

MERRY CHRISTMAS  
AND  
HAPPY NEW YEAR  
FROM THE  
ILLAWARRA AMATEUR  
RADIO SOCIETY INC.

*Christmas Party.*

The annual Christmas Picnic will be held at Cataract Dam on Sunday 15th December. This is the big, fun, social event of the year. Bring the wife, kids and girlfriend(s) for a 'barbi' out at the dam. Fire wood and hot water are usually provided at the dam. Santa will definitely be there! (If you are bringing any children along, please bring a small gift, name clearly marked for each child so Santa can give it to them.)

Kick off time will be 10:00 am. There is room for cricket or even volley ball, both of which went down very well at previous socials!

See you there.....

*Ray,*

IARS Social director.



The

# PROPAGATOR



Illawarra Amateur Radio Society Inc.

The monthly newsletter of the Illawarra Amateur Radio Society Inc.  
Registered by Australia Post publication number :- NBH - 1491.

Meetings are held on the second Tuesday each month (except January) at 7.30 pm in the  
State Emergency Services building in Montague St, Nth Wollongong.

Visitors are most welcome.

NOVEMBER 1991

## QUESTIONNAIRE RESULTS

### CALENDAR

**DECEMBER:** This year's Christmas night will feature Col Christiansen, talking about his time spent in the Antarctic. This is a family night so everyone in the clan can come. Bring a plate of munchies along as well please. There will be no committee meeting in December.

Also in December will be the Christmas party - Ray VK2XCC has written a separate article.

**JANUARY:** January is my month off - no Propagator to write and no Society meeting. However there will be a committee meeting on the 3rd Tuesday.

**FEBRUARY:** Ian O'Toole to speak on military and historical matters. Also don't forget the Gosford Field Day (see inside).

**MAY:** All you auction freaks out there note down May's meeting.

We had 26 responses from the Questionnaire, 24 members and 2 non members. For those who might be interested, here is what we found:

Generally people were happy with the Tuesday 7:30pm timeslot.

The most popular topics for meetings came in the following order: Construction, auction, demonstrations, computers, A.T.V., E.M.E, operating hints, trip reports and so it went.

Amateur radio should be promoted in schools, many were prepared to help out (watch for some future action on this one), the Society should run licence courses, field days and visits to other clubs.

The regular types of radio worked were: Antenna build, repeaters, HF DX (sorry Jo), packet, homebrewing, ragchewing, RTTY and so forth.

The types people were interested in were: Antenna building, homebrewing, HF DX, packet, microwaves, repeaters, RTTY, CW, ATV and so it went. Most people would help newcomers to this work.

People are mostly in the club for comradeship and growth of the hobby.

COUT P 7

Minutes of IARS Committee Meeting -  
19 November 1981 at SES HQ,  
Montague Street, North Wollongong.  
Start 19:30

Present: VK2 KLH (Chair), DSH, GID,  
GPJ, KCV, MT, TKE, URB, XCC, XSV,  
Corey Hatch.

Apologies: VK2 KHE, TKE.

The minutes of the last Committee  
Meeting of 15/10/91 were read and  
received. Moved VK2 GPJ, XCC

**Correspondence in:**

- \* BARG News - Ballarat & District  
ARG Newsletter.
- \* Whats new in Radio Communications  
Oct 81
- \* APC - Moorabbin & Dist ARC.
- \* 1x Questionnaire
- \* 5x Subscription renewals
- \* 2x Membership Applications

**Correspondence out:**

- \* WIA - re the concern of members  
regarding the Examination Service

**New Members:**

We are pleased to welcome V.  
Bayliss VK2AWB and R. Maughan  
VK2CRM as members to the IARS.

**Reports:**

\* Lifestyle Expo - 19 -20/10/91.  
The Expo was well supported by  
volunteers from the club and a  
positive response was obtained from  
visitors to the Expo. Over 700  
items of literature were handed  
out. We would like to thank the  
Wollongong office of DOTC for  
supplying brochures, pamphlets and  
their general support, and also  
local radio station 2WL for the  
opportunity of presenting our hobby  
at the Expo. Thanks also to Ken  
VK2KNG for preparing excellent  
pamphlets for distribution.

**Treasury:**

The Treasurer's report was  
received. A half yearly report  
will be presented at the December  
Committee Meeting for presentation  
in the Propagator.

**Repeaters**

\* VK2RUW 438.225 MHz is operating  
satisfactorily. Final testing of  
the Goulburn link is being made and  
should be completed by late  
November. This will allow coverage  
to areas as far west as Young.

\* VK2RAW 148.850 MHz and 147.575  
MHz (Packet) is suffering  
interference which has not been  
resolved. The repeater may be off  
air for repairs and maintenance,  
but probably not before the New  
Year - advance notice will be given  
over the repeater.

\* VK2RIL 147.275 MHz minor maint  
work is required and will be  
undertaken shortly. 438.725 MHz is  
being refurbished and may be on air  
shortly.

\* 2M Beacon - Rob is considering  
installing a 2m CW practice beacon  
at Knight's Hill. This will serve  
to help we lesser lights to upgrade  
and also test the coverage area for  
2m from Knight's Hill in case we  
ever have to resite our repeaters.

**December Meeting:**

Col Christiansen will talk on  
Antarctica and Amateur Radio - plus  
the Christmas get-together. If we  
can't have a VK2XCC style White  
Christmas at least we can hear  
about one. Will Santa have a  
little Packet for XCC ??

**Questionnaire:** The questionnaire  
responses have been collated by  
Brian VK2KLH, and make interesting  
reading (see report this issue).  
One interesting result is that a  
majority of respondents regularly  
build antennae (antennas?). We  
need members with practical antenna  
building and raising skills to  
serve on a committee to advise on  
setting up the Club Station. This  
will be raised at the next General  
Meeting.

The winner of the 1981-92 free  
subscription for questionnaire  
respondents is: BOB MAUGHAN VK2CRM.

There will be NO December Committee Meeting but we will have a Committee Meeting on the 3rd Tuesday in January 92.

Attractions planned for 1992 include:

- \* Ian O'Toole - military equipment.
- \* Roger Henley - spread spectrum.
- \* Rob's next video - "Around the Sites II - The IARS Strikes Back"
- \* Auction - probably May 92.
- \* AGM and elections - July 92.
- \* Construction, helpful hints etc night is also planned.

Christmas Party: This year's party will be held at Cataract Dam on Sunday, 15th December, 1991 starting around 10.30. (See Ray's article elsewhere...Ed).

Gosford Field Day - Ken VK2TKE to organise a bus excursion to Gosford in February 1992. (Details elsewhere...Ed).

The Committee would like to wish all members, readers and their families all the best for a Merry Christmas and a Happy New Year.

Meeting closed 21:30.

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#### GOSFORD FIELD DAY

1992 Gosford Field Day is on the second weekend in February, which is not too far away. As was done last time, the Illawarra Amateur Radio Society will be running a bus to the Field Day.

Cost will be about \$10 per person, which includes entry to the Field Day. Last time the bus was booked out, but some people dropped out when the time came. To stop people missing spots, this time there will be a deposit required.

More details early next year. See Ken VK2TKE for details and for bookings.

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#### 1991 - A LOOK BACK

Strange, really. This is in fact the last Propagator for the year and so we have a bit of a look at the happenings of the year. After digging all of my past issues out from under my brother's electric guitar (don't ask - it's a long story), we note the following big points in 1991.

February saw the usual Gosford field day, with the IARS's first organised bus trip. Participants were treated to some skillful navigation by Ken VK2TKE, and had a great time (and spent lots of money).

The first ever W.I.A conference of clubs was held to discuss relevant issues. (Dare I say not discuss other issues?)

John VK2XGJ developed his local packet radio Bulletin Board system, which although not done by the Society definitely benefits a lot of members (except of course for Ray VK2XCC).

A project has been commenced to connect mains power to our oldest repeater site - VK2RAW. Another project brought underway is the Club history reports, by Lyle VK2ALU.

The club station tower has been raised and several attempts at putting the 20m yagi up were each foiled by obscenely strong winds the first night it was up.

This year was also the last year (and hopefully not the last) that the Society had a display at the 2WL expo, which you could call the region's largest trade fair. This was also a well enjoyed event as well as promoting both the IARS and the hobby as a whole.

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## REPEATER REPORT

Firstly, apologies to the Editor. I hope he wasn't expecting a big report this month to help him fill the Propagator. If he thought last month's report was short, check out this one.

Nothing much has happened to the Club's repeaters in the last month (bit of a change...Ed). No battery problems, no antennas breaking, not even any pager problems.

**VK2RUM/UHF** - Maybe by the time you read this, 438.225 will be linked to VK2RGN 438.325 at Goulburn. Our end at Knight's Hill has been sitting, waiting patiently for a signal from Mt Gray. The path has been tested on a few occasions now and presents very good signal strengths at both ends. Ian VK2AIJ (ex VK2XIJ) tells me that everything is basically installed and pointed, he's just fine tuning the system. There is still (as always) a couple of small things to do to the system, to make it that much better and enjoyable to use.

**VK2RAW/VHF** - Yes, the desense is still with us. The removal of the entire system from Mt Murray is on "stand-by" at the moment. Due to other current commitments, there would be no guarantee that the repeater would only be off air for one week. We will have to play it by ear as to when we can get the work done.

**VK2RIL/VHF** - No problems with this system at present. Some maintenance of the backup batteries needed in the future.

**VK2RAW/PKT** - No one has complained to me about the digipeater, so I suppose it must be OK. Is it? (Ray VK2XCC says that the output power needs turning down a bit...Ed).

**VK2RIL/UHF** - Work progressing, with future developments underway. (in other words, they're not telling...Ed).

**VK2RUM/HF** - It's going OK. (Come on, Rob, can't you do a bit better than that...Ed).

Well that brings us to the end of my report, intellectually stimulating and thought provoking it wasn't, but what the hell. On behalf of the Repeater Committee I would like to wish everyone a safe and happy Christmas and New Year.

Till next year... Rob VK2MT.

\*\*\*\*\*

See Jack at

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1964 - and to July 1965.

As the Technical College was not available to us for meetings over their end-of-year break, the club made use of the AIS Visitors Centre again for the January 1964 meeting, which was a Ladies Night at which suitable films were shown.

At the AGM in March, the new club Officers elected were -  
President-Jack Williams VK2ZCX.  
Vice Pres-Lyle Patison VK2ALU.  
Sec/Treas-Don Reynolds VK2ZRK  
(Re-elected).  
Asst Sec-John Simensen VK2ANO.  
plus a committee of five.

In April a visit was made to Tallawarra Power Station and the E.C. System Control Regional Centre at Yallah, to inspect communication equipment used for System Operation by E.C.N.S.W.

Technical and general interest talks given at meetings during 1964 may serve to illustrate member's interests at that time -  
Feb-Rolling your own transformers.  
Mar-Amateur Radio Satellites.  
Apr-ECNSW communication system.  
May-Causes and suppression of TVI-given by the local District Radio Inspector, John Milton.  
Jun- Amateur Radio in South Africa  
Jul-Single Sideband-by Arie Bles.  
Aug-Current state of VHF in Sydney -by Pres. and Committee members of NSW VHF Group.  
Sep-Symposium "Why I am interested in Amateur Radio" (a)Building Gear (b)DX (c)Rag Chewing (d)VHF and UHF by four club members.  
Dec- Oscar 3 Radio Satellite.

October saw the first exhibition of club member's radio equipment (home built of course!) while the first club Auction was held in November.

Club activities, other than monthly meetings, for 1964 included

a Family Picnic at Jamberoo Showground in May and JOTA operation by three of the members from their homes. This method was tried in order to more easily make DX contacts for the Scouts and Guides than had been found possible from the Mount Keira Scout Camp.

A club technical library was formed during the year, for use by members.

Name badges were obtained and were worn at meetings etc.

The major event of the year was again the Field Day, held once more in October at the Mount Keira Scout Camp, in order to make use of its excellent facilities and to enjoy its wonderful scenery. The events were along the same lines as the previous year - with the addition of Pedestrian 2 metre Fox Hunts, using "Sniffers" and a Ladies Broom Throwing Competition. Commercial Equipment was on display. It was again voted a most successful day and thoroughly enjoyed by both members and visitors alike.

The club's 2 Metre Fox Hunts were now being held regularly each month - being made progressively harder as participants gained experience and used more sophisticated equipment. The winner of one event became the Fox for the subsequent event, thus sharing the fun.

The club meeting place was changed to Coniston Scout Hall as from December 1964 in order to overcome the "Tech. Holiday" problem and to move to a location more central to where many of the members lived.

As at the end of 1964 the club had Assets of Forty Pounds (£80).

1965.

The new computer installation at

AIS was inspected during January.

Ian Hopkins, VK2ZIH, presented a trophy to the club in February, when he was leaving the district. It was to be awarded to the member who gained the highest aggregate point score for each year in the monthly Fox hunts - making competition even more fierce!

At the AGM in April, the previous year's Officers and Committee were re-elected.

Technical talks at monthly meetings included - VHF Gear, Silicon Diodes, Maritime Radar and Dio. VK2ANO's Single Sideband Transceiver (home built of course) and Pulse Width Audio Amplifiers.

Unfortunately, no records have been found to cover the period August 1965 to March 1966, but a debate was to have been held at the August 1965 meeting - on Valves versus Transistors.

Lyle. VK2ALU.

#### FOR SALE

Yet more ads hot off the Packet from VK2TFH: (Sorry - sending ads over amateur radio is not legal unless you are the W.I.A, so I must have got it some other way.)

Yaesu FT-101E HF rig, in mint condition, not even run in yet. This rig has a genuine 280W output power on SSB. \$550 or offer.

Commodore CB4 computer with assorted software, datasette, disk drive, packet modem & software, power supplies and a Philips FM-1680 packet rig. All together as one lot: \$550 no offers.

Dick Smith VZ300 microcomputer, including a working RTTY modem and some software. A great way to get yourself started on RTTY. Price: an amazingly low \$70.

All of the above equipment is being sold by Dave VK2XDB, phone (042) 714347.

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From P 2

People like to see technical and construction in the Propagator, followed by reports and operating hints.

VK2RAW(VHF) is by far the most used repeater, then VK2RUW(UHF), VK2RIL(VHF) and VK2RAW(packet). Generally people are happy with the repeaters, and cheers to the two who said that they couldn't access VK2RIL(UHF).

Many thanks to those who took the trouble to answer the sheet for us.

Congratulations to Bob VK2CRM, who won the free year's membership to the IARS. For those who don't know Bob, he is in fact the newest member of the Society and so he is now financial up until July 1983!

Having a look at the results, we see that there is quite a talent of people out there. We notice a very strong technical interest (which is fair enough!). Some suitable topics for future meetings are being looked at in line with the results.

Also, we see that people are interested in getting into microwaves, ATV and CW. Looks like we might have to blow the dust off VK2KHE's old norse net again!!!

But the main thing we notice is that generally, people are fairly happy with how things are going in the Illawarra Amateur Radio Society.

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#### HOW EMBARRASSMENT!

Last month's front page commented on the blue wrappers to indicate those who were not financial members of IARS. Picture my face when my copy showed up in a blue wrapper! Not to worry - all has been sorted out now and so I can read all the stuff that I write.

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\*\*\*\* Page 7 \*\*\*\*

# Capacitance Measurement with a Dip-Meter

This simple gadget is characterized by moderate accuracy and very low fiddle-factor!

By Frank Noble,\* W3MT

Surplus and old capacitors have one common feature — no clue as to capacitance value, either because the label fell off or faded out, or because the color code is no longer readable. Also, even though the labeling is legible, the capacitance value may be far removed, for one reason or another. A measurement sufficiently accurate for most purposes can be obtained in a simple manner.

In the interest of providing a wide range of measurement, we chose the largest semi-circular plate variable capacitor<sup>1</sup> that is commonly available, 400 pF, and resonated it with a coil at about 2 MHz, the lowest usable frequency on most dip meters. The desirability of a low frequency is twofold: First, the L/C ratio is reasonable for the large capacitance desired and, second, hand capacitance effects are minimized.

## Low Capacitance Measurement

To measure capacitance from zero to 400 pF, the circuit is dipped with the variable,  $C_R$ , at maximum capacitance and with the unknown capacitor out of the circuit. Then the unknown capacitor,  $C_X$ , is directly shunted across the coil (D to G in Fig. 2) and the circuit is re-resonated with  $C_R$ . The capacitance removed by rotating the variable unit is equal to the unknown capacitance; accordingly,  $C_R$  is calibrated in capacitance removed so that the device will be direct reading over this range.

## High Capacitance Measurement

Where the unknown capacitance is larger than 400 pF, a fixed, 400-pF capacitor is connected in series with the unknown (S to G in Fig. 2). The range is thus extended to infinity, in theory, although accuracy will suffer severely for

<sup>1</sup>Although not strictly necessary, a semi-circular plate capacitor will yield a nearly linear calibration, which is much easier to interpolate.

\*100C4 Belhaven Rd., Bethesda, MD 20034

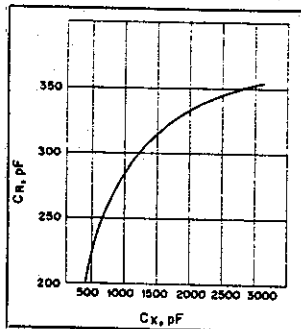


Fig. 1 — This curve shows the values for unknown capacitors in relation to various settings of the main tuning capacitor,  $C_R$ , where  $C_R$  has a range between 200 and 350 pF. See text concerning capacitance values larger than 3000 pF.

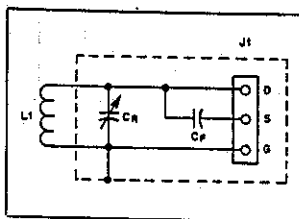


Fig. 2 — This simple resonant circuit permits the measurement, in connection with a GDO, of capacitors of unknown value. Small-value capacitors (400 pF and under) are connected between the direct (D) terminal and ground, while larger-value capacitors are connected between the series (S) terminal and ground.  $C_F$  — 400-pF silver mica.  $C_R$  — 400-pF air variable.  $J_1$  — Three-terminal barrier strip.  $L_1$  — 45 turns of no. 28 enamel wire wound on a National XR-50 form (or equivalent), slug removed. Dia 1/2 inch (13 mm), winding length 1 1/16 inch (17.5 mm). Outer (hot) end returned via interior through empty threaded hole.

values greater than about 3000 pF. We are fortunate here in that the required accuracy in measurement of large capacitor is usually low, since these values are generally used for bypass and coupling purposes. The external capacitance the tuned circuit "sees" in this situation is

$$C_S = C_R = \frac{400 C_X}{400 + C_X} \quad (\text{Eq. 1})$$

where  $C_S$  is the capacitance of the series combination, and  $C_R$  is the capacitance removed by rotating the variable, as before. Rearranging Eq. 1

$$C_R = \frac{1}{\frac{1}{C_X} + 0.0025} \quad (\text{Eq. 2})$$

$$C_X = \frac{1}{\frac{1}{C_R} - 0.0025} \quad (\text{Eq. 3})$$

All capacitances are in picofarads. The relationship between  $C_R$  and  $C_X$  is plotted in Fig. 1.

## Circuit

The schematic diagram is given in Fig. 2. Coil geometry and the operating frequency are not critical; the values used here are roughly 14  $\mu$ H and 2 MHz. A good choice for the chassis is a Radio Shack 270-239 measuring 2-1/8  $\times$  1-5/8  $\times$  4 inches (54  $\times$  29  $\times$  102 mm). It is this large to prevent it from walking around.

Entirely adequate calibration can be done with four 100-pF, 5% mica capacitors. In this model, the dial skirt is labeled with the digits 0 through 4, corresponding to hundreds of pF of capacitance removed. A more-careful calibration is probably not justified because the ambiguity of the dip is considerable, even with light coupling.

Since this is a substitution method, inaccurate dip-meter calibration does not affect the measurement. The only requirement is frequency stability. This approach does not require the use of an inductor of known value, as would be the case where the "standard" technique is used.



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### LEATHER TONGUE AWARD

An informant (no, I'm not going to tell you who, but I do know who he is) has requested the award of the not very coveted Leather Tongue award to Ray VK2XCC and VK2YGY (ry, don't know the name there).

It seems that they were travelling up the coast to Nowra on the 11th of November. They were talking to each other on 147.275, no not the repeater, just using simplex on the repeater's output frequency. The QSO was heard for at least 45 minutes by a home station who was attempting to listen the the repeater. Well done, fellas, you are now the proud recipients of the Award.

### PACKET NEWS

John VK2XGJ advised us that the VK2ZXC "digipeater" from Port Kembla has been removed and returned to John's place. This was mostly because it was not seeing much use, and John said that he would rather have his radios etc back than leave them somewhere that they aren't getting used.

Also on the Packet front, the NetRon system at VK2RAW/PKT has been in use for some time, and gives an excellent coverage area, allowing you to run into either VK2RAW or VK2RSD, and come out as far afield as Orange and beyond.

## ANTENNAS

Readers of issues of last year's Propagator will remember our infamous "Dennis's Antenner Column". In light of the apparent interest in construction articles and antenna building, we may introduce some sort of column for this in the future. However, it will be a bit more serious than Dennis's. The other reason for writing about antennas is that it is something I know a little bit about.

One of the big trademarks of the legendary "ham down the road" is the backyard full of large antenna systems. No doubt many of our readers have something tricky themselves. The shack here at VK2GID is made using only homemade antennas. Perhaps some members may care to string a few words and a picture together to tell us about their favourite and best model. (Please!!!)

I run a 40m (perimeter) delta loop for all bands 40m through to 10m. One of the advantages of a loop antenna (of which a quad is one) is that you can use it on harmonics of the design frequency. So my 40m loop works on 20m, 15m, 10m and so on. A 160m loop could be used for all bands 180m to 10m (big deal says John VK2XGJ), once you figured out how to hold it in the sky.

The element is just copper wire, which only has to be strong enough to hold itself up. Of course you also need poles or what have you to get the thing into the air. Mine is fed with a homemade 4:1 balun, but they work just as well directly fed from coax.

OK, so there is a fairly dismal article about VK2GID's humble HF antenna (which works pretty well). Let's hear about your antenna work, so that everyone can benefit, and I can fill up our magazine!

\*\*\*\*\*

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### DOTC QUESTION

Normally, this is one of the first parts of the Newsletter that I write. However this has been a lazy month so it comes later. No doubt you have been puzzling over last time's question: What is the PEP of a 100% modulated SSB transmitter?

The answer was (D) - Four times the unmodulated power. I can't explain this one very well, because it isn't clear to me.

This time our sheet asks about tuned circuits: At resonance a series circuit consisting of an inductor and a capacitor appears to be:

- (A) Inductive
- (B) Capacitive
- (C) Resistive
- (D) Reactive

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### THANK YOU KEITH!

Over the past few years, Keith VK2OB has been running courses (and more recently examinations) with the T.A.F.E. to help people enter and progress through our hobby. Unfortunately, due to the changing management of the Australian Amateur service, he can no longer continue this very desirable service.

Somewhere else in these pages should be an article telling a bit about Keith's pursuits in this field. Many thanks from the Society and the amateurs of the Illawarra (also a lot of almost-amateurs) to Keith for the efforts over the years. It's a pity to see you go!

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\*\*\*\* Page 11 \*\*\*\*

**POST BOX** - All mail can be sent to "THE ILLAWARRA AMATEUR RADIO SOCIETY" at PO Box 1838, Wollongong, 2500.

**REPEATERS** - VK2RUW - 29.820 Voice Mt Murray/Knights Hill  
- VK2RAW - 146.850 Voice Mt Murray  
- VK2RIL - 147.275 Voice/RTTY Sublime Pt  
- VK2RAW - 147.575 Packet Mt Murray  
- VK2RUW - 438.225 Voice Knights Hill  
(Off air) - VK2RIL - 438.725 Voice/RTTY Sublime Pt

**BROADCASTS** - The Wireless Institute of Australia, N.S.W Division broadcast is relayed to 29.820 MHz and 146.850 MHz at 10.45am and 7.15pm each Sunday. Callbacks after the broadcast. RTTY broadcast in the week before the Club meeting, Sunday evening, 8:45pm on 147.275 MHz, relayed onto 3.618 MHz +/- GRM and 29.820 MHz, with callbacks immediately after.

**NEWS LETTER** - The "PROPAGATOR" is published each month to reach all financial members in the week preceding the Club meeting. Article and letters are always welcome. Commercial advertising \$40 per quarter page per year, member's classifieds free for one issue. See Graham VK2GID for details.

**MEMBERSHIP** - \$15.00 P.A, concessions \$12.00 P.A, expiring immediately after the Annual General Meeting in July.

**STORE** - The Club store is open at each meeting, and sells all sorts of hard to get knick-knacks that you might need.

**LAWRENCE** - VK stations require 10 contacts with IARS members. Overseas stations require 5 contacts. One contact with the Club station  
**HARGRAVE** VK2AMW is suitable. Details of contacts are to be sent to the  
**AWARD** Club secretary.

\*\*\*\*\* COMMITTEE \*\*\*\*\*

|                  |                                      |                         |
|------------------|--------------------------------------|-------------------------|
| PRESIDENT        | -VK2KLH - Brian Clarke               |                         |
| VICE PRESIDENT   | -VK2GID - Graham Denney (042) 286732 |                         |
| SECRETARY        | -VK2KCV - Pat Kennedy (042) 673199   |                         |
| ASSIST SEC       | -VK2GPJ - Pat Jordan                 |                         |
| TREASURER        | -VK2TKE - Ken Goodhew                |                         |
| ASSIST TREAS     | -VK2URB - Robert Bonella             |                         |
| COMMITTEE        | -VK2DSH - Dale Hughes                | -VK2GPJ - Pat Jordan    |
|                  | -VK2XCC - Ray Ball                   |                         |
| ASSOCIATES       | -VK2KNG - Ken Grimm                  | -VK2MT - Rob McKnight   |
|                  | -VK2XGJ - John Simons (042) 814828   |                         |
|                  | -VK2XLA - Graeme East                | -VK2XSV - Vic Hee       |
|                  | -VK2URB - Robert Bonella             | - Ron Hanks             |
| REPEATER PRES    | -VK2MT - Rob McKnight                |                         |
| REPEATER COMM    | -VK2TKE - Ken Goodhew and others     |                         |
| QSL CARDS        | -VK2JBS - Bill Stone                 | -VK2GID - Graham Denney |
| PUBLICITY        | -VK2KNG - Ken Grimm                  |                         |
| BROADCAST        | -VK2TKE - Ken Goodhew and others     |                         |
| EDITORS/PRINTERS | -VK2DSH, VK2GID, VK2XCC              |                         |
| SOCIAL DIRECTOR  | -VK2XCC - Ray Ball                   |                         |
| CANTEEN          | - Ron Hanks                          |                         |
| STORE & TOWER    | -VK2XSV - Vic Hee                    |                         |
| DOTC LIASON      | -VK2OB - Keith Curle                 |                         |
| LIFE MEMBERS     | -VK2ALU - Lyle Patison               | -VK2CAG - Graeme Dowse  |
|                  | -VK2OB - Keith Curle                 |                         |