THE PROPAGATOR

MONTHLY NEWSLETTER OF THE ILLAWARRA AMATEUR RADIO SOCIETY

PO BOX 1838 WOLLONGONG NSW 2500

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MEETINGS ARE HELD ON THE SECOND MONDAY OF EACH MONTH (EXCEPT JANUARY) AT 7.30 P.M. IN THE CONGREGATIONAL HALL, CORNER OF COOMBE AND MARKET STREETS, WOLLONGONG. VISITORS ARE WELCOME TO ATTEND MEETINGS.

NOTICE OF MEETING: The next meeting of the Illawarra Amateur Radio Society will be held on May 9th in the Congregational Hall, Coombe Street, Wollongong.

LAST MONTH'S MEETING: This was held on April 11th, 1983, in the Congregational Hall, and some 40-odd members attended. The meeting was opened by President Dave VK2DFL, and three visitors received the usual warm welcome. The following matters were raised in General Business:

Due to a combination of circumstances it had not been possible to get the April Propagator posted to members before the meeting. However, copies were available at the meeting and those not collected then would be posted to members.

In response to VK2ALU Lyle's request for a spray painter in the April Propagator, Morry VK2EMV has volunteered but at the time of writing a 240V spray paint outfit is still urgently required.

Peter VK2XAN told the meeting that the figure of $277 given in his article 'Review of Solar Panel ...' in the last Propagator was incorrect, it should be $32.

In the absence through sickness of Paul VK2ZQT, Denis VK2DMR mentioned the proposal for a DX Group in the Club, interested members please contact Paul. Also it has been suggested that a Club Field Day be held at Lysaght's Oval, Figtree, on a date to be decided. Dave VK2DFL in formed the meeting that in future the Committee meetings would be held at Lysaght's Oval (in the office between the Bowls Club and the tennis courts) at 7.30p.m. on the 3rd MONDAY of the month.

The meeting was told that Pat Seberry, Assistant R.I., wants logging of all 2-metre mobile contacts. Denis VK2DMR proposed a motion from the Club that keeping of logs be not mandatory, as is the case in the U.S. and Canada.

Denis VK2DMR then auctioned the Photo-Copier and Transmitter Tuning Unit, the first going to Ron VK2AXF but the second being passed in. A Goldair Fan Heater, the raffle prize, was won by Jim Hayes who is not yet the owner of a call.

Charlie Proctor VK2BOZ nad kindly donated a number of old 'Amateur Radio' magazines for sharing out amongst interested members. From one that I obtained, dated June 1971, I culled the information that G5RV, of antenna fame, is now (was then) VK9LV. Wonder where he is now?

The meeting concluded with the usual tea, coffee and biscuits.

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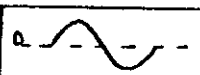
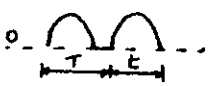
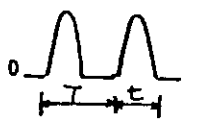
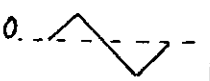
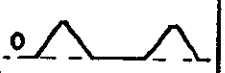
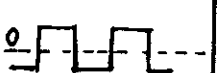
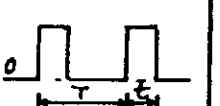
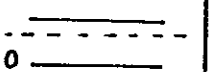
WAVEFORM MEASUREMENTS WITH ANALOGUE MULTIMETERS

Most amateurs possess a multimeter, and will no doubt be aware that the AC ranges of current and voltage on these meters display rms values for a sine-wave. That is to say the meter measures the average value of the sinewave and the scale is calibrated for the rms of a sinusoidal waveform. However, it may not be realised that an average responding rms calibrated meter may be used to measure other waveforms, thus extending their use, providing allowance is made for a mathematically derived factor. The factor by which the scale is to be multiplied is shown in the accompanying table for various waveforms.

Waveform		Peak to Peak	Zero to Peak	r.m.s.	Average
Sine		2.828	1.414	1.000	0.900
Rectified Sine		1.414	1.414	1.000	0.900
Halfwave rectified Sine		2.828	2.828	1.414	0.900
Sine Pulse		$1.414\left(\frac{T}{t}\right)$	$1.414\left(\frac{T}{t}\right)$	$\sqrt{\frac{T}{t}}$	0.900
Sine Squared		$1.800\left(\frac{T}{t}\right)$	$1.800\left(\frac{T}{t}\right)$	$1.103\sqrt{\frac{T}{t}}$	0.900
Triangle or Sawtooth		3.600	1.800	1.040	0.900
Full wave rectified triangle or Sawtooth		1.800	1.800	1.040	0.900
Halfwave rectified triangle or Sawtooth		3.600	3.600	1.470	0.900
Triangle or Sawtooth Pulse		$1.800\left(\frac{T}{t}\right)$	$1.800\left(\frac{T}{t}\right)$	$1.040\sqrt{\frac{T}{t}}$	0.900
Square		1.800	0.900	0.900	0.900
Halfwave rectified Square		1.800	1.800	1.272	0.900
Rectangular Pulse		$0.900\left(\frac{T}{t}\right)$	$0.900\left(\frac{T}{t}\right)$	$0.900\sqrt{\frac{T}{t}}$	0.900
Exponential Pulse		$0.122\left(\frac{T}{t}\right)$	$0.122\left(\frac{T}{t}\right)$	$0.166\sqrt{\frac{T}{t}}$	0.900
d.c.		1.000	1.000	0.900	1.000

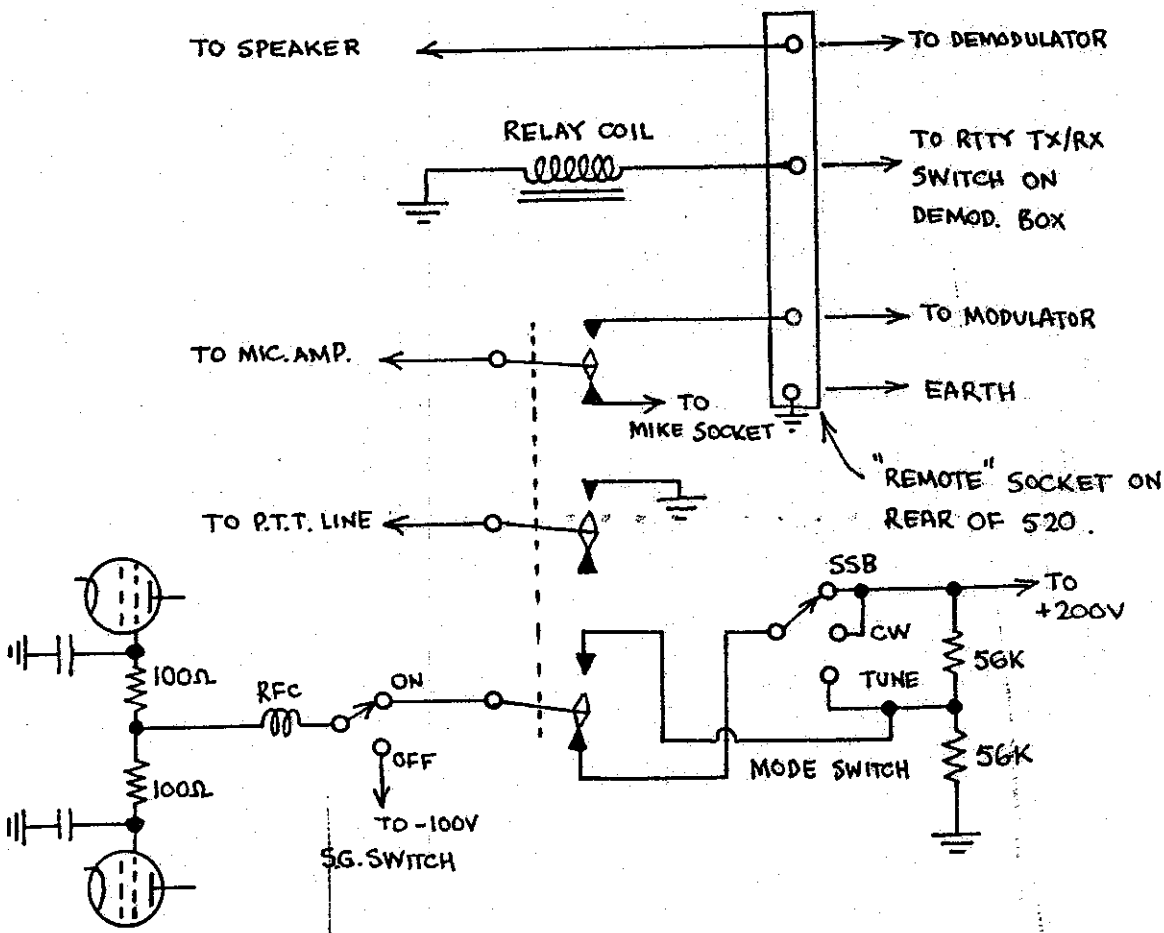
From: The Welding Institute Research Bulletin.

Contributed by: Ian Squires VK2DKS

USING A TS520 WITH RTTY

- Brian VK2AXI

With the arrangement shown below, a single-pole single-throw switch on the teleprinter modulator/demodulator box performs three functions: (1) turns on the transmitter, (2) disconnects the microphone and (3) reduces the screen voltage of the final valves to reduce the output power.



The three-pole two-throw relay is mounted inside the TS520. When the relay is "off", the 520 functions normally. When the relay is "on", the push-to-talk line is earthed, which turns on the transmitter. Input to the microphone amplifier is switched from the microphone to the audio from the teleprinter modulator. The screen grid line is disconnected from its normal +200 volt supply in the CW and SSB modes, to the +100 volts as applied in the "tune" mode.

The audio input from the modulator was adjusted to a level similar to that from the microphone. When transmitting RTTY under these conditions, the plate voltage is about 900 and the plate current about 70 mA, giving a DC power input of 63 watts. If the output stage is about 50% efficient, the RF output will be just over 30 watts, and the heat dissipated will be just over 30 watts - or 15 watts per valve, which is well inside the 35 watt plate dissipation rating claimed for a 6146B in the back of the ARRL handbook.

Changing between RTTY and SSB operation is easy - for RTTY, operate the switch on the mod/demod box; for SSB, operate the normal PTT switch. The automatic power reduction on RTTY should prevent embarrassing accidents.

Spare contacts on the "remote" socket on the back of the 520 were used for audio in from the modulator and the relay coil. Audio from the speaker was already available at the socket. The relay was mounted to the 520 chassis with a bracket of scrap aluminium, using some empty space above the audio output board.

CHANNEL NUMBERING

THERE SEEMS TO BE SOME CONFUSION ABOUT WHAT TO CALL THE REPEATERS AND HOW THEIR NUMBERS RELATE TO THE FREQUENCY.

THERE HAVE BEEN A NUMBER OF DIFFERENT BAND PLANS ADOPTED OVER THE YEARS AND SEVERAL METHODS OF NUMBERING CHANNELS BOTH SIMPLEX AND REPEATERS, IN THE 2 METRE AND 70CM. BANDS.

WHEN REPEATERS FIRST APPEARED THERE WERE ONLY 4 CHANNELS ALLOCATED FOR THEM, AND THEY WERE NUMBERED 1 TO 4. OUR REPEATER ON MT. MURRAY WAS KNOWN AS CHANNEL 1 AND DURAL WAS CHANNEL 4.

THE OFFSET BETWEEN TRANSMIT AND RECEIVE WAS 500KHZ, AND OUR FREQUENCIES WERE 145.6 AND 146.1MHZ.

IT SOON BECAME OBVIOUS THAT MORE CHANNELS WERE NEEDED AND A NEW BAND PLAN WAS FORMULATED ALONG WITH A NEW SET OF FREQUENCIES TO ACCOMMODATE 7 REPEATER CHANNELS. THE NEW CHANNELS WERE INTERLEAVED BETWEEN THE EXISTING ONES, AND SO AS NOT TO ALTER THE NUMBERS OF THE EXISTING ONES, THEY WERE LEFT AS THEY WERE AND THE NEW CHANNELS WERE GIVEN THE NUMBERS 5, 6, AND 7.

THE CHANNEL SPACING WENT FROM 100KHZ TO 50KHZ.

THIS LASTED FOR A COUPLE OF YEARS, THEN IT SEEMED THAT VK3 HAD A DIFFERENT BAND PLAN TO VK2. THERE WAS MUCH DISCUSSION WITHIN THE W.I.A. AS TO WHICH BAND PLAN TO ADOPT AS A NATIONAL STANDARD.

THE END RESULT WAS A SYSTEM THAT GAVE US 15 CHANNELS, AND USED BOTH SECTIONS OF THE 2 METRE BAND (146 TO 147 AND 147 TO 148MHZ). ONE OF THE REASONS FOR THIS WAS TO GET AMATEUR REPEATERS AWAY FROM THE SATELLITE SEGMENT, JUST BELOW 146MHZ. CHANNEL SPACING STAYED AT 50KHZ; AND FOR REASONS STILL VAGUE TO ME, REVERSE OFFSET WAS TO BE USED IN THE UPPER MEGAHERTZ. THIS WAS THE STANDARD PLAN AND WAS AGREED UPON BY ALL STATES.

ALL EXISTING REPEATERS WERE GIVEN A FREQUENCY CHANGE AND A NEW CHANNEL NUMBER. OURS BECAME CHANNEL 6 UNDER THE NEW PLAN, AND THE FREQUENCIES WERE CHANGED TO WHAT THEY ARE TODAY.

LATER, IT BECAME NECESSARY TO PROVIDE MORE REPEATER CHANNELS WITHOUT ALTERING THE BASIC BAND PLAN, AS BY THIS TIME THERE WERE TOO MANY REPEATERS ALREADY IN OPERATION TO CHANCE THEIR FREQUENCIES AGAIN.

THE SPACING BETWEEN CHANNELS WAS REDUCED TO 25KHZ. AND A NEW SET OF CHANNELS WAS INTERLEAVED BETWEEN THE EXISTING ONES. ONLY THE CHANNEL NUMBERS WERE CHANGED , AND THATS WHEN OUR REPEATER BECAME CHANNEL 5.

ALL THIS TIME A SIMILAR EXERCISE WAS GOING ON ON THE 70CM. BAND, AND ALTHOUGH A NATIONAL BAND PLAN WAS FORMULATED THERE ALSO, THE CHANNEL NUMBERING SYSTEM WAS DIFFERENT BECAUSE THE 70CM. PLAN WAS PLANNED FROM THE OUTSET RATHER THAN HAVING 'GROWN' IN KEEPING WITH GROWING DEMAND FOR MORE CHANNELS.

A UNIVERSAL NUMBERING SYSTEM WAS DEVISED THAT WAS APPROPRIATE TO BOTH OF THE BANDS, AND WAS DIRECTLY RELATED TO THE FREQUENCY OF THE CHANNEL. THE ONLY UNFORTUNATE THING ABOUT IT IS THAT IT HAS 4 DIGITS IN THE CHANNEL NUMBER, AND IS THEREFORE MORE DIFFICULT TO REMEMBER, AND SO MANY OF US 'OLD TIMERS' STILL HANG ON TO THE OLD SIMPLE NUMBERS THAT WE ARE USED TO.

NOTE THAT THE OLD METHOD OF NUMBERING REPEATER CHANNELS GAVE NO RELATIONSHIP BETWEEN CHANNEL NUMBER AND FREQUENCY.

UNDER THE PRESENT SYSTEM, THE LAST 4 DIGITS OF THE RECEIVED FREQUENCY BECOMES THE CHANNEL NUMBER, NO MATTER WHAT THE BAND, AND WHETHER IT IS A SIMPLEX OR REPEATER CHANNEL.

THE CORRECT INFORMATION ON OUR REPEATERS IS AS FOLLOWS:-

CHANNEL 6850 VK2RAW (MOUNT MURRAY) 146.25 IN, 146.85 OUT.
CHANNEL 8225 VK2RUW (HILL 60) 433.225 IN, 438.225 OUT.
CHANNEL 7275 VK2RIL (SUBLIME POINT) 147.875 IN, 147.275 OUT.
CHANNEL 8725 VK2RIL (SUBLIME POINT) (433.725 IN, 438.725 OUT.

GRAEME VK2CAG

REPEATER REPORT

MT. MURRAY

A NEW IDENT UNIT WAS FITTED ON 11/4/83. THE NEW UNIT IS THE SAME AS THE ONE IN 7275. IT USES ALL CMOS CHIPS AND DRAWS 3 MILLIAMPS FROM THE BATTERY AS AGAINST 300 MILLS FOR THE OLD UNIT.

THE OLD IDENT UNIT WAS BUILT BY HANK VK2BHL ABOUT 10 YEARS AGO, AND USES DTL CHIPS. IT WAS STATE OF THE ART AT THE TIME, AND IT HAS BEEN WORKING WELL UNTIL A FEW MONTHS AGO WHEN IT INTERMITTENTLY CYCLED PART OF THE CALLSIGN OVER AND OVER FOR HOURS AT A TIME.

IT NEVER PLAYED UP WHEN WE WANTED IT TO, AND DEFIED ALL ATTEMPTS TO FIND THE TROUBLE.

THE NEW UNIT HAS BEEN SET FOR A SLIGHTLY HIGHER MORSE SPEED, AND STILL HAS THE HIGH AND LOW TONES ----- THE LOW ONE BEING NORMAL AND THE HIGH TONE MEANING THAT THERE IS A POWER FAILURE AT MT. MURRAY AND THE REPEATER IS RUNNING FROM BATTERY SUPPLY.

A NEW BATTERY CHARGER IS UNDER CONSTRUCTION WHICH WILL REPLACE THE OLD 'RECTIFIER AND RESISTOR'. THE NEW CHARGER IS VOLTAGE AND CURRENT LIMITED, AND INCORPORATES A STEP-DOWN TRANSFORMER TO MATCH THE 32 VOLT LANDLINE TO THE CHARGING CIRCUIT. THIS WILL GIVE A HIGHER CHARGE RATE WITHOUT THE DANGER OF OVERCHARGING WHEN THE VOLTAGE REACHES AROUND 14 VOLTS. AT PRESENT THERE IS NOTHING TO STOP THE CHARGER FROM OVERCHARGING, AND THAT IS WHY FREQUENT TOPPING UP OF THE BATTERY IS NECESSARY. IT SHOULD ALSO BE MORE POWER EFFICIENT, AND MAKE THE REPEATER MORE IMMUNE TO LIGHTNING SURGES ON THE LANDLINE DUE TO THE SPECIALLY DESIGNED ISOLATION TRANSFORMER.

INCIDENTALLY, SINCE THIS REPEATER WAS MOVED TO THE TOP OF THE HILL AROUND MID LAST YEAR, NOT ONE FAILURE HAS BEEN DUE TO LIGHTNING. PREVIOUSLY WHEN THE TX AND RX OCCUPIED SEPARATE SITES, THE FAILURE RATE FROM LIGHTNING STRIKES WAS ABOUT ONE A MONTH DURING THE SUMMER MONTHS --- AVERAGING 6 A YEAR OVER THE LAST 5 YEARS.

HILL 60

A NEW IDENT BOARD OF THE SAME TYPE WAS FITTED TO THIS REPEATER ON 17/4/83 WHICH REPLACED THE OLD TTL UNIT.

THE OLD UNIT IDENTIFIED EVERY 5 MINUTES REGARDLESS OF WHETHER THE REPEATER WAS IN USE OR NOT. THE OLD BOARD WAS FITTED TEMPORARILY TO GET THE REPEATER ON THE AIR IN THE MIDDLE OF LAST YEAR.

THE NEW CMOS UNIT GENERATES LESS HEAT AND IS EASIER ON THE POWER SUPPLY. IT GIVES THE REPEATER THE SAME CHARACTERISTICS AS OUR OTHER REPEATERS, IN THAT IT WILL ONLY IDENTIFY EVERY 5 MINUTES WHILE IT IS IN USE, AND WILL REMAIN SILENT FOR THE REST OF THE TIME.

SUBLIME POINT

CHANNEL 7275. DURING THE FIRST WEEK AN I.C. FAILED IN THE IDENT BOARD, BUT SINCE IT WAS REPLACED ALL IS WELL.

UP TILL NOW IT HAS BEEN WORKING WITHOUT FAULT, AND GIVING THE EXPECTED COVERAGE.

THERE HAS BEEN SOME INSTANCES OF POWER LINE INTERFERENCE TO THE RECEIVER AT THE SITE A FEW WEEKS AGO, BUT IT HAS NOT RE-APPEARED. THE REPEATER IS SITUATED CLOSE TO A POWER POLE CARRYING HIGH VOLTAGE TO A TRANSFORMER WHICH SUPPLIES THE 240 VOLT MAINS TO THE BUILDINGS IN THE AREA. THE INTERFERENCE SHOWS UP AS A BUZZING NOISE ON ALL BUT VERY STRONG SIGNALS, AND MAKES THE REPEATER TO APPEAR 'DEAF.'

ANY RECURRENCE OF IT AND IT WILL BE REPORTED TO THE APPROPRIATE AUTHORITIES.

A NEW BATTERY CHARGER IS UNDER CONSTRUCTION SIMILAR TO THE ONE BEING BUILT FOR MT. MURRAY, BUT FOR 240 VOLT OPERATION. THIS WILL REPLACE A SMALLER UNIT THAT WAS DONATED BY JOHN VK2BHO, AND HAS DONE A GOOD JOB IN KEEPING THE REPEATER ON AIR UP TO NOW.

THE BIGGER CHARGER IS NEEDED BECAUSE BOTH REPEATERS WILL BE WORKING FROM A SINGLE 140 AMP-HOUR BATTERY.

CHANNEL 8725 (THE PHILIPS SC9) IS STILL BEING WORKED ON. ALTHOUGH IT DOES WORK, ITS PERFORMANCE LEAVES MUCH TO BE DESIRED. IT HAS BEEN CONVERTED FROM 24 VOLTS POSITIVE EARTH (THATS RIGHT) TO 12 VOLTS NEGATIVE EARTH AND ALTHOUGH IT WORKS AND PERFORMS AS PER SPECIFICATIONS, THE RECEIVER IS DEAF BY PRESENT DAY STANDARDS. THE RF AND MIXER STAGES ARE BEING RE-BUILT AND A CONTROL BOARD IS STILL TO BE DESIGNED AND MADE THAT WILL MAKE THE REPEATER COMPATIBLE WITH THE PROPOSED MICROPROCESSOR CONTROLLER THAT WILL CONTROL BOTH REPEATERS WHEN THE TIME COMES.

GRAEME VK2CAG

A MESSAGE FROM JIM WALKER OF THE SHOALHAVEN AMATEUR RADIO CLUB.

JIM WOULD LIKE US TO KNOW THAT THEIR REPEATER ON 147.2MHZ. IS AVAILABLE FOR ALL TO USE. ANY RUMOURS THAT MAY HAVE BEEN CIRCULATING AROUND ABOUT IT BEING INTENDED FOR THEIR LOCAL CLUB MEMBERS ONLY ARE NOT TRUE. THEIR REPEATER HAS, HOWEVER, BEEN PLAGUED BY INTERFERENCE FROM THEIR LOCAL VHF PAGING SYSTEM, AND THAT EXPLAINS WHY THE REPEATER APPEARS TO GO OFF THE AIR UNEXPECTEDLY AT TIMES.

THE SHOALHAVEN AMATEUR RADIO CLUB HAS ONLY 13 MEMBERS, AND THEIR ANNUAL SUB IS $10. THEY ARE LOOKING FOR REPEATER MEMBERS AT $5 PER ANNUM TO HELP FINANCE THE REPEATER.

JIM ADVISES THAT THEIR AGM IS ON 10TH OF JUNE.
THE PRESIDENT IS WARWICK KNOWLES VK2DJE,
SECRETARY JIM WALKER VK2AJT,
TREASURER DENNIS GOODLANDS VK2KEZ.

Hunting Noise

- - with a grid dipper

John P. Dieringer W6RVP
9010 Ramsgate Avenue
Los Angeles CA 90045

Noise external to receiving equipment can sometimes be difficult to pinpoint. A spectrum analyzer is beyond the reach of most amateurs. Here is a cheap substitute that has been proven.

Some time ago man-made interference was tearing up communications across a wide spectrum, seriously upsetting some military operations. Engineers tried to solve this with a spectrum analyzer and failed. As hams, a friend and myself were asked if we could solve this. A little thought as to why the engineers failed led us to the conclusion that their equipment was too sophisticated. I devised the idea of using my Heathkit grid dipper and a scope. The scope was hooked to the internal dipper diode and ground. At 2 MHz there was plenty of grass when the dipper coil was placed near any building wiring. Reducing the scope sensitivity, the grass was barely noticeable. We probed around. It didn't take long to locate a relay used for aircraft obstruction lights that was defective, with pitted chattering contacts.

Any battery operated dipper can be used. It can be hooked up to the audio section of a battery operated portable radio for use away from the shack. Make sure the dipper switch is in the diode position, so it is being used as a field strength meter. To hook the dipper up, solder one wire to the output side of the dipper diode and the other wire to ground. These wires go either to the scope vertical input or, in the case of a radio, to the volume control. Do not wire to the volume control center tap.

Tuning the dipper to harmonics, hunting parasitics, or debugging a transmitter is easy, too, since the scope gives an excellent visual display. ■

from "73"

FOR THE PROPAGATOR:

Life Membership

In the April issue of the Propagator, a few words were written about the Society's Life Members, in particularly Graeme VK2CAG. Some information has been gathered about our second 'Lifer' Keith VK2OB who had membership bestowed upon him at our March AGM.

Keith Curle VK2OB

Keith has been one of the Society's front line members for near on fifteen years and as with many others, his interest in radio and association with the technolgy has been developed over a long period. He built his first crystal set at the age of seven and he no doubt has continued in that vein until the present.

Keith's employment , mainly at Email, Qantas, IBM and presently M.M. has kept him in touch with the state of the art, or as some will say, enabled those Companies to stay abreast of the art.

Keith association with the Society began in the late sixties. He passed his theory in 1969, gained VK2ZYI in early 1970 and late 1970 was on air (converted car-phone co-op.) on 2m - first contact, Barry Lacey VK2ZYL. Keith gained his full call in 1975, VK2BUU but, due to confusion with VK2BW, applied for a change, hence VK2OB, by 1976. It is interesting to note that VK2BUU is not a currently issued call sign.

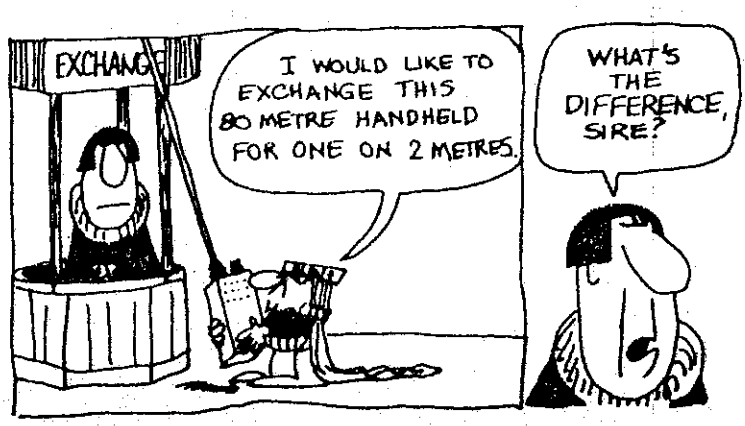
Keith took on the responsibilities of Secretary in 1969, President 1970 and since that time, with the exception of two years due to work committments, has held one or the other of those two senior positions. He still has not put his feet on the bench. The Vice Presidency bears his name.

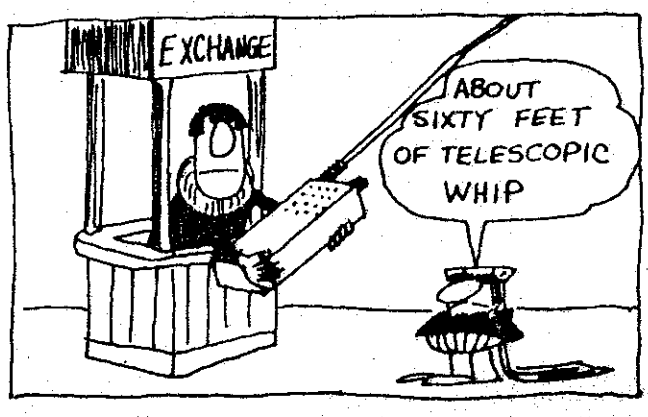
Equal to his contributions on the official side, Keith has contributed directly or indirectly to the CW training of something like 50% of members. (The call sign of our notable exception however rhymes with zoo). From all reports, Keith's CW tapes must proliferate the Illawarra, these tapes being made principally for lessons conducted in his stack. For two years, Keith conducted CW lessons on 160m for the benefit of listeners using VK2OB converted K-Mart transistors. Together with CW, Keith has taught both novice and full amateur students at the local Technical College for a period of five years with unequalled success.

It is reported also that, with Graeme, VK2CAG, Keith satisfies the spares supply/technical advice department for many of the Society's members.

It is the contribution of members like Keith who foster the principles of both technical competence and club organisational skills. He has excelled in both of these fields and it is hoped, Keith, that Life Membership of the Society in part recognises your contribution.

Murray VK2KER





MOONBOUNCE REPORT - May 1983.

Last month's request in the Propagator for assistance to clean down and paint the shelving units in the operating building was promptly answered by an offer by Morry VK2EMV who, with able assistance, is applying his painters skills to the job, which should be completed by the time that this is published - allowing for the transfer of some of the items from storage to their operating position. Control systems wiring inside the operating building can then proceed.

Jim VK2DLJ was given the material and working drawings for making up the main part of the dual mode feed horn which will be used as our initial feed antenna for 1296 MHz operation.

When the remaining work and adjustments are completed on this horn it will be mounted on the feed tripod in the dish.

The low level driver stage for the transmitter is now complete and is giving 2 watts output for 400 milliwatts input. When installed in the drive chain, this will provide more than adequate drive for the power amplifier to give 120 watts output, allowing for any coax. losses involved prior to the P.A. stage should it be mounted up in the dish.

Most of the "mechanical" work is now completed on two receiving preamplifiers of the DL7YC design and their completion is my main project at the moment.

The next working day at the dish is planned for Saturday 30/4/83, during which we hope to make final adjustments to the dish tripod mounting to reduce the "whipping" of the tubing under windy conditions, install the sighting telescope, dish pointing declination selsyns and their wiring etc., as well as sorting out the feed mounting platform position more accurately. If enough starters are available the shelving units wiring arrangement may also be started.

Lyle VK2ALU

CALIBRATING 2-METER RECEIVERS USING HARMONICS. In the absence of a counter or other suitable piece of test equipment, a surprisingly good job of setting a 2-meter fm receiver on frequency can be done using the harmonics from a 15 or 10-meter transmitter. This assumes that the transmitter or its companion receiver has reliable dial calibration. In my case, I depend on my Collins 75A4 as the frequency standard, since its dial can be read to 100 Hz increments with little difficulty, and it tracks to within 100 Hz between 100 kHz calibration points. To set the 2-meter receiver on frequency, divide the desired channel frequency by five, tune the 10-meter receiver to that frequency, zero beat the transmitter, and zero the 2-meter receiver on the transmitter harmonic. If your transmitter doesn't cover all of 10 meters (147 MHz/5 = 29.4 MHz), the same trick can be done on 15 meters using the seventh harmonic for frequencies above 147 MHz. (147 MHz/7 = 21 MHz). It may be necessary to temporarily remove your low-pass filter to hear these harmonics. Make sure you are not tuning up on top of someone on 15 or 10 when you are doing this. Using this technique, it should be possible to set a 2-meter fm receiver to within 1 kHz or less. Once the receiver frequency is set, most radios have provision for zeroing the transmitter to the receiver.

"Ham Radio" from "The Lyrebird".

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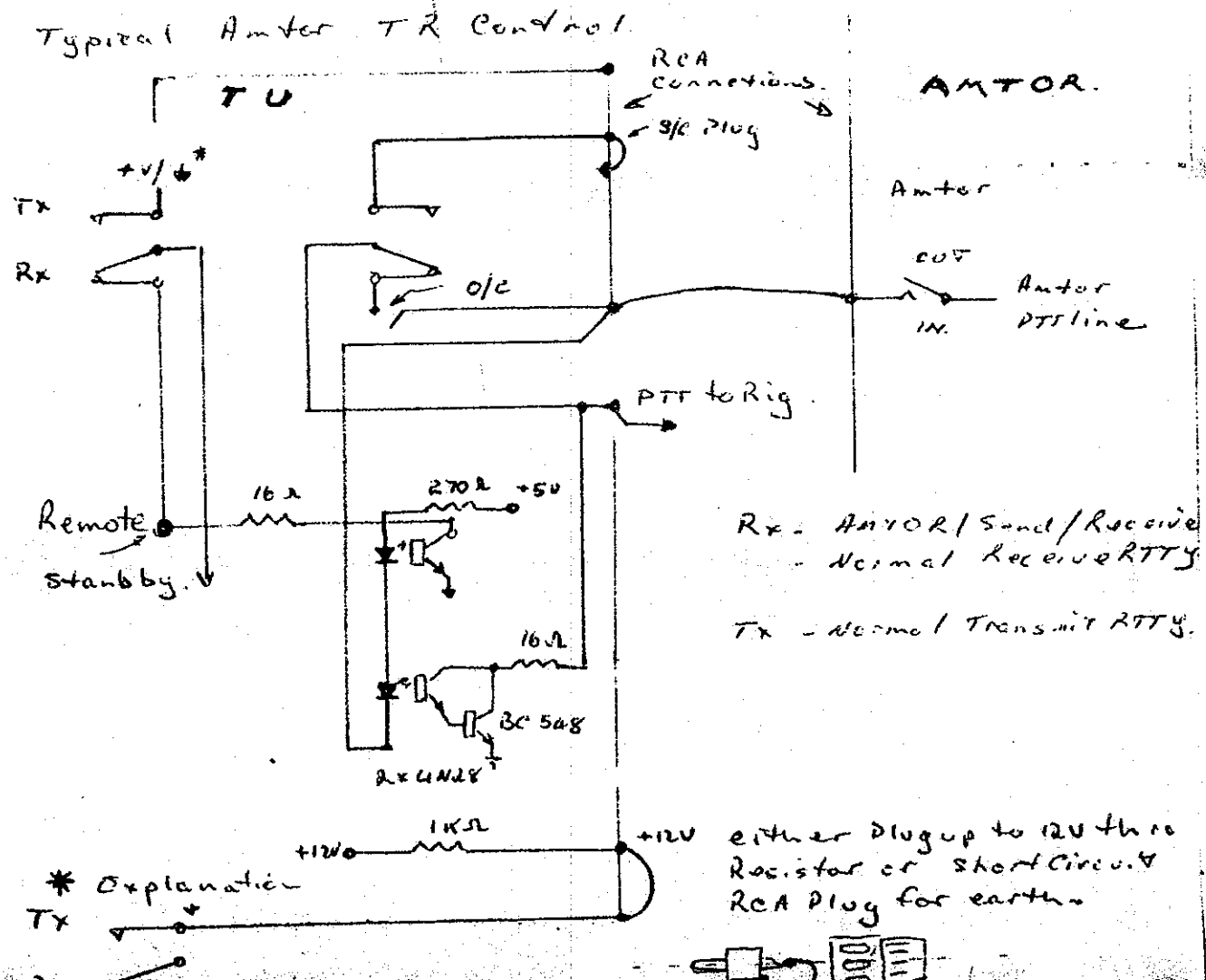
CIRCUIT 1, THIS IS A TYPICAL CIRCUIT FOR MOTOR CONTROL OF AT DT600, ETI TERMINAL UNITS. THE CIRCUIT PROVIDES AUTOMATIC CONTROL, MANUAL AND MOTOR OFF CONTROL.

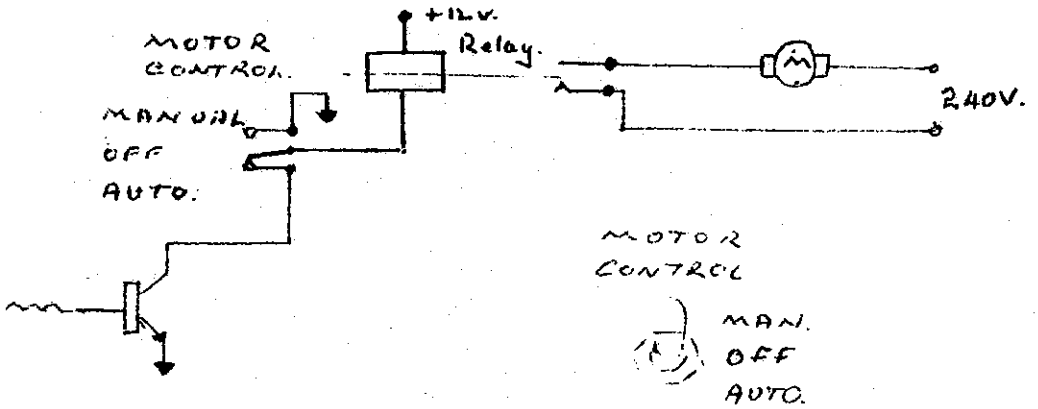
CIRCUIT 2, THIS IS A TYPICAL CIRCUIT FOR PTT AND STAND-BY (TU MARK-HOLD ON TRANSMIT). THE CIRCUIT PRIVIDES EITHER EARTH FOR TRANSMIT OR EARTH FOR RECEIVE. IT ALSO ALLOWS FOR EITHER EARTH OR + VOLTAGE FOR STAND-BY. THE REMOTE IS FOR EXTERNALLY CONTROLLING THE STAND-BY LINE TO THE TU. SEE DIAGRAM 4 FOR STAND-BY EARTH/+VE OPERATION EXPLANATION.

CIRCUIT 3, THIS CIRCUIT ALLOWS FOR CPU OPERATION USING A SIO CHIP, THE CIRCUIT HAS A TRANSMIT OVERRIDE IN THE FORM OF THE TR SWITCH. RTS COMMING FROM THE SIO CHIP IS FED BACK TO THE SIO CHIP VIA THE CTS LINE WHEN THE TR SWITCH IS THROWN. THIS WHEN DECTECTED BY THE CPU WILL THEN TRANSMIT INFORMATION. THE OPTO'S WHICH WORK OF THE CTS LINE SWITCH THE TU TO STAND-BY AND SWITCH THE PTT LINE. THE CIRCUIT CAN BE USED WITH THE TR SWITCH THROWN TO TX AND THE CPU UNDER CONTROL OF THE OPERATOR SETS THE RTS LINE SWITCHING THE STAND-BY AND PTT LINES.

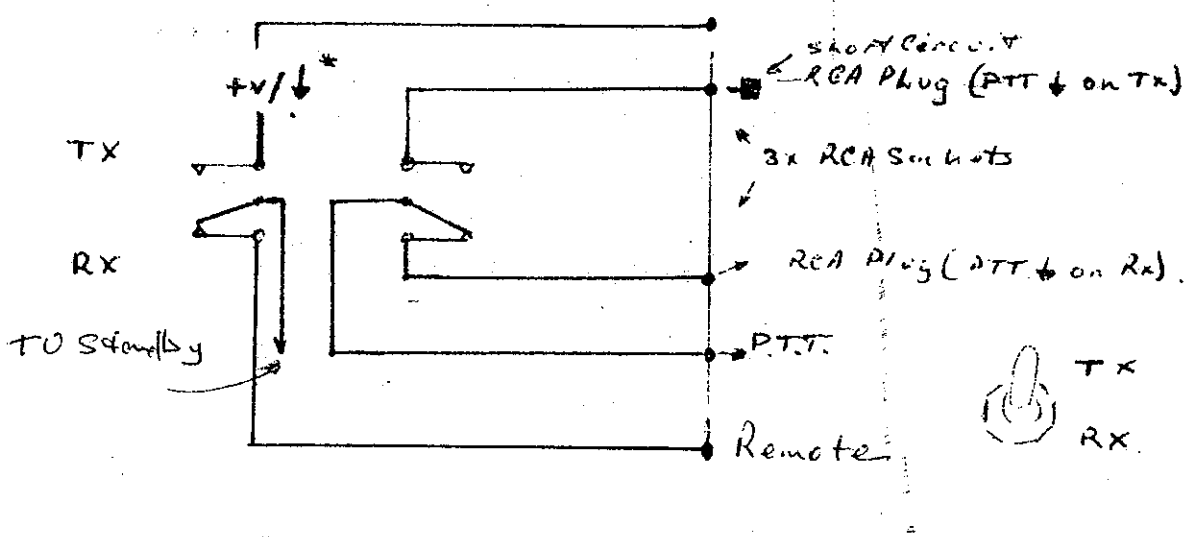
CIRCUIT 4, THIS CIRCUIT USES THE BASIC CIRCUIT AS IN DIAGRAM TWO. THE CIRCUIT IS USED TO IMPLEMENT AMTOR TRANSMISSION, OPTO'S ARE USED HERE TO SPEED UP THE PTT LINE SWITCHING PROCESS. THE CIRCUIT CAN WORK NORMALLY AS A RTTY STATION USING THE TR SWITCH OR BY LEAVING THE SWITCH IN THE RECEIVE POSITION AMTOR CAN BE USED.



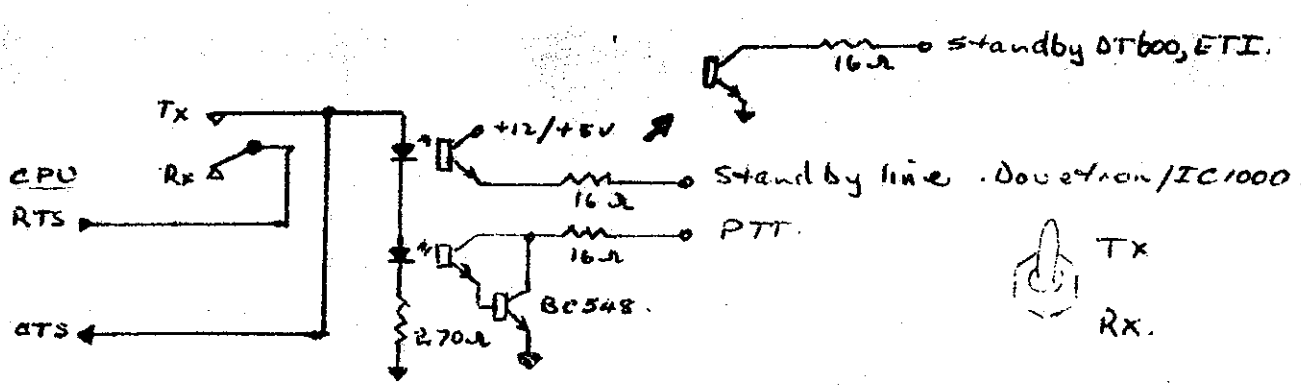
1 Wiring Motor Control Circuit.



2 Press to talk (PTT) line Control. (MANUAL)

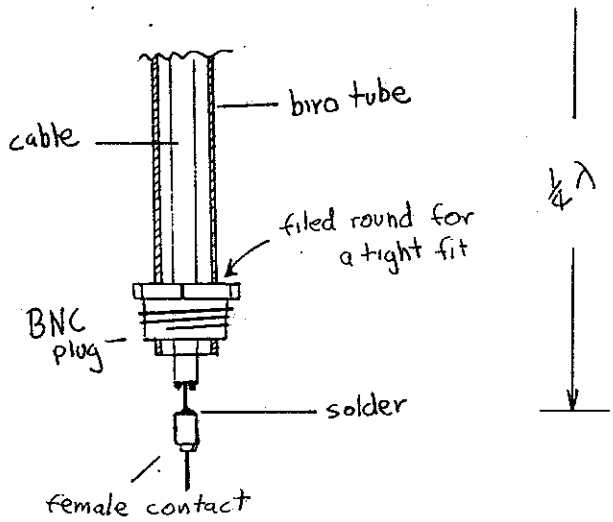


3 Press to talk. CPU. Controlled. manual/AUTO. (CPU TR Control)



1/4 Wave Cheapie for 2m handhelds

This 1/4 Wave has double the field strength of the usuall rubber ducky antenna used on handhelds and still has flexibility.
The best cable to use is a multicore type, at least 5 thick cores.
The biro tube supports the bottom end, only one core needs to be soldered into the female contact.



Fred VK2YSB

Antenna Gain Facts

-- don't be misled

Ken Schnell W5OBR
2607 Easy St.
Pasadena TX 77502

This will be a short article to discuss the gain of antennas. I always get confused when someone quotes me a gain of a particular antenna. The confusion arises because I don't know what baseline or reference point he is using. Normally, in measuring HF antenna gain, the figures are referenced to those obtained by using a horizontal dipole (halfwave). In the FM communications field, the reference for gain is still a halfwave dipole, but mounted in the vertical plane. As far as the FCC rules are concerned, antenna gain is based on a halfwave dipole as a reference. This can be important because many antenna manufacturers use an isotropic source as a reference for listing the gain of their antennas. A common antenna (and the simplest) is the 1/4 wavelength whip perpendicular to ground plane. By comparison to an isotropic source, this antenna shows a gain of .3 dB. Additionally, the 1/2 wavelength antenna shows a gain of 2.1 dB over isotropic or 1.8 dB gain over a 1/4 wavelength antenna. The common 5/8 wavelength antenna, that we see so often on the mobiles, has a gain of 1.2 dB over the 1/2 wavelength or 3.3 dB over isotropic. Higher omnidirectional gain is usually accomplished by using stacked halfwave dipoles. As an example, four stacked halfwave dipoles on 146 MHz can provide approximately 6 dB gain. Usually the maximum number of halfwave elements stacked vertically will be eight (8), which should provide an omnidirectional gain of about 9 dB. ■

Antenna Type	Gain
Isotropic	.0
1/4 wave	.3
1/2 wave	2.1
5/8 wave	3.3
Collinear	6.0

From "73"

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ALTHOUGH BENJAMIN FRANKLIN was not the first to think that lightning might be electrical in nature (others had approached the idea earlier, including Sir Isaac Newton and Francis Hauksbee), he was the first to demonstrate it. And he did invent the lightning rod. In 1752, he attached an iron rod to the chimney of his house and strung an insulated wire down to his water pump, where it was grounded. He thought that it would protect the house from any lightning bolt. As it turned out, his house was hit by lightning 35 years later, when he was 81 years old. The rod worked.

"The Lyrebird"

THE ILLAWARRA AMATEUR RADIO SOCIETY - P. O. Box 1838 Wollongong 2500

Meetings: Second Monday of every month except January at 7.30 p.m. in the Congregational Church Hall, Coombe Street, Wollongong. Committee Meeting - 3rd Monday of each month.

Repeaters: VK2RAW - 6850 VHF Mount Murray. VK2RIL - 7275 VHF Sublime Point.
VK2RUW - 8225 UHF Hill 60 Port Kemble. VK2RIL - 8725 UHF Sublime Point.

Broadcasts: Club news - RTTY on 6850 VHF repeater at 7.00 p.m.; Voice on 6850 VHF, 7275 VHF 8225 UHF and by relay on 3562 Khz and 28460 Khz at 7.15 p.m. on Sunday night prior to Club meeting. Call backs after the W.I.A. relay at 7.30 p.m.

W.I.A. Relays: on 6850 VHF at 11.00 a.m. and 7.30 p.m. weekly on Sunday.

Club Nets: 3562 Khz SSB on Sundays at 8.00 p.m. and slow morse net on 28440 khz on Tuesday at 8.00 p.m.

Newsletter: "The Propogator", published monthly to reach financial members in week prior to meeting. All articles, ads etc. to the editor, Leo Kleeborn, VK2YJK at 33 Lombard Avenue, Fairy Meadow 2519. Telephone 84.9751. Copy deadline 3rd Tuesday each month.

Membership: The Secretary, I.A.R.S. P. O. Box 1838, Wollongong 2500. Full membership is $7.00 per annum; students and pensioner concessional members $4.00 per annum.

QSL's: For financial members who are also financial members of the W.I.A. ONLY.
Inwards: Mike Keech VK2DFK, QTHR; Outwards: Ian Callcott VK2EXN QTHR.

Awards: The award of the I.A.R.S. is "The Lawrence Hargrave" award. VK stations require 10 contacts with I.A.R.S. members; overseas stations require 5 contacts with I.A.R.S. members or contact with the Club station VK2AMW is sufficient in itself for the award. Band details - time, day, date, frequency, station worked + $2.00 or 4 I.R.C.'s to Award Manager, I.A.R.S., P. O. Box 1838, Wollongong 2500. No QSL cards required.

Store: The Club store operates at each Club meeting.

Committee: President - Dave Myers VK2DFL, 78 Highlands Pde., Bulli.
Vice President - Keith Curle VK2DB, 24 Beach Drive, Woonona.
Secretary - Murray McConnell VK2KER, 62 Ramah Avenue, Mt. Pleasant.
Treasurers - Geoff Cuthbert VK2ZHU, 2 Nioka Avenue, Keiraville.
Richard Fox VK2ERF, P. O. Box 1120, Wollongong

General Committee: Mike Keech VK2DFK, Ian Callcott VK2EXN, Ray Ball VK2XCC Morry Van-De-Voretenbosch VK2EMV, Jim Mead VK2EJM, Jock Taylor VK2JT, Roy Parton VK2KD.

Repeater Chairman: Graeme Dowse VK2CAG.

Repeater Committee: Mike Keech VK2DFK, Morry Van-De-Vorstenbosch VK2EMV, Ian Callcott VK2EXN, Dave Colless VK2EZY.

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