# *** QDG DIGIPEAT April 2018 ***

Digipeat is the Official Newsletter of the Queensland Digital Group
Incorporating 'Amateur Eye', the Official newsletter of the
South East Queensland Amateur Television Group

## April QDG Meeting

The Next QDG general meeting will be held on Friday April 20 at the **Chermside Library**,
 375 Hamilton Rd, Chermside QLD 4032
**Car park off Kittyhawk Drive**
Doors will open at 7:00pm for a meeting start of 7:30pm.
If the door is closed please phone Alan 0401 716 778

## Editorial

It's been a busy month with moving house, John Moyle field day, 23 on 23 and many other Amateur Radio activities.
The Redcliffe club's Redfest is being rescheduled to June as there will be no BARCfest this year, I will send out a Digipeat Extra when I have the date confirmed in writing.

Alan VK4NA

## WIA Radio and Electronics Convention and AGM
18th, 19th and 20th of May 2018
SeaWorld - Gold Coast Queensland

The WIA Annual General Meeting (AGM) and Technical Forum will be held over the weekend of 18th, 19th and 20th May 2018 at SeaWorld on the Gold Coast.

This year's event is being organised by the Gold Coast Amateur Radio Club (GCARC) with most of the weekend's activities taking place at the Sea World Resort. Accommodation is available at the Sea World resort as well as a number of hotels, caravan parks and venues within close proximity. As has become the tradition, there will be a Friday night dinner this will lead into a full day on Saturday with a field day on the Sunday and many unique tours.
https://www.wia.org.au/joinwia/wia/2018agm/

# Welcome to the April 23-on-23

Monday 23rd April is the next scheduled 23-on-23 - providing another opportunity to activate your 1,296MHz and other uWave home or portable station capabilities.

Operations will be conducted as follows:
Phone/CW
Start time: 10:00z / 8:00pm AEST / 9:00pm ADST
QRG: 1,296.100MHz

Digital and 2,403MHz
Start time: 11:00z / 9:00pm AEST
23cm QRG: 1,296.225MHz (Mode JT65)
13cm QRG: 2,403.100MHz USB

These events are designed to develop the level of activity on 23cm and above amateur bands.

Please do not hesitate to share with others who you know have capability and see if we can continue to grow the numbers of participating stations.

Activity is not limited to stations within SE VK4, everyone is very welcome to participate. Please share and promote on other FB pages.

As is often proven, if the participating stations are unaware of your operation, there is a high likelihood that you won't be worked. [Quite simple and very logical really!]

Please take a moment to share advice of your participation here, and on the night log into VKLogger.com on the evening and the '23&Above' iChat page, so that attention to 'exploiting' the path can be achieved.
http://brisbanevhfgroup.com/

Good luck to everyone.

de VK4CZ via Facebook


# Maleny DSTAR repeater gets upgraded

Mark Kyle VK4KZK has been busy building a new 2m repeater for the Maleny site. VK4RDS 146.7375MHz -600KHz has now been kitted out with a MMDVM modem and a Pi-Star image. DSTAR P25, C4FM and DMR are supported on this new setup. The DSTAR only repeater remains unchanged on 438.550 MHz -5.2MHz. Mark has built in a few smarts to this setup such as remote power cycle and 3G modem connection for internet access. Sunshine coast radio amateurs can make use of well priced second hand VHF radios such as the Tait 9100 p25 radios easily found on ebay. Dont forget to try the new multimode reflector DCS389D. This special reflector allows operators in all the different digital voice modes to talk to each other. For example I can talk DSTAR to the other party that is on DMR. We are really starting to see some amazing progress in the DV space. These multimode reflectors are a step change in what you can achieve using digital voice modes. They allow all the different flavours of digital modes to talk to each other!
http://www.dstar.org.au/sunshine-coast-digital-voice-repeater/

Facebook Container Extension: Take control of how you're being tracked
March 27, 2018

Our Multi-Account Containers extension has been a game changer for many users, letting them manage various parts of their online life without intermingling their accounts. To help Firefox users have more control of their data on Facebook, we've created the Facebook Container Extension.
https://blog.mozilla.org/firefox/facebook-container-extension/

# VI4GAMES

VI4GAMES call sign is now is use.

This is a special event call sign
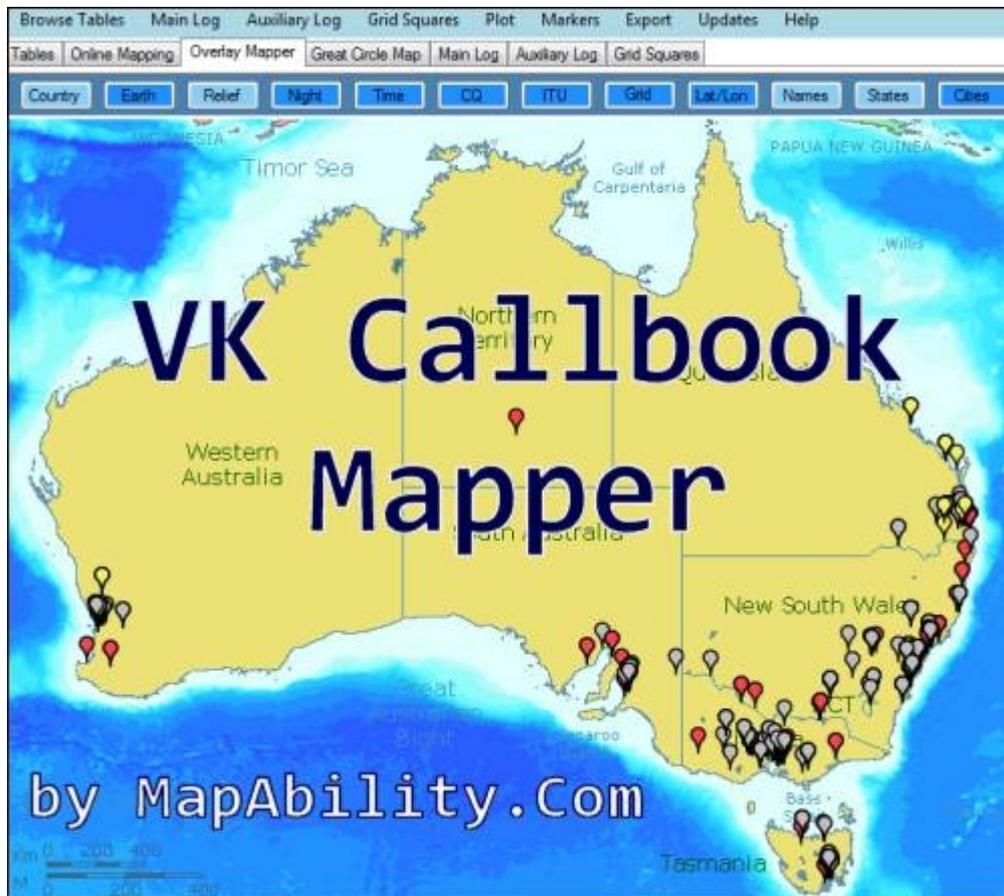that can be used up to 31st May 2018.
http://www.gcars.com.au/



# SDR receivers online

Today's technology allows us to build radio receivers that sample radio signals and process them on a PC or an embedded system. Similarly, transmitters can be built that generate the RF signal digitally, then convert it to analog. Software Defined Radio (SDR) refers to the technologies that make these exciting things possible.

This site has been created to popularize SDR technology. With the help of a cheap USB DVB-T dongle you can get into SDR quite easily. It allows you to listen to the radio signals around you, but it also lets you to learn about DSP and code your own receiver.

On sdr.hu, you can find SDR receivers that amateur radio operators shared, so you can listen to radio signals without even having to buy any SDR hardware! In fact, amateur radio is a great thing and also lets you experiment with transmitting on the air, by using various frequency bands and modulations.
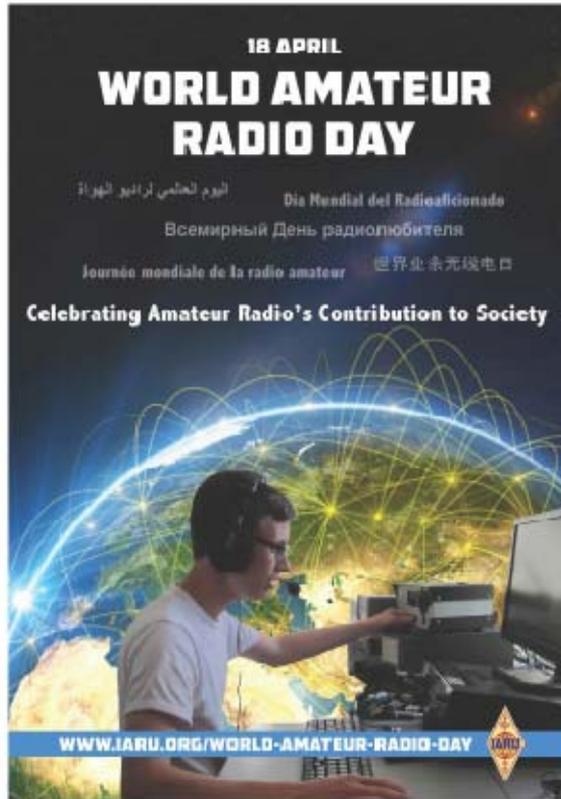http://www.sdr.hu/



Welcome to the 'VK Callbook Mapper' - an Amateur Radio callbook for Australia that can be updated daily, can be visualised on Overlay and Online maps, and can be spatially queried and compared against other data tables (9 supplied), imported lists (many types), ContestRadar, and your own ADIF or Cabrillo logs.
http://www.mapability.com/ei8ic/vkcallbook/



Go to site for anything time related.
https://www.timeanddate.com

18 APRIL
WORLD AMATEUR
RADIO DAY

أيوم العالمي لراديو الهواة          Dia Mundial del Radioaficionado
Всемирный День радиолюбителя

Journée mondiale de la radio amateur          世界业余无线电日

Celebrating Amateur Radio's Contribution to Society

WWW.IARU.ORG/WORLD-AMATEUR-RADIO-DAY

# World Amateur Radio Day

Every April 18, radio amateurs worldwide take to the airwaves in celebration of World Amateur Radio Day. It was on this day in 1925 that the International Amateur Radio Union was formed in Paris.

Amateur Radio experimenters were the first to discover that the short wave spectrum — far from being a wasteland — could support worldwide propagation. In the rush to use these shorter wavelengths, Amateur Radio was "in grave danger of being pushed aside," the IARU's history has noted. Amateur Radio pioneers met in Paris in 1925 and created the IARU to support Amateur Radio worldwide.

Just two years later, at the International Radiotelegraph Conference, Amateur Radio gained the allocations still recognized today — 160, 80, 40, 20, and 10 meters.  Since its founding, the IARU has worked tirelessly to defend and expand the frequency allocations for Amateur Radio. Thanks to the support of enlightened administrations in every part of the globe, radio amateurs are now able to experiment and communicate in frequency bands strategically located throughout the radio spectrum.  From the 25 countries that formed the IARU in 1925, the IARU has grown to include 160 member-societies in three regions. IARU Region 1 includes Europe, Africa, the Middle East, and Northern Asia. Region 2 covers the Americas, and Region 3 is comprised of Australia, New Zealand, the Pacific island nations, and most of Asia. The International Telecommunication Union (ITU) has recognized the IARU as representing the interests of Amateur Radio.

Today, Amateur Radio is more popular than ever, with more than 3,000,000 licensed operators!

World Amateur Radio Day is the day when IARU Member-Societies can show our capabilities to the public and enjoy global friendship with other Amateurs worldwide.
http://www.iaru.org/world-amateur-radio-day.html

Andrew VK4TEC gave a very interesting talk on tracking weather balloons at the March QDG meeting.



Some of the equipment from Andrew's talk.

# 5.7 GHz from QG62mk to QG62lm

https://m.youtube.com/watch?feature=youtu.be&v=q3-SyxKQhGQ

# 76GHz contact VK4CSD/P and VK4FB/P

https://www.youtube.com/watch?feature=youtu.be&v=66xQT6Ht-_I&app=desktop



## Fan Dipole Antenna

The Fan Dipole Antenna also known as  "Parallel Dipole Antenna" or "Fanned Dipole Antenna" is a multi-band wire antenna tha can be very easy to build.

This antenna consist basically of multiple dipole antennas, sharing the same coaxial feed line.

Each dipole should be cut for the approximate centers of the bands where you would like it to resonate.

When the signal is transmitted, only the element resonating for that band is seen by your radio, basically because the other dipoles present an higher impedance.
https://www.dxzone.com/5-best-diy-fan-dipole-antenna-projects/



Redcliffe site for the John Moyle field day 2018

IC-7610 in use at the Redcliffe club VK4IZ JMFD site, this was a brand new radio just out of the box

## How to Pull Images from Satellites in Orbit (NOAA 15,18,19 and METEOR M2)

Over the past 2 months, me and my friend Artem have been building antennas to receive signals from weather satellites as they pass overhead. This video chronicles our progress through this project and goes through some of the science involved in working with radio and receiving transmissions. We explore how dipoles work and how to build them, and how we built our final double cross antenna. We used an SDR (software defined radio) called a HackRF to do the work of interpreting the received signals and then decoded them with some special software. We pulled images from 4 satellites: NOAA 15, 18 and 19 as well as METEOR M2. The satellites broadcast immediately as they take the images and no images are stored, so we're likely the only ones on earth with these images.

https://m.youtube.com/watch?v=cjClTnZ4Xh4&feature=share

## Make a High Voltage Capacitor - 7.5 nF 15,000 Volts

A simple method is shown to make high voltage capacitors, useful for Tesla coils and other high voltage projects.

https://m.youtube.com/watch?v=eA_CD499Ohs&feature=share

## Request an Azimuthal Map

Use this form to create an azimuthal map for any location on the globe. You can customize the map in a variety of ways by changing the options in the web form.

https://ns6t.net/azimuth/azimuth.html

## The Isotron Antenna

  Solve Virtually Any Restricted Space Problem - 40 Meter Isotron only 22 inches x 16 inches x 15 inches!
  Easy, Quick, and Simple Installation
  Tunes & Performs Without Radials or Antenna Tuners
  Handles Up to 1000 Watts PEP
  Durable Construction, Can be Used in Extreme Weather Conditions
  Excellent For Portable Operation - Emergencies, RV's, Field Day, Motels, Etc.
  Multi-Band Operation on One Feedline with Back-to-Back Mounting & NO Loss of Performance>
  Can be mounted in ANY Position Without Loss of Performance
  Maritime Operation - Uncluttered Setup, with Stainless-Steel Fasteners & Not Dependent Upon Grounding for Performance
  SO-239 Connector on All Models
  One Year Warranty on Material & Workmanship
http://isotronantennas.com/

## Beryllium Oxide poisoning

Hi, I am sharing a bit of my experience as a semi retired broadcast and bench tech. I wonder how many folks realize that some power tubes,chimneys for the tubes, and for many RF power transistors.
  In case you do not know what the white ceramic looking stuff is it is usually Beryllium Oxide, BeO for short. it is relatively safe in its solid form, but if it is overheated to the point of becoming a white powdered substance it is extremly toxic if ingested in any way,just do a search for that substance and you will find the info.
https://forums.qrz.com/index.php?threads/beryllium-oxide-poisoning.251844/

## The essential 2018 VPN buyer's guide

Using a VPN is imperative for maintaining your privacy and security online - here's your guide to choosing the best one for you.
https://www.engadget.com/2018/03/28/2018-vpn-buyers-guide/?utm_source=Engadget&utm_medium=Facebook_Ads&utm_campaign=Prospecting_Auto_BoostedPost_VPNRoundup_SaleID%3D+14801_3.28.2018

# KevinChant.com

Kev's FREE resource for (mainly) Australian vintage radio information, circuits, parts etc.

- For Sale / Services
- Services Offered
- Australian Valve Radio Circuits
- Car Radio Circuits
- Australian TV Circuits
- American Valve Radio Circuits
- European Valve Radio Circuits
- Japanese Valve Radio Circuits
- Record Players
- Tape & Reel to Reel
- Transistor Radio Circuits
- Test Instruments
- Amp / Audio Equip.
- Radio Pictures
- Information
- Information Wanted
- Valve Related Movies
- Resources / Links
- Friends / Contributors

https://www.kevinchant.com/

Attention all radio blokes in Australia. I have been asked to set up a Facebook page for the purpose of selling vintage radio related items within Australia. Unlike Ebay there will be no fees so it should help make this a reasonably efficient way of moving your surplus items.  Please feel free to go to the link below, I will approve requests as soon as I see them.
https://www.facebook.com/groups/VRBST/



# 630m Band 472 to 479kHz Transverter
http://www.minikits.com.au/eme223-630m

## Station Ground

Damage-prone installations almost always include one or more of the following mistakes:

Cable wiring that mixes or combines various independent systems at sensitive equipment without a common entrance panel

Cables and wiring that routes above ground, especially several feet above ground

An entrance or equipment ground that is not bonded to the mains ground

An equipment ground without an entrance panel, or that is not bonded to the entrance panel
https://www.w8ji.com/station_ground.htm

## Antenna System Bonding and Grounding Requirements in the USA

Whitham D. Reeve (© 2012 W. Reeve)
http://www.reeve.com/Documents/Articles%20Papers/Reeve_AntennaSystemGroundingRequirements.pdf

## DMR radio communication

How to Build a Code Plug
 For those that are new to DMR hopefully this will help you get on air.
You may have heard the term CPS, basically it's the software we use to program the radios. The files created are called "Code Plugs". You may be able to find code plugs created by someone else for your radio that have what you want mostly included however, I find it much more rewarding to write my own. You'll also get a better understanding of how these radios work by writing your own code plug.
http://www.k9npx.com/2018/04/how-to-build-code-plug.html?m=1
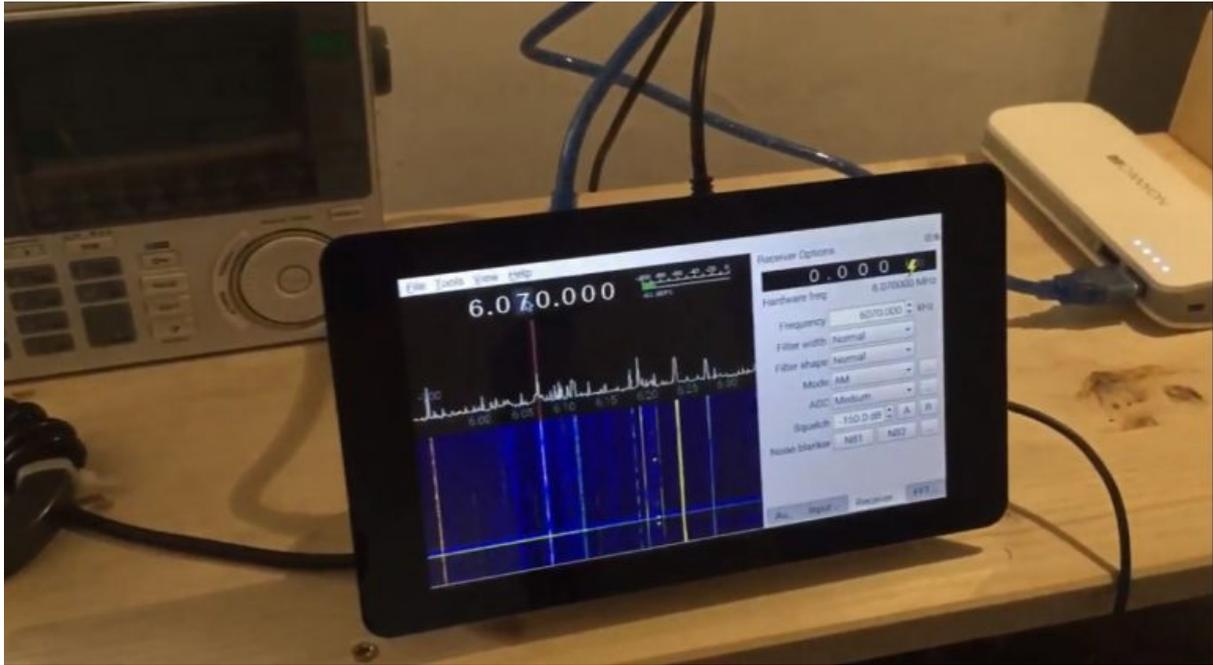
## Grounding for Lightning

A good ground is very important, maybe the most important thing, in mitigating lightning damage; the more energy you can divert to ground before it gets into the house or equipment room, the less you have to deal with through lightning and surge arrestors. More importantly, more energy diverted to ground means less can go through your electronics!
https://www.solacity.com/grounding/

## Ham Radio- Electronics

Projects and information
http://www.amalgamate2000.com/radio-hobbies/radio/

Tudor demos his portable Raspberry Pi-powered AirSpy HF+

Many thanks to SWLing Post contributor, Tudor Vedeanu, who has kindly shared details about his portable Raspberry Pi system which now can run the AirSpy HF+ SDR.

https://swling.com/blog/2018/04/tudor-demos-his-raspberry-pi-powered-airspy-hf/

## µBITX – A compact 10 watts HF transceiver

Upto 10 watts pep on lower HF bands, dips to 5 watts on 28 MHz

SSB and CW

Simple to build and align

Minimal controls

Based on Arduino Nano controller and a Si5351 for all local oscillators

Double conversion, superhet architecture

It can be scratch built for less than $50 or you can just buy the kit

http://www.hfsignals.com/index.php/ubitx-circuit-description/

## How to Build a QRO Balun (Universal for 40M to 10M)

https://m.youtube.com/watch?v=kzLCJ_E4VxI&feature=youtu.be



## DLW Associates AM Broadcast Band Brick-Wall High Pass Filters FL1718

https://www.dxengineering.com/parts/dlw-fl1718

# Optimizing Antennas

#191 Optimizing Antennas using a cheap N1201SA VNA (Vector Impedance Analyzer), LoRa
Knowing how your antennas work or build and optimize our antenna is very rewarding.
Unfortunately, it needs knowhow and some costly equipment to do that. Today we will change that,
and I show you an affordable new tool which enables these tasks.
https://m.youtube.com/watch?v=ZpKoLvqOWyc

# Electrical filter design and analysis program

Elsie is a Windows® electrical filter design and analysis program.
Elsie™ is an uncommon commercial-grade lumped-element ("L-C") electrical filter design and
network analysis program, directed toward the engineer or technician involved in that line of work.

Here are pertinent features of the Professional edition of Elsie:
Elsie is 32-bit Windows® electrical filter design software nicely written to help engineers design and
analyze lumped-element filters in the audio through microwave range. Thanks to the standard
interface, all of the various aspects of program operation are quite easy to use. Most options are
selected by clicking on buttons. No scripts. Not a DOS lookalike.
https://elsie.apponic.com/

# Australia's broadband speeds: first report

29 March 2018
The ACCC today released the first results from its broadband speed testing program, which show
NBN broadband services from iiNet, Optus, Telstra and TPG are now delivering between 80 and just
over 90 per cent of the maximum plan speeds in the evening busy hours.
https://www.accc.gov.au/media-release/australias-broadband-speeds-first-report

# KRACK Wi-Fi attack

KRACK Wi-Fi attack threatens all networks: How to stay safe and what you need to know
https://www.pcworld.com/article/3233308/security/krack-wi-fi-security-flaw-faq-tips.html

# Best antivirus

Keep your Windows PC safe from spyware, Trojans, malware, and more
https://www.pcworld.com/article/3219792/computers/best-antivirus-for-windows-pc.html

# Best VPN services of 2018

Reviews and buying advice
https://www.pcworld.com/article/3198369/privacy/best-vpn-services-apps-reviews-buying-advice.html

# Many VPN Providers Leak Customer's IP Address via WebRTC Bug

Around 20% of today's top VPN solutions are leaking the customer's IP address via a WebRTC bug known since January 2015, and which apparently some VPN providers have never heard of.
https://www.bleepingcomputer.com/news/security/many-vpn-providers-leak-customers-ip-address-via-webrtc-bug/

# Software Defined Radio with HackRF

This ongoing video series will be a complete course in Software Defined Radio (SDR). In this course, you'll build flexible SDR applications using GNU Radio through exercises that will help you learn the fundamentals of Digital Signal Processing (DSP) needed to master SDR. For the over-the-air exercises, you'll need a HackRF One or other SDR peripheral.
https://greatscottgadgets.com/sdr/



PHOTO 1: Clockwise from left: low-bands ferrite choke, mid-bands choke, high-bands choke and the ferrite cores.

# An 'In Practice' Special

Cost-effective ferrite chokes and baluns
by Ian White, GM3SEK
This article is a greatly expanded version of my mo
nthly 'In Practice' column that appeared in
Radcom
 for May 2010. That three-page article described so
me new designs of ferrite loaded chokes
for suppressing unwanted common mode currents at HF.
http://www.ifwtech.co.uk/g3sek/in-prac/inpr1005_ext_v2.pdf

# Wideband Amplifier Low-noise LNA 0.01-4GHZ Broadband Module Signal Receiver AQO3

https://m.ebay.com/itm/Wideband-Amplifier-Low-noise-LNA-0-01-4GHZ-Broadband-Module-Signal-Receiver-AQO3/112668134897?_trksid=p2057872.m2749.l2649&_mwBanner=1

# MSHV Amateur Radio Software

MSHV Supported working modes: MSK JTMS FSK ISCAT JT6M FT8 JT65 PI4

http://lz2hv.org/mshv

# Rocket Lab is redefining how we access space

Introducing Electron, Rocket Lab's latest launch vehicle - delivering small satellites to low Earth orbit at an unprecedented frequency.

https://www.rocketlabusa.com/

# 'Highly advanced' Slingshot malware remained hidden for six years

Researchers have discovered a "highly sophisticated and complicated" malware threat that has managed to remain hidden for at least six years.

https://www.itnews.com.au/news/highly-advanced-slingshot-malware-remained-hidden-for-six-years-486803

# LIGHTNING PROTECTION for RADIO COMMUNICATION SITES

Radio communication sites are particularly prone to lightning strikes which can cause damage and downtime to sensitive electronic communications equipment.  This paper examines the reasons for this phenomenon and discusses protection techniques which may be applied to all radio communication sites whether used  as microwave repeaters, cellular telephone basestations for analogue or digital GSM applications or for broadcasting purposes.

By following a total systems approach it is possible to protect these sites from even direct strikes to towers, antennas and power lines.

http://www.novaris.com.au/images/stories/Sales%20Kit/SK09/Radio%20Comms.pdf

# Radio Mobile Prediction Software

A nifty freeware bit of (windows) software for hams and other radio people is called "Radio Mobile". This tool allows you to simulate and map predicted coverage of your location using terrain and clutter data and maps expected coverage into Google maps.

http://www.vk3bq.com/2013/12/01/radio-mobile-prediction-software/

# ACMA Radcom Database

Register of Radiocommunications Licences
http://web.acma.gov.au/pls/radcom/register_search.main_page

# 2m SSB

Sunshine Coast 2m SSB net
19:30 Sundays on 144.300 MHz
Don't just use your equipment on field days; come up on air every Sunday.

# Brisbane 160m net

Monday nights at 7:30pm local 1.848 MHz. LSB

# SEQATV Club Net

Wednesday nights
7:30 PM EST on VK4RRC 146.925MHz repeater

# 2018 dates

September 8, SUNFEST at Woombye, http://www.vk4wis.org

November 10, GCARS Hamfest, Albert Waterways Community Hall, http://www.gcars.com.au

VK & ZL Ham Fests & Events for 2018 http://www.vk4ice.com/hamfests.htm

# Contests 2018

## VHF-UHF Field Days
Summer 2018 – Saturday 13 and Sunday 14 January.
Winter 2018 – Saturday 23 and Sunday 24 June.
Spring 2018 – Saturday 24 and Sunday 25 November.
Summer 2019 – Saturday 12 and Sunday 13 January.
Winter 2019 – Saturday 22 and Sunday 23 June.
Spring 2019 – Saturday 23 and Sunday 24 November.
Summer 2020 – Saturday 18 and Sunday 19 January.
Winter 2020 – Saturday 20 and Sunday 21 June.
Spring 2020 – Saturday 28 and Sunday 29 November.
http://www.wia.org.au/members/contests/vhfuhf/

# QDG information

## QDG meeting dates 2018

January 19
February 16
March 16
April 20
May 18
June 15
July 20
August 17
September 21
October 19
November 16
December 21

Unless otherwise noted, QDG group general meetings are held on the third Friday of the month at the **Chermside Library**, Brisbane.
Doors will open at 7:00pm for a meeting start of 7:30pm.

## QDG Membership

QDG Membership is presently free.

As of June 2017 the QDG has 71 members.
Information and a list of members are up on the web site http://www.qdg.org.au/qdgmem.htm
Membership forms are on the web site.

## QDG Membership services

Members receive additional 'Digipeat Extra' emails and invitations to other club activities not included in the Digipeat newsletter.

## Sound Card to Radio Interface

This computer to radio interface can be used for any audio mode including voice.
The SCI provides isolation to remove earth loops as well as providing switching and level adjustment.
Contact Richard VK4ZA on 07 3376 5231, email richatkn@tpg.com.au or via the QDG web site.
Please contact Richard if you are interested in a dual interface PC board or a mark 2 version with modified connections.

## Alan Simpson memorial home brew competition

August QDG general meeting http://www.qdg.org.au/qdgmes.html

## QDG club contacts

Club contact: Alan Wills VK4NA
Digipeat Editor: Alan Wills VK4NA
Web site: Alan Wills VK4NA
Web site hosting: Tim O'Donohoe
Supper: Alan Wills VK4NA

JOTA: John VK4CJO
Phone: Alan Wills VK4NA 61 07 3491 8032
Mobile: 0401 716 778
Twitter @VK4NA

Email: qdg@qdg.org.au

Web site: http://www.qdg.org.au

Digipeat http://www.qdg.org.au/qdgdigi.htm

QDG
11 Kroning Court
Petrie QLD 4502
Australia

# South East Queensland ATV group Information

## SEQATV meeting dates 2018
Please check the SEQATV Web site

Unless otherwise noted, SEQATV group general meetings are held on the first Tuesday on the even months at the Redcliffe Club rooms, that is every second month, please see the club Web site for details.
The club is located at MacFarlane Park in Klingner Rd, Kippa Ring.(UBD Map 91 Ref G 1)
https://www.google.com.au/maps/place/MacFarlane+Park,+Kippa-Ring+QLD+4021/@-27.2214151,153.0882619,17z/data=!4m2!3m1!1s0x6b93e5f47d867511:0xe926a70030364326

## SEQATV group Membership
 SEQATV group Membership is set at the AGM, please contact the secretary for the current fee.
The membership fee remains at $20.00 for 2016

## SEQATV group Membership services
Members receive additional 'Amateur Eye Extra' emails and invitations to other club activities not included in the Digipeat or Amateur Eye newsletters.

## SEQATV Club Net
Wednesday nights
7:30 PM EST on VK4RRC 146.925MHz repeater

## The SEQATV group Officers

**Elected officers:-**
President:  Arnold Youngberg VK4SU
Secretary:  Bruce Jones VK4EHT
Treasurer:  Andy Beales VK4KCS

**Coopted Officers:-**
Callback Officer:  Peter Jones VK4YAC
Vice President:   Alan Wills VK4NA

Assistant Secretary Bill VK4ZWJ
Additional coopted officers will be added as required.

## SEQATV group Contact Information
South East Queensland Amateur Television Group
**Postal address now 129 Prior St, Tarragindi. 4121**

Amateur Eye (club mag) Phone: Alan Wills VK4NA 61 07 3491 8032

Email: secretary@seqatv.org

Web site: http://www.seqatv.org/

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*


# Enjoy your hobby!

73 Alan VK4YAR / VK4NA


# \*\*\* Queensland Digital Group \*\*\*
 **\*\*\*     SEQATV group      \*\*\***
\*\* Supporting Radio Communications in VK4 \*\*