

THE PROPAGATOR

MONTHLY NEWSLETTER OF THE ILLAWARRA AMATEUR RADIO SOCIETY

PO BOX 1838 WOLLONGONG NSW 2500

VOLUME 83, NUMBER 8

SEPTEMBER 1983

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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 Monday September 12th, 1983, at 7.30 p.m. in the Congregational Hall, Coombe Street, Wollongong.

LAST MONTH'S MEETING:

The August meeting of the Illawarra Amateur Radio Society was held on August 6th 1983, and despite delay in preparation of the Propagator, resulting in its being late, about 60 to 70 members were present. Two visitors, one of them using VK2ZLK from Nowra, received the usual welcome.

President Dave VK2DFL told the meeting that Chas. VK2ZMT was in Figtree Hospital and would no doubt welcome visitors from the I.A.R.S. We wish Chas a speedy recovery.

Keith VK2OB said that on September 3rd he would be demonstrating Amateur radio gear at Corrimal Park and invited others to come and 'man a stand'.

Dave VK2DFL mentioned that there had been no 80 metre net the previous Sunday night, and pointed out that others were only too anxious to take over the frequency if it was not kept in use.

Lyle VK2ALU then informed us of the mishap to the Oscar satellite. It seems that a collision with the rocket casing caused a leak, resulting in failure of the kick motor firing to put it into the planned orbit. It is now in a further orbit from Earth and because of the Van Allen radiation belts, instead of a 7 year life, only a 2 year life is now estimated. The satellite is also tumbling. It is operating in Mode B and contacts have been made with it on 2 metres, as yet using only its low gain antenna.

A mini-auction was then held, some 20 lots being auctioned by Denis VK2DMR. Bidding was slow and several lots had to be passed in. Afterwards Dave VK2DFL put a number of bags of close tolerance capacitors in the store, for sale at 3 for \$2. Books of tickets for the Guessing Competition for the VZ200 Computer were also available at the meeting.

The meeting concluded with the usual refreshments.

Moonbounce Report - September 1983

The following has been carried out since the last report-
The dish pointing selsyn systems were installed and calibrated.

The dual mode feed horn was constructed with valuable assistance from Jim VK2DLJ who did the major sheetmetal work. It was then optimised for minimum reflected power and coupling between transmit and receive ports as well as best circularity of polarisation of transmitted energy.

The feed mounting platform was installed on the feed tripod of the dish with assistance from Ian VK2EXN and the feed horn was mounted accurately in position in relation to true axis of the dish and its focal point.

The sighting telescope was mounted on the dish structure, coincident with the true axis, and the dish was used to track the Sun's movement optically. This test revealed an error of 0.5 degree of runout in Hour Angle for each hour of dish movement in this plane. Correction will require the whole dish structure to be rotated slightly in an anticlockwise direction.

Three low noise receiving preamplifiers were constructed, all using GASfet transistors. They were each adjusted in conjunction with the feedhorn and at present two are operating satisfactorily while the third is not stable, possibly due to bypassing problems as different types of bypass capacitors were used in each preamplifier.

The receiving system coax. and power cables were run to the feed horn and a preamplifier was temporarily installed, together with the rest of the receiving system, to allow Sun noise checks to be done. These showed an initial 14dB of Sun noise which may be improved later by further optimisation of the receiving system. Antenna radiation angle tests were also done, using the Sun, and it was found to have a half power beamwidth of just under 2 degrees!! This is equivalent to 38dBi dish gain.

The transmitter power amplifier unit was mounted in a weatherproof box, together with cooling blowers, motor operated remote tuning system of plate circuit and an output power sensing unit.

The transmitter is now delivering a measured power output of 120 watts into a dummy load and is almost ready for installation at the dish site in the next few days, although lack of weatherproof type plugs and sockets for the auxiliary power and control functions will require it to be removed for further work after initial EME tests are made using temporary leads.

Arrangements have been made for 1296MHz EME tests with Z25JJ in Zimbabwe next weekend, 4th and 5th Sept., which is just prior to him dismantling his EME equipment in preparation for a move of his QTH to South Africa later this year.

As our program of construction work is very tight and will rely on fine weather for installation of items on and cabling to the dish later this week, the chances of a successful EME test are not yet clear.

Lyle VK2ALU.

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GETTING DOWN TO THINGS

Amateurs, of course, should always be willing to tackle do-it-yourself earth-moving projects: putting in antenna supports; laying earth mats; hammering in earth rods; digging in radials etc. So, apparently, is one Chris Culver, a part-time student in Sheffield. According to "The Guardian" newspaper, Mr. Culver decided to put up his own garage, but ran into a few small pro lems even before he had finished the foundations. He:

Sliced through a power cable, blacking-out the neighbourhood four times;
Chopped through a gas main, cutting off supplies to a neighbour's home - four times: and
Struck a sewer, blocking it and causing rats to appear - four times.

Mr. Culver is reported to have said: "I admit I have bitten off more than I can chew. But I always do and I will get there in the end".

Just where he will get to is not clear, but his next project is a d-i-y swimming pool in the backyard - so far he has weakened a 20ft-high retaining wall, the local council has had to shore it up and has threatened him with a £10,000 bill.

Goodness knows what will happen if Chris Culver takes up amateur radio. Meanwhile, there is perhaps a moral in the story for all of us. There are more things buried in the back garden than any one man dreams of!

- from "Radio Communication", September 1980.

HIGH POWER

Due to an unfortunate error, the 144MHz and 432 MHz beacons of the UCSAT satellite were both turned on at the same time during 1982. Both of the command receivers were severely desensed as a result. Several unsuccessful attempts were made to access the 432 MHz receiver using very high power from earth and a very high power 144MHz transmitter was being constructed.

On 20th September 1982, equipment at the Stanford Research Institute in the U.S.A. successfully accessed the 432 MHz receiver, and the 144MHz beacon was turned off.

The SRI system that finally cracked the de-sense problem comprised a 16 Kilowatt output 432 MHz p.a., loaned by Eimac-Varian, feeding a 46-metre dish antenna with 42dBd gain, producing an effective radiated power of 253.6 Megawatts.

One AMSAT pundit had commented "at these flux levels UOSAT will respond to command or incandescence... or both. The only real question is which will occur first."

- from "Practical Wireless, December 1982.



TO: The Editor:
The DT 600 Kit:

I read with interest Ken, VK2DQI's, observations on the A.N.A.R.T.S. DT600 Kit. I will first of all comment on Kens findings, then add my own comments.

1. I too found it hard to get the kit "out of A.N.A.R.T.S." - when I did it too was short a few bits and pieces, however I got them at the Kenny Street Emporium.

2. Yes, the drilling is tedious work and so are the "through the board connections". Unlike Ken I bought wire wrap sockets for all my I.C.'s and stood them off the board by about 5 mm's. It worked out fine. I also substituted for the 741's the mil spec equivalents - also from the Kenny Street dealer.

3. I was lucky and got two edge connectors at Jaycar in Sydney at a sale - they fitted end to end and suited the board beautifully.

4. Yes, the coils are a pain in the butt. I cheated and altered greencaps to get it all in the ball park, then used the pot core adjustment to "line it up" - but there's a big snag-see 6 below.

5. I must agree with Ken that it is not a simple kit or circuit but I did figure the circuit out.

6. The alignment - ah yes, well if you have a full lab set up, with sweep audio and scope etc., etc., etc. its probably easy, but the instructions are both hazy and wrong. If you follow them you "aint going to get it going". So:- align the input filter so that you have a hump at 2125 (first coil), a hump at 2295 (third coil) and a lesser hump at 2110 (middle coil), OK? Well, may be: what I did, with Ian VK2ASN's help was, isolate each coil (forget that short-out a section rubbish - it doesn't work) and tune for a peak. If in doubt change the audio generator frequency and watch the CRO pattern amplitude, check that it is a true peak. We used a frequency counter to read off the frequency directly.

Then the mark and space filters are relatively easy. As I said I altered the capacitors, being inherently lazy and its a damn sight easier too. Mostly I used the same marked values, which vary widely in actual value. when I left to come up here it was percolating nicely and really does a great job - streets ahead of the ETI design, but then so it should be.

7. Now to my "mods"---

(a) I used a nice aluminium case (the two part blue and silver aluminium variety) to house the DT600 and UART regenerator (E A design, modified).

(b) I bought the pair of Trickies centre zero tuning and signal strength meters (and had to change the relevant resistors). They are front panel mounted, with the mark and space leds on either side of the centre zero meter - mark on left and space on right and the meter reads in the same sense.

(c) I put all function switches below in a row, with the print led and used the driver output to switch the Siemens M100 data lines via a relay - using the O and Q keys on the M100.

(d) I chose to leave my unit in fast start mode and wired the pins accordingly.

(e) I am using the unit with a Sony ICF2001 general purpose (but nevertheless good) receiver without a preselective filter and the results are absolutely great. If the tuning meter is centre zero and the signal meter reads anything above zero the DT600 will faithfully decode it and if you use the UART it works on 50 or 45.45 baud equally well. I cheated a bit and set my UART out frequency to about 47 baud (the same as my M100 speed). Even on the cruddy 240v 50 Hz Ac here (range 190v - 315v and frequency 48 + to 52.5 or 80) it still runs well. I've copied about 38 countries in probably less than 20 hours on air time and between 2200 and 1200 UTC: I haven't tried from 1200 - 2200: mostly in 21.080 - 21.098 range, but a couple up around 28.080 and few or so in the 14.070 - 14.098 range.

73'S

Eric P29 ZEF

Dear, Eric

Thank you for Your letter. I pass it on for general coment.

Best of luck

73'S

Leo Ed.

REPEATER REPORT

WORK IS PROGRESSING WELL WITH THE RTTY REGENERATOR SECTION OF 7275 SUBLIME POINT. THE RTTY REGENERATOR CONSISTS OF A VALID TONE DETECTOR, AN ACTIVE FILTER, A DEMOD, A LOGIC CONTROLLER AND A MOD. ALL THESE CIRCUITS ARE ON THE SAME PC BOARD, WHICH WAS DESIGNED BY MYSELF TAKING THE BEST IDEAS FROM VARIOUS PROVEN CIRCUITS.

THE VALID TONE DETECTOR CIRCUIT USES A SPECIAL DEDICATED CHIP, AN FX101. THE CIRCUIT IS TAKEN FROM THE VK3RTY REPEATER, THE REPEATER OF THE EASTERN AND MOUNTAINS DISTRICT RADIO CLUB. THEIR GROUP WAS VERY HELPFUL IN SENDING US THE CIRCUIT DIAGRAMS AND OTHER GENERAL INFORMATION ON THEIR RTTY REPEATER. THE PURPOSE OF THE VALID TONE DETECTOR IS TO DETECT A VALID RTTY SIGNAL AND SWITCH THE REPEATER OVER TO RTTY MODE AND INHIBIT VOICE WHILE THE INPUT IS RTTY. WHEN THE RTTY SIGNAL DISAPPEARS, THE REPEATER WILL SWITCH BACK TO NORMAL VOICE MODE. IT IS IMPORTANT TO HAVE A GOOD RELIABLE CIRCUIT HERE AS INCORRECT MODE SWITCHING WOULD CAUSE REAL HAVOC.

THE ACTIVE FILTER IS AN LM3900 QUAD OP AMP THAT LIMITS AND FILTERS THE PRE-MUTE AUDIO FROM THE RECEIVER AND PRE-EMPHASIZES THE FREQUENCIES AROUND 2125 AND 2295KHZ., BEFORE PASSING THEM ON TO THE DEMOD.

THE DEMOD IS A SIMPLE PLL CHIP, THE XR2211. THE SIMPLE CIRCUIT IS SIMILAR TO THOSE BEING MADE UP BY SO MANY CLUB MEMBERS AT THE MOMENT FOR THEIR RTTY STATIONS. THE XR2211 WORKS VERY WELL ESPECIALLY WITH THE ACTIVE FILTER IN FRONT.

THE LOGIC CONTROLLER HAS 4 CMOS CHIPS AND ITS PURPOSE IS TO DIRECT THE RTTY TONES TO THE TX, TO SET THE TIME-OUT TIMER FOR 10 MINUTES INSTEAD OF THE USUAL 4 MINUTES ON VOICE. IT ALSO ALLOWS FOR FUTURE CONNECTION OF A MICROPROCESSOR WHICH WILL HAVE OVERRIDING CONTROL OF THE RTTY SECTION. IT ACCEPTS RTTY PULSES FROM THE MICRO AND DELIVERS SIGNALS TO IT.

THE MODULATOR IS A BIT SPECIAL. BEING A REPEATER, I FELT THAT THE TONES MUST HAVE A HIGH ORDER OF ACCURACY AND STABILITY, ESPECIALLY AS THE REPEATER OPERATES IN AN ENVIRONMENT OF TEMPERATURE EXTREMES AND HIGH HUMIDITY AT TIMES. THE REPEATER SHOULD BE GOOD ENOUGH TO BE USED AS A 'STANDARD' FOR US TO USE WHEN SETTING UP OUR RTTY EQUIPMENT. IT USES A CRYSTAL OSCILLATOR AND A PROGRAMMABLE DIVIDER WHICH DIVIDES THE CRYSTAL FREQ (2.35 MHZ) BY TWO NUMBERS, EACH OF WHICH REPRESENT MARK AND SPACE. THE TONES COME OUT OF THE DIVIDER AS SQUARE WAVES AND ARE THEN ROUNDED UP INTO SINE WAVES IN ANOTHER ACTIVE FILTER SIMILAR TO THE ONE IN THE DEMOD.

WE ARE STILL AWAITING A COUPLE OF HARD TO GET CHIPS (THE XR2211 AND THE FX101), SO WHEN WE GET THESE WE WILL HAVE THE REPEATER OFF AIR FOR A FEW DAYS WHILE THE RTTY SECTION IS BEING FITTED AND ALIGNED.

THE NEW ENCODER/DECODER SYSTEM FOR LINK RECEIVER SWITCHING AT MT. MURRAY IS WORKING WELL, AND ALL THE WIA BROADCASTS HAVE BEEN RELAYED IN THE LAST FEW WEEKS WITHOUT A HITCH.

THE STATE REPEATER COMMITTEE MEETING WAS HELD ON THE SAME DATE AS OUT LAST CLUB MEETING, SO WE DID NOT SEND A REPRESENTATIVE. HOWEVER, WE ARE BEING WELL REPRESENTED BY CORRESPONDENCE, AND IN OUR LAST LETTER WE ASKED IF THEY WOULD CONSIDER A CHANGE OF AERIALS AT SUBLIME POINT (70CM. ONLY) TO OMNI-DIRECTIONAL. THIS ARRANGEMENT WOULD GIVE BETTER COVERAGE INTO SYDNEY.

WIND POWER IS VERY MUCH UNDER DISCUSSION FOR MT. MURRAY. THERE IS A POSSIBILITY THAT WE MAY PURCHASE OUTRIGHT A COMPLETE WINDMILL AND GENERATOR ASSEMBLY, AS THERE ARE A FEW ATTRACTIVE UNITS ON THE MARKET AT REASONABLE PRICES COMPARABLE WITH THE COST OF THE SOLAR PANELS THAT WE WERE LOOKING AT A COUPLE OF MONTHS AGO. A UNIT THAT GENERATES AN AVERAGE OF 50 WATTS AND STARTS CHARGING THE BATTERY AT 4 KNOTS WIND SPEED, AND HAS A PROPELLER SIZE OF AROUND LESS THAN A METRE IN DIAMETER SEEMS TO MEET OUR NEEDS NICELY. THIS IS A VERY SMALL UNIT COMPARED WITH THE MULTI KILOWATT UNITS THAT ARE DESIGNED TO SUPPLY THE NEEDS OF A HOMESTEAD.

□□□□□

GRAEME VK2CAG

At the mini-Auction at the August meeting, the old VK2RAW indent unit and tone Encoder unit were auctioned.

FOR SALE

SELL IN GOOD WORKING ORDER KENWOOD TS520S TRANSCEIVER AND ATU 200 AND MC 10 HAND MICROPHONE AND 2 ONLY NEW 6146B AND ONE ONLY NEW 12BY7A TUBES. OPERATING MANUAL AND COPY OF PART WORKSHOP MANUAL AND ORIGINAL CARTONS. LOT FOR \$650 FIRM TO LICENSED AMATEUR/S.
P. RICHARDSON, VK2BRP, QTHR.

PCB CONTAMINATED DUMMY LOADS MAY POSE A SERIOUS HEALTH HAZARD
in many ham shacks! According to the Center for Disease Control in Atlanta, many RF dummy loads manufactured as recently as the late 70s utilised transformer cooling oil containing PCBs, which have been linked with liver cancer. PCB use is now prohibited by law, and all contact with any oil that could contain PCB should be avoided. Even fumes from a warm load could be dangerous in a poorly ventilated shack!

Ham Radio Magazine, July 1983

SCANNER RADIOS - THE FEDERAL GOVERNMENT IS CONSIDERING LEGISLATION TO COVER EAVESDROPPING ON RADIO COMMUNICATIONS. THE RADIOS, WHICH SELL FOR ABOUT 300 DOLLARS, ARE CAPABLE OF RECEIVING VHF AND UHF BANDS USED BY TWO-WAY RADIO SYSTEMS. BOTH POLICE AND PRIVATE INDUSTRY WANT ACTION ON HAVING CONTROLS PLACED ON THEIR SALE AND USE. IT IS ILLEGAL TO INTERCEPT THE MOBILE PHONE SYSTEM UNDER THE TELECOMMUNICATIONS INTERCEPTIONS ACT. THE RADIO COMMUNICATIONS BILL DUE TO BE INTRODUCED INTO FEDERAL PARLIAMENT WOULD NOT CONTROL THE USE OF SCANNER RADIOS. AT PRESENT, INTERCEPTION OF ANY RADIO COMMUNICATION SIGNAL, EXCEPT THE MOBILE PHONE SYSTEM, IS NOT AN OFFENCE. HOWEVER, THE GOVERNMENT IS CONSIDERING SEPARATE LEGISLATION ON RADIO INTERCEPTION.

FROM THE ANARTS NEWS BULLETIN, 17TH JULY 1983.

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 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 VK2OB, 24 Beach Drive, Woonona.

Secretary - Murray McConnell VK2MY, 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-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