THE PROPAGATOR

MONTHLY NEWSLETTER OF THE ILLAWARRA AMATEUR RADIO SOCIETY

PO BOX 1838 WOLLONGONG NSW 2500

November 1983

VOLUME 83, NUMBER 10
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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 on Monday 14th November. On this evening, the Society's annual auction will be conducted. Please see inside for further details.

LAST MONTH'S MEETING

Attendance topped sixty - six members and visitors. During the 'formal' part of the evening, President Dave VK2DFL confirmed that Sublime Point 2m was officially off the air but Graeme VK2CAG appeared to be ready to reinstall the RTTY regeneration equipment well within the anticipated one week. Graeme promised a brief explanation which is included in this issue.

It was also announced that Mike VK2DFK had been the group's first member to establish an AMTOR contact. This was during the weekend 8/9th October.

Following the recent DOC examinations, the following new call signs are about; Jim VK2QU, was NJF, Paul VK2KPS, was PFU and Sep VK2KIH who was briefly VK2PTZ.

Following the official meeting, Gil McPherson VK2ZGE faced the firing squad on the 70cm kits now in abundance in the area. Gil, rising to the occasion, demonstrated a 70cm 17 element array available for easy assembly. These units are now in the Club Store and are available (driver excluded) for $15.00.

The raffle for the VZ200 computer was drawn with Andrew McEwan being the lucky member. Roy VK2KO took out the second prize of 20 instant lotto tickets and Carolyn, Graeme VK2CAG's harmonic being a lucky third with ten tickets. It is believed Neville VK2NIFTY made the most out of second and third prizes.

The personal gear of the late Chas Hedley VK2MT was auctioned. The proceeds will be forwarded to Chas's family in Newcastle when details are finalised. A special thanks to Denis VK2DMR who kept the bidding spirited.

73's Murray VK2MY
for Ken VK2DOI

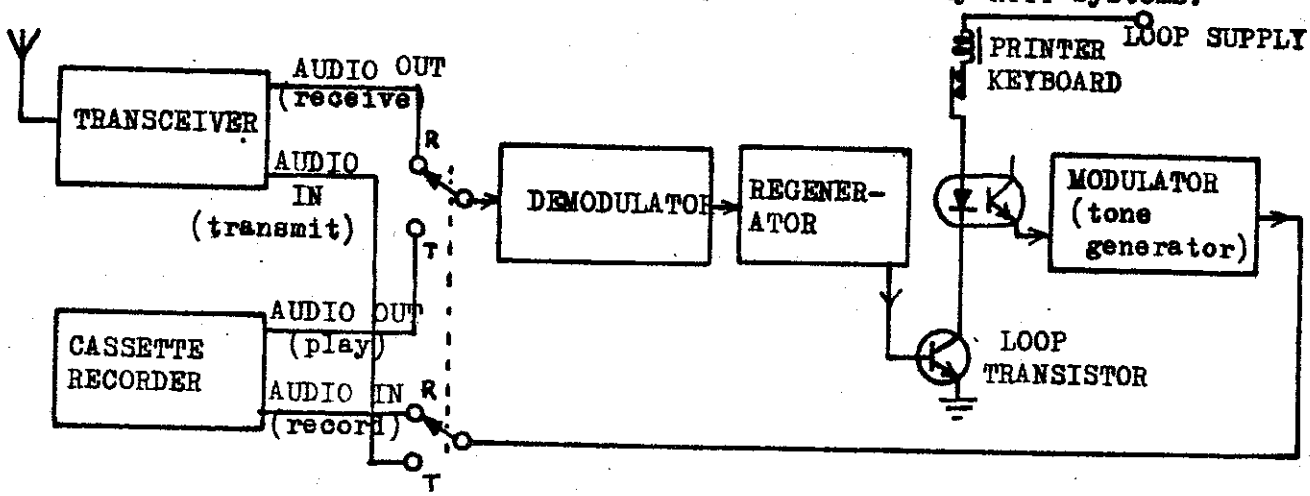
RECORDING RTTY ON CASSETTE TAPE

Brian VK2AXI

Paper punch tape is ideal for preparing RTTY material, and for storing short messages. However, for long messages or pictures - which may require 30 minutes or more - paper tape is bulky and prone to tangling and damage when passing through the tape reader. Cassette tape is an attractive storage medium for such lengthier material.

Two problems of tape which must be solved are (1) Noise, QRM, etc which occurs on direct off-air recordings and (2) variation in frequency on playback due to wow and flutter of the (usually cheap) recorder.

Both these problems can be overcome by suitable use of the UART regenerator and two-tone generator which already exists in many RTTY systems.



In Receive Mode, RTTY tones from the receiver are demodulated as usual. Clean teleprinter characters are produced by the regenerator which keys the teleprinter loop circuit to produce printout. An opto-coupler in the loop circuit operates the tone generator, and the locally generated tones are recorded on tape. The recording consists of clean, correctly timed tones. (Of course, if the demodulator and regenerator decode a character incorrectly for any reason, a wrong character is recorded on tape - albeit clean and correctly timed!)

Local material from the teleprinter keyboard or tape reader can also be recorded via the opto-coupler and tone generator.

In Transmit Mode, signals from the cassette recorder are fed into the demodulator and then regenerated. Again, the regenerator drives the local loop to produce local copy, and the opto-coupler in the loop keys the tone generator, whose output is fed to the transmitter. Thus the transmitter obtains stable, properly timed tones instead of the poorer quality output from the cassette recorder.

REPEATER REPORT

THE RTTY REGENERATOR WAS FITTED TO SUBLIME POINT 2 METRES CHANNEL 7275 ON MONDAY 10/10/83. THE REPEATER WAS TAKEN OUT OF SERVICE ON MONDAY MORNING 10/10/83 AND WAS BACK ON AIR ON TUESDAY AFTERNOON THE NEXT DAY.

CHANNEL 7275 IS NOW A DUAL MODE REPEATER WHICH AUTOMATICALLY SWITCHES FROM VOICE TO RTTY MODE UPON RECEPTION OF RTTY TONES.

HERE ARE SOME OF THE UNUSUAL CHARACTERISTICS OF THIS REPEATER.

VOICE OPERATION IS THE SAME AS FOR ANY OTHER NORMAL VOICE REPEATER. TIME-OUT IS 4 MINUTES AND THERE IS A HALF-SECOND GLIDING TONE THAT SOUNDS LIKE SOMEBODY RIPPING A PIECE OF RAG WHEN THE REPEATER IS ABOUT TO TIME OUT. (RAG CHEWERS REMINDER).

WHEN A TONE OR COMBINATION OF TONES BETWEEN THE RANGE OF 2075HZ AND 2345HZ IS RECEIVED BY THE REPEATER FOR HALF A SECOND WITHOUT A BREAK, THE REPEATER WILL SWITCH TO RTTY MODE. THE FREQUENCIES MENTIONED ABOVE REPRESENT 50HZ ABOVE AND BELOW THE UPPER AND LOWER LIMITS OF THE NORMAL RTTY TONES OF 2125 AND 2295HZ.
THE REPEATER WILL THEREFORE ACCEPT AND REGENERATE RTTY TONES THAT ARE UP TO 50HZ OFF FREQUENCY.

WHEN THE REPEATER HAS SWITCHED TO RTTY MODE IT WILL STAY IN THAT MODE EVEN IF THE INPUT SIGNAL IS DROPPING OUT, PROVIDED THAT THE SIGNAL IS PRESENT MORE OFTEN THAN NOT. THAT IS, THAT THE SIGNAL HAS AN AMPLITUDE DUTY CYCLE OF GREATER THAN 50%.
THIS PREVENTS THE REPEATER FROM DROPPING BACK TO VOICE MODE WHEN RECEIVING A WEAK AND FADING RTTY SIGNAL.

WHEN IN RTTY MODE, THE REPEATER'S TRANSMITTER IS CONTROLLED BY THE PRESENCE OF RTTY TONES RATHER THAN THE RECEIVER MUTE ACTION. THIS MAKES FOR ACCEPTANCE OF EXTREMELY WEAK AND OVER-DEVIATED TONES WHICH MAY NOT OPEN THE MUTE ON THE REPEATER'S RECEIVER. THE RTTY TONE DETECTOR AND DEMODULATOR ARE FED WITH PRE-MUTE AUDIO, THAT IS, AUDIO STRAIGHT FROM THE RECEIVER'S DISCRIMINATOR THAT HAS NOT PASSED THROUGH THE MUTING CIRCUIT.

IN RTTY MODE, ALL RECEIVED TONES ARE DEMODULATED AND THEN THE RESULTING DATA PULSES ARE USED TO CONTROL THE MODULATOR WHICH, BEING CRYSTAL CONTROLLED, PUTS OUT CORRECT FREQUENCY MARK AND SPACE TONES OF CONSTANT AMPLITUDE. THE REPEATER DEVIATION ON RTTY IS SET TO PLUS/MINUS 3.7KHZ RATHER THAN 5KHZ TO ALLOW FOR DISCREPANCIES IN FREQUENCY AND MUTING CHARACTERISTICS OF THE VARIOUS RECEIVERS IN USE.

THERE IS NO PROCESSING OF THE DEMODULATED RTTY DATA IN THE REPEATER SO ANY TYPE OF DATA FORMAT, BAUDOT, ASCII OR OTHER, AND AT ANY REASONABLE SPEED SHOULD BE REGENERATED AND FAITHFULLY SENT BY THE REPEATER, PROVIDED THAT THE 2125 - 2295 TONE SET IS USED.

WHEN IN RTTY MODE THE TIME-OUT PERIOD IS EXTENDED TO JUST OVER 10 MINUTES.

IT IS EASY TO CONFIRM THAT RTTY MODE HAS BEEN TRIGGERED BY THE 2125HZ MARK TONE THAT COMES BACK AFTER TRIGGERING THE REPEATER, INSTEAD OF THE USUAL HALF SECOND SILENT CARRIER BURST.

IT IS NOT DIFFICULT TO TRIGGER RTTY MODE BY WHISTLING INTO THE MICROPHONE AT AROUND 2KHZ.

THE REPEATER REVERTS BACK TO VOICE MODE ABOUT ONE SECOND AFTER RTTY TONES CEASE FROM THE INPUT. THIS MEANS THAT EITHER THE RTTY STATION CEASES TO MODULATE, OR CEASES TO TRANSMIT.

THE CW IDENT IS NOT AFFECTED BY THE MODE, AND IT IS HOPED THAT THE IDENT WILL NOT INTERFERE WITH RTTY RECEPTION. IDENT OCCURS EVERY 5 MINUTES WHILE THE REPEATER IS IN USE.

THE REPEATER WILL ALWAYS PRODUCE NOISE-FREE TONES REGARDLESS OF THE QUALITY OF THE INPUT SIGNAL. THIS DOES NOT MEAN THAT THERE WILL BE NO ERRORS. IF THE INPUT SIGNAL IS VERY WEAK, THE DEMOD IN THE REPEATER MAY CAUSE ERRORS TO BE TRANSMITTED RATHER THAN RANDOM NOISE.

A NOISY SIGNAL INTO THE REPEATER CAN USUALLY BE IDENTIFIED AT THE START OF THE TRANSMISSION, JUST BEFORE THE REPEATER LOCKS INTO RTTY MODE. THERE WILL BE A SHORT PERIOD WHEN THE REPEATER IS DECIDING WHETHER THE INPUT IS A VALID RTTY SIGNAL. DURING THIS HALF-SECOND PERIOD THE INPUT SIGNAL IS REPEATED JUST AS IF IT WERE A VOICE TRANSMISSION SO THE ACTUAL SIGNAL QUALITY CAN BE ASSESSED AT THIS TIME.

ONE THING TO WATCH IS THAT WHEN USING THIS REPEATER FOR NORMAL VOICE COMMUNICATION, MAKE SURE THAT THERE IS NOT ANOTHER RECEIVER RUNNING IN THE BACKGROUND THAT IS TUNED TO A RTTY STATION. THE MICROPHONE CAN PICK UP THE SOUND OF THE RTTY TONES AND CAUSE THE REPEATER TO LOCK ONTO RTTY MODE, THEREBY INHIBITING VOICE AUDIO.

WHEN THE REPEATER IS IN RTTY MODE IT WILL NOT TRANSMIT VOICE. IN FACT, IT WILL ONLY TRANSMIT EITHER 2125 OR 2295KHZ TONES.

WELL, HAVE FUN PLAYING WITH THIS NEW 'TOY' AND I HOPE THAT YOU ALL HAVE MUCH ENJOYMENT FROM IT. WE HOPE TO EXTEND ITS CAPABILITIES IN THE FUTURE BY INCORPORATING 'MAILBOX', MESSAGE STORAGE AND CLUB NEWS AS WELL AS WIA AND ANARTS BULLETINS ACCESSIBLE ON DEMAND BY SENDING THE APPROPRIAT COMMANDS. MORE OF THIS LATER ON.

GRAEME VK2CAG

Remote Rain Gauge

-- for gauging remote rain

Richard A. Little K9EEH
407 15th Ave.
Sterling IL 61081

For those of you who have a rain gauge, and would like to know how much rain fell without going out and checking, build this simple indicator for use inside the house.

Drill very small holes at whatever markings you want on your gauge. Use stiff copper wire and epoxy. Use about a 100 Ohm resistor for current limiting to the LEDs.

Make up any type of indicator panel for use inside the house with the LEDs. Label next to each LED the same reading as on the rain gauge so when that light comes on that will be how much rain you have in the rain gauge. ■

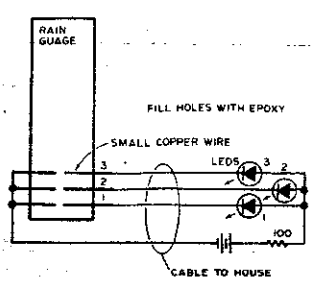


Fig. 1. When the water gets up to the first marking, water will short across wire and turn on LED #1 inside the house.

From "73"

Moonbounce Report - November 1983.

Our EME contact with Z25JJ was confirmed by exchange of QSL cards, which means that VK2AMW has now had Moonbounce contacts with him on both 432 and 1296MHz. QSL cards are held for 432MHz EME contacts with 24 stations in 11 countries as a record of past operation in this mode.

Work has continued on equipment to get it completed in its more permanent form. Separate regulated 12 volt supplies and a 100VDC supply were installed on the Control chassis in place of my individual instrument supplies which had been pressed into service initially. The weatherproof multipin sockets which had been provided from an Adelaide source by VK5ZO were installed on the PA box and receiver preamplifier box, allowing both of these units to be completed, ready for painting.

The 144MHz VXO frequency source for the transmitter was completed and its output frequency was calibrated accurately over the range 143.995 to 144.020MHz. This will allow operation up to 1296.180MHz

Modifications were made to the transmitter low level driver and to the driver stage to increase its output to 15 watts, which reduces to 5 watts at the input of the PA because of loss in the coax. cable between them.

The new control and remote metering panel was made up and installed in the Operating Room ready for wiring up.

An automatic 'CQ de VK2AMW' keyer unit is partially completed.

Saturday, 29th October saw Ian VK2EXN and his assistant Neil burn out 16 slots in the dish structure holding down plates to allow the dish to be realigned for more accurate tracking of the Moon. The whole structure was then rotated by approximately 2 degrees, but as the Sun was not visible through the heavy cloud layer, some clearer days will be needed to allow final adjustments to be made. Thanks to Neil and his father for their assistance.

Provided that the weather cooperates, it should be possible to have the equipment completed and reinstalled to allow VK2AMW to be operational again by 26th November, which coincides with the second weekend of the ARRL EME contest, during which most of the 1296MHz EME stations may be on.

Lyle VK2ALU.

"M" NUMBERS . Most amateurs are familiar with the R-S-T signal report system, used mainly in CW operations, but also used in radiotelephone work to indicate signal readability and strength. The phone RS system nowever, says notning about signal quality. The IARU's recommended RSM code, snown nere, adds a new "M-number" to report on the received quality of modulation. M-1: Unintelligible modulation; M-2: Defective modulation due to spurious or parasitic oscillations or to causes unknown; M-3: Defective modulation due to frequency modulation of the carrier (would not apply to FM); M-4: Defective modulation due to overmodulation; M-5: Good modulation, not exceeding 100%.

"RNARS Newsletter" from "The Lyrebird"

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I.A.R.S. ANNUAL AUCTION.

As is the usual case, the club's annual auction will be held at the November meeting. To assist both vendors and bidders I have set out below some information you may require.

The Illawarra Amateur Radio Society acts for the vendors in the disposal of unwanted goods and a commission of 10% is levied for the service, such levy is used for the benefit of club members and is considered as general revenue. The Auctioneer (Denis VK2DMR) acts as an agent for the club and receives no emollument for his services.

In general, to assist in the efficiency of the sale please identify your goods with a name or a call-sign, a general description of the goods and advise the committe members who are lotting the sale whether you desire a reserve to placed on the lot. If considered by the auctioneer that the reserve is unrealistic the lot will not be offered for sale and the goods returned to the vendor. At the conclusion of the sale, after all lots have been paid for, you will receive the sale price less the club's commission. It should be pointed out to club members that the usual auction commissions range from 17.5 to In excess of 25% for general goods and chattels.

CONDITIONS OF SALE.

1.) The highest bidder shall be the purchaser and in the event of any dispute arising, unless one of the claimants will advance, the lot shall be put up again and resold, the auctioneers decision will be final.

2.) When demanded by the auctioneer, a cash deposit of 10% shall be paid by the purchaser. Such deposit shall apply to any of the lots purchased.

3.) All goods are open for inspection prior to the sale and are sold with all faults, if any.

4.) No error or misdescription shall vitiate the sale and the purchaser shall be bound to take delivery of the goods sold without allowance or abatement in price.

5.) Any deficiency in the quantity described shall vitiate the sale and neither the auctioneer nor the vendor shall be bound to deliver more than is in their possession.

6.) The vendor reserves the right of making one bid at the time of sale of each lot and the auctioneer may refuse to accept the bidding of any person.

7.) All goods shall lie at the purchasers risk from the fall of the hammer and neither the auctioneer nor the vendor shall be liable for any damage or loss which may arise thereafter.

8.) No lots to be removed during the sale and delivery to be taken and the goods removed at the completion of the sale. Any goods not so removed may thereafter be stored at the clubs store or elsewhere and such storage shall be be deemed to have been made by the auctioneer at the request of the purchaser.

9.) Terms are prompt cash or certified cheque and all lots are to be paid for before the removal of any one or more lots.

10.) In the event of non-compliance with any of the above terms and conditions, any deposit paid by the purchaser shall be absokutely forfeited and the goods resold either by public auction or by private contract, without notification, at the risk and expense of the former purchaser who shall be liable for any deficiency which may arise. but shall not be entitled to any profit which may accrue from such resale.

In the above terms and conditions, the word "auctioneer" means "Denis McKay".

LOW COST TRICKLE CHARGER You can build a trickle charger for just about zero cost. This one was for a 12-V lead-acid storage battery in a recreational venicle that sits idle for considerable periods. A bit of pawing through what remains of my once extensive junk collection revealed a transformer with three 5-volt windings. There's nothing sacred about the total voltage needed from the transformer. Anything above about 15 volts and below about 35 volts can be used. The hyper-simple method of controlling the charge rate can cope with a wide range of ac voltages. Sniffing through my diode collection nosed out one with a 3-A rating; one with a lesser capability would have served quite well. All that remains is to ascertain the size of the light bulb you'll need for the desired charge rate. Here my multimeter came into use. Starting with the 10-A range and with a 25-W bulb in the socket, the charger was hooked across a 12-V battery. The meter barely moved. A milliampere meter was substituted. It showed about 35 mA, a bit on the light side. Other light bulbs were tried, revealing that the charge rate could be varied from a few milli-amps to over an ampere just by swapping bulbs. The size bulb you might need will depend upon what voltage your transformer produces plus what charging rate you desire. Be sure you start with a low-wattage bulb, or you might end up with a popped diode or a bent needle! "73 Magazine" from "The Lyrebird"

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USING LAMPS, LEDS AND NEONS. How many of us, I wonder, realize that operating these lamps from dc greatly shortens their lives, compared with the use of a low-impedance ac source? One reason is that dc is often fed to the lamp through a series resistor or through a semi-conductor device. Unfortunately the filament resistance of a lamp increases with age, so that the voltage across any lamp forming part of a resistor chain will gradually increase. Even more deadly is the uneven evaporation of the filament (causing notches) that, for reasons not fully understood, is more serious with dc-operated lamps. It is suggested that ac operated lamps can last from 2 to 10 times as long as those operated from dc. Lamp life is affected, of course, by supply voltage, roughly in accordance with the type of life curves often supplied by the manufacturers. It is, however, important to appreciate that makers' life estimates etc. are based on the devices being operated in ideal rather than practical conditions. A lamp operating in a flashing mode will normally fail more rapidly. There is a danger of choosing a flashing time that excites mechanical resonances of the filaments with many resonant points, and the adjacent turns may short-circuit when a filament vibrates. Switching a lamp on and off at intervals sufficiently long for the filament to cool down will tend to reduce lamp life because of the high inrush current when the cold filament is first switched on. Tungsten filaments, incidentally, are more fragile at room temperature than at operating temperature. Ventilation, usually by encouraging convection of air, keeps bulb temperatures low and will extend the life of the bulb. In comparison with an incandescent lamp, a light-emitting diode (led), although normally providing less light intensity, can last virtually forever (a well made led has a half-life of over 20 years of continuous use!) In effect useful life is determined by the gradual loss of light intensity and so tends to be measured to the point where the intensity has dropped to half its original value. But, of course, it is necessary to pay attention to a number of points if such longevity is to be achieved. Do not mix leds and lamps in close proximity: the heat from the bulbs can destroy the leds. At high ambient temperatures the light output from a led decreases; continuous running at 80°C or higher accelerates the loss of intensity. At low temperatures (which can crack the bulb of a miniature lamp) a led can be extremely efficient. A led always needs a series (ballast) resistor to limit current. A led can be operated from ac, but because the reverse breakdown voltage is usually only about 3-6V, it may need a series diode or diodes in inverse parallel configuration, in addition to a series resistor. A cut-price led may well be a device with lower than rated light output, since such devices are often weeded out during manufacture and disposed of at bargain prices. Like most semi-conductor devices, a led can be damaged by careless soldering; makers often specify a maximum soldering temperature of 260°C for not more than 5sec. When attempting to fit a led into a 0.1 in. matrix printed circuit board, note that not all devices have standard lead spacings. Miniature neons have a rated life a good deal better than incandescent lamps but only about 1/10 that of a led. They last longer on ac than dc (about twice as long) and should not be exposed to nigh temperatures. An undesirable characteristic of some neons is a tendency to flicker due to movement of the corona discharge.

"Radio Communication" from "The Lyrebird"

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FOR SALE

TEN TEC DELTA 580 Transciver C/W matching 240V - 12V 20Amp. Powersupply.TEN TEC Mike and Service Manuals included.

Price $550-

Please contact: M.Weston (VK2CM)
23 Timbara CR.
Surfside
Batemans Bay 2536 Phone (044) 725565

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 Kembla. VK2RIL - 8725 UHF Sublime Point.

Broadcasts: On Sunday night prior to Club Meeting - 7.00 p.m. RTTY on 6850 VHF Repeater; 7.15 p.m., Voice on 6850 VHF, 7275 VHF and by relay on 3.562 Mhz. Call backs after the WIA relay at 7.30 p.m.

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

Club Nets: 3562 Khz SSB on Sunday at 8.00 p.m. and slow morse net on 28.440 Mhz on Tuesday at P

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CHRISTMAS PICNIC

For Members and Families and Friends

Sunday Dec. 4th 1983

AT

CORDEAUX DAM

AT

10.00 am till .....

Please give us your thoughts at General Meeting - 14.11.83

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33 Lombard Avenue,

membership is

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General Committee: ...il VK2XCC Morry Van-De-Vorstenbosch VK2EMV, Jim Mead VK2EJM, Jock Taylor VK2JT, Roy Parton VK2KO.

Repeater Chairman: Graeme Dowse VK2CAG.

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

Broadcast Officers: Denis McKay VK2DMR, Paul Gardiner VK2ZQT.

QSL's: Mike Keech VK2DFK and Ian Callcott VK2EXN.

Propogator Editor & Staff: Leo Kleeborn, Editor VK2YJK, Ken Frost VK2DOI, Cartoonist Brian Wade VK2AXI.

Storepersons: Kitty and Kel Smith VK2PSK, VK2PSI.

Life members: Graeme Dowse VK2CAG Keith Curle VK2OB