



BE THE INSPIRATION

# The Wahroongler

Rotary  
Club of Wahroonga



## Bulletin of The Rotary Club of WAHROONGA

Chartered 1975 and Meeting at 7.15 am Wednesdays, at Warrawee Bowling Club  
Rotary Australia's first Breakfast Club 20<sup>th</sup> March 2019, Vol 44, No 35

## Stuart's Scribblings



A big thank you goes to Peter Kirkwood for arranging the visit to the Optus Satellite Earth Station. It was even more interesting and informative than I expected. There is a report later in the bulletin. Peter is happy to organise a further tour for those who could not make it. Phill Comfort has offered to collect expressions of interest, so please respond to the e-mail he sent out last week.

Organisation of the Bobbo has reached its climax, with everyone instructed on their roles for the day. Fingers crossed now that the weather is kind to us, although the seven day forecast is predicting possible thunder showers. With that out of the way, the full attention of our Club must now be focussed on the Novus Foundation Dinner. Please remember Peter Smith's appeal to work on three key elements: 1) look out for items for both the major auction and the silent auction, and don't forget to think of useful contacts you might have, 2) gather enough friends and colleagues to have a table of 10 at the dinner, and 3) if you do not intend to make up a table, stand by to be allocated one of the many roles that need to be filled in the night.

We are indeed a busy Club and there are many and varied tasks to be undertaken. One thing that we could all do to help this is to find some new members. There are many candidates for Rotary out there. All we need to do is ask them! After all, that is how you became a Rotarian.

I have heard a few grumblings about the quality of our guest speakers. Personally, I have found recent speakers to have been generally interesting and informative, but I do know that it is a challenging task to keep up a continuous stream of candidates prepared to speak in the brief early morning time-slot which our Club's format dictates. However if any member would like to suggest a potential speaker and/or topic, we would certainly follow it up.

This week we make our annual expedition to the Sydney Adventist Hospital. The San is important to our Club. Not only are they the largest employer in Wahroonga, they are also our partners in the Novus Foundation, along with the McCarroll Motor Group. In addition we cooperate with them on other activities, such as the San Fun Run, the Christmas Carols, and they provide medical support teams for the Bobbo, as well as entering a large team of riders! At breakfast this week we will be presenting vocational excellence and community service awards to staff and volunteers. I am grateful to Jim Verco for the hard work he has undertaken behind the scenes to organise this event, in coordination with the San.

**Stuart Armstrong**

**20<sup>th</sup> Mar— Bill Leventhal Awards at the SAN**

## Last Week @ WBC

**President Stuart** welcomed our guests, Paul Rickard and Ray Rice, both from Turramurra RC, Joshua McKenna and Charlotte Weatherall, the leaders of the new Rotaract Club. They plan that it will be the biggest such club very soon. Pauline Fuller, Hon. Member and Rosie Dahill. Welcome back Peter Kirkwood from his cruising.



**Announcements—Ken Broadhead** hopes everyone going to the Optus Ground Station visit knows where it is. We'll meet outside at 10.30 and go inside where there is on-site parking. It will be for an hour. It is a 21<sup>st</sup> century astro-*gnomial* masterpiece.



**Jim Verco** next week we meet at the SAN for breakfast at the San Café around from the lifts on Level 4. You can park in the San Clinic Parking and make sure you get your free pass out. Come early 7.15 am as we have 7 awardees, plus some family, friends and managers.



**Anne Prescott** thank you to the people who have collected the Woolworths tiles with the letters on the back. She'll take them to Nepal to her teachers for English classes. They have no resources. The tiles with letters on them are very useful in games and stuff. She told us how she chatted to the cashier, when filling her bag and hoped they'd be very generous as she was taking them to Nepal. She ended up getting a lot in her bag and hopes we all use our great skills to get a lot more.

**Kerri Hodge** there are some fabulous games on the back.

**Steve McGregor** George needs more friends to visit. Dr Leon Clark had problems post surgery at the San.



**President Stuart** Janet Grundy was registered for the Conference, but is not able to go. At this stage she can't get a refund on the Conference or accommodation. If anyone has a sudden urge to go to Newcastle, please talk to him.

He can't tell us the full details of ordering some shirts but it's getting closer. Straw poll on—Pockets on polo? - Yes, for all engineers.

People who don't care?

It is more complicated as pockets are not standard on polos. Would you pay more for pockets Y/N? He'll consider it.

He is wanting to connect with the Woolworths manager via Hornsby Connect, about the tiles, not necessarily now, but at the end of the competition, when they may want to chuck a pile of tiles and with this cause they may keep them and not chuck them.



**Sgt Jo-Ann** HKWS was a great success at their Gala Dinner. They had 418 seats. They raised \$35-40K profit. She and Brian won Best Couple with Batman full suit and she had the dress and jacket.

They also had the end of the Apron Project with aprons designed and made in America and Australia that were auctioned.

**Lucy Dahill** modelled hers—Superhero apron, who is maybe a mum; maybe lots of papers call out and fly the flag in her own right.

**Sgt Jo-Ann** wore her cutting up apron. Where is a cloth when you cut up onions?

**Hs&Ts** Carol Johnson won.

**Fines** Richard really was in strife for his parking this week.

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**Paul Rickard** the number of registrations is up from last year at 2,100. That's 50-70 more than last year and this depends on the weather. Donations are up as well. All approvals are in from yesterday, even though they started 8 mths ago with Ku-ring-gai Council.

Thank you for your support on the day and in the weeks leading up to it. The morning can be challenging, whether it is hot, or cold, or wet, or boring. But what is most important is Rider, Volunteer and Public safety as our **highest priority**.

You are a visible presence in the lime green vests and motorists slow down and cyclists are reassured and it's safer for all. We need to ensure that cyclists start and finish and come back.

They send out for feedback and from last year more than 1,000 came back. The number 1 item was the marshals—how welcoming they were; how they made the ride fun; how good it was; how supportive the Rotarians were. They set our ride apart from other events.

**Ray Rice** the direction is to ensure everyone gets back safely and it is run efficiently. Thank you for your support. **What's new in 2019?**



Route and safety procedures are the same, and enhanced by:

- Cut off time at LGSM Dr/West Head Rd now **9.20am** (30 minutes earlier)
- TCP 62 (West Head Rd/Lib Gen SM Drive) under stop/go controllers
- TCP 80 (Mona Vale Rd/Myoora) revised + more witches hats
- Huge support from schools and Rovers

## Bobbin Head Cycle Classic 2019



This is the 8<sup>th</sup> year of this Bobbo Cycle Classic. Stress—it is not a race.

By making these changes, it will speed up the ride. When they had the cut off for West Head at 9.50 the last riders were too slow coming back and had to be picked up on the return trip. There are 74 volunteers from PLC who will help at drinks spots and the finish and not do marshalling. They can be the cheer squad.

A group of Rover Scouts are using the Bobbo as their major social project.

In your bags you will find the map and details about road closures that you need to be aware of and the effects on the roads and extra traffic on the roads.

### Road Closures

- National Park at North Turramurra – **6.15 am to 9.15 am** – traffic diverted to Mt Colah. Motorists travel in same clockwise direction as riders.
- National Park at Cottage Point Rd – **7.30 am to 12.30 pm** – traffic diverted to West Head Rd entry. Motorists travel in same anti-clockwise direction.  
Note: Access to Cottage Point **not** impacted
- Karuah Rd, Turramurra Ave, Warrimoo Rd, Woodbury Rd (all part)

1.5 mths ago there was a head on when a rider slammed into an oncoming vehicle.

There are over 2,000 riders who will want to park around Karuah Oval, or will travel by public transport, so be aware of parking restrictions. We've been advised that Sydney Trains that they will be doing track work that day.

### Cut Off Times and Places

- National Park Gates at Mt Colah – by **8.15 am**, all riders surrender bib or return to Tm'ra
- Toolang Oval St Ives – by **10.00 am** – mainly 57km, surrender bib or return to Turramurra
- Terrey Hills (Booralie Road) – by **10.00 am** – 80km and 104km, surrender bib or return to Turramurra
- West Head Turn-Off – by **9.20 am (was 9.50)** – 104km, surrender bib or return to Turramurra via Akuna Bay

This is designed so the tail does not stretch out.

### Drink and Rest Stops

There are multiple rest stops – water, light food, toilet facilities and basic first aid at

- Toolang Oval St Ives (57, 80, 104 km riders) - so riders can get going
- Kinka Reserve at Terry Hills (57, 80, 104 km riders)
- West Head - 104km rider
- Thai Terrey Hills (near Mona Vale Road) – 80 & 104km riders
- Outside K'gai HS, Bobbin Head Rd, North Turramurra **27km riders ONLY**

### Bibs (colours and numbers)

104 km 10,001 to nn <b>Blue</b> (blue)	80 km 8,001 to nn <b>Green</b> (green)
57 km 5,001 to nn <b>Yellow</b> (yellow)	27 km 2,001 to nn <b>Pink</b> (pink)

### Marshal Teams Sectors

There are two new Team Leaders—Alpha with Chris Lewis and Echo with Mark Hedges.

There are a number of items in your bags. You have a plastic bag with your own **Individual Marshal Brief**, your map, Traffic Control Plan with specific Instructions and contacts for your Team Leaders. **It is very important that you READ THIS SHEET.**

The map shows you exactly where the marshal is designated to stand in order to help the riders see you clearly, while you remain safely on the kerb. If you were at 42C Kenthurst St and riders needed to do a right hand turn the picture shows how you show a strong hand

signal—'Go right' in a clear loud voice. To make the riders stop, rise both arms and loudly say 'Stop'

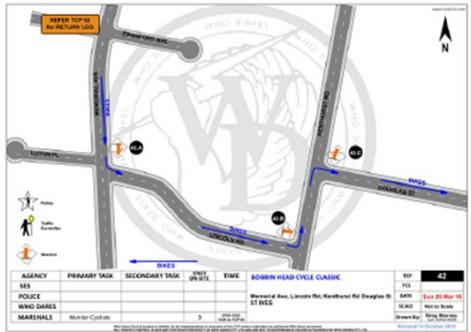


Or, you could use a whistle



- ⇒ Do not leave your post unattended.
- ⇒ If you need a Rest Break, call your Team Leader.
- ⇒ After the event the sweep vehicle will come around to let you know the last riders are through. It has flashing yellow lights, pink flag & bike trailer.
- ⇒ If you have any queries, call your Team Leader.
- ⇒ Don't think the riders know which way to go, especially when they are tired and their sugar levels are low. It is up to you to make sure they go the correct way. If one takes a wrong direction, then 100 others will follow them.
- ⇒ Stay on the designated spot for everyone's safety.
- ⇒ Note hazards on the day—call your Team Leader if you can't fix them.

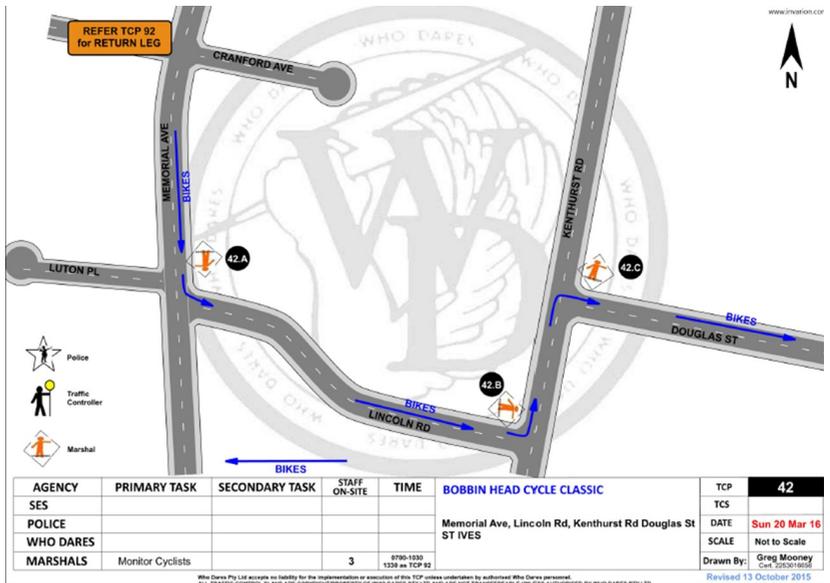
**Individual Marshal Brief: 42.C**



POSITION	42.C
BRIEF No.	
TIME	0700-1000
TEAM LEADER	Tim Wilson
TEAM LEADER MOBILE	0417 681 423
TEAM LEADER E-MAIL	wilsons@anemorgapolutions.com
EXACT POSITION	N/E cor Kenthurst /Douglas
GPS POSITION	
TRAFFIC CONTROL REQUIRED?	
EQUIPMENT REQUIRED	
OTHER DUTIES	
RTS SPECIFIC RISKS & PRECAUTIONS	Cats Traffic Direct Cyclists
VOLUNTEER 1 MARSHAL NAME	Bob Ivey
VOLUNTEER 1 MARSHAL MOBILE	0417 267 072
VOLUNTEER 1 MARSHAL E-MAIL	ivey@bigpond.net.au
VOLUNTEER 2 MARSHAL NAME	Doug Reid
VOLUNTEER 2 MARSHAL MOBILE	0417 443 193
VOLUNTEER 2 MARSHAL E-MAIL	dougreid@gmail.com
Who to Call?	

Legend:   
 ■ Risk/Drags ■ Strong Mental Pts ■ SES ■ Who Dares ■ Heavy Traffic Controls ■ Police ■ Duplicate Position

- ⇒ They did a full check yesterday, there were no pot-holes.
- ⇒ Ku-ring-gai Council has been filling holes on Burns and Mona Vale Roads.
- ⇒ Take a broom to sweep up any gravel.



## HAZARDS COME IN MANY FORMS

- ⇒ Report hazards to your Team Leader
- ⇒ Eg. - Car Doors, Gravel/Leaves, Overhanging Branches, Grates, Potholes (please try to broom off debris and clear overhanging branches)



**STUDY THE EMERGENCY RESPONSE PLAN – YOU WILL HAVE A COPY IN YOUR KIT BAG**



## Emergency Response Plan (Precis)

### LIFE THREATENING

- Call 000 (triple zero) Just do it !!
- Then notify your Team Leader
- Render assistance without putting yourself in danger
- Don't move the victim

### NON LIFE THREATENING

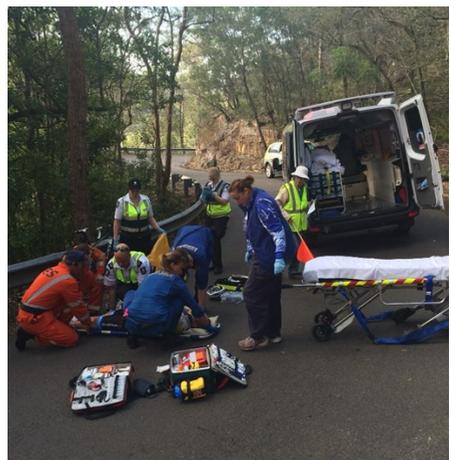
- Call your team leader, who will contact the paramedic
- Keep injured rider off the road
- Provide marshalling around incident
- Complete Incident Response Form

**BE CLEAR ABOUT WHO TO CONTACT AND BE PREPARED - IT CAN HAPPEN**

**CO-OPERATE FULLY WITH REGULATORY AUTHORITIES & ALWAYS WEAR the Hi Viz Vest**

**DO NOT STAND ON THE ROAD AT ANY TIME**

**You may stop cyclists if necessary, but must only stop traffic in an EMERGENCY**



- ⇒ Be able to advise cyclists where the nearest Drink and Rest Stops are.
- ⇒ A number of Mobile Bike Mechanics will be on the route – they may not be able to attend all calls. Call your Team Leader if support is needed.



**PLAN AHEAD FOR ANY WEATHER**

**Unless POLICE CANCEL,  
THE RIDE WILL GO AHEAD,  
REGARDLESS OF CONDITIONS**

**REMEMBER TO BRING A HAT,  
RAINCOAT, INSECT REPELLENT, SUN SCREEN, FOOD & WATER**

### A FEW OTHER POINTS

- \* **Start Times** 104km at **6.30am**; 80km at **7.00am**, 57km at **7.10am** and 27km at **7.20am**
- \* We expect first riders to return to Karuah at about 8:30am
- \* **MAKE SURE YOU HAVE YOUR MOBILE PHONE FULLY CHARGED AND YOUR TEAM LEADER'S MOBILE NUMBER IN YOUR CONTACTS**
- \* Keep riders to the left, no more than two abreast
- \* Be courteous to motorists
- \* Notify your Team Leader if you need assistance
- \* **SWEEPER VEHICLES AND MINI BUSES follow event and collect cyclists unable to continue for any reason – they will be returned to Karuah Oval with their bikes**
- \* Hand back your kit bag at the end of the day please!

Team	Area	Team Leader
Alpha	Turrumurra to Mt Colah	<b>Chris Lewis (KRC)</b>
Bravo	Mt Colah to Nth Turrumurra	Tim Shea (TRC)
Charlie	Turrumurra/Burns Rd	<b>Michael Andrews (Lifeline)</b>
Delta	St Ives	Tim Wilson / Derek Molloy (SIRC)
Echo	Mona Vale Road	<b>Mark Hedges (TRC)</b>
Foxtrot	Terrey Hills to Park Entrance	Doug Reid (WRC)
Golf	McCarrs Creek Rd, Lib Gen Dr	<b>John Collins (WRC)</b>
Hotel	West Head Road Loop	Greg Starr (WRC)
India	Reserve	TBA (TRC)

## A few practical points

- ⇒ Please bring a garden broom to clear roadway of twigs and gravel
- ⇒ Stand 10m before intersection in visible (safe) location (see your Individual Marshal Briefing Sheet)
- ⇒ Do not step in front of riders
- ⇒ Don't wave arms or hands around – this can bring down a rider
- ⇒ You are not Traffic Controllers—they have special qualifications and we have some
- ⇒ Be courteous to motorists and locals, but if they are upset, or abusive, call your Team Leader who will call police. Do not interact with them.

**Marshal Training Video** <https://www.youtube.com/watch?v=gRr1ofxyUW0>

**To Recap - what you need to know** — [www.bobbo.com.au](http://www.bobbo.com.au)

- Where you need to be – what time to be there.
- Be aware that our road closures may cause delays.
- Any specific issues (risks and precautions) at your marshal point
- The direction of the ride from your point
- How to contact your Team Leader (mobile)
- Be familiar with the Emergency Response Plan

It's been a great success. We have raised over \$1m for our partners. It's a showcase for what Rotarians can do.

**SMILE, ENJOY the DAY AND ENCOURAGE THE RIDERS! They do appreciate it. Thank You!**

## CYCLIST BRIEFING (Precis)

- The Bobbin Head Cycle Classic is **NOT** a race
- All riders must **comply with all road rules**
- No more than 2 abreast, single file in specific areas
- Attach rider bib to bike handle bars
- The event will cease at 1:30pm – surrender their bib if they wish to keep riding
- Emergency response actions
- Riders are expected to bring a spare tube, or tyre, but many can't change them, so the backup van can be called.

A few years ago a couple of riders in a group at Bobbin Head clipped wheels—a few spent days in hospital.

**David Russell** last year there were cyclists all over the place at Kinka Oval, like Brown's cows.

**Ray** as marshals, you keep off the road.

In the past they had 6 horse floats and one semi-trailer. This time there's 2 horse floats and one semi-trailer. At Karuah there is a trailer parked there and one at Toolang.

At Terry Hills they have the Rural Fire Service and some special folk to look after Kinka.

The residents who can't get through can get annoyed as they see riders each weekend, but we'll try to keep them more on the side.

**President Stuart** people work for months, from July for this huge event and preparing all week. At the end of the ride the end process is to take down all the signs ready for next time.



*bobbin head*  
**CYCLE CLASSIC**  
*Pedal to save lives*

## Letters to the Editor

Liz Richards has asked us to see if the Club's members can go and see him. As you know George was devoted to the Club and does miss all his friends and the fellowship.

His address is: Room 327, Bowden Brae Gardens  
1-7 Frith Avenue, Normanhurst

If anyone needs to contact him they can do so by contacting his wife, details as follows -  
Elizabeth Richards, +61 (0)2 9489 8659, [liz.a.richards@bigpond.com](mailto:liz.a.richards@bigpond.com)

Regards, Steve McGregor  
Rotary Club of Wahroonga - Welfare

I would like to thank Peter Kirkwood for organising the visit to the Belrose (Optus) Satellite Facility yesterday. I asked him today if he would be able to organise another visit. Unfortunately it has to be in weekday business hours, because it was so interesting. Shirley thoroughly enjoyed it too, and neither of us knew what the visit would be like. Peter said if enough people were interested then he would organise another visit. Anyone can go, but you have to be an Australian citizen to go into the Satellite Control Room. It was not just what we saw, it was the information imparted that was the most interesting. So to show an "EXPRESSION OF INTEREST" please reply to me on: [phillip.co@bigpond.com](mailto:phillip.co@bigpond.com) Then if there is enough interest I will let Peter know and he will provide a date and then Len can (if I ask nicely) provide an RSVP. Regards, Phill, Member of the Fun Committee.



## Optus Satellite Base Station Visit at Belrose, 13th March



With thanks to Peter Kirkwood 14 WRC members and 2 spouses were able to do this 2 hour tour: Ken Broadhead, Ian Cameron, Gabrielle & Peter Kirkwood, John Julius, John Welch, Greg Starr, Rob Hamilton, John Cameron, Stuart Armstrong, Jim Fulton, Len Stanley Rob Giacometti, Phill & Shirley Comfort & Kerrin McCormack

**Mark Powell**, Optus Technical Specialist has been with the company for 30 yrs



**Mark** gave us an overview of the history and what we were to see.

The Australian Government had the PMG—Post Master General's Dept, for domestic communications, primarily telephone and wireless and OTC, Overseas Telecommunications Commission for international communications, primarily satellite, HF and undersea cable. The Government decided to invest in a domestic satellite program and established the company, Aussat PL. The first satellite went up in 1985. Many of the people in Aussat came from OTC as they had the relevant experience.

This covered all capitals, Auckland in NZ and broadcasters ABC and SBS and around the country. It took news from one state to the others. Historically, it took Foxtel, SBS, Sky-Channel, plus data for banks and was a business satellite. There were four blackspots in the country, but less in the cities. This is the primary site at

Belrose then also at Lockridge, Perth. Canberra has better weather than Belrose as Sydney's weather can interfere with the signals with rain—and we get lots here.



We own all our

satellites and have sent up 10 and retired five spacecraft. We use the KU frequency band 12-14GHz. The spacecraft from Perth uses 17GHz. The Optus Oxford Falls operates on different frequencies and other providers have international overseas communications.

The A Series satellites were launched using the space shuttle. The majority of more recent satellites have used the French [Ariane Rockets](#) that have been used for most launches. There were a couple using the Chinese [Long March Rockets](#), but one of these two B2 satellites was lost on launch, the first time in 30 years.

**Query**—how many rockets are up in space now?

**Mark**—globally, hundreds. You can look up [Norad](#) who have the job of tracking all the space junk and satellites around earth and

how much there is. There is a lot of money up there.

The craft are designed to last for decades, but are dependent on the amount of fuel they can carry to stay in orbit. When this runs out the craft can't be adjusted and ceases to function.

There is research into having a fuel cell piggy back on another shuttle to keep them going, or to grab it and refuel them. The [rocket fuel](#) used to be hydrozene mixed with oxygen.

Now we have fibre between capitals, that can carry large chunks of information and data. The band width provides low cost delivery and has almost unlimited band width. Australia is a great place with TV broadcasts, Foxtel and PayTV. There is 5G across the Nullarbor and it seems like the be



all and end all to have high speed data over your phone.

The early satellites included a low L Band and lower frequency with a mobile satellite that was capable of covering up to 120km out to sea, primarily



The first satellite put up in space



**Belrose Satellite Facility, Sydney NSW**



for land mobile services. The spacecraft now are not capable of covering beyond the coast, but lots of others are.

OPTUS is 20 yrs old (formerly Aussat) when the government wanted a second carrier to compete against Telstra. With this second licence they had to buy Aussat. They already had a good customer and revenue base and it became part of this consortium. They had shares in cable companies for under sea cables in the Pacific Ocean, etc.

**John Cameron** why are some dishes bigger than others?

**Mark** when they used analogue equipment they needed big dishes for a bigger gain in the old days. At Oxford Falls—Telstra site, the dish is 32m. It was at Moree and this was closed down and it was moved.

The craft now are more powerful and technical and have greater resilience—they're smarter. They don't need bigger dishes, so cost a lot less money. They come now in 11m or 7m and as technology advances they reduce in size.

The dishes are pointed directly at the satellites that are positioned in geostationary orbits above and rotate at the same speed as the earth. The red arrow shows the one dish that can rotate to track satellites, or other objects, coming into our range.

The newer ones are in a low earth orbit and can move in the day.

With 3G, 4G and 5G it is just a larger pipe to pump data through. You have 4K TVs and on your phone with 3D images.

Tidbinbilla, south of Canberra, has a few 32m dishes and a 64m antenna for deep space dish. Satellites are positioned 36,000kms above earth and they need to have more satellites for Optus. There is a business case for another craft and they'd like to get a new spacecraft.

**Query**—how long does it take for a signal to get to and from the satellite?

**Mark**—half a second to get from the dish and back. They monitor this. The old craft spin gyroscopically and use gas to trim them. If they run out of gas, they can't be stabilised to get their orientation correct. The new ones have three gyros. We split into two smaller groups to cover the facility.

**Dave McQuillan** half the work involves the control and operation of the space craft, with their orbit dynamics and satellite control and the health and safety of space craft.

The other half involves communications with customers and services.

The Long March rockets were launched in China, the French rockets were launched from French Guiana and the American ones from Cape Canaveral.

There are 22 problems that are all automated. There are two eclipses and equinoxes a year when the earth is between the satellite and the sun and they need to switch equipment. Some satellites have been hit and lost. The space debris can be the size of a marble, but travelling at 28km/sec or more, creates a great impact. They have had a few close calls with space junk that has come within a few kilometres—they can't track it by the metre. There are apps for everything. You point it upwards and it can tell you what you are looking at.

**The NBN** started out as fibre to the home, then fibre to the street. But for rural areas, satellites are still the best.

There are two satellites allocated for work with the NBN and they have a space slot from 146°-150° allocated to them through the Australian Communications and Media Authority that gets its authority from the international body, the [ITU in Switzerland](#) International Telecommunication Union.

Governments organise who can access the slots in space over particular target areas over their countries. If they do not have a satellite in the slot for a number of months, then they can lose it. They had an old satellite that was due to be de-commissioned and pushed out further to a different orbit to keep it out of the way, but another country had lost its satellite, so it was agreed they could use it as their new one had been delayed in getting into space and they could not afford to lose their slot after paying so many millions for it.

The area they occupy is about a 75km square with +/- 0.05° margin for the old drum like satellites to spin in it. Now they are like a small bus travelling at 3km/sec. Their propellants are two types of fuel that are kept separate until they meet and ignite on contact, but no ignition system actually ignites on contact. There is a nozzle thruster to keep pointing it with drift and eccentricity.

The geo-stationary satellite is at a fixed point in space in relation to earth. At the end of life for satellites with fuel, as a limiting factor, antennas follow. The moon and sun pull them in a north/south direction, so five thrusters can overcome this inclination. To correct for this they follow a figure 8 shape in adjustments over the edges of the square slot to gradually save wobbles in transmission. Defence can follow other stationary satellites over the equator.

Low earth orbits are from 400-2,000 kms and they can bump into enough particles and need to use fuel to be stabilised. When they run out of fuel you'd think they'd come back to earth, but it takes as much fuel to bring them back as it did to get them there, so they are pushed further out.

Ranging carrier checks each hour with a signal to the spacecraft. There is a phase delay with 54 hertz wavelength with 1,000 km that gives greater frequency that can tell where it is within 10 m. At 36,000 kms out you can do nothing useful.

A modulated carrier puts out information in a signal data stream of 1s and 0s. When it is a flat reed line all is well. When it is not straight, there are pings and alarms that the satellite needs attention.

In the Satellite Control Centre there were banks of computers everywhere and on the wall time clocks—with GMT—Greenwich Mean Time, or as the French describe it as the UTC—Universal Time Constant and a number of other key time zones.

Palo Alto - 16.52; Dulles - 19.52; Seletan - 8.52; Perth - 8.52 and Sydney - 11.52.

At any time 24/7 there needs to be two techs on each 8 hr shift, with a minimum of one in the room at all times. In one day they had 161 alarms go off on one dead satellite.

To monitor the weather you can go to [spaceweather.com](#) There are 1 on 100 years solar flares, and yes it can be expensive. At \$500m for a satellite they can lose 1% capacity in one

flare and this degrades the solar cells. There are micro-media impacts and degradation over the life of the satellite.

**Ken** what qualifications do you need to do this job?

**Dave** had an unusual route. He worked in a piggery & animal husbandry & entered later in life at 31 after he did an Electrical Engineering Dip in TAFE. He's been with Optus for 26yrs. He also did in house training. Now most folk have degrees. The last guy on had 4 degrees, with one from MIT—Massachusetts Inst of Technology and 12 yrs in the RAAF as a Squadron Leader. He's been here 18 yrs.

You need a degree in engineering, with electrical and spacecraft engineering. They become Modulation Technicians with Coms or with Traffic.

The systems we use include Unix with PC capability, with Linux on a separate networks. They make sure they have no viruses and USB thumb drives get no access.

In the event of a power outage they have three large marine diesel generators that can power the whole site, even with only one. The engines are constantly heated and warm ready to go within a minute of a power interruption.

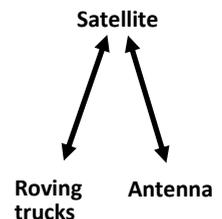
**With the Comms and Customer Service Area** there were wall to wall screens going 24/7.



When rain affects the signals, they switch services from Sydney to Canberra, and if it is affected, they switch to Perth.

Space craft have 2 poles that are A, or B poles on the horizontal or vertical plane. In the picture above left, it shows three weather screens that are always monitored to see the capitals and which have the best reception with power.

Roving reporters with small antennas on their truck roof transmit up to the satellite that then sends it back to the main antenna. The original A1 was like a round spinning bin (p 11), but now they are like a

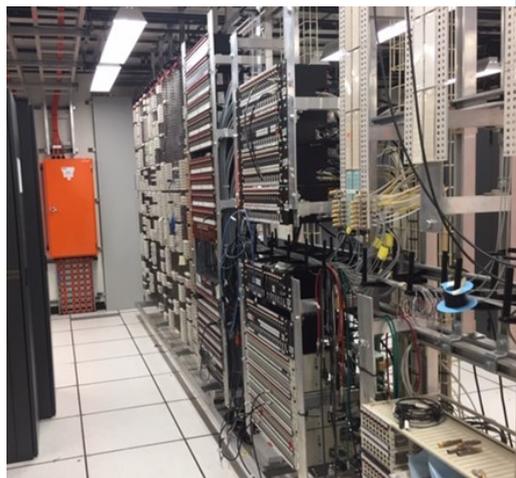


2.3m square cube box that has 2.5 tons loaded on it. One signal can carry 12-15 channels, but if one picture fails, they all fail in every transponder.

They need folk who have RF knowledge of radio signals and computer skills with digital processing, that used to be in analogue. But there is a lot of on the job training done.

The ages of the workers starting out were in their 20s-30s and many stayed 30 yrs, before redundancies and now they're in their 50s. They do 12 hr shift work that is staggered and they have at least an 8 hr break. It used to be 3 x 8 hr shifts.

#### Tour continued with look at electronic/electrical hardware



Suspended floors with cabling underneath. Temperature kept at 22° and 75% humidity. Each antenna has its own equipment attached and backups.



Outdoors 5 Antenna in geo-stationary mode, pointing directly at the satellite.  
(Ladies need to be in flat shoes)



When customers have had problems with reception, they often set up for them to get signals through smaller antenna that prove highly effective and more cost efficient.

The one mobile TTC Antenna can track other satellites and objects that come into our range.









Brian and Jo-Ann Moffat won Best Couple at the HKWS Dinner with Batman full suit and she had the dress and jacket.

**Following the letter of the Law** — A young Law student, having failed his Law exam, goes up to his crusty old professor, who is renowned for his razor-sharp legal mind.

**Student:** "Sir, do you really understand everything about this subject?"

**Professor:** "Actually, I probably do. Otherwise I wouldn't be a professor, would I?"

**Student:** "OK. So, I'd like to ask you a question. If you can give me the correct answer, I will accept my mark as it is. If you can't give me the correct answer, you'll have to give me an "A".

**Professor:** "Hmmm, alright. So what's the question?"

**Student:** "What is legal but not logical, logical but not legal, and neither logical nor legal?"

The professor wracks his famous brain, but just can't crack the answer. Finally he gives up and changes the student's failing mark into an "A" as agreed, and the student goes away, very pleased.

The professor continues to wrack his brain over the question all afternoon, but still can't get the answer. So finally he calls in a group of his brightest students and tells them he has a really, really tough question to answer: "What is legal but not logical, logical but not legal, and neither logical nor legal?"

To the professor's surprise (and embarrassment), all the students immediately raise their hands. "All right" says the professor and asks his favourite student to answer.

"It's quite easy, sir," says the student. "You see, you are 75 years old and married to a 30 year old woman, which is legal, but not logical. Your wife has a 22 year old lover, which is logical, but not legal. And your wife's lover failed his exam, but you've just given him an "A", which is neither legal, nor logical."

## LINKS

[What is Rotary?](#)

[VIP Dates for 2018-2019](#)

[Dementia Café Flyer](#)

[Bobbo Sponsorship Prospectus](#)

[Bobbo 2019](#)

[Novus Foundation Press Release](#)

[Novus Foundation Almost](#)

[Novus Foundation 2019 Beneficiaries](#)

[Winter Ball Links](#)

# The Rotary Club of Wahroonga

Link for [Stuart's Saints](#): 2018-2019 Board & Committees

## ATTENDANCE AT THE LAST MEETING AT WBC

**Attendance:** 38/62 members, 61.29% or 66.13% with 3 applied make-up credits

**Hon Life Member:** Gordon Fuller (Uralla RC)

**Visiting Rotarians:** Paul Rickard & Ray Rice (Turramurra RC, to give briefing)

**Visiting Rotaractors:** Joshua McKenna, Charlotte Weatherall

**Apologies:** Helen Clarke, Robert Ferguson, Ashley Fraser, James Fulton, Karen Gair, Brett Goods, Colin Grundy, Terrence Hodge, Susan Owen, Margaret Sachs, Radha Simhadri, Peter Smith, Janelle Speight, Ron Wainberg, Richard Webb, Rochelle Wiley

**Visitor:** Rosie Dahil (Lucy Dahill)

## Applied Make-up Credits for 13<sup>th</sup> March

Clean-up Aust Day at Wahroonga Park: 3<sup>rd</sup> Mar—Margaret Sachs & Ron Wainberg  
Rotaract Meeting, 13<sup>th</sup> Dec—Janelle Speight

## RECEPTION & HOSPITALITY ROSTER, from Club's Website for the year

If you are unable to attend any day please arrange a substitute and inform

*Len Stanley* at [len.stanley29@gmail.com](mailto:len.stanley29@gmail.com) or 0420 849 017, or 9144 4049

Date	Set up & Put away	Hospitality	Reception (2 Rotarians)
20 <sup>th</sup> Mar	Carol Johnson	Terry Hodge	Judith Kaine, Jo Karaolis
27 <sup>th</sup> Mar	Terry Hodge	Carol Johnson	Jo Karaolis, Judith Kaine
3 <sup>rd</sup> Apr	Judith Kaine	Jo Karaolis	Carol Johnson, John Julius

## CLUB & DISTRICT DIARY for 2019

**24 Mar 7.00am-1.00pm Sunday - BOBBO Cycle Classic**

**29 Mar Fri 3-4pm** Triple H 100.1 FM Community Radio Studio—Peter Smith on NOVUS

**29-31 Mar 2019 Rotary Rocks, Rotary District Conference, Newcastle**

*14 Apr District Assembly Training for all 2019-20 Board Members & Executives*

**25 May 2019—Novus 2019, please pop it in your Diary for 2019**

1-5 June 2019—Rotary International Conference Hamburg

**29 June—District Changeover**

## SPEAKERS' PROGRAM FOR MARCH-APRIL 2019

*20 Mar*— Bill Leventhal Awards at the SAN, Stuart Armstrong

*27 Mar*— Four-way Test high school student debate Ken Broadhead

World Harmony Day 21<sup>st</sup> – refugee Speaker TBC Helen Clarke, Rob Ferguson

*3 Apr* — Ben Jackson, World Unis Debating comps & Club Service C'mttee Doug Reid

*10 Apr* — Dr M Hari Haran, Indian Music Therapy

*17 Apr* — Club Meeting

**ANNIVERSARIES:** None this week