
THE PROPAGATOR

MONTHLY NEWSLETTER OF THE ILLAWARRA AMATEUR RADIO SOCIETY
PO BOX 1838 WOLLONGONG NSW 2500

VOLUME 82, NUMBER 5
Registered by Australia Post Publication No. NBH1491

JUNE 1982

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.

THE JUNE MEETING

The next meeting of the Illawarra Amateur Radio Society will be held on June 14th, 1982 at the usual venue. Guest speaker will be John Lukey, VK2ZUH, his subject being 'Amateur Television' with particular reference to the Sydney ATV Repeater. This is to be located on the eastern edge of the Blue Mountains and will cover the whole Sydney basin. Looks like another meeting you can't afford to miss, and as usual you'll have the chance to try your luck in the raffle. Visitors welcome, and refreshments will be available after the meeting.

LAST MONTH'S MEETING

The meeting was attended by some 50 to 60 members who gave a hearty welcome to Brian, VK2AXI, the previous Propagator Editor now living in Yanco and paying a short return visit to Wollongong.

A Kambrook electric kettle was the raffle prize and was won by Grant, the young son of Paul, VK2DZJ, who will now presumably be kept supplied with plenty of hot tea during QSO's!

The tables at the front of the hall were loaded with an impressive array of ham gear stocked by Macelec Pty. Ltd., ranging from a Daiwa SWR/Power meter to the TS 830 and SX 200 Scanner. Barry Hartley gave a brief rundown on the equipment and brochures were available to those who wanted them. Barry was preceded by Don Sanders, VK2WB, who demonstrated the various modes of a RTTY/MORSE/ASCII decoder device, with digital readout including a 24 hour clock. When a spare power lead was available, Ned VK2AGV was able to demonstrate his keyboard, paddle and Accu-keyer which have been the subject of articles in the Propagator last year. The press of members round the tables showed the interest the demonstrations had aroused. We hope to run a further article in the Propagator soon.

NEW CALLSIGN

Congratulations to Kevin (ex-PGP) on at last receiving his new callsign. He is now the proud owner of VK2EBI, which will no doubt by now have taken its place in the rear window of his car.

QSL CARDS

The QSL Inwards Manager, Mike Keech VK2VXS, is holding cards for the following members: VK2DJ, VK2APG, VK2NHA, VK2NKG, VK2NYL, VK2NYZ, VK2VDE, VK2VDN, VK2VOM, VK2YKG. Please collect these at the next meeting or as soon as possible.

WHAT MIGHT HAVE BEEN

The first patent for a system of communication by means of electro-magnetic waves, numbered No. 12039 was granted on 2 June 1896 to the Italian-Irish Marchese Guglielmo Marconi, G.C.V.O. (Hon) (1874-1937). A public demonstration of wireless transmission of speech was, however, given in the town square of Murray, Kentucky, U.S.A. in 1892 by Nathan B. Stubblefield. He died destitute on 28 March 1928. The first permanent wireless installation was at The Needles on the Isle of Wight, by Marconi's Wireless Telegraph Co.Ltd., in November, 1896.

The Guinness Book of Records.

"Who's this Nathan B. Stubblefield you may ask. "Never heard of him before." And indeed the very name sounds fictional and perhaps even comical. But according to the above source and others, he did exist, and did succeed in transmitting the human voice over a distance of some miles without the use of wires. "73" Magazine for December 1980 carries an article on what is known of his achievements, and from this and an examination of his patent specifications it appears that his method used magnetic induction rather than electromagnetic propagation, and also perhaps earth currents. The "73" article also refers to another American inventor, Reginald Aubrey Fessenden, who on December 11th, 1906 gave the first public demonstration of voice transmission using Herzian waves.

Herzian waves - these are of course so named in honour of Heinrich Hertz whose name is also used in place of the old cycles-per-second. Watt, Volt, Amp, Farad, Henry etc are all of course from the names of early pioneers in the study of electrical and magnetic phenomena. Perhaps Marconi arrived on the scene too late to qualify for a unit to be named after him, but it is interesting to speculate on the difference in terminology had these radio pioneers given their names to such units.

Imagine resonating an inductance of 'x' Stubblefields with a capacitor of 'y' Fessendens, to give a frequency of 'z' Marconis!

VK2DOI

SPECIAL EVENT CALLSIGN PREFIX

The Department of Communications has given permission for Australian amateurs to use the "AX" prefix in lieu of "VK" during the Commonwealth Games in 1982.

The "AX" prefix may be used from 15th August, 1982 to 15th November, 1982 inclusive.

For Sale: Barlow Wadley XCR 30 Receiver.. \$150 plus 27MHz - 3.5MHz transverter \$70 phone peter VK2NJA 28 1395

AXIOMS

Radio amateurs do a lot of experimental work for themselves, and so are often aware of the discrepancies of "book theory" and "how to do it in practice". R. V. Jones, in "Most Secret War" relates a wartime incident in which one specialist appreciated practical problems and another did not:

"One salutary incident that I recall concerned a British mathematical physicist and an American theoretical physicist, Dr. Charles Kittel, who had been set together, side by side, to work on the problem of deducing the characteristics of German magnetic mines laid at sea, especially the sensitivity and polarity of the firing mechanism. The data from which the characteristics were to be deduced were the reports of our minesweepers as they exploded the mines, with the positions of the explosions being reported as ranges and bearings from the minesweepers.

"The first thing that Kittel wanted to do was to take a few trips on a minesweeper to sample the data for himself. The British theorist refused to do this, on the argument that he could only make a few trips, and therefore any experience so gained might be heavily biased, and therefore much too dangerous as a basis for generalization. So he stuck to his desk while Kittel went out minesweeping.

"What Kittel immediately found was that the reports from the minesweeping crews were wildly inaccurate as regards both range and bearing, and the only item of data on which one could rely was whether the mine had exploded to port or starboard.

"Simplifying all the later reports down to this extremely limited observation, he nevertheless succeeded in deducing the answer; but the British theorist went on accepting the data as accurate and never reached an answer."

In a different vein, the same book describes the successful use which the British made of a German radiolocation system which was discovered to be operating in northwest Spain. It transmitted a fan of radio beams out into the Atlantic and over the Bay of Biscay. Jones writes:

"Happily, the thought occurred to me that we were operating more aircraft over the Bay of Biscay than the Germans were. I therefore asked our Chief Navigation Officer if Coastal Command could make better use of the system than the Germans themselves. He held an enquiry at the Command and two days later advised that the Command would very much appreciate the service.

"All that we now had to do was to photograph the station; from the separation of the aeriels, and their direction of alignment, the necessary instructions could be worked out. The code name 'Consol' was given to this system, and Coastal command used it with much success. So much so, in fact, that its use was continued for civil purposes after the war. It was beautifully simple, requiring only the necessary charts, a simple receiver and a stop-watch in the aircraft, not special receivers as were necessary for our own systems. Since the war, it has spread throughout the world and is still in operation".

73, Brian VK2AXI.



THE PROPAGATORThe etching of Printed Circuit Boards

Following discussions with a number of club members about the etching of printed circuit boards I thought it worthwhile that I set down in relatively simple terms the process involved in etching copper (whether or not it is on a laminated board). The discussion must regrettably be in chemical terms since the process is a chemical process.

Many metals (including aluminium and zinc) will dissolve in dilute acid without difficulty. Copper however, will not do so because it is relatively noble (it is below hydrogen in terms of electrochemical activity). The basic process required is to turn copper (Cu) into Copper (Cu^{2+}) ions (i.e., we will OXIDISE the copper) i.e.,



To do this we can use many different reagents. Among these are Ammonium (or Potassium) Persulphate, Ferric Chloride, and dilute acids with an oxidising agent, or oxidising acids. All of these materials will oxidise copper which is unprotected by etch resist. The choice will depend on the speed and efficiency required, and the price and availability of the appropriate materials.

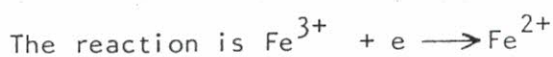
So let's look at each material in turn.

1) Ammonium Persulphate

This material is easily obtainable, is relatively safe to use, and gives a clear solution when dissolved (unlike Ferric chloride). It is best used warm to hot and is best catalysed with a small amount of mercury chloride. Another advantage is that the resulting solution is copper sulphate which for large users can easily be used to recover the copper by electroplating.

2) Ferric chloride

The reactions of ferric chloride are relatively complex but basically the dissolved solution consists of a mixture of hydrochloric acid and ferric (Fe^{3+}) ions.

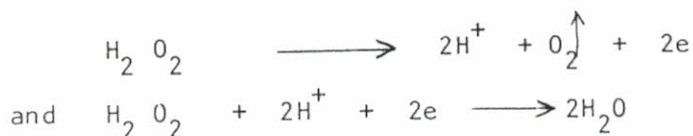


Ferric chloride is the most common etchant used by amateurs. However it is messy, relatively slow, the dash solution marks viewing the progress of etching difficult and worse, can cause bad staining of skin and clothes - apart from its corrosive effects.

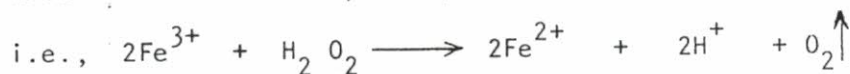
3) Dilute Acid with oxidising agents

These reactions are very useful etching methods but unfortunately because they are not understood are often misused or abused. The acids involved are usually sulphuric acid (battery acid) or hydrochloric acid (muriatic acid or spirits of salts). The most usual oxidising agents are hydrogen peroxide (100 Vols) or Sodium Nitrate (solid). The concentrated forms are used so that excessive dilution of the etchant does not occur.

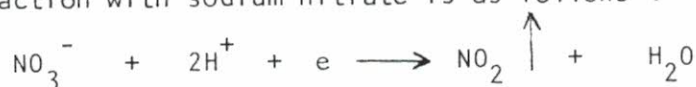
Hydrogen Peroxide is both an oxidising and reducing agent i.e.,



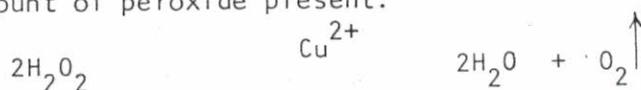
Therefore the common practice of adding peroxide to ferric chloride solution is not only pointless but counterproductive because the ferric chloride is reduced by the peroxide and not the copper.



The reaction with sodium nitrate is as follows :-



These methods are both quick and cheap. Unfortunately it is somewhat difficult for amateurs (except those in a laboratory environment or appropriate industries) to obtain. Also as the copper dissolved the copper ions produced tend to catalyse the following reaction to reduce the amount of peroxide present.



(Hence the bubbles produced).

EXTREME CARE SHOULD BE USED WITH PEROXIDE-HYDROCHLORIC ACID MIXTURES, DUE TO THE EVOLUTION OF POISONOUS AND CORROSIVE CHLORINE GAS IN SOME CIRCUMSTANCES. IN ADDITION 100 VOLS. PEROXIDE DESTROYS SKIN (RAPIDLY)

4) Oxidising Acids

Nitric acid is sometimes used as an etchant. It is not recommended due to the difficulty of controlling the reaction and the destruction of many etch resists by the acid.

I hope this information is of some help.

DENIS VK2 DMR

Fast printed circuit etching

Here is a simple method for fast printed circuit board etching which I have been using successfully for several years. Instead of the classical ferric chloride solution, I use a mixture of one part hydrochloric acid to three parts 40 per cent hydrogen peroxide. This solution strips the board clean of unprotected copper in less than 30 seconds.

Both chemicals are nasty and should be treated with due respect. Skin contact must be avoided, and the etching should be carried out with all windows open and within close reach of a running tap. The reaction releases a fair amount of heat, which again speeds up the process. A splash

of water, though, is all that is needed if the fizzing gets too drastic.

The etching may be carried out in any shallow plastic or glass container. As no sediment is formed, the only agitation required is a gentle rocking of the tray in order to disperse the heat. The solution should be mixed immediately before use, as the peroxide decays fairly quickly once mixed with the acid. The ratio of the ingredients is fairly critical, although too much peroxide works better than too little. It is advisable to test the solution with a bit of scrap board before plunging in one's newly finished masterpiece.

(By J. Langvad, in "Wireless World".)

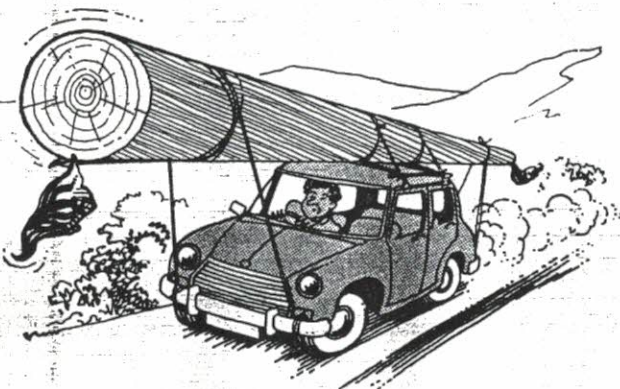
"IT WORKS" GOGGLES and RUBBER GLOVES are strongly recommended.

17-032470

Amateurs and the CIA

Little reaction has been forthcoming on the disturbing suggestion in the book "The Real Spy World" by Miles Copeland, a former CIA organiser, that amateur transmissions are sometimes used for clandestine intelligence operations. He suggests that high-speed "squirt" or "screech" signals are sometimes played in the background to ordinary "ham radio messages" since it is no longer possible to pass speeded up transmissions over international telecommunications circuits due to the presence of cut-off filters. Copeland claims that squirt recordings "are still used to good effect on 'ham' radio transmissions". It is much to be hoped that if CIA or any other organisations have ever in the past used amateur radio in this way, the practice has long ceased.

It is of course well known that radio amateurs played a big part in both German and British clandestine radio during World War 2, in very different circumstances. Last September we noted how SOE's suitcase sets (A2, A3, B1, B2, B3 and MCR1) owed much to Major John I. Brown, G3EUR, as a member of the Inter-Services Research Bureau. John Brown has recently joined Avel-Lindberg Ltd to provide a liaison service to handle technical queries on their uninterruptible power supplies. Since considerable emphasis was placed in the SOE-ISRB work on providing novel forms of power supply for use in the field, his wartime experience should stand him in good stead.



The new mast for I.A.R.S. repeater



—advice on a suitable front-end

Answer to last month's

HAM PUZZLE



Answer to last month's "Puzzle This One Out!"

- VK2DOI

a-b-c is equal to zero, being one side of the equation taken away from the other side. Any number multiplied by zero is also zero. Thus, a is not equal to b, but a times zero is equal to b times zero.

MY RULER.

I have a ruler, an ordinary 15 inch long ruler, which I guard jealously. I don't know where I got it from now, it's chipped, faded and a bit hard to read, but it's just about irreplaceable. "Throw it away," you may say, "this is the metric age, you don't need inches anymore!" And even if I do, I have other inch rules, carefully hoarded or bought overseas, so what's so special about this one? Because it's a 'decimal' inch rule, that is, the inches are divided into tenths, not quarters, eighths and sixteenths like the others. And that's important because i.c. pins are 0.1 inch spacing, and as long as the U.S. retains the inch measurement (and they show no signs of going metric yet) we in electronics had better hang on to our inch rulers, and blow the Metric Conversion Board for not doing their homework properly. Just try to design a p.c. board layout with half a dozen i.c.s, using a metric ruler and you'll see what I mean.

Ken, VK2DOI.

HELP-HELP-HELP-HELP-HELP-HELP-HELP-HELP-HELP-HELP

Some time ago a list was taken of those members who were prepared to help in the collation, folding sealing and addressing this journal.

Unfortunately the writer has lost, mislaid or destroyed the list.

The task is simple and (if there are enough helpers) quick. It requires your presence at 7.30 p.m. on the Monday prior to the meeting. If you can help fill out the attached form and give to MIKE VK2 VXS at the meeting.

I can and will help to mail the Propagator - Mike. Please put me on your little list of helpers!!

I can help every month

☐

I can help every
second month

☐

I can help when you
require me

☐

My name is

and can be contacted on telephone number

THE ILLAWARRA AMATEUR RADIO SOCIETY

Meetings: Second monday of each month except January at 7.30 PM in the Congregational Church Hall, Coombe Street, Wollongong.

Postal: The Secretary, I.A.R.S., P.O. Box 1838, Wollongong 2500.

Repeaters: VHF 6850 (146.250 in / 146.850 out) - VK2RAW

UHF 8225 (433.225 in / 438.225 out) - VK2RUW

Broadcasts: Club news on VHF 6850, UHF 8225 & by relays via VK2PBP on 28.460 Mhz and VK2YKQ on 3.565 Mhz at 7.15 PM on the sunday night preceeding the monthly meeting. News to Eric Fien VK2YVF on telephone 71 6364 by 6.30 PM.

W.I.A. relays via VHF 6850 at 11.00 AM & 7.30 PM every sunday.

Nets: 3.565 Mhz SSB on sundays at 8.00 PM & 28.440 morse at 8.00 PM every tuesday.

Newsletter: The Propagator is mailed to reach members in the week preceeding the meeting. Editor Leo Kleeborn, VK2YJK, telephone 84 9751 for news items and advertisements. Copy deadline is the last tuesday of the month.

Membership: Write to the Secretary or contact any committee member. Annual dues are \$ 7.00 full member & \$ 4.00 pensioner or concessional member.

QSL Service: Available to members of the I.A.R.S. who are ALSO members of the W.I.A.

Bureau managers - Mike Keech (Inwards) & Ian Calcott (Outwards).

Award: The Award of the I.A.R.S. is the Lawrence Hargrave Award. VK stations must work 10 different I.A.R.S. members: Overseas stations must work 5 I.A.R.S. members. Alternatively any amateur who works the Club Station VK2AMW qualifies for the award. Send details of contacts - stations worked, day date, time and frequencies together with \$ 2.00 or 4 I.R.C.'s to the Secretary. QSL cards are not required.

Store: The store operates at each meeting. Contact Paul Ferguson for stock details.

Committee: President - Keith Curle, 24 Beach Drive, Woonona 2517. VK2OB

Vice President - Denis McKay, 17 Doncaster Street, Corrimal 2518. VK2DMR

Secretary - Dave Myers, P.O. Box 1838, Wollongong 2500. VK2PBP

Treasurer - Geoff Cuthbert, 2 Nioka Avenue, Keiraville 2500. VK2ZHU

Repeater Chairman - Graeme Dowse, VK2CAG. Repeater sub-committee :-

Pat Jordan, VK2KEY; Denis McKay, VK2DMR; Mike Keech, VK2VXS, Eric Fien, VK2YVF; Mark Ryan, VK2KFI.

Broadcast Officer: Eric Fien, 331 Cordeaux Road, Mount Kembla 2526. VK2YVF

QSL: Mike Keech VK2VXS & Ian Calcott VK2EXN.

Propagator Editors: Leo Kleeborn, VK2YJK & Ken Frost, VK2D0I. Cartoonist - VK2KING by Brian Wade, VK2AXI.

Store: Paul Ferguson, VK2DZJ.

Publicity: Dave Henderson, VK2YKQ.

General Committee: Jock Taylor, VK2JT; Ray Ball, VK2PHD & Morry Van de Vorstenbosch VK2EMV

"All right, Johnny, you can ask one more question but keep it short."
 "Well Dad, if a doctor gets ill and another doctor doctors him, does the doctor doctor the doctor the way the doctor being doctored wants to be doctored, or does the doctor doctor the doctor in his own way?"
