK2AMS	Mark	2	SSB
VK2DVZ	Ross	1	SSB
VK3AXH	Ian	1	SSB
VK3NX	Charlie	1	Digi

2.4 GHz Terrestrial			
VK3QM	David	31	SSB
VK3PY	Chas	30	SSB
VK3AKK	Ken	29	SSB
VK3NX	Charlie	29	SSB
VK3WRE	Ralph	12	SSB
VK3ES	Andy	8	SSB
VK3ALB/p	GARC Team	7	SSB
VK3BJM	Barry	7	SSB
VK3PF	Peter	7	SSB
VK3KH	Michael	6	SSB
VK3HZ	David	5	
VK6KZ	Wally	4	
VK3KH	Michael	3	Digi
VK3ZUX	Denis	3	SSB
VK1DA/p	Andrew	2	
VK2AMS	Mark	2	
VK3PF	Peter	2	Digi
VK2DVZ	Ross	1	SSB
VK4EME	Allan	1	SSB

2.4 GHz EME			
VK3NX	Charlie	50	CW
VK7MO	Rex	14	
VK7MO	Rex	10	Digi
VK3NX	Charlie	8	SSB

3.4 GHz Terrestrial			
VK3QM	David	28	SSB
VK3AKK	Ken	27	SSB
VK3NX	Charlie	27	SSB
VK3PY	Chas	26	SSB
VK3WRE	Ralph	8	SSB
VK3PF	Peter	6	SSB
VK6KZ	Wally	4	
VK2AMS	Mark	3	
VK4CDI	Phil	3	SSB
VK2AMS	Mark	1	Digi
VK2EM	Bruce	1	SSB

3.4 GHz EME			
VK3NX	Charlie	33	CW
VK4CDI	Phil	13	
VK4CDI	Phil	12	CW
VK3NX	Charlie	7	SSB
VK3NX	Charlie	2	Digi
VK4CDI	Phil	2	Digi

5.7 GHz Terrestrial			
VK3QM	David	28	SSB
VK3NX	Charlie	26	SSB
VK3PY	Chas	26	SSB
VK3AKK	Ken	25	SSB
VK3WRE	Ralph	9	SSB
VK3PF	Peter	7	SSB
VK3ALB/p	GARC Team	6	SSB
VK3KH	Michael	4	SSB
VK6KZ	Wally	4	
VK2AMS	Mark	2	
VK3BJM	Barry	2	SSB
VK3PF	Peter	2	Digi
VK3ZUX	Denis	1	SSB

5.7 GHz EME			
VK3NX	Charlie	42	CW
VK3NX	Charlie	5	SSB
VK3NX	Charlie	1	Digi

10 GHz Terrestrial			
VK3HZ	David	82	
VK3HZ	David	39	SSB
VK3NX	Charlie	33	SSB
VK3PY	Chas	31	SSB
VK3QM	David	30	SSB
VK3AKK	Ken	29	SSB
VK6DZ	Derek	25	Digi
VK3HY	Gavin	14	
VK3PF	Peter	13	SSB
VK3WRE	Ralph	12	SSB
VK6DZ	Derek	12	SSB
VK3ES	Andy	10	SSB
VK3ALB/p	GARC Team	7	SSB
VK7MO	Rex	7	
VK3KH	Michael	6	SSB
VK7MO	Rex	6	SSB
VK6KZ	Wally	5	
VK2AMS	Mark	3	
VK2EM	Bruce	3	SSB
VK3KH	Michael	3	Digi
VK1DA/p	Andrew	2	
VK3BJM	Barry	2	SSB
VK3NX	Charlie	2	Digi
VK3UH	Ken	2	
VK3ZUX	Denis	2	SSB
VK7MO	Rex	2	Digi

10 GHz EME			
VK3NX	Charlie	39	
VK3NX	Charlie	34	CW
VK7MO	Rex	7	Digi
VK3NX	Charlie	6	Digi
VK3NX	Charlie	2	SSB

24 GHz Terrestrial			
VK3HZ	David	23	
VK3HZ	David	12	SSB
VK3QM	David	6	SSB
VK3AKK	Ken	5	SSB
VK3NX	Charlie	5	SSB
VK7MO	Rex	3	SSB
VK6KZ	Wally	2	
VK3WRE	Ralph	1	SSB

24 GHz EME			
VK3NX	Charlie	8	
VK3NX	Charlie	6	CW
VK3NX	Charlie	4	Digi
VK7MO	Rex	4	Digi

47 GHz Terrestrial			
VK3AKK	Ken	4	SSB
VK3NX	Charlie	4	SSB
VK3QM	David	4	SSB

76 GHz Terrestrial			
VK3HZ	David	3	SSB
VK3KH	Michael	1	SSB

122 GHz Terrestrial			
VK3KH	Michael	1	SSB

474 THz			
VK3WRE	Ralph	3	AM
VK3HZ	David	2	
VK7MO	Rex	2	
VK7MO	Rex	2	Digi
VK7TW	Justin	2	
VK3QM	David	1	SSB
VK7TW	Justin	1	Digi

This Table is managed by David Smith VK3HZ who may be contacted by email at <callsign>@wia.org.au

The guidelines for the Table may be found at *www.vk3hz.net/gridsquares*

Next update of this Table will be on **16 August 2015.**

Honours for the ILLW our prime fun-event

Jim Linton VK3PC

The Ayr Amateur Radio Group (AARG) that began activating maritime navigation beacons with its biennial *Scottish Northern Lighthouses Award Weekend* in 1993 has honoured a stalwart that has kept the radio amateur light burning.

A meeting of AARG discussed the evolution of the event which became International Lighthouse and Lightship Weekend in 1998 due to demand, initially mostly from Europe then globally.

The AARG had been looking for an activity event and chose the activation of lighthouses. The prime drivers of the portable activation were John Forsyth GM4OOU and the late Mike Dalrymple GM4SUC.

Then a letter from Mike GM4SUC invited participation from down under in the re-named International Lighthouse and Lightship Weekend.

That letter, read out on the Australian Naval Amateur Radio Society (ANARS) net, struck a responsive chord with Kevin Mulcahy VK2CE, who activated the Green Cape Lighthouse as VK2SEA, and a few others who also joined in.

So much fun was had with ILLW that Kevin volunteered to be the Oceania coordinator, and Mike GM4SUC appointed him in 2000 to create the ILLW website.

Mike was a long standing AARG member who served as its treasurer for 19 years. Sadly he passed in 2005. In memory of Mike GM6SUC the AARG each year activates Turnberry Lighthouse UK0000 as GB2LT.

Since 2005 organising the fun-event was left to Kevin VK2CE. His involvement has also mustered a supporting team.

During a recent family visit to Melbourne, Tony Devine GM6BAO met up with Kevin VK2CE to express sincere appreciation for the work he had done in growing ILLW.

Photo 1: Tony GM6BAO (left) presents Kevin with a Quaich engraved with "To Kevin VK2CE with many thanks for all your work and commitment to ILLW, vy 73 de AARG.

Tony GM6BAO said: "Not in its wildest dreams did the Ayr Amateur Radio Group (AARG) ever think the event would grow from its small beginning to now exceed 500 registrations from some 56 countries.

"The beginning of what is now the world's prime fun-event has been discussed by our members, who strongly believe it's well over due to recognise a prime motivator who has helped make it grow in registrations and status."

"They decided to honour Kevin VK2CE for driving and growing the ILLW for many years, by presenting an inscribed pewter traditional Quaich Scottish drinking cup from the highlands, and a bottle of Glenlivet single malt aged whiskey."

A very surprised yet humble recipient was lost for words at first, stunned by the presentation from the Ayr Amateur Radio Group.

Expressing thanks, he read the inscription and gazed at it while gathering his thoughts.

Then Kevin VK2CE said: *"Thank you for the honour that has turned up out of the blue from the originating group that started my involvement 17 years ago."*

"I accept this fine gift on behalf of myself and the ILLW team. Ted W8TTS has been with me since day one as the Manager of the ILLW Lighthouse List which determines whether a registration is valid, the Publicity is handled by Jim VK3PC, and for last few years Ken M1DZT

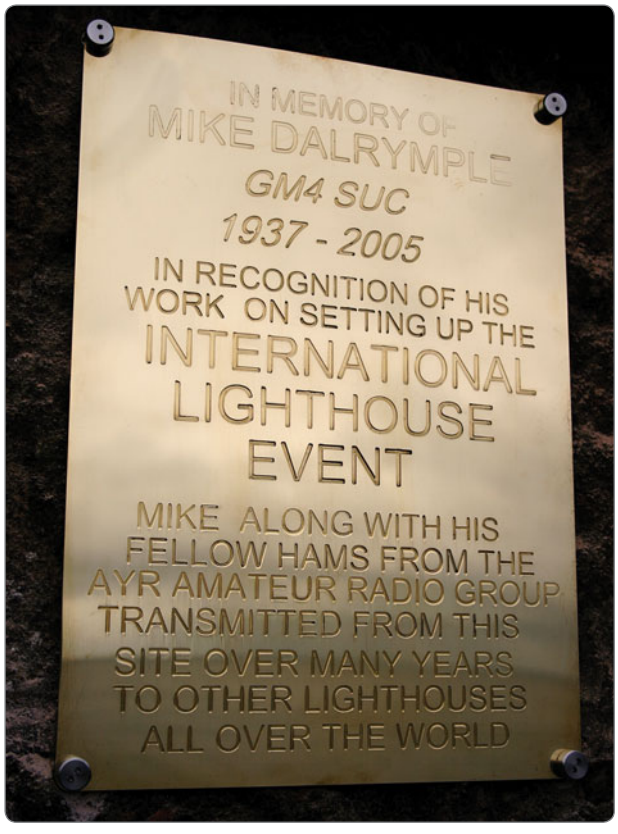

Photo 2: The plaque that remembers Mike Dalrymple GM4SUC who began the fun-event.

does the Google Earth file for all those registered."

He said the basic objective on ILLW was to promote public awareness of lighthouses and lightships and their need for preservation and restoration. At the same time it promotes Amateur Radio and fosters goodwill.

Kevin VK2CE explained: *"It aims to help highlight these magnificent structures which are all around the world, but under real threat from commercial pressure, changing ownership and some vandalism."*

History shows us that before lighthouses, ship captains were guided in some areas by the lighting of fires. From the turn of the 18th century there were purpose-built lighthouses.

The famed Fresnel lens enabled them to rotate a concentrated beam of light, giving each an instantly identifiable signature.

A book *'A Short Bright Flash'* by Theresa Levitt traces the birth of the lighthouse, and tells the story of Augustin Fresnel, who invented a lens enabling lighthouses to efficiently illuminate many times brighter and further.

The physicist and engineer populated the entire French coast with his revolutionary lens, which was then adopted at lighthouses throughout the world.

With shipping trade of goods and passengers increasing, this form of maritime navigation was built in many places of danger to provide navigation in coastal areas, and on inland waterways.

Once they were mainly manned with lighthouse-keepers, then they went through a phase of automation, and due to expense of maintenance were gradually overtaken by modern technology.

The ILLW *www.illw.net* is a fun-event held always on the third weekend of August, with its guidelines, past-activation reports and registration online.

Editor's Note: Now is the time to plan your participation. Many have already indicated their plans to activate lighthouses for the 2015 event on 15 & 16 August.

Photo 3: The famous Turnberry Lighthouse in Scotland where it all began.

Contributions to *Amateur Radio*

AR is a forum for WIA members' amateur radio experiments, experiences, opinions and news.

Your contribution and feedback is welcomed.

Guidelines for contributors can be found in the AR section of the WIA website, at *http://www.wia.org.au/members/armag/contributing/*

Email the Editor: *editor@wia.org.au*

About Hamads

- Submit by **email (MUCH PREFERRED)** or if written and mailed please print carefully and clearly, use upper AND lower case.
- Deceased estates Hamads will be published in full, even if some items are not radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
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- Copy to be received by the deadlines on page 1 of each issue of Amateur Radio.
- Separate forms for For Sale and Wanted items. Include name, address STD telephone number and WIA membership number.

'Hamads'
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BAYSWATER VIC 3153
hamads@wia.org.au

"Hey, Old Timer..."

If you have been licensed for more than 25 years you are invited to join the

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Write to **RAOTC**
PO Box 107, Mentone
VIC 3194
Ian Godsil 03 8707 1177

or Bill VK3BR on 03 9584 9512, email *raotc@raotc.org.au* for an application form.

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Advertisements with only a PO Box number address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

ADVERTISERS INDEX

WIA Functional Committees

The WIA is a membership organisation with a very wide range of complex functions and member services. Core functions and services are administrative in nature (general administrative functions, membership services, examination and callsign management, financial etc…) and are performed by salaried staff.

Volunteers perform a diverse range of highly specialist functions (ACMA liaison, Frequency Co-ordination, Standards liaison, Interference issues, technical support and training and assessment etc.). These volunteers provide the majority of member services, however they have been loosely organised and often overstretched.

The new committee system attempts to structure the WIA's non-core activities into 10 broad functional areas, each comprising a team of volunteers under the direction of the WIA Board. This structure is intended to spread the workload on our volunteers, improve communications between members and the WIA Board, improve services to members, and encourage more people to become involved in the WIA.

WIA Committee Charters

Spectrum Committee

(Regulatory, ACMA, ITU, IARU, Repeaters & Beacons, Standards, Interference & EME, Monitoring Service)
Geoff VK3AFA, Phil VK2ASD (Director), Peter VK3MV, Roger VK2ZRH (Director), Brian VK3MI, Dale VK1DSH, Peter VK3APO, Richard VK2AAH, Gilbert VK1GH, Rob VK1KRM, Noel VK3NH, Doug VK3UM

- Perform all ITU and IARU liaison activities.
- Liaise with, and act as the 1st point of contact for, the ACMA.
- Advise the Board, and enact Board policy in relation to all radio communications regulatory issues and the LCD.
- Represent the WIA to State and Local Government
- Represent the WIA to Standards Australia
- Provide specialist technical advice and coordinate repeater and beacon licence applications and frequency allocation.
- Develop responses to significant and prolonged harmful interference issues affecting amateur radio operations.
- Provide an information resource for EMC/EMR issues.
- Administer the IARU Monitoring Service in Australia
- Provide a technical resource to other committees and the WIA Office.

Technical Advisory sub-Committee (Tech support, Band plans etc.)

John VK3KM, Doug VK3UM, Rex VK7MO, Paul VK5BX, Walter VK6KZ, Barry VK2AAB, Bill VK4XZ, Peter VK3PF, Paul VK2TXT, Peter VK1NPW, John VK1ET, Peter VK3BFG, Eddie VK6ZSE, Peter VK3APO

Administrative Committee

John VK3PZ (Treasurer), Greg VK2SM (Assistant Treasurer), David VK3RU (Secretary), Mal VK3FDSL (Office Manager), Phil VK2ASD (President), Chris VK5CP (Vice President)

- Responsible for the efficient and correct operation of the WIA office.
- Responsible for staffing and workplace safety.
- Provide a specialist administrative resource to the WIA office as required.
- Manage contractual agreements.
- Manage business relationships.
- Ensure compliance with the ACMA Business Rules
- Prepare yearly budgets
- Prepare quarterly financial reports for the Board
- Prepare independently reviewed YE financial reports and balance sheets for circulation to the membership prior to each Annual General Meeting.
- Manage insurances and to be responsible for currency of insurance policies.
- Maintain a complaints register.
- Ensure complaints are handled in accordance with WIA policy and any contractual agreements.

Communications, Marketing, Publications and AGM Committee

Robert VK3DN (Director), Phil VK2ASD (Director), Jim VK3PC, Graham VK4BB (Broadcast), Roger VK2ZRH (Director) Publications sub-Committee (AR Magazine, Callbook etc): Peter VK3PF (Editor AR), Peter VK3PH (Editor Callbook), John VK3PZ (Treasurer), Ernie VK3FM, Peter VK3AZL, Evan VK3ANI, Ewan VK3OW, Bill VK3BR

- Communication with members and the public:
- Communicate with the membership.
- Publicise WIA activities and initiatives.
- Develop strategies and resources for the promotion of Amateur radio to the public.
- Develop strategies and resources for the promotion of WIA membership to the Amateur community.
- Supervise and/or perform promotional activities.
- Co-ordinate the yearly AGM activities

Education Committee

Fred VK3DAC (Director), Owen VK2AEJ, Ron VK2DQ, Mal VK3FDSL (Office Manager)

- In association with the WIA's RTO and affiliated clubs offering training services, develop and administer the WIA's training and assessment systems.
- In association with the Spectrum Strategy Committee, develop and maintain the various licence syllabi and associated question banks.
- In association with the Community Support Committee and the RTO, develop and maintain the Emergency Communications Operator scheme.
- Ensure the confidentiality and security of all personal information, question banks and examination papers.

Radio Activities Committee

Chris VK5CP (Director), Geoff VK3TL

Contests sub-Committee

Alan VK4SN, Denis VK4AE/3ZUX, John VK3KM, Tony VK3TZ, Kevin VK4UH, Colin VK5DK, James Fleming VK4TJF

Awards sub-Committee

Bob VK3SX, Marc VK3OHM, Laurie VK7ZE, Alan VK2CA, Alek VK6APK, David VK3EW, Paul VK5PAS, ARDF sub-Committee: Jack VK3WWW, ARISS sub-Committee: Tony VK5ZA

- All activities associated with actual radio operation, such as: contests, awards, distance records, QSL services, ARISS, AMSAT, ARDF etc.

QSL Card sub-Committee

Geoff VK3TL, Alex VK2ZM, John VK1CJ, Max VK3WT, June VK4SJ, Stephan VK5RZ, Alek VK6APK, John VK7RT, Craig VK8AS

Historical and Archive Committee

Peter VK3RV, WIA Historian, (Leader), Drew VK3XU, Linda VK7QP, Martin VK7GN, Ian VK3IFM, Will VK6UU, David VK3ADW, Jennifer VK3WQ/VK5ANW, Roger VK2ZRH (Director)

- Develop, maintain and preserve the WIA's historical and archive collection
- Encourage access to the collection by WIA members and those seeking historical material for publication.

IT Services

Robert VK3DN (Director), Tim VK3KTB

- Provide an IT resource to other committees and the WIA Board.
- Be responsible for the off-site data back-up of all IT systems information.
- To update and maintain the WIA website as required.
- Advise the Administrative / Financial committee in relation to the MEMNET Cloud Service contract.

Community Service Committee

Fred VK3DAC (Director), Greg VK2SM (Assistant Treasurer), Ewan VK4ERM (Director), Paul VK5PH

- Develop, promote and co-ordinate all WIA community support activities

New Initiatives

Phil VK2ASD (Director), Robert VK3DN (Director), Roger VK2ZRH (Director), David VK3RU (Company Secretary)

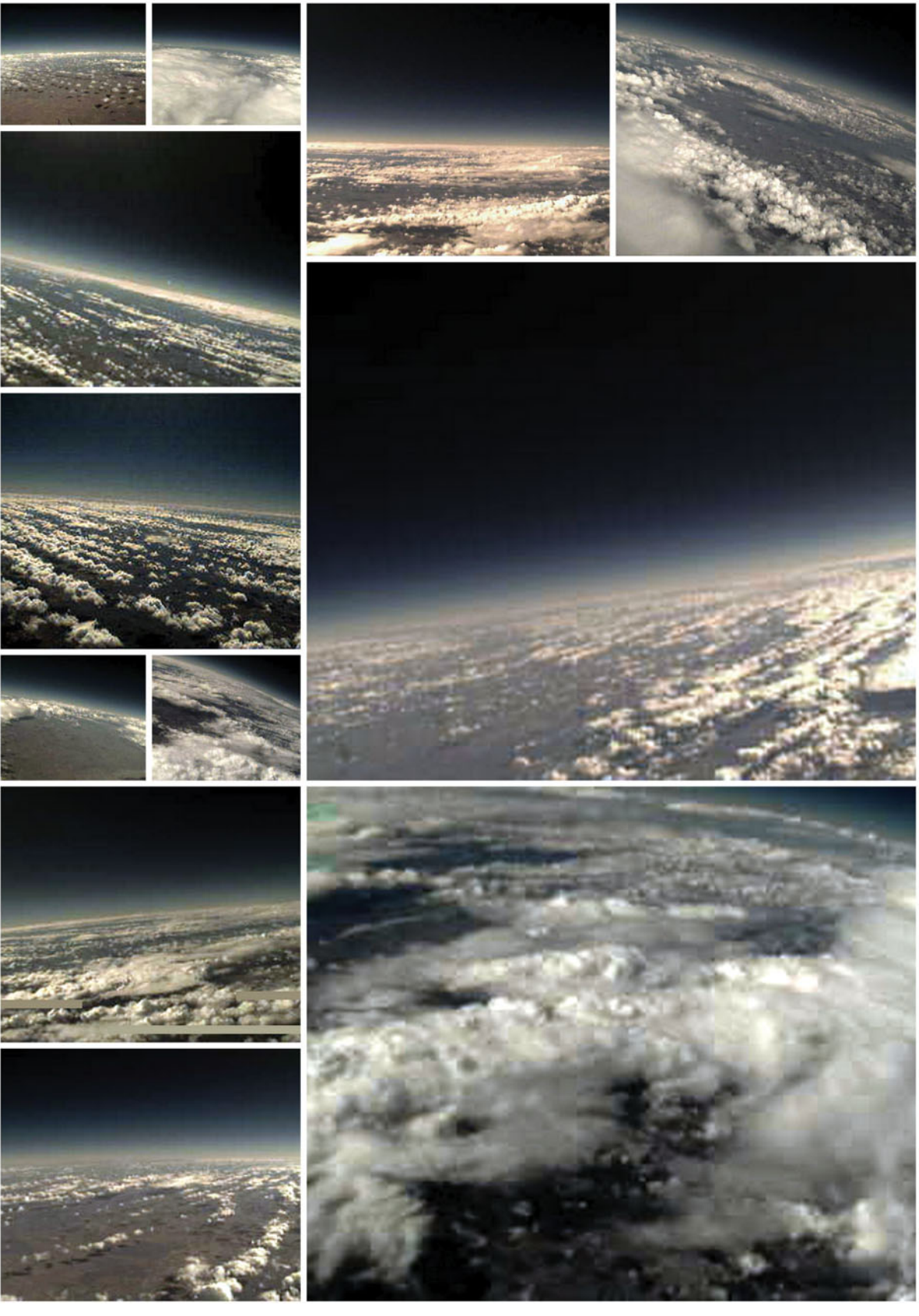
- Think-tank ideas and initiatives to advance amateur radio and WIA membership.
- On approval by the Board, run proof of concept trials.

Affiliated Clubs Committee

Ted VK2ARA, Mal VK3FDSL (Office Manager), John VK3PZ (Treasurer), Phil VK2ASD (Director)

- Manage all arrangements between the WIA and WIA Affiliated Clubs
- In cooperation with the Administrative / Financial committee, manage the Club Insurance Scheme
- Encourage stronger relationships and communications flow between the WIA and WIA Affiliated Clubs
- Encourage increasing WIA membership ratios in Affiliated Clubs
- Manage the Club Grants Scheme
- Identify and bring regional Affiliated Club issues to the attention of the WIA Board.

MARTG – Global Space Balloon Challenge



The ***Melbourne Amateur Radio and Technology Group*** flies two high altitude balloons as part of the annual Global Space Balloon Challenge. Using amateur radio digital modes, they received some good pictures of near space, but for the group the story does not stop there. See the story commencing on page 10.

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