
THE PROPAGATOR

MONTHLY NEWSLETTER OF THE ILLAWARRA AMATEUR RADIO SOCIETY

PO BOX 1838 WOLLONGONG NSW 2500

Volume 83, Number 3

April 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.

LAST MONTH'S MEETING:

March 14th 1983 saw the conducting of the Annual General Meeting of the Society. While the change in government was not quite as dramatic as was demonstrated 9 days earlier, a group of approximately forty members nominated and elected a little over half those present to the wide variety of positions needed to run the Club as well as it has been in the past.

A full list of those serving the Club appears on the back page. Most names will be familiar, with different to responsibilities; some will be new altogether. Congratulations to all involved and a deserved thanks from the Club to everyone for accepting these responsibilities.

Past President Keith VK2OB opened the meeting by congratulating Dave VK2DFL and Mike VK2DFK on the gaining of their full amateur call signs. The comment was made that an additional 2m repeater was necessary to handle the new traffic generated by this duo - however strong denials resulted.

The Treasurer's Report was presented by Geoff VK2ZHU with appropriate explanations. Details will appear elsewhere in this issue.

Keith VK2OB after thanking past members of the various committees for their able and willing assistance, declared all positions vacant and vacated the chair for Lyle VK2ALU as Returning Officer, to start the elections.

To opening proceedings after the elections, new president Dave VK2DFL nominated Past President Keith VK2OB for life membership of the Club.

This was carried by acclamation; Keith now joins Graeme VK2CAG as a life member of the Illawarra Radio Society.

In General Business Ron VK2DXQ advised those present that the Tech College was looking for a lecturer on antennas, required for an 18 week period after the end of June, 1983. Skill notwithstanding, tertiary qualifications are required!

Paul VK2ZQT raised the subject of the IARS's own field day. The matter was held over for further discussion.

After the formalities of the election, the raffles of various items took place. Those more fortunate were Ian VK2EXN - a set of heavy screwdrivers, Graeme VK2CAG - a set of not so heavy (jewellers) screwdrivers, Gerald - a set of small sockets and Jim VK2NJF - a set of small drills.

Resident auctioneer Dennis VK2DMR set the pace for the old 80w amplifier from Channel 5 which went to Mike VK2DFK, (Please refer para 3), and the phone console which was snapped up by Richard VK2ERF.

ATMOSPHERICS?

The following information, from a volume of Astronomical Data by Allen, shows that there is more going on around us than meets the eye!

Electrical Storm Data:

Mean upward current in a single thunderstorm = 0.9 amps.

Mean world population of thunderstorms = 2200.

Mean total thunderstorm area = $800,000 \text{ km}^2 = 0.0016$ of the earth's surface.

Mean charge in a lightning flash = 16 coulombs.

Energy of a lightning flash = 2×10^{17} ergs.

Breakdown electric field in thunderstorm = 10^4 volt/cm approximately.

Mean thunderstorm field = 800 volt/cm.

Potential difference in lightning flash = 4×10^9 volts approximately.

Mean height of thundercloud striking to earth = 5.2 kilometres.

Fine weather atmospheric data:

In normal fine weather, a potential gradient exists within the atmosphere which drives positively charged ions towards the earth. Insulated objects above the earth therefore tend to acquire a free positive charge. The potential gradient, in volts per metre at various altitudes is given in the table:

Altitude above sea level (km):	0	1	2	5	10	15	20	50
Potential gradient (volts/m):	130	75	45	15	5	2	1	0

The fine weather air-to-earth current for the whole earth = 1500 amps (!)

Resistance between the whole earth surface and the conducting layer above 20 kilometres = 200 ohms.

- Brian VK2AXI



A BIT OF NOSTALGIA BACK IN THE DAYS BEFORE REPEATERS.

ABOUT 15 YEARS AGO WHEN I FIRST GOT MY AMATEUR LICENCE THE LOCALS GOT TOGETHER ON SUNDAY MORNINGS ON 6 METRES ON 53.982MHZ AM. SOMETIMES THERE WERE 3 OR 4 STATIONS ON AND SOMETIMES AS MANY AS A DOZEN. HOW THIS NET STARTED UP AND HOW LONG IT WAS RUNNING BEFORE I CAME ON THE SCENE I DON'T KNOW, BUT IT WAS THE LONGEST RUNNING NET I HAVE BEEN IN, AND I CANNOT REMEMBER A SUNDAY MORNING WHEN THERE WAS NOBODY ON. IT RAN FOR ANYTHING FROM AN HOUR OR SO TO WELL AFTER LUNCH TIME. THE CLUB WAS MUCH SMALLER IN NUMBERS THEN (AROUND 30 MEMBERS) BUT NEARLY EVERYONE USED TO ATTEND THE MEETINGS AND ALMOST EVERY MEMBER WAS ON 6 METRES. THERE WAS NO NOVICE LICENCE THEN, SO EVERY LICENCED AMATEUR WAS ENTITLED TO OPERATE ON VHF.

MOST OF THE EQUIPMENT IN USE WAS MODIFIED VALVE TYPE 2-WAY RADIO CARPHONES. MOST OF THE COMMERCIAL 2-WAY RADIO SERVICES WERE GOING TO FM, SO THERE WERE PLENTY OF SURPLUS AM SETS ABOUT. THERE WAS A FAIR AMOUNT OF HOMEBREW GEAR ABOUT TOO, SOME VFO CONTROLLED, BUT MOST OF US WERE CRYSTAL CONTROLLED, WITH ONE CRYSTAL FOR THE NET FREQUENCY, AND THE MORE LUCKY ONES HAD A CRYSTAL THAT GAVE US AN OUTPUT IN THE LOWER PART OF THE BAND FOR WORKING DX WHEN THE BAND WAS OPEN.

NEARLY ALL OF US HAD MODIFIED OUR RECEIVERS FOR VFO CONTROL, AND SOME WERE USING A CONVERTER AHEAD OF A COMMUNICATIONS RECEIVER. THE AERIALS WE USED WERE MOSTLY A GROUND PLANE OR VERTICAL DIPOLE. A FEW OF US WERE KEEN ENOUGH TO WORK THE DX WITH 3 OR 4 ELEMENT BEAMS. NET OPERATING WAS MUCH THE SAME AS IT IS TODAY, BUT DX OPERATION WAS VERY MUCH DIFFERENT. WHEN IT WAS SUSPECTED THAT THE BAND MAY HAVE BEEN OPEN, ONE WOULD HAVE PLUGGED IN HIS DX FREQUENCY CRYSTAL AND GAVE A LONG CQ CALL. AT THE END OF THE CALL HE WOULD SAY THAT HE WOULD BE TUNING THE BAND FOR A CALL. HE WOULD THEN CAREFULLY TUNE THE WHOLE 6 METRE BAND LOOKING FOR A STATION THAT MIGHT BE CALLING HIM. THE FOLLOWING QSO WOULD BE ON 2 SEPARATE FREQUENCIES, SINCE MOST OF THE STATIONS WERE CRYSTAL LOCKED AND HAD ONLY A CERTAIN NUMBER OF SPOT FREQUENCIES. THERE WERE A FEW RECOGNIZED DX CALLING FREQUENCIES ... 53.032 IS ONE THAT I CAN REMEMBER.

CW WAS USED WHEN WORKING DX AND THE FELLOWS WITH THE DOWN-CONVERTERS HAD A DISTINCT ADVANTAGE WITH THE STABLE RECEIVER AND BFO.

AROUND THE BEGINNING OF 1970 THERE APPEARED TO BE SOME INTEREST IN 2 METRES. THERE WAS A LOT OF EXPERIMENTING GOING ON LONG BEFORE THIS, MAINLY ON AM AND CW IN THE LOWER PART OF THE BAND. MY INTEREST WAS AROUSED BY TALKING TO SOME SYDNEY AMATEURS ON 6 METRES ABOUT SOME EXPERIMENTS GOING ON WITH FM USING SURPLUS VALVE TYPE CARPHONES. THERE WERE QUITE A NUMBER OF HIGH BAND CARPHONES COMING ONTO THE SURPLUS MARKET, AND WERE EASY TO GET GOING ON 2 METRES. I WAS ABLE TO WORK MOST OF THE SYDNEY STATIONS ON 6 METRES, AND WANTED TO GIVE 2 METRES A TRY.

MY FIRST 2 METRE QSO WAS WITH VK2ALU ON 1ST OF MARCH 1970 ON 146.0MHZ. THERE WERE ONLY 3 RECOGNIZED FM NET FREQUENCIES THEN, AND THEY WERE CHANNEL 'A' (145.854), CHANNEL 'B' (146.0) AND CHANNEL 'C' (146.146). MOST OF US HAD A SINGLE CHANNEL SET AND HAD ONLY CHANNEL 'B' FITTED, WHICH WAS THE CALLING CHANNEL. ALL OF THE 2 METRE FM GEAR WAS CRYSTAL LOCKED ON TRANSMIT AND RECEIVE. I ORIGINALLY HAD AN AWA MR6 CARPHONE RUNNING 10 WATTS. I FOUND THAT I COULD ONLY WORK THE SYDNEY STATIONS THAT WERE RUNNING A FAIR BIT OF POWER AND IN HIGH LOCATIONS. RESULTS WERE NOT AS GOOD AS 6 METRES. THERE WERE ABOUT 4 OR 5 OF US ON 2 METRES IN WOLLONGONG AT THIS TIME.

PROPAGATORLIFE MEMBERSHIP

The Society has recently elected two of its members to the ranks of Life Membership. Graeme VK2CAG, was elected at the September 1982 General Meeting and Keith, VK2OB at the March Annual General. These few background notes have been collected from a few but, no doubt reflect the views of many....

GRAEME DOWSE VK2CAG.

Graeme's association with the Society came about in perhaps a casual manner but from that time has continued in a most permanent one. A Wollongong boy from the year dot, his interest in matters electronic started at an early stage as a hobby, then became a profession and now is a combination of both.

While working as a Radio Technician at H.G. Palmers, Graeme developed a friendship with an SWler and, on learning of the existence of Radio Hams, and wishing to provide some legitimacy to this growing interest, obtained exam papers, syllabi and the like and passed the full call in 1968.

Graeme then built himself a 6m transceiver to join what other Hams there might be on the local AM net on 53.982 MHZ. It was then that he discovered not only the existence of other amateurs (the majority operating converted carphones) but the existence of a local Club. The year of 1968 saw him licensed, on air and in the Club. His first official contact was on 40m on 12-12-68 with a station in Eugowra in Western NSW.

Graeme has since injected his professionalism into his activities within the Society. It would appear that, except for a minor aberration in 1970 when he became an appliance operator on 2m, Graeme has homebrewed all his own gear. He has made himself available on a continuing basis for technical advice to countless members and his expertise in this area has been demonstrated visibly (and aurally) in our Mt Murray, Hill 60 and Sublime Point repeaters. Graeme has been a driving force behind the installation of these units and since the commissioning of Mt Murray in 1973, has been Chairman, Technical Adviser and General Factotem on matters relating to the Society's repeaters.

He has also published various articles on VHF in AR, one notably being a theoretical and practical comparison of quarter wave and five-eighth wave 2m antennae. His explanation for this article was that while listening mobile on 2m, there appeared to be a lot of conflicting information among would be authorities -- hence the publication.

Graeme would be one of the Society's oldest continually active members. It is hoped your association continues....Thanks Graeme..

-/-/-/-/- /-/-/-

Murray VK2KER

Next month the Saga of Keith VK2OB

THE ROLE OF THE REPEATER HAS CHANGED SINCE THE ADVENT OF THE HAND-HELD SET AND THE USE BY MOST AMATEURS OF SIMPLE QUARTER WAVE MOBILE ANTENNAS MOUNTED ON THE MUDGUARD OR GUTTER. IT IS A FACT THAT MOST OF THE CURRENTLY AVAILABLE COMMERCIAL TRANSCEIVERS HAVE ONLY AVERAGE RECEIVER PERFORMANCE, AND REQUIRE A FAIRLY STRONG SIGNAL TO GIVE GOOD COPY. IT IS A FACT THAT PEOPLE THESE DAYS TEND TO GO IN FOR THE NUMBER OF 'FEATURES' THAT A RIG HAS, SUCH AS SCANNING, MEMORIES, FLASHING COLORFUL DISPLAYS, ETC., RATHER THAN FOR 'EXCELLENCE' IN BASIC PERFORMANCE.

SO HENCE THE REASON FOR THE SECOND REPEATER AT SUBLIME POINT, TO GIVE THAT STRONGER SIGNAL IN THE AREA WHERE MOST OF ITS USERS LIVE, AT THE EXPENSE OF BEING UNABLE TO WORK STATIONS FURTHER AFIELD.

I THINK THAT REPEATERS ARE A LOT OF FUN, AND THEY FULFILL A NEED BUT UNFORTUNATELY THEY KILL THE SPIRIT OF EXPERIMENTATION, AS THEY DO MOST OF THE WORK FOR US IN COMMUNICATING. THE 'GOAL' BECOMES THE ABILITY TO ACCESS THE REPEATER, BUT WHAT AFTER THAT?

I GUESS THAT I AM ONE OF THE LUCKY ONES, IN THAT I STILL HAVE A CHALLENGE TO ACCOMPLISH, AND THAT IS TO CONTINUALLY STRIVE TO IMPROVE THE PERFORMANCE OF OUR REPEATERS, AND IN DOING SO I HAVE THE ADDED SATISFACTION OF KNOWING THAT OTHERS AS WELL AS MYSELF WILL BE ABLE TO TAKE ADVANTAGE OF THE WORK I AM DOING.

GRAEME VK2CAG

MOONBOUNCE REPORT - APRIL 1983.

Barry 2ZAG had the satisfaction of seeing the dish moving in both Hour Angle and Declination under its own power on 26th March, largely as a result of some 40 hours of his wiring work and earlier motor replacement and gearbox repairs by Wojciech. Barry also completed the very necessary, but previously inadequate, 240 volt system earthing and equipment earth bonding which is now securely connected to good earths.

Another step forward was also made on 26th March when the feed tripod, which is made up of 6 metre long tubes, was installed in the dish by a 4 man team under the leadership of Ian 2EXN - who had made up the apex plate and tube plug arrangement for the tripod.

Construction of the transmitter 1296MHz low level driver stage is now well under way and more useful information has been received on another type of GASfet low noise receiver preamplifier. It is intended to make up one of this type of preamplifier and one of the W6P0 design to compare results and to provide the necessary preamplifier - postamplifier stages for the receiving system.

The date for the next working day at the dish will be discussed at the April club meeting. On this day it is hoped to install the sighting telescope and wiring, dish pointing selsyns and possibly the feed mounting platform on the tripod.

URGENT. - Can we get a volunteer please to clean down and spray paint the two second hand shelving units which will soon be needed to accommodate the receiving and transmitting equipment, chart recorder and power supplies etc. in the operating building.

Lyle VK2ALU

THE CHALLENGE WAS THERE, SO THE STAGE WAS SET FOR IMPROVING MY SETUP TO SEE IF IT WAS POSSIBLE TO GET AS GOOD A RANGE ON 2 METRES AS I GOT ON 6 METRES. I HAD A REGULAR SKED WITH A STATION AT MERRYLANDS IN SYDNEY'S WESTERN SUBURBS ON 40 METRES, AND WE SET A GOAL FOR OURSELVES TO BE ABLE TO WORK ON 2 METRES. AT FIRST WE COULD NOT HEAR EACH OTHER, BUT AS EACH WEEK WENT BY, WE WOULD EACH DO ANOTHER ALTERATION TO OUR STATION LIKE PUTTING UP A BIGGER ANTENNA OR INCREASING THE POWER OR 'TWEAKING' THE RECEIVER UNTIL AT LAST A ONE-WAY WEAK SIGNAL GOT THROUGH. WE THEN SET OUR GOAL HIGHER TO ACHIEVE NOISE FREE 2-WAY COMMUNICATION ON 2 METRES... AND, YOU KNOW, WE DID IT.. THE EXTRA SIDE BENEFITS OF ALL THIS EXPERIMENTATION WAS THAT WE HAD IMPROVED OUR 2 METRE CAPABILITY TO THE EXTENT WHERE WE WERE BOTH (AND OTHERS) WERE HAVING REGULAR AND SUCCESSFUL CONTACTS WITH A CANBERRA STATION, VK1CR.

I ENDED UP WITH A 16 ELEMENT PHASED ARRAY WITH ROTATOR, 40 FT 8 I BUILT A 100 WATT AFTERBURNER USING A QB3/300, AND FITTED A STATE OF THE ART FET PRE-AMP TO THE RECEIVER. NEXT CAME A CHANNEL SWITCH AND THE OTHER 2 CHANNELS. THEN I DISCARDED THE LOT AND CAME UP WITH A FULLY SOLID STATE HOMEBREW RIG THAT LICKED THE PANTS OFF THE OLD GEAR. THIS RIG, INCIDENTALLY, IS THE SAME ONE THAT I USE WHEN MOBILE. YES, IT NOT ONLY STILL WORKS, BUT THE RECEIVER PERFORMANCE STILL IS BETTER THAN ALL OTHERS THAT I HAVE COMPARED IT WITH. (LATEST KENWOOD, ICOM AND KDK).

THE NEXT STEP WAS TO TRY FM BACK ON 6 METRES. THERE WAS A NATION-WIDE COMMON FREQUENCY ON 6 METRES BEING USED FOR FM SO I GOT ANOTHER MR6 CARPHONE AND MODIFIED IT TO WORK ON THIS FREQUENCY, 52.525. THERE SOON BECAME A BURST OF ACTIVITY ON THIS CHANNEL LOCALLY, ABOUT HALF A DOZEN OPERATORS. WE FOUND THAT 6 METRES FM WAS A MORE SUITABLE MODE FOR MOBILE OPERATION. WHEN THE BAND WAS OPEN, SIGNALS ON FM WERE MOST IMPRESSIVE BECAUSE OF THE LACK OF NOISE... WE WERE USED TO THE CONTINUAL BACKGROUND NOISE ASSOCIATED WITH AM SIGNALS.. THE FADING, ETC., WERE NOT AS EVIDENT ON FM. 6 METRES FM LOOKED LIKE TAKING OFF IN A BIG WAY UNTIL THERE WAS TALK OF REPEATERS BEING USED ON 2 METRES.

6 METRE REPEATERS WERE NEVER APPROVED BY THE DEPARTMENT, POSSIBLY BECAUSE OF THE AMOUNT OF DX ACTIVITY AND THE POSSIBILITY OF FOREIGN STATIONS OPERATING THROUGH THEM. 2 METRES, HOWEVER, WAS A DIFFERENT STORY.

REPEATERS WERE MAINLY RESPONSIBLE FOR THE UPSURGE IN 2 METRE ACTIVITY, AS IT WAS NO LONGER NECESSARY TO RUN LOTS OF POWER AND HAVE A BIG ANTENNA TO BE ABLE TO GET ENOUGH RANGE TO WORK A GOOD NUMBER OF STATIONS.

AT THE TIME WHEN REPEATERS WERE BEING DEVELOPED, THE FIRST OF THE COMMERCIALY MADE 2 METRE RIGS CAME ONTO THE MARKET MAKING IT THAT MUCH EASIER TO GET ONTO THIS BAND. THEN CAME THE HAND-HELD SETS.

MOST OF THE OPERATING ON 2 METRES IN THOSE DAYS WAS FROM BASE TO BASE OR MOBILE TO BASE. OUR 2 METRE REPEATER WAS SET UP WITH THE IDEA OF USING IT TO BE ABLE TO WORK INTO SYDNEY AND DOWN THE COAST AND INTO THE WEST OF THE ESCARPMENT, AREAS WHICH WERE DIFFICULT OR IMPOSSIBLE TO WORK FROM THE MOBILE OR BASE STATION WITH A SIMPLE ANTENNA. THE REPEATER WAS NOT MUCH OF AN ADVANTAGE ON LOCAL CONTACTS. SINCE THERE WERE ONLY A SMALL NUMBER OF LOCAL OPERATORS THEN ON 2 METRES, THE REPEATER GAVE US A BIG ADVANTAGE IN BRINGING US INTO RANGE OF A MUCH LARGER NUMBER OF STATIONS. THIS WAS THE MAIN PURPOSE OF THE REPEATER, AND IT SERVED ITS ROLE VERY WELL. THE FACT THAT THERE WERE A FEW DEAD SPOTS IN ITS COVERAGE IN ITS PRIMARY SERVICE AREA DID NOT MATTER AT ALL WHEN YOU CONSIDER THE ADVANTAGES OF A WHOLE LOT LARGER AUDIENCE THAT IT GAVE.

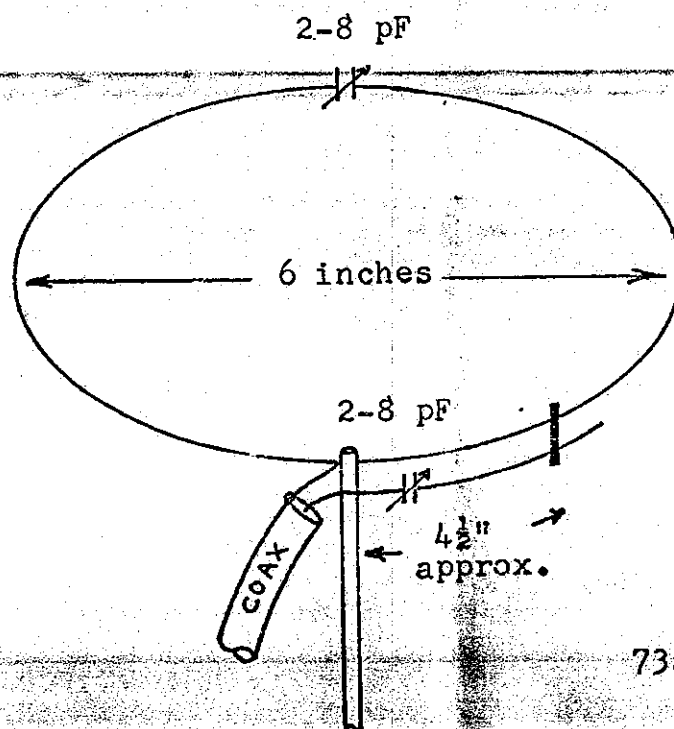
MINI HALO

The popularity of rigs like the IC202 has brought a lot of amateurs to 2M SSB and the rigs portability has given rise to quite a number of mobile stations. Described here is a horizontally polarised mobile aerial suitable for 2M and although perhaps not quite as effective as a full size halo the small size should make it attractive to the mobile operator. The overall size is only 6 inches in diameter. The element and gamma match are $\frac{1}{8}$ " brass welding rod and the mast $\frac{1}{4}$ " brass tube with the main element and the match being 1" apart.

Tuning

The aerial may be tuned as follows - with an SWR bridge in line or using a field strength meter the capacitor on the main element is adjusted to bring the aerial to resonance.. The capacitor in the match is then peaked and the shorting bar adjusted for best SWR

Constructional details are left to the ingenuity of the builder as many ideas are to be found in the various magazines and handbooks.



73s John VK3YCD

144 MHZ 3 ELEMENT MOBILE BEAM

For those contemplating the Club 2M TX HUNTs some form of beam will be necessary. The following article describes such an aerial which is simple to construct and feed, and whilst no wild claims are made for gain or front to back ratio it should serve the purpose well.

The number and spacing of the elements is the main factor governing the impedance of the beam, and it is necessary to ensure that this value will be a convenient one. I favour 75 ohms and consequently the design is based on this figure.

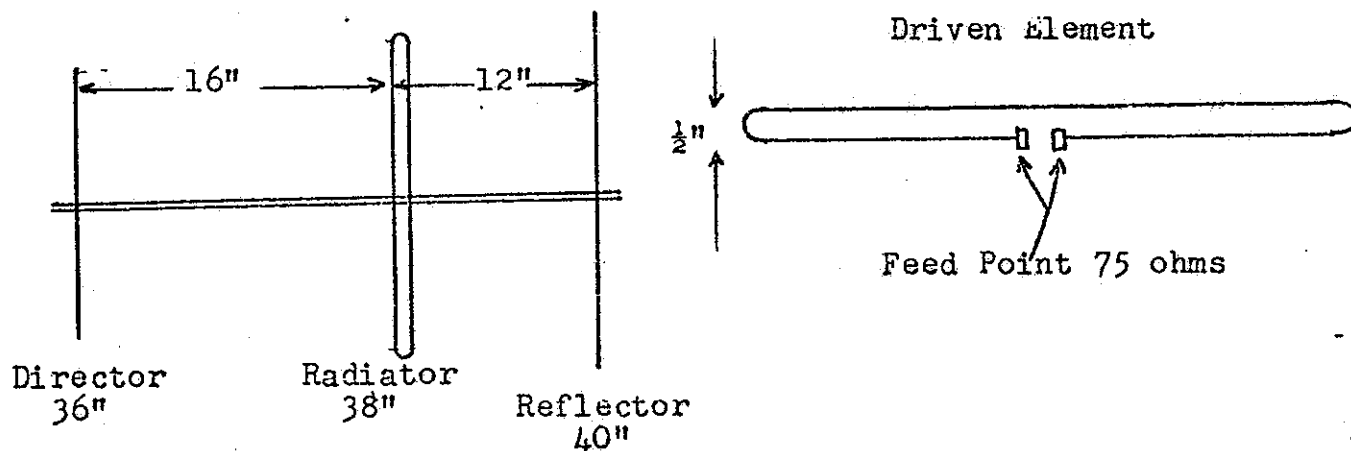
Information shows that with a three element beam, a spacing of $.15$ of a wavelength ($12''$) between radiator and reflector and a spacing of $.2$ of a wavelength ($16''$) between radiator and director will give an impedance of 75 ohms at the centre of the folded dipole.

This gives us a 1:1 match

The driven element is $38''$ long with the folded spacing being $\frac{1}{2}''$ centre to centre. The element is constructed of $\frac{1}{4}''$ tubing.

Mechanical details are left to the constructor.

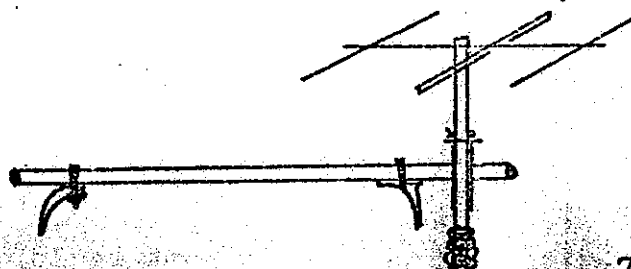
A 1:1 balun should be used at the feed point although the coax could be joined directly, the slight loss of performance and a probable higher SWR perhaps not being too important for this application. (the main criteria being that it receives, has directivity and is simple to construct)



Mounting this on the car becomes the next problem.

Ski-bars would appear to be one of the simplest answers, and it would cost around \$5 if you can find someone to go halves with you in a pair.

A piece of tube welded or clamped at right angles on the end of the ski-bar will serve as the bearing and support for the mast of the beam, a split pin and washer stopping the mast sliding too far through. Leave enough protruding to allow the armstrong rotator to get a good grip but not so much that you cannot open the door



73s John VK3YCD

REVIEW OF SOLAR PANEL FOR CHARGING BATTERIES IN HAND-HELD TRANSCEIVERS

I recently purchased a solar panel from Tandy Electronics. Cost \$277- for use in charging the batteries of my hand-held transceiver while hiking and camping.

Ratings are: 6 volts @ 80mA
12 volts @ 40mA in full sunlight

Measured
Performance: 6 volts @ 190 mA
12 volts @ 90 mA in full sunlight.

The unit came complete with reflectors that clip onto the side of the unit, although in Australia I don't think they are necessary as the array gets very hot when they are fitted.

Power is brought out to a 2.5mm phonotype jack and a switchable cord with crocodile clips and plug is supplied. This arrangements makes it easy to make up cords to suit all the appliances I want to use with it.

Approx. size is 4" x 6" x $\frac{1}{2}$ " deep and the weight is approx. 8 ozs.

Those who have worked me while solar powered pedestrian portable will no doubt be well aware the when the sun gets obscured by a cloud, power output falls.

Field use has proved it is a very robust device and has a multitude of uses (Especially on a farm with no power being available).

No internal details are available yet but it appears to consist of 32 cells arranged to be switched as 32 cells for 12 volts and parallel groups of 16 cells for 6 volts. Unfortunately no reverse current flow protection diode is fitted (current will flow from batteries to cells in darkness) but as most modern transceivers incorporate a diode in the lead for reverse voltage protection, this does not really matter.

The list cartage price is \$31.95 so it works out at approx. \$32 per peak watt. By comparison a solar panel is available from Sensor Tech in Sydney for approx. \$350 and will deliver 1 amp @ 14.4 volts. This is approx. \$25 per peak watt.

Cost has to fall to approx. \$0.50 per peak watt before solar power can become competitive for everyday use and efficiency for solar cells is about 14% but special cells manage 20%.

Summing up expensive but everlasting (20 yrs +) power source.

Peter Laughton (VK2 x AN)
28 Immama Avenue
West Wollongong 2500

ILLAWARRA AMATEUR RADIO SOCIETY

CASH FLOW STATEMENT

PERIOD ENDING
28.2.82

PERIOD ENDING
28.2.83

GENERAL INCOME

564.00	Newsletter Subscriptions	733.00
554.10	Raffles	526.75
5.00	Donations	13.00
346.00	Auction Sale	144.70
58.60	Hargraves Award	5.00
20.00	Unrepresented Cheque	-
57.99	Cash for Supper	53.30
<u>1,105.69</u>	<u>TOTAL GENERAL INCOME</u>	<u>1,475.75</u>

LESS EXPENSES

564.19	Newsletter Printing	271.86
225.92	Newsletter Postage	180.91
201.73	Raffle Prizes	287.30
695.15	Repeater Costs	412.42
250.00	Hall Hire	130.00
324.62	Miscellaneous	179.87
334.96	Hargraves Award	-
<u>2,578.57</u>	<u>TOTAL GENERAL EXPENSES</u>	<u>1,462.16</u>

NET GENERAL INCOME

1,074.19	Sales from Store	647.45
898.50	Less cost of Purchases	758.40
<u>175.60</u>	<u>NET PROFIT ON SALES</u>	<u>-110.95</u>

NET INCOME

-24.56

VALUATION OF STOCK

1,145.32	Stock (At Cost)	1,066.31
898.50	At Start of Period	762.40
	Cost of New Purchases	

2,043.82	Cost of Stock Sold	1,828.71
977.51	Stock (At Cost)	589.18
<u>1,066.31</u>	<u>At End of Period</u>	<u>1,220.53</u>

NOTE 1: "Cost of stock sold" is "Sales from store" x 0.91 to allow for our 10% profit on sales.

NOTE 2: A Stock Take is recommended to adjust value of stock on hand.

G B CUTHBERT VK2ZHU

ILLAWARRA AMATEUR RADIO SOCIETY

CASH FLOW STATEMENT

PERIOD ENDING
28.2.82

PERIOD ENDING
28.2.83

952.01 CASH BOOK BALANCE AT START

154.82

PLUS RECEIPTS FOR PERIOD

564.00	Newsletter Subscriptions	733.00
1,074.19	Sales - Components and Publications	647.45
554.10	Raffles	526.75
346.00	Auction Sale Commission	144.70
5.00	Donations	13.00
58.60	Hargraves Award	5.00
20.00	Unrepresented Cheque	-
57.99	Cash payment for Supper	53.30
<u>2,679.88</u>		<u>2,123.20</u>

2,679.88

2,679.88

LESS PAYMENT FOR PERIOD

546.19	Newsletter Printing	225.86
225.92	Newsletter Postage	180.92
898.50	Printing Machine Repairs	46.00
695.15	Purchase of Resale Items	762.40
334.96	Repeater Costs	412.42
201.73	Hargraves Award	-
25.00	Raffle Prizes Costs	287.30
73.50	Conference of Clubs	-
47.00	OSL Costs	-
250.00	WIA	-
57.99	Licences	68.00
109.75	WICEN	-
	Hall Hire	130.00
	Supper Costs	53.30
	Bank Charges	12.00
	Other Items	46.57
<u>3,477.07</u>	<u>TOTAL PAYMENTS</u>	<u>2,224.76</u>

3,477.07

3,477.07

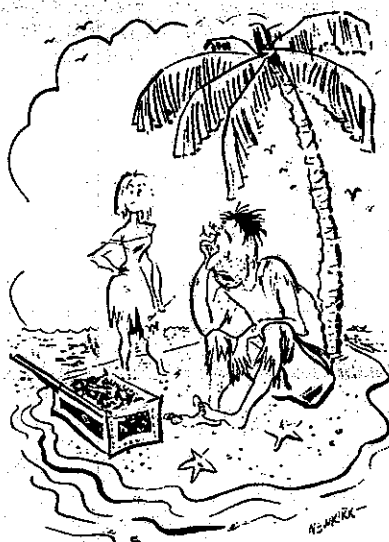
CASH BOOK BALANCE AT AND

53.26

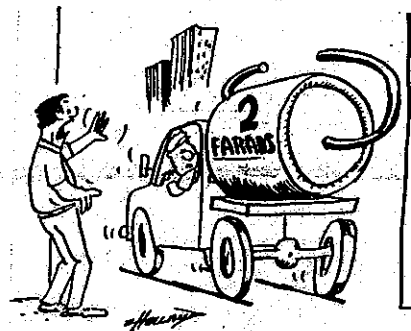
G B CUTHBERT VK2ZHU
TREASURER



"Now if you're into satellite TV, this is the house for you!"



"I can't believe it—a whole trunk full of radio parts, but not a single piece of wire."



"Hold it! I ordered two MICRO farad!"

AUCTION

THERE WILL BE A NUMBER OF ITEMS AUCTIONED AT THE MEETING.

- 1/- LOTS AND LOTS AND LOTS OF PMG TYPE RELAYS
- 2/- ONE TRANSMITTER TUNING UNIT WITH VERY LARGE INDUCTORS AND TUNING CAPACITORS EX- MARINE BEACON TRANSMITTER
- 3/- ONE OLD STYLE PHOTOCOPIER, COMPLETE AND WORKING. USES PHOTO-SENSITIVE PAPER.
- 4/- PARTLY BUILT HF TRANSMITTER AND BITS AND PIECES.

SUBSCRIPTION TO THE ILLAWARRA AMATEUR RADIO SOCIETY

Attached is \$7.00 in payment for membership for the period April 1983 to March 1984.

NAME:

ADDRESS:

POST CODE:

CALL SIGN IF ANY:

WIA MEMBER: YES ☐ NO ☐

DO YOU WANT TO JOIN WIA YES ☐ NO ☐

WANT QSL CARDS AT MEETING YES ☐ NO ☐ WIA MEMBERS ONLY

NB. Receipts will be available for collection at following meeting. If postage is required please enclose SAE

Please send to: The Honorary Treasurer
Illawarra Amateur Radio Club,
PO Box 1838,
WOLLONGONG NSW 2500

Meetings: Second monday of every month except January at 7.30 P.M. in the Congregational Church Hall, Coombe Street, Wollongong. Committee meet 3rd tuesday of each month.

Repeaters: VK2RAW - 6850 VHF Mount Murray. VK2RIL - 7275 VHF Sublime Point.

VK2RUW - 8225 UHF Hill 60 Port Kembla. VK2^{RIL}~~RUW~~ - 8725 UHF Sublime Point.

Broadcasts: Club news - RTTY on 6850 VHF repeater at 7.00 P.M.; Voice on 6850 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 3562 Khz on tuesdays 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 97 51. 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 VK2VXS, QTHR ; Outwards: Ian Calloott VK2EXN QTHR.

Awards: The award of the I.A.R.S. is "The Lawrence Hargrave" award. Vh 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. Send details - time, day, date, frequency, station worked + \$ 2.00 or 4 I.R.C.'s to Awards 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 DVE, WOONONA

Secretary - MURRAY M'CONNELL VK2KER, 62 RAMAH AVE, MT. OUSLEY

Treasurers - GEOFF CUTHBERT VK2ZHU, 2 NIOKA AVE, KEIRAVILLE.

RICHARD FOX VK2ERF, P.O. BOX 1120, WOLLONGONG.

REPEATER CHAIRMAN - GRAEME DOWSE VK2CAG.

REPEATER COMMITTEE - MIKE KEECH VK2DFK, MORRY VAN-DE-VORSTENBOSCH VK2BMV,
IAN CALLOTT VK2EXN, DAVE COLLESS VK2EZY

Broadcast officers - DENIS MCKAY VK2DMR, PAUL GARDINER VK2ZQT

QSL's - Mike Keech VK2VXS & Ian Calloott VK2EXN.

Propogator Editor & staff: Leo Kleeborn, Editor VK2YJK, Ken Frost VK2DOI, cartoonist Brian Wade VK2AXI.

STORE PERSONS - KITTY AND KEL SMITH VK2PSI, VK2PSK

GENERAL COMMITTEE - MIKE KEECH VK2DFK, IAN CALLOTT VK2EXN, RAY BALL VK2XCC,
MORRY VAN-DE-VORSTENBOSCH VK2BMV, JIM MEAD VK2EJM, JOCK TAYLOR VK2JT,
ROY PARTON VK2KO

LIFE MEMBERS - GRAEME DOWSE VK2CAG KEITH CURLE VK2OB