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WINFILE.NLF

CONTROL.EXE

FIFED11.EXE

CLANIC.INI

MAIL.CNF

QBASIC.PIF

EXCELTER.INI

FOOTGOLF.INI

MIMSELF.EXE

CHECKE.PIF

MOUSE.INI

MENCH.INI

MOUSECON.INI

CONNCH.INI

MORTON.PIF

GE.INI

COL.INI

MATH.DL

SYSTSEPT.INI

PIEVER.INI

POWERPP.DLL

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SECURE.DAT

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TERMINL.DAT

TERMINL.EXE

CLIPPER.EXE

CLIPDRG.INI

VICER.EXE

CONTROL.INI

APPLICATION.CNF

ENRITCH.INI

TODD.PIF

256COLOR.DAT

HIST.INI

LEVELING.INI

BOMB.DAT

NETSTOR.INI

THUNDER.DAT

VIMOS.DOC

FROM-231

IN.CNF

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TRENED.INI

TROUTIN.DLL

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# GATEWAY

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GAMES.OLD

STARTUP.CNF

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DOCHFF.INI

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WININI.V31

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EMMSOC.EXE

RED.EXE

DING.DAT

KEENGE.PIF

JUNEDON.INI

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CHARLCT.NC

APFCECTU.CNF

HPLAYEN.INI

RED.INI

REDON.INI

REDONIMP.INI

KAWIAGE.DAT

LATCHOFF.DAT

SHUTTLE.DAT

VPR.INI

VICER.TIS

HUBBACUP.INI

VPR.SCR

VPR.C.SCR

VPR.V31

The Official Journal of The Gippeland  
Gate Radio and Electronics Club Inc.

THRECE.NLF

CENTO.CNF

CENTO.EXE

SYSTEM.OLD

VIN.DAT

SYSTEM.INI

TANWENR.NLF

VINCH.INI

VCHMOZ.QCC

November 1996



## Gippsland Gate Radio and Electronics Club Inc.

Club Meetings are held on the third Friday of each month  
at the Cranbourne Girl Guide Hall in Grant Street.

The doors open at 8:15 PM & the meeting commences at 8:30 PM.

**Visitors are most welcome.**

### Committee Members 1996/1997

President	Ian Jackson	VK3BUF
Secretary	Ivan Blezard	VK3ARV
Treasurer	Paul Ash	VK3HSA
Event Queue Co-ord.	Helmut Inhoven	VK3DHI
Social Co-ordinator	Reg Goddard	VK3UK

Magazine Editors &	David Campbell	VK3XMF
Printing and Dispatch	Cathie West	Ph. (03) 9789 6401

Deadlines for articles is Thursday week prior to the Meeting.

### Club Station VK3BJA Located at the Guide Hall

Club Repeater VK3RDD Freq. in 52.575, out 53.575 Mhz

Call in Freqs. are HF on 28.325 Mhz, USB

VHF on 146.225 Mhz, FM and UHF on 438.850 Mhz, FM

### Current GGREC Inc Membership Fee Schedule

Full Member \$25.00, Pensioner Member \$12.50

Junior Member \$12.50, Extra Family Member \$7.50

Fees due after each April Annual General Meeting.

## Notes From The Editors

**Its a BOY !** if you hadn't heard - William Alexander Campbell was born on Thursday 31st October, weighing in at 9lb 14oz! He's a red head like his mum and he will be at the Christmas party for those who want to gawk.

Down to business now - We have plenty to thank this month for contributing to this edition of Gateway. Thanks to Gavin and Dianne for their Yarra River Cruise tales, Dorothy and Ross for their versions of the recent Eildon weekend away, Hal for his picture of the campsite, Colin 3HR for the Blackhat story, Helmut 3DHI for the Event Queue and Propagation reports, Melinda 3HRJ for organizing and providing the personal profile of this months speaker and Ian 3BUF for the Presidents report.

There won't be a magazine in December as usual, but you should receive one in January if all goes to plan. So here's an early Merry Christmas and Happy New Year to everyone from us all at VK3XMF QTH.

Jingle bells.. Jingle bells... David & Cathie

## THE PRESIDENTS REPORT

This report is a bit different to your regular report. As I type I am sitting in a reclining stretcher next to a blazing campfire a mere four metres from a near overflowing Lake Eildon. Its dark and breezy, the stars are out and I have a good glass of Black Douglas by my side. Also around the fire are Bobbie and Colin, (celebrating their 47th wedding anniversary), Helmet VK3DHI and Dorothy, Ivan VK3ARV, Dianne, Ross and Hal. We had just returned from an excellent meal at the Mansfield Hotel and completed our regular sked on 80 metres. I can't think of a better way to spend a Melbourne Cup weekend. (Brief pause while I refill my glass)

Other members who made the trip this weekend were Ron VK3EXJ and Judy, Peter VK3VB and Pat VK3OZ, and a surprise appearance from my mum and dad (Eric and Pauline), plus many other members who popped up on 80 metres. Excuse me while I pause as the wind just changed and I got some smoke in my eyes (Cough!). It is good to see that the group spirit needed for a successful field trip is alive and well in the Club. Rather than blowing all my report space on this one event, I will leave the details to someone else to expand upon in a separate article.

On Friday the 1st, we received a call on Ron's mobile from Dave VK3XMF to inform us of the arrival of William Alexander Campbell to his clan. Congratulations to Cathie and Dave for another bouncing addition to the family.

I have to mention our successful JOTA (Jamboree on the Air) this year. Our efforts at the Guide hall were most effective, with about one hundred and twenty kids attending. The ATV link to the Scout camp at Police Paddocks proved to be particularly effective. I hope that we can make this a regular feature at subsequent JOTA events.

In view of the interest shown in Amateur Television, I would like to take up Dave's suggestion that we purchase some ATV transmitters for Club use. The proposal that will be put forth this meeting is that we buy a pair of 10W 426mHz transmitter kits from the VK5 W.I.A. kit service and set them up with an internal power supply in a sturdy enclosure and add a couple of UHF beam antennas. The intention is that between events such as JOTA we can loan them out to members to conduct ATV experiments of their own. Borrowers would only have to find their own video camera to make a working station. To produce two transmitters of this type I estimate that we would have to commit approximately \$600 of the Clubs funds. After some discussion, we will put it to the vote this Friday night.

As we are now in November, this will be our last meeting for 1996, the next one being on the third Friday in January (the 17th). Our final event for the year will be the Christmas break up barbecue on Saturday the 14th of December. This will be held at my place, 105 Franciscan Ave in Frankston from 1:00 onwards. Barbecue facilities will be available, plus some outdoor cover in case the weather turns daggy. Toss in your bathers regardless of the weather as the spa pool will be hovering around 36 degrees. We look forward to seeing you there.

Cheers from Ian Jackson, VK3BUF

# EVENT - QUEUE 11/96

Information supplied by Helmut VK3DHI  
(Amended by Ed.)

FRIDAY 15.11.96 8.15 PM OFFICIAL CLUB MEETING  
(LAST MEETING FOR 1996)  
TALK ON "YACHTING AND RADIO"

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SATURDAY 14.12.96 1.00 PM GGREC CHRISTMAS BREAK-UP  
(LOCATION IAN VK3BUF'S)

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MONDAY 06.01.97 8.00 PM COMMITTEE MEETING  
FRIDAY 17.01.97 8.15 PM OFFICIAL CLUB MEETING  
SATURDAY 25.01.97 10.00 AM AUSTRALIA DAY WEEKEND  
VISIT TO BALLARAT'S SOVEREIGN HILL

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FRIDAY 21.02.97 8.15 PM CLUB MEETING

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## PERSONAL PROFILE OF THIS MONTH'S SPEAKER

Roger Sayers is Chairman of National Forge Limited and Cork & Seals Pty Ltd, Managing Director of Blanmore Pty Ltd, and Chairman of the Victorian Enterprise Group.

Roger's career in electronics began when he qualified as an amateur radio operator in 1965 in the UK. His callsign in UK is GB3UTM. The callsign still holds. His interest in amateur radio then changed his professional life as Roger then became an engineer working in R & D with The Plessey Group. During this time at Plessey, Roger was engaged in the development of the **PVT 150 1000W HF Remote Self-Tuning Transmitter**, the **PR 155 Communications Receiver** (once ranked as the world's number one professional receiver), then working his way up the spectrum Roger developed the first **wide-band ultra linear 50W UHF amplifier** (semi-conductor). He then spent a while specialising in the study of non-linear distortion. Roger became head of R & D for Electro-Thermal Engineering in 1975 and in 1980 moved to Australia to head up the manufacturing divisions of a scientific instrument company where he was responsible for the development of some Australian "firsts": **the hand-held nephelometer, an instrument for measuring inter-facial surface tension, and a device for generating rotating magnetic fields**. Roger still maintains an active interest in electronics design as Blanmore still provides electronics design services for interesting projects only.

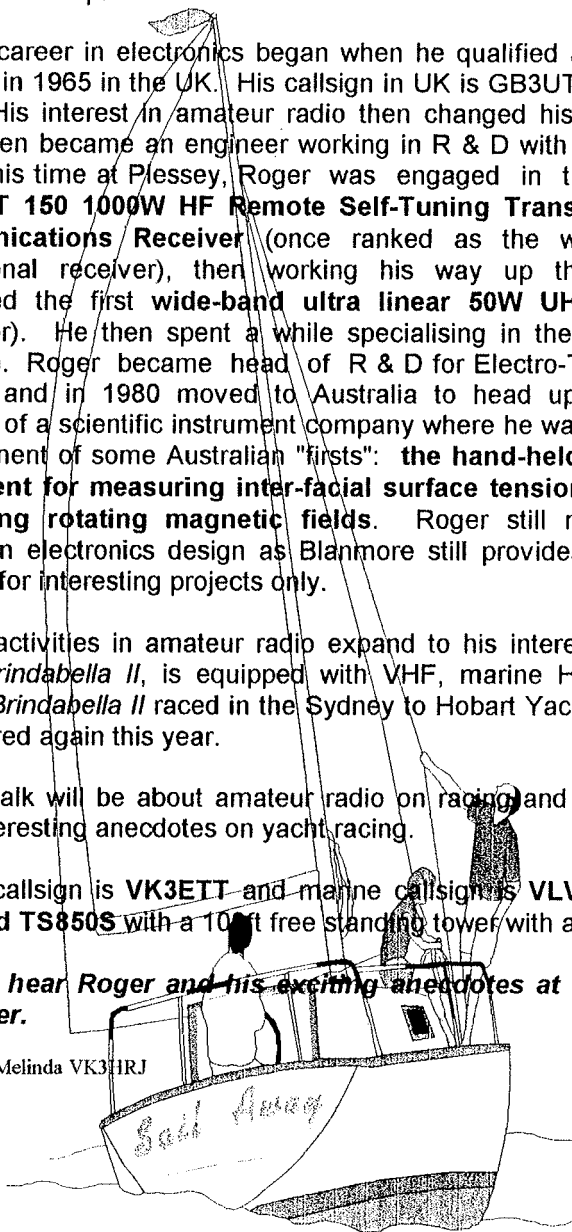
Roger's activities in amateur radio expand to his interest in yachting. His yacht, *Brindabella II*, is equipped with VHF, marine HF and HF amateur radios. *Brindabella II* raced in the Sydney to Hobart Yacht Race in 1995 and has entered again this year.

Roger's talk will be about amateur radio on racing and cruising yachts and some interesting anecdotes on yacht racing.

Roger's callsign is **VK3ETT** and marine callsign is **VLV9759**. His rig is a **Kenwood TS850S** with a 10 ft free standing tower with a 3 element beam.

**See and hear Roger and his exciting anecdotes at the meeting on 15 November.**

Supplied by Melinda VK3HRJ



## THE CRUISE ON "THE ROYAL BARGE"

Our day started out with a train ride to the city. A little overcast, but pleasant enough. The group met up at Southgate where we all hopped aboard "the Royal Barge". There was a right royal turnout - Ron EXJ and Judy, Helmet DHI and Dorothy, Peter VB and Pat OZ, Ian BUF and Dianne, Ross and Hal, Albert BQO and Trish and their 3 pretty daughters (I thought Ross, Hal and I were set!), Daddy HSA and Mummy, our neighbours Joe and Rosie and of course myself (in a journalistic capacity).

Daddy's "once-removed" cousin, Stephen, drove the launch - a pretty blue boat - and I had a go at steering, although I much preferred steering the window wiper mechanism.

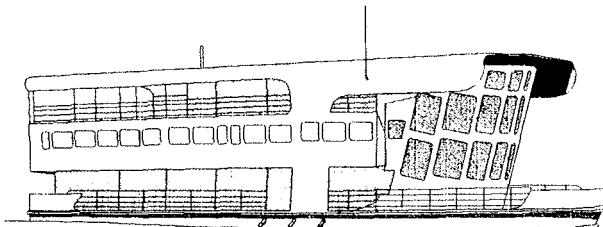
The route took us up the Yarra through Toorak, Richmond, Melbourne then around the ports area and part way up the Maribyrnong River. There was so much to see - the fancy big Toorak mansions, seagulls, tugboats, enormous container ships and the tall cranes for loading them. At one stage Ross thought he might be picked off the deck by one of them!.. We went under a big bridge (West Gate) and many low ones (where we nearly had to duck). Stephen had a lot of interesting things to tell us about what we were passing.

An array of gourmet sandwiches were provided and, although Mummy made me a vegemite one, I much preferred eating Dianne's. It was fun sharing her sandwich on her knee with the wind rushing through our hair. There were drinks too but no beer for me - I was on assignment.

The trip went for about 2 hours and was most enjoyable. After the cruise, the group dispersed around the Southgate complex - watching street performers, eating snacks and wandering through the various stalls.

Our day ended with a train trip from the city, except I don't remember too much about that...

Gavin Ash, Cub Reporter



# YARRA RIVER CRUISE

By Dianne Jackson

Last month 18 people from the GGREC went on a cruise on the Yarra river. We all met at 12 noon at Southgate. There was just enough time for a quick cappuccino before boarding the Royal Barge "Elizabeth Anne". The Queen of England once travelled in this very boat.

First we cruised up the river past the MCG, some stately homes and a lot of waving picnickers, then back past Southgate, the new exhibition building, Polly Woodside and the huge new casino building site. Our next destination was the Port.

On the way down the river we passed under some very low bridges. They were so w that the people standing on the deck of the boat had to duck their heads.

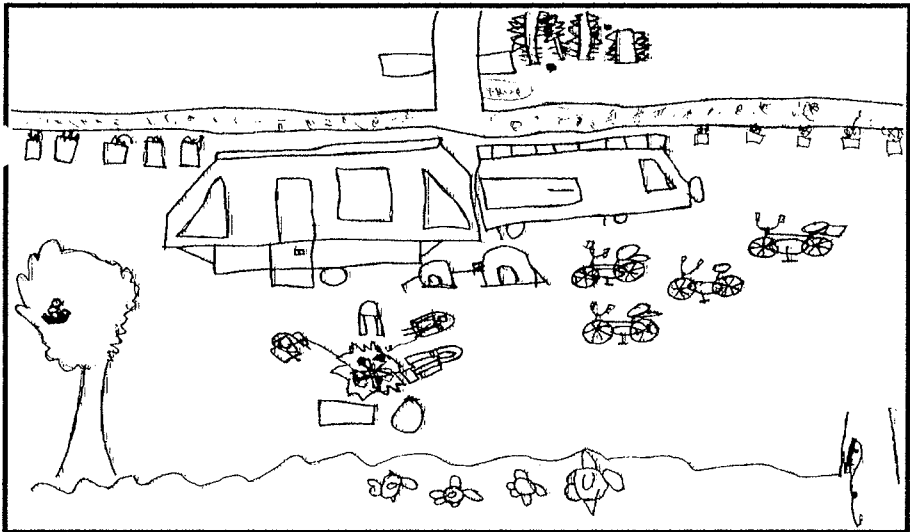
At the Port we were all fascinated to see some large cargo ships being loaded up with shipping containers and we waved to the crane drivers.

It was amazing to see a single tug boat pushing one of the cargo ships into position. The weather was overcast but the rain held off and the sun even managed to break through the clouds as we passed under the Westgate bridge.

When the cruise was over we all went our separate ways, some exploring Southgate or enjoying the free entertainments. We enjoyed wandering past the art gallery and the numerous art and craft stalls of a Sunday market. Finally, we strolled through one of the many beautiful gardens surrounding Melbourne and saw some baby ducklings swimming in a pond.

\*\*\*\*\*

## Picture of the Eildon Campsite by Hal Jackson



# Brain Teasers?

What is the main difference between 'Tuned Radio Frequency' (TRF) receivers and Superheterodyne receivers?

What is the difference between 'Single Conversion' and 'Double Conversion' in Superheterodyne receivers?

What do the following terms mean? - Sensitivity, Selectivity, Signal-to-noise ratio, Bandwidth, NBFM, Regeneration and Slope Detection.

What kinds of transmission would you need a BFO to receive?

What is the function of a Limiter and a Discriminator in an FM receiver?

What is the major difference between a Discriminator and a Balanced Ratio Detector?

How do you measure the signal-to-noise ratio of a broadcast from a heavy metal rock band? (You can't. The signal is indistinguishable from the noise!)

What layers make up the Ionosphere?

What is meant by the term Maximum Useable Frequency? (MUF)

What is the Critical Frequency and how does it differ from the Maximum Useable Frequency?

For a radio contact between Melbourne and Auckland NZ at 10:00 am on a Wednesday morning, which amateur band would best be used?

How does the Sunspot cycle affect propagation?

What do the following terms mean? - Sky Wave, Ground Wave, Space Wave, Reflected Wave, Blow Wave, Skip Zone and Skip Distance.

Calculate the length of a half wave dipole for 53 MHz (allow 5% for velocity factor)

What function do traps perform on antennas?

What do the following terms mean? - Radiation angle, Front-to back ratio, Polarisation, Forward Gain, Directivity and Isotropic Radiator.

You are using an antenna on the 10 metre band, you notice that the VSWR is lower on 28.6 than on 28.1 MHz. This would indicate: a) the antenna is too long, b) the antenna has water in it, c) the antenna is too short or d) there are at least three magpies on it.

If a moving coil ammeter was rated at one volt Full Scale Deflection (FSD) at a current of 50ma, what is the resistance of the coil?

What is the main difference between a Dip Meter and a Wavemeter?

When would you use a VTVM or FET meter instead of a regular multimeter?

What are the symptoms observed on a TV set experiencing Front-end overload?

Describe the difference between Harmonic and Parasitic Interference?

If you were operating on the 28MHz (10 metre) band and your neighbour was experiencing TVI, but only on channel one. (This is not in Melbourne) What types of RF filters could you use and where should they be installed?





# Personality Profile Page



**Full Name ?**

Colin Arthur Bishop.

**Call Sign ?**

VK3HR

**Age ?**

The wrong side of sixty!

**When did you first join GGREC ?**

1988

**What do you like about Amateur Radio ?**

Camaraderie.

**What's your favourite band ?**

2 Metres.

**What type of antennas do you have ?**

2 Metre Slim Jim, 80 Metre dipole and a TH3 Mk 3.

**How tall is your radio tower ?**

6 Metres.

**What did you do for a job ?**

Automotive Spare Parts Salesman for Reg Hunt and Lanes.

**Where did you do it ?**

Throughout metro Melbourne.

**What was your first amateur rig ?**

IC701.

**What made you become involved in Amateur Radio ?**

Dr Ian Jackson.

**What's your favourite fast food ?**

Magnum icecream.

**What's your favourite drink ?**

A finger of whisky.

**What was the strangest thing you did**

**while working as a projectionist?**

Projecting a film wound in backwards by Graham Kennedy (aged 15).

**As a child what did you want to be when you grew up ?**

A film projectionist.

**What does your wife think of Amateur Radio ?**

She loves it!

**What rig would you buy if I gave you \$10,000.00 ?**

IC736.

**How many miles/kilometres did you do in you career**

**as a spare parts rep in the auto. game?**

3,500,000 kilometres over 46 years!

## MELBOURNE CUP WEEKEND AT LAKE EILDON

by Ross Jackson

When we got home from school (no, adults didn't go to school) then we hopped into the car and left. When we got there Ivan Ron and Judy had already set up camp, but we only had a little fire. There were pine trees on one side and a few chopped down trees and bushes on the other side and in between that there was a road fire break and three little bumps so when it rains the water goes down a tunnel from there. We were looking for pine cones when dad came along and said "lets go to the top of this track to the next track, to the top of the hill". When we got to the top of the hill, there were not pine trees but gum trees surrounded by some hills. When we got back to camp almost everybody went to the machine parade in Mansfield. Boy was it noisy and busy. One was when you plopped some corn in the machine and it shook all kernels in to a bucket.

The Lake, boy was it high and big. It was 1km wide just about. After we got back from the machine display we had a little rest and then we went to see further down the lake. There were heaps of trees. The track was ok for people who were driving very slowly, but if you went fast boy was it dusty! We got up to camp number fourteen. The funny part was a campsite called Kamp Krusty, but Kamp Krusty was very bushy. When we were about to go to campsite fifteen Ron said on radio that Grandma and Grandad were at our campsite. So we turned around and headed back to camp, but we took the short cut.

It wasn't long before we had a fire. On Friday night's fire we were having a great time, wrapping spuds in foil and putting them in the fire when the phone rang and we had an even bigger surprise. Cathie had her second baby, his name was William Alexander Campbell. On Sunday, I hope that it was sunny if other people were camping because it was soaking wet where we were. We couldn't do anything except play inside and play 'Trouble' with Grandma. We did not have a fire because it was still raining. I think on Monday we went on our bikes to Goughs Bay. Mum and Dad bought some ice creams. I had a Mint Chock Paddle Pop and Hal had a Golden Gaytime. But it was the worst ride for Hal because he fell over because of me. It was a lot of pedal work.

When you had to go to the toilet you had to bring a piece of wood down for the camp fire. Ivan went fishing but he caught no fish. Grandad didn't catch any fish either.

On Sunday we went to Jamieson but dad left his hat at the fish and chip shop. The next day Ron and Judy got it.

When we went to Mansfield on Monday night we had dinner at the Mansfield Hotel. I had sausages and chips and Hal had fish and chips, but when Grandma and Grandad finished their dinner they left to go back to Corowa. I had a great caramel Sundae for desert.

The next day we had to leave. The trip wasn't long and then we unpacked.

The End.

## CUP WEEKEND TO LAKE EILDON.

Once again the GGREC had a camping weekend, this time on the banks of Lake Eildon. Camps were put up on the Delatite Arm. The campsite was detected and claimed by Ivan VK3ARV and Ron VK3EXJ already on Thursday. Ian VK3BUF with family and Peter VK3VB and Pat VK3OZ as well as Colin VK3HR and Bobby arrived on Friday.

The Lake was filled to capacity. A camp fire was lit, a perfect start to a good weekend. Indeed, the weather was perfect at least until Sunday. Despite the very heavy rain on Sunday, we all had a good time by coffee, tea and cake and chatting about everything. Ivan tried to catch some fish but was not successful, not even a carp had a nibble on the hook.

The next morning the sun came out again, but it was cool and windy. The lake was glittering, birds singing and the nature was just nice to watch. Some members decided on a bike ride whilst others went to Mansfield or Jamieson for shopping or sight-seeing.

In the evening a few members went for a meal to Mansfield for dinner. We all were spoiled by a good meal and big portion of ice cream or chocolate mousse. After arriving back at the camp we were sitting under the stars around the camp fire, chatting and drinking brandy with tea (or the other way around).

All up it was a very nice weekend, something to be repeated in time to come.

Written by Dorothy

## THE STORY OF THE *BLACK HAT*

On our happy weekend at The Pines, Delatite Arm, Mansfield - the story of "The Black Hat" began to unfold.

One of our party cries out forlornly ..."I've left my Black Hat at the Fish and Chip shop at Jamieson". This caused an uproar among the group. Volunteers were called to retrieve it. Ron EXJ's hand went up. "I will do the search and retrieve."

Another party (HR and Co) quickly volunteered as a follow up posse. On arriving at Jamieson, EXJ collected the precious cargo and took off for Wood's Point.

Meanwhile... HR and Co called into the shop with the green verandah and were told "Sorry, the Black Hat has already been picked up." HR and Co then decided that while they were in town, they would have a look around. On sighting an historic post office thought to be worth a look, they ventured in. Talking to the Post Master, HR divulged that they were on a mission to retrieve a Black Hat. The Post Master exclaimed "We all know about the story of the Black Hat!". It seems Ian's Black Hat is more famous than Ian.

COLIN (HR)

(What exactly was the reward offered for the Black Hat....?)

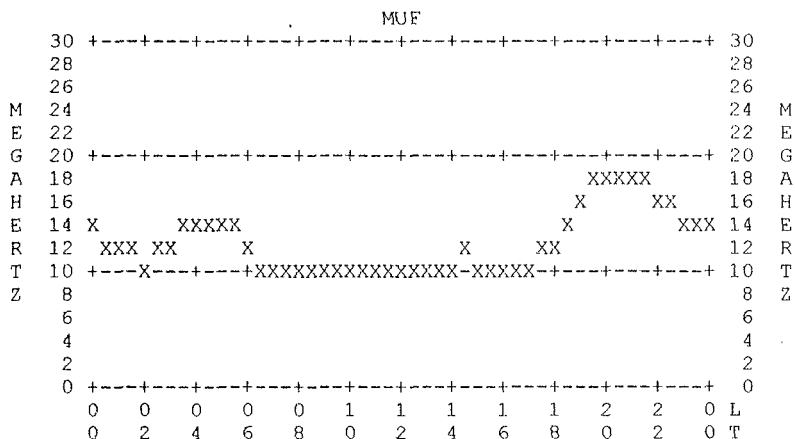
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07-11-96

England to Melbourne, Vict.

SSN: 0.0 Flux: 64.9 Radiation Angle: 2 deg for Minimum No. of F Hops:

7



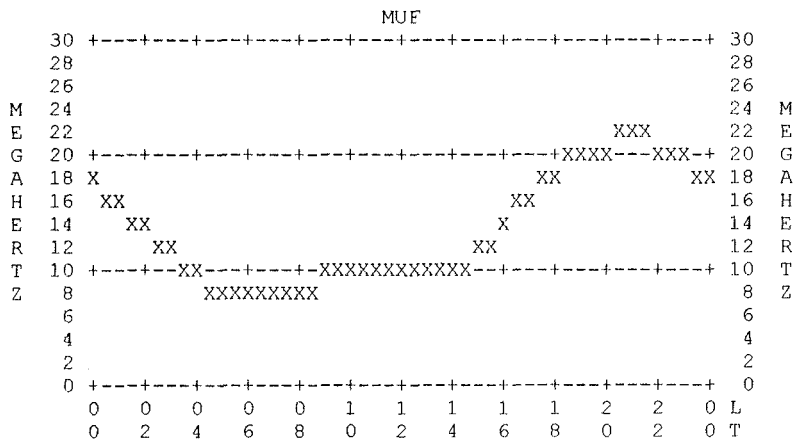
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07-11-96

England to Melbourne, Vict.

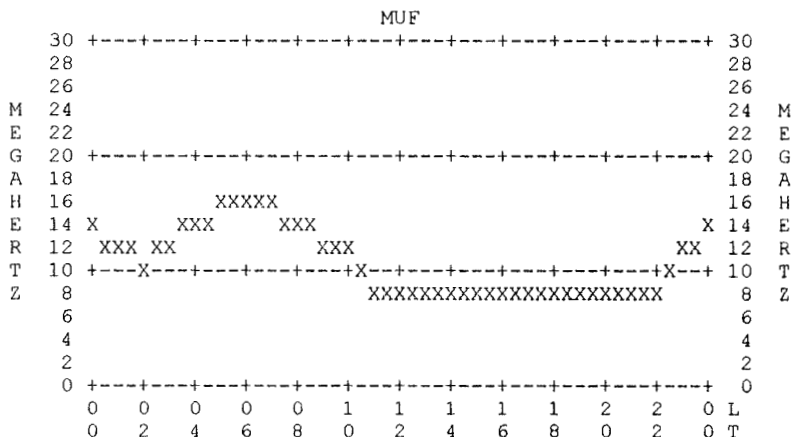
SSN: 0.0 Flux: 64.9 Radiation Angle: 4 deg for Minimum No. of F Hops:

6



07-11-96

SSN: 0.0 Flux: 64.9 Radiation Angle: 4 deg for Minimum No. of F Hops: 6



ROYCE --- Miniature UHF C.B. --- only 160mm x 145mm x 25mm  
\$150.00 (ONO)

Cheap 2 mtr FM Mobile Radio. Prefer converted ex-commercial unit such as FM828 or similar. Must be 25 watt unit or close.

--- will swap for above C.B. if applicable ---

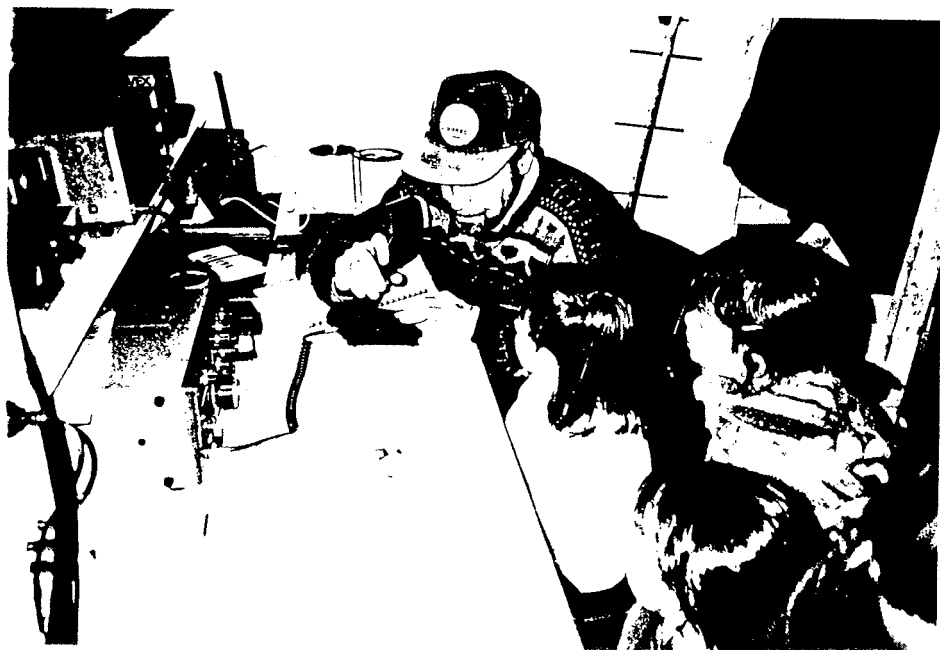
\*\*\* Contact Kerry Clayton (VK3KFC) for both the above on \*\*\*

\*\*\* 03 54604726 \*\*\*

OR P.O. Box 473 Maryborough 3465.



# *Photos from this years JOTA*



## **RADIO HISTORY - According to Grolier.**

### **Early Experimenters - continued.**

#### **Marconi's Contribution**

It apparently did not occur to Hertz, however, to use electromagnetic waves for long-distance communication. This application was pursued by Guglielmo MARCONI; in 1895, he produced the first practical wireless telegraph system. In 1896 he received from the British government the first wireless patent. In part, it was based on the theory that the communication range increases substantially as the height of the aerial (antenna) is increased.

The first wireless telegraph message across the English Channel was sent by Marconi in March 1899. The use of radio for emergencies at sea was demonstrated soon after by Marconi's wireless company. (Wireless sets had been installed in lighthouses along the English coast, permitting communication with radios aboard nearby ships.) The first transatlantic communication, which involved sending the Morse-code signal for the letter S, was sent, on Dec. 12, 1901, from Cornwall, England, to Saint John's, Newfoundland, where Marconi had set up receiving equipment.

#### **The Electron Tube**

Further advancement of radio was made possible by the development of the ELECTRON TUBE. The DIODE, or valve, produced by Sir Ambrose FLEMING in 1905, permitted the detection of high-frequency radio waves. In 1907, Lee DE FOREST invented the audion, or TRIODE, which was able to amplify radio and sound waves.

#### **Radiotelephone and Radiotelegraph**

Up through this time, radio communication was in the form of radio telegraphy; that is, individual letters in a message were sent by a dash-dot system called MORSE CODE. (The International Morse Code is still used to send messages by shortwave radio.) Communication of human speech first took place in 1906. Reginald Aubrey FESSENDEN, a physicist, spoke by radio from Brant Rock, Mass., to ships in the Atlantic Ocean.

#### **Armstrong's Contributions**

Much of the improvement of radio receivers is the result of work done by the American inventor Edwin ARMSTRONG. In 1918 he developed the superheterodyne circuit. Prior to this time, each stage of amplification in the receiver had to be adjusted to the frequency of the desired broadcast station. This was an awkward operation, and it was difficult to achieve perfect tuning over a wide range of frequencies. Using the HETERODYNE PRINCIPLE, the incoming signal is mixed with a frequency that varies in such a way that a fixed frequency is always produced when the two signals are mixed. This fixed frequency contains the information of the particular station to which the receiver is tuned and is amplified hundreds of times before being heard at the loudspeaker. This type of receiver is much more stable than its predecessor, the tuned-radio-frequency (TRF) receiver.

In order to transmit speech the radio waves had to be modulated by audio sound waves (see MODULATION). Prior to 1937 this modulation was done by changing the amplitude, or magnitude, of the radio waves, a process known as AMPLITUDE MODULATION (AM). In 1933, Armstrong discovered how to convey the sound on the radio waves by changing or modulating the frequency of the carrier radio waves, a process known as FREQUENCY MODULATION (FM). This system reduces the effects of artificial NOISE and natural interference caused by atmospheric disturbances such as lightning.

#### **Radiobroadcasting**

(This subject is treated in more detail under RADIO AND TELEVISION BROADCASTING.) The first regular commercial radio broadcasts began in 1920, but the golden age of broadcasting is generally considered to be from 1925 to 1950. NBC was the first permanent national network; it was set up by the Radio Corporation of America (RCA). Radio was also being used in the 1930s by airplane pilots, police, and military personnel.

Significant changes in radio occurred in the 1950s. Television displaced the dramas and variety shows on radio; they were replaced on radio by music, talk shows, and all-news stations. The development of the TRANSISTOR increased the availability of portable radios, and the number of car radios soared. Stereophonic broadcasts (see STEREOPHONIC SOUND) were initiated in the early 1960s, and large numbers of stereo FM receivers were sold in the 1970s. A recent development is stereo AM, which may lead to a similar boom for this type of receiver in the 1980s.