# THE PROPAGATOR

MONTHLY NEWSLETTER OF THE ILLAWARRA AMATEUR RADIO SOCIETY
P.O. BOX 1838 WOLLONGONG N.S.W

VOLUME 85, NUMBER:7 AUGUST 1985

REGISTERED BY AUSTRALIA POST PUBLICATION NO . NBH 1491

MEETINGS ARE HELD ON THE SECOND TUESDAY OF EACH MONTH (EXCEPT JANUARY) AT 7:30 PM AT THE STATE EMERGENCY SERVICES BUILDING, MONTAGUE STREET, NORTH WOLLONGONG. VISITORS ARE WELCOME TO ATTEND MEETINGS.

THE NEXT MEETING : The next meeting of the Illawarra Amateur Radio Society will be held on Tuesday 13th August at the usual meeting rooms at the SES headquarters in Montague Street, North Wollongong. The meeting will be a video night with tea or coffee and biscuits afterwards, so come along and bring a friend or the XYL along.

The raffle this month will be different from the usual meeting raffles.......this month's will be a meat raffle with two trays of meat up for grabs. Ask the XYL how many tickets to get!!!

LAST MONTHS MEETING : Attendance at last months meeting was down on the usual, with about 35 members and no visitors (perhaps largely due to the late posting of the Propagators due to a hold-up with the labels for the posting- appologies from the Editor.)

Our guest speakers were Bruce Beresford VK2RT and Ian Eddie VK2IE who gave a talk on the Furguson Big Board Computer and the exchange of data on Packet Radio ( see article inside this month for an introduction to Packet for those who missed the meeting.). Thanks to both Ian and Bruce and to Mike VK2DFK who organized the talk and who set up the antenna on his vehicle.

What were those mystery goodies about which so much has been said in the last month, that appeared with the tea and bickies at the last meeting? Come along this month and perhaps you will find out what all the fuss was about if our supplier can be persuaded to bring another batch along.

Note that fees are now due if they have not already been paid. You may pay at the next meeting or send remittances to the Post Box ( shown back page. )

# REPEATER REPORT GRAEME VK2CAG

Sublime Point

The aerial mast which was bent over in the wind last month has been turned around again by the wind and is facing Northward at present at an angle of 45 degrees to the vertical. This explains why the signal from Sublime point repeaters is down in the Wollongong area and is stronger than normal in Sydney. The rest of the equipment at Sublime Point has been checked out and is functioning normally. It is not known at this stage how long it will be before we have the aerial back to normal as there is a lot of work involved.

Hill 60

8225 is still struggling on with a temporary transmit antenna since I have had insufficient time to have a look at the broken one. One of our members has made a very kind offer to fix it for us and this is nost appreciated.

Mt. Murray

Ian and myself visited the site with a few others with the intention of replacing the rope guys with the new 'Debeglass wire', The weather was not suitable to allow the mast to be lowered so it will have to be done another time. While at the site, which is the first time since mid-February that anyone has been there, we found that one of the rope guys was broken, and we re-positioned the remaining guys to make the antenna as secure as possible until we get suitable weather to do the job properly. Apart from the batteries being very thirsty after 5 months of inattention, all else seemed OK. It was very windy at the time, and we witnessed for the first time the charging current meter reading past full scale on some of the gusts. Thats more than 6 amps. The solar panel was contributing 1½ amps at midday, and thats not bad for this time of the year. There is certainly no shortage of energy at the moment.

There has been more strong wind since that visit, and the signal from the repeater has been varying considerably with intermittent de-sensing of the receiver on weak signals. This pointed to antenna problems again, so Ian braved the weather again a week later to check it out. Ian reports that the SWR is 1.5:1 which is a bit high for the duplexer to see, and would explain the de-sensing. No signs of physical damage was seen and the weather again did not allow the mast to be lowered to further investigate the problem. It seems that the problem is a minor one but we are at the mercy of the weather as usual at Mt. Murray. Ian re-tightened the guys and at present we have our fingers crossed for one of those rare fine days to occur on a weekend.

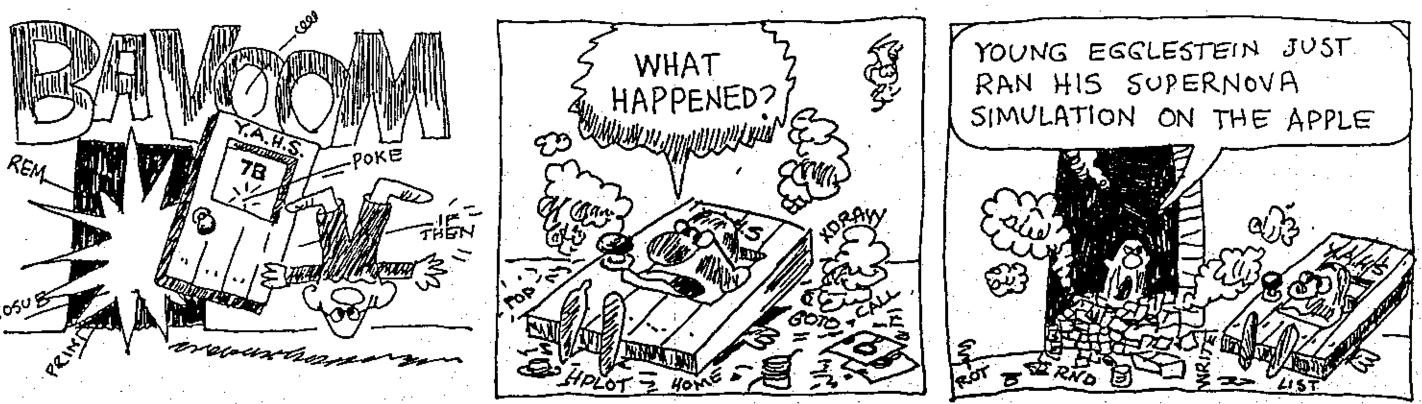
In brief, it appears that all of our repeaters have suffered damage to their aerials caused by the wind. Repairs to aerials involves a lot of time and hard work, and the repeater committee appreciates the offers of help.

---

CORRECTION CORRECTION CORRECTION CORRECTION CORRECTION

There is an error in the article in last month's Propagator on the 12 volt 2 amp regulated power supply.
The supply that is used as a basis for the project is in fact a 24 volt unit, and not a 48 volt one as was stated.
There are still some of these left at Cavion's so grab one while they last!

---




Thanks to Brian VK2AXI for the VK2KING cartoons regularly appearing in the Propagator. Word has it that Brian spent a couple of days in hospital during June after tearing his stomach muscles while working on his car. Careful, Brian, or we will have another Morry joining the "Old Croakie's Net" on the Sublime Point repeater during the day.
Best Wishes from all of us for a speedy, painless recovery from all of us in Wollongong, Brian.

# E.M.E. REPORT BY LYLE VK2ALU

Discussions were held on EME equipment operation during visits to G3WDG and VE7BBG while on our holiday in England and Canada etc. recently. G3LTF and PAØSSB were also contacted by phone while in their vicinity. All these stations have been worked on EME by VK2AMW on either 432 or 1296MHz.

A critical look at results obtained by VK2AMW indicated that it may be possible to improve our reception of signals by readjustment of the feed horn of the dish. It will therefor be removed from the dish shortly for this work, which will keep our EME station 'off-air' until further notice.

As the EME equipment has not been operated over the past 10 weeks while I have been away, it was checked out, during the EME Sked. weekend on 21/7. All operated normally at first, although the IF receiver sensitivity was still low, then the transmitter developed a fault which will require it to be removed for investigation at home.

EME communication at higher frequencies.

G3WDG has had several EME contacts with OE9XXI etc. on the 2300MHz Amateur band. VE7BBG indicated that it should be possible to obtain echoes from the Moon on the 10,000MHz Amateur band with 35 watts output into a 10 ft. dia. dish. The receiving system would require to have a 2dB noise figure with 500Hz passband. The interesting point is that all the above transmitter and receiver requirements have been individually achieved by Amateurs but not used for EME operation. It would be interesting to have to keep the Moon within the 0.6 degree beamwidth of the antenna!!

Satellite Notes.

The reason for the solid signal from VE7BBG on both Mode B and Mode L was apparent when the setup was inspected! Cor makes a very good case for Mode L operation over that on Mode B, though we have had excellent contacts on Mode B following my return home.

The RSGB Headquarters satellite communication station was also seen while in the United Kingdom. The antenna system for Mode B looks good. The 70cm. portion of this antenna was described in the June 1985 issue of 'Wireless World' which should be on sale in VK shortly.

Congratulations again to Graham VK5AGR for his recent appointment as an Oscar satellite Command Station - one of the very few in the world. Graham produces the Amsat Australia monthly Newsletter, several issues of which have now been received. This is a most interesting and useful publication for anyone engaged in satellite communication, as it contains articles on satellite operation and equipment construction including information on computer software programs. It is, of course, quite up to date with what goes on - both on the international and local fronts and has one big advantage over any of the overseas journals in that its publishing lead-time is very short and it doesnt take long to reach you in the mail. It is well worth the $15 annual subscription fee. Subs. may be forwarded to AMSAT AUSTRALIA GPO Box 1234 Adelaide 5001.

Lyle VK2ALU.

## SIX NEW WAYS TO TELL THE RIGHT TIME.

Ken VK2DOI

New methods for keeping time and observing the Earth's rotation, more precise than previously available, have necessitated defining six different kinds of time to serve a variety of purposes, scientific and practical.

Greenwich Mean Time, long used by navigators, has been replaced by various forms of universal time, but the meridian passing through Greenwich, England, still defines the time zone to which universal time applies.

Anyone who wishes to "tell the time" with great precision must, after correcting for the local time zone, choose between the following several kinds of time, each abbreviated from its designation in French:

1) UTC (Co-ordinated Universal Time). This is the time, based on atomic clocks, broadcast by most observatories. To keep it within one second of the Earth's rotation rate, corrections, or "leap seconds", are sometimes decreed by the Bureau Internationale de L'heure in Paris.

2) UTO is the time an astronomer obtains, for example, by observing when a star crosses the local meridian. It eliminates errors resulting from previous changes in the Earth's spin, but does not allow for effects of spin axis wobble, which can tilt the local meridian and affect local time observations.

3) UT1 is like UTO but is corrected for the wobble. It determines the nature of the Earth's spin at that particular moment and is used to monitor spin changes.

4) UT2 is predictive, taking into account expected variations in the rotation resulting from seasonal changes in air circulation and polar wobble.

5) TAI (International Atomic Time) is based on highly precise atomic clocks at several observatories throughout the world. Their readings, in terms of the international second (based on oscillations of cesium 133 atoms), are correlated by the bureau in Paris. In contrast to co-ordinated universal time, which is corrected to keep pace with vageries in the earth's spin, TAI is never corrected and is now 21 seconds ahead of UTC.

6) Sidereal time refers to the Earth's rotation relative to the universe and uses the vernal equinox as its reference point. Because of the Earth's orbital motion around the Sun, it gains on universal time at a rate of about four minutes a day, or one day a year.

7) Ephemeris time, once widely used by astronomers, has, like Greenwich Mean Time, been replaced.

The Sydney Morning Herald.

*************************************************************************************

UHF TRANSCEIVERS-: All those considering buying UHF transceivers (except handhelds) take note. The VK1 devision have an agreement with Trio-Kenwood where any UHF transceivers ordered through the VK1 devision will be sold at "substantially reduced prices". If the VK1 devision can order 25 of the units, Kenwood will donate a UHF repeater to the division. So if you want to get onto UHF consider this offer and contact Allan Howse VK1KAL on (062) 58 2568, or Phil VK2KPL on (048) 91 2920.

On seeing the bit about VK2ALU in the June issue of the Propagator, I got to wondering how many of those Amateurs who had to do a six month probationary period on CW when they received their licences shortly after WWII actually sat for the AOCP examination during the war years.-Does anyone know if this examination was held regularly throughout the war period? (I sat for it in early 1942 and my AOCP was dated 26th March 1942.)

By the way, the Lancaster squadron on which I served may have been 'illustrious' but it certainly was not 'Illawarra'. To my knowledge there were four Australian squadrons in Bomber Command in England during WWII, but none was associated with a particular area in Australia.

Lyle Patison VK2ALU.

---

# Amateur packet radio:

## The history and operation of packet radio are examined along with its requirements for software and hardware

***Imagine sitting down** in front of your station for an evening. You get out your 2-meter fm transceiver, attach it to a cable coming from an 8 × 8 × 3-inch "black box" connected to your data terminal. After turning everything on and initiating a short dialog between the terminal and the box, you enter a friend's call letters. After a short pause you see:*

****CONNECTED to (call sign)*

*on your terminal. From this point on, everything you type appears on your friend's terminal, and everything he types appears on yours. Your friend could be within simplex range, or within voice repeater distance, or accessible only via a series of linking stations. In fact, you might need a satellite link to talk to your friend!*

*He asks, "Would you like a copy of my latest program for playing 'Escape The Maze'?"*

*"Sure," you reply, "only my compiler can't handle your gigantic programs. Why don't you just send me a dump of the machine language (binary) program?"*

*"No problem. Let me know when you're ready," he sends back.*

*You go over to your home computer, power it up, load your communications program, connect it to the box instead of the terminal, and type, "OK, let 'er rip."*

*Then you start your file-loading program and wait. Soon, binary data begins arriving from your friend at slightly less than 120 bytes of data per second. You sit back relaxed, knowing that even though the QSO is being held under noisy conditions, with occasional QRM breaking through, you won't receive a single bit incorrectly.*

*After the program has been stored away, you resume your conversation. It is almost boringly error-free, and with the speaker disconnected from your radio you don't even hear the QSO, which is being periodically interrupted by the automatic identification of both stations in CW. Later on you try out the new program and, sure enough, find you've received the whole thing perfectly.*

*Does this sound like magic? It shouldn't — it's happening right now with packet radio.*

**Packet radio promises to open** new worlds of communications undreamed of just a few years ago by making possible the rapid transfer of digital information over great distances — with a virtual guarantee of integrity down to the last bit. This is tremen-

By Margaret Morrison, KV7D, and Dan Morrison, KV7B, 4301 E. Holmes, Tucson, Arizona 85711

dously attractive. Not only can traffic be exchanged between hams equipped with data terminals, but just as easily between a ham and a computer, or between two computers.

Let's look first at what a packet is and then at the history of packet communications and the kind of hardware and software packet radio requires. We will use the two most familiar systems to serve as examples, although others are in use as well. These two are the VADCG (Vancouver Amateur Digital Communications Group) system and the TAPR (Tucson Amateur Packet Radio) system.

## what is a packet?

Packet radio is a relatively new form of digital communications. It has some characteristics in common with older forms, such as ASCII and RTTY, how both familiar to the Amateur community. In all of these modes information is coded in binary form, that is, as a series of 1s and 0s. The information is translated into an audio signal consisting of alternations between two tones, and the audio signal then used to modulate an rf signal to produce an FSK or AFSK transmission.

In an ASCII or RTTY system, the transmission typically consists of a sequence of individual characters separated by periods of unmodulated carrier transmission. In order for the receiving station to interpret the characters correctly, extra transitions are added at the beginning and end of each character (start and stop bits). Depending on reception conditions, anywhere from all the information to virtually none of it may be received correctly; what's not received correctly may be garbled or missed completely.

A packet consists of binary data (which might be ASCII, Baudot, or some other code), and the modulation techniques may be essentially the same as for conventional ASCII or RTTY, although the exact interpretation of the tones may be different. The VADCG and TAPR TNCs produce AFSK, but more sophisticated schemes are being developed. (The TNC, or terminal node controller, is the "black box" referred to in the introduction to this article. It is a complete microcomputer-based communications system with a good-sized memory; 30 kilobytes in the case of the TAPR TNC. It does all the work involved in sending and receiving packets).

In a packet, the individual characters, or bytes, are run together with no space at all between. This eliminates the need for both the start and stop bits as well as the dead time between characters. The result is much more efficient information transfer. The analog of start and stop bits are sent only for the beginning and end of the packet, and the transmitter is keyed only while information is actually being sent. •

Extra information is inserted into each packet that enables the receiving station to determine automatically whether the packet was received without error. Thus every correctly received transmission is acknowledged. The sending station can keep retransmitting its information until it is assured that it has gotten through. Other features of the packet which facilitate this "handshaking" are described later.

## history of packet radio

Packet switching is a technology that was developed to tie computer users into a network which could extend over a wide area. It has been used for many years over common carrier lines, both commercially and by government. The first large-scale packet network in North America was ARPANET, set up in 1969 by Bolt Beranek and Newman, Inc., for the Defense Advanced Research Projects Agency. This network introduced packet switching, in which each message sent is broken up into small packets and each is switched to its destination over the quickest communications path available at that instant. Data interconnections are typically 50-kilobit-per-second wideband lines, and the packets are passed from node to node until they arrive at their destination. Typical end-to-end times are 250 milliseconds, and receipt of data is acknowledged.

Other networks around the world soon began operation, and today there are many government and commercial computer networks, such as TYMNET and TELENET, which allow users all over the country to access thousands of computers remotely.[1]

Packet radio experiments began in the 1970s. One of the largest packet radio systems, based at the University of Hawaii and known as the ALOHANET, linked together a number of computers and users, and also provided access into ARPANET and satellite links.[2] Other systems were developed for the purpose of providing distributed automatic digital communications for remote sensing stations.

Packet switching networks (both wire and radio based) generally use one of two methods for routing packets from the originating station, through intermediaries, to the destination. In one system used by TYMNET and others, a central controller determines the optimum path for a particular pair of stations on the basis of the stations present in the network at any time. In the other system, the network itself is intelligent and determines the routing between stations. This is the system that was pioneered by ARPANET.

North American Amateurs first entered the picture in Canada, where, beginning in 1978, the Department of Communications encouraged the use of packet radio by permitting Amateur packet transmissions and by giving exclusive use of 221 to 223 MHz and 433 to 434 MHz to packet and digital transmissions. Taking advantage of this ruling, VADCG, a group in Vancouver, British Columbia, designed the first well-known Amateur packet radio TNC, and soon TNCs became widely distributed.[3] Their use in the U.S. followed a rule by the FCC making such ASCII transmissions legal in March of 1980. Finally, in October of 1982, the FCC revised Part 97.69, lifting many restrictions on digital communications and advanced data transmission. Today many experimenters using the VADCG TNC, the TAPR TNC, and homebrew systems are hard at work, developing this new mode of communications.

## anatomy of a packet

The basic element in packet radio is the frame — a string of bits with a specific format. The bits are presented to the transmitter on a modulator output line. In the case of the TAPR and VADCG TNCs, the modulation system uses 1200-Hz and 2200-Hz tones and coherent (phase-continuous) FSK, with a data rate of up to 1200 bits per second; it is compatible with the Bell 202 standard modem. Other modulation systems being developed for Amateur use include minimum shift keying (MSK), and various forms of phase shift keying (PSK). These schemes, which are more efficient than ordinary FSK, are useful for long-haul traffic, especially via satellite.[4]

The FSK signal is related to the bit stream according to specific digital encoding rules. The most commonly used system is non-return to zero inverted (NRZI) encoding. In this system, a transition from one tone to the other is interpreted as a 0, whereas no transition during the bit period is a 1. Such a method is used because, according to the rules by which the frame is constructed, a transition is guaranteed at least once in every five bit periods. This is needed to keep the receiving station in "sync" with the incoming data.

The actual structure of the frame varies from one packet radio system to another. The structure makes possible, among other things, the delivery of the message to the proper recipient and a system for ensuring data integrity. The most frequently encountered format for frames is known as HDLC, or High Level Data Link Control. Each HDLC frame consists of six fields, as shown in **fig. 1**.

In order of transmission, FLAG1 is first. It is at least eight bits long, consisting of the bit pattern 01111110. This particular combination is unique to FLAG1 and FLAG2, and appears nowhere else in the frame. Part of the transmitting station's job is to alter the message content of the frame to prevent this combination from appearing elsewhere (a process known as bit-stuffing). This alteration is, of course, undone by the receiving station. FLAG1 (which may be repeated several times before the rest of the frame is sent) says, "Get ready! Here comes a frame!"

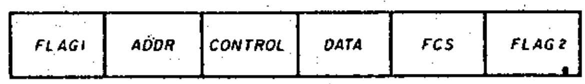



**fig. 1. Schematic representation of an HDLC frame.**

The ADDR (address) field varies among the various packet radio systems developed in the Amateur community. HDLC requires only that it be at least one byte long. It typically contains the source address, and may contain the destination address and perhaps routing information. The address field contains the information which permits delivery of the packet.

The CONTROL field also varies among systems. The length of this field specified by HDLC is one or two bytes. The information contained in this field typically includes acknowledgment information for previous packets successfully received; an indication that the sender would like to begin talking (connect) to the destination station; a request to terminate the conversation (disconnect); or other "supervisory" functions, such as requests to stop transmitting or to resume transmitting (referred to as flow control).

The DATA field consists of zero or more bytes of information (zero in the case of simple acknowledgments, for example). They may be in any bit pattern — ASCII characters, part of a binary program, you name it. (The FCC, however, would like you to have available enough information so they can decipher your data!) The HDLC standard requires that when five consecutive 1s appear a 0 be inserted. This is the bit-stuffing mentioned above. It prevents data from being mistaken for flags, and also ensures frequent tone transitions if NRZI encoding is used. Upon reception, these extra 0s are discarded. Typically, the maximum data length is 128 to 256 bytes.

The last item in the frame prior to the ending flag bits is the FCS, or frame check sequence, an extremely important two-byte number computed by the transmitting station based on all the bits in the frame following FLAG1. If the frame is received in garbled condition it is extremely unlikely that it would be garbled in such a way as to produce the same FCS. The FCS is separately computed by the receiving station and, if both numbers agree, there is virtual certainty that the frame was received as sent.

Finally, the frame ends with another byte of flag field, thus indicating to the receiving station that the previous two bytes were indeed the FCS.

FROM HAM RADIO July 1983.

Continued Next Month

OR SALE **** FOR SALE **** FOR SALE **** FOR SALE **** FOR SALE

- 1 TH5-DX Hy-Gain 5 element tribander beam with balun.
  In good condition - Has reliabally 'travelled' the world.
  ALL OFFERS CONSIDERED.

- Icom IC 02A handheld. With * 240 Volt charger * d.c. mobile charger * spare battery case * hand mic. * vinyl case * 5/8 ext. whip.
  ALL OFFERS CONSIDERED.

Contact David VK2NH (02) 727 3169 (before 11 am/ after 7pm)

---

- 10 metre beam TET as new, never used $130.00
- EAT 300 antenna tuning unit. Brand New. $170.00

Contact Martin VK2BMH Phone (042) 67 3836.

# The race to be airborne

## Who was the first Australian to make a powered flight?

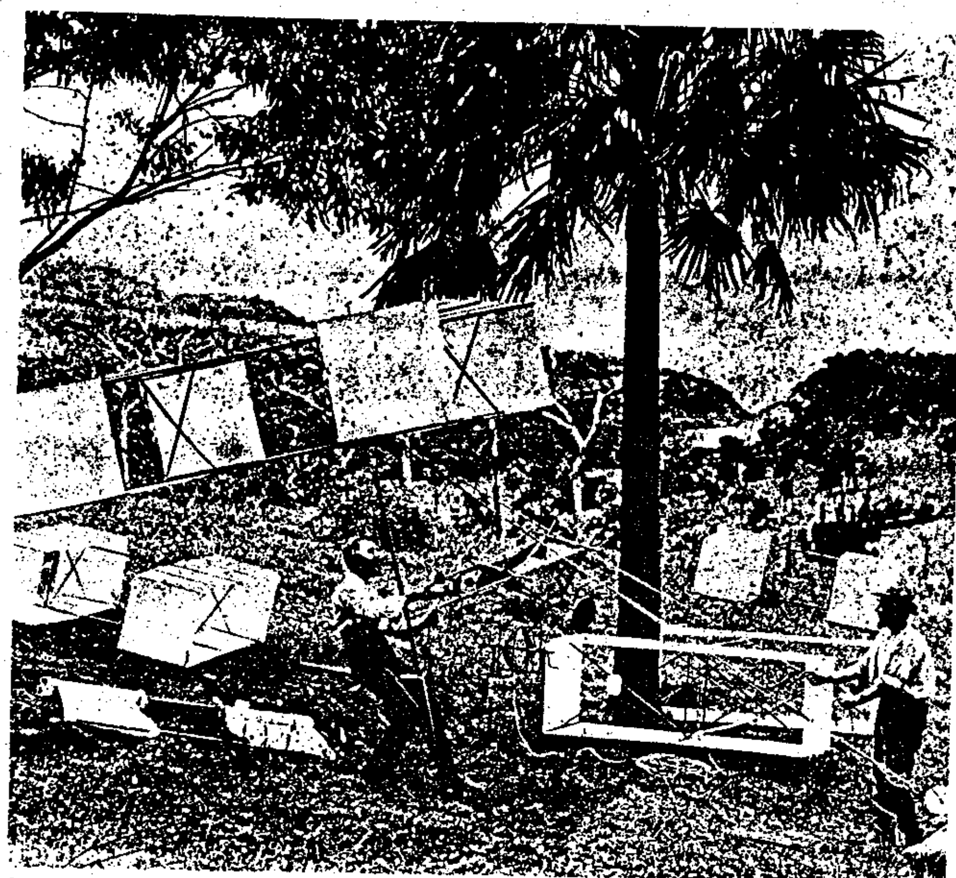
When the Commonwealth was born, in 1901, no man anywhere had ever left the ground in a heavier-than-air, powered machine. Many flights in balloons and airships had been made since the first ascent by Jean-François Pilâtre de Rozier in France in 1783, but these depended on the lighter-than-air principle. There had also been a good deal of experimenting with kites and gliders in the late 19th century, but the real race was to be the first to fly a steerable, powered, heavier-than-air machine.

The story of aviation began on 17 December 1903, when the Wright brothers, Orville and Wilbur, made man's first controlled flight in a heavier-than-air machine at Kitty Hawk, North Carolina, USA.

In Australia, as in America and Europe, the answers to the problems of human flight were eagerly sought by a few enthusiasts. Among them was Lawrence Hargrave, a scientist and inventor whose experiments with kites and powered models influenced many early British and European designers, though his discoveries were not utilised by the Wrights. Hargrave never achieved true flight, but he was lifted to a height of 4.8 metres by four box kites at Stanwell Park near Sydney in 1894.

Collaborating with Hargrave in experiments with box kites in the 1890s was George A. Taylor, a man of extraordinary versatility: an artist, editor, journalist, inventor, astronomer, town-planner and radio engineer, with a messianic belief in the future of radio and aviation. Taylor came far closer to manned, controlled flight than Hargrave had done, when on 5 December 1909 he was lifted from the ground in a glider at Narrabeen Heads, near Sydney. His glider had a wingspan of 5.4 m and weighed 58 kg, and in the course of 29 flights made that day—not only by Taylor, but also by his wife Florence, Edward Hallstrom, the inventor, Charles Schultz and Mrs Schultz—Taylor achieved the maximum distance in a flight of 100 metres.

When Taylor was persuaded by his wife to abandon such tests, he turned his attention to other fields of experiment. In 1911, he fired a field gun by radio, and succeeded in exchanging wireless messages between speeding trains. 'The world may see wireless dirigibles go forth with camera, photograph a position, drop bombs, and mechanically return to their base,' he prophesied.



Lawrence Hargrave suspended beneath one of his box kites to test its lifting power during experiments at Stanwell Park, NSW, in 1894. Hargrave never achieved free flight, although on one occasion a train of four box kites lifted him 4.8 metres into the air in a 33 km/h wind

On 28 April 1909, the inaugural meeting of the Aerial League of Australia was held in Sydney's Hotel Australia. Lawrence Hargrave, who took the chair, was appointed a vice-president, and George Taylor honorary secretary. The objects of the league were:

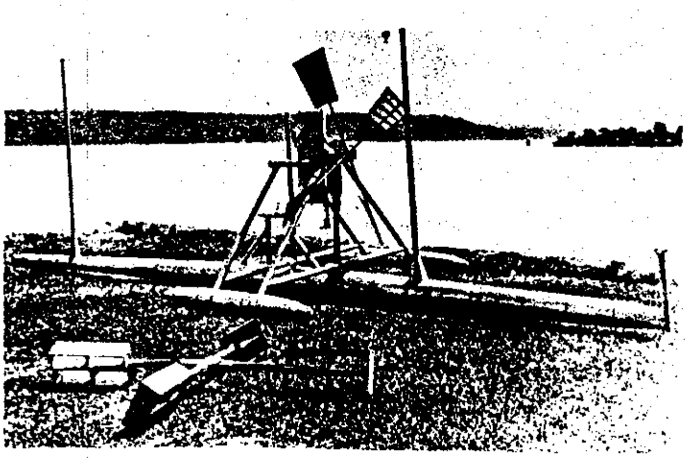
To watch the latest achievements in aerial engineering.

To secure the best recognition for Australian efforts in that direction.

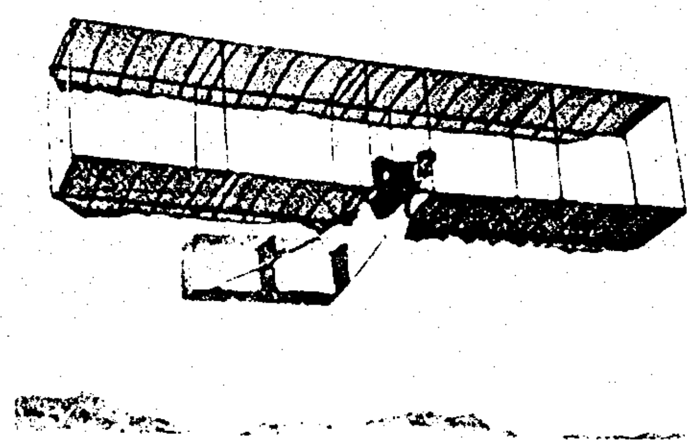
To awaken public attention to the grave danger in allowing foreign nations to excel in aerial navigation.

To join forces with the Aerial League of the British Empire in advocating that the Empire should secure the same supremacy in aerial navigation as it has enjoyed in the command of the Sea.

On 11 September 1909, the Australian Defence Department announced in the *Commonwealth Gazette* a competition with a prize of £5000 [$140,000] for the best and most suitable aeroplane for military purposes. Only native-born Australians or naturalised British subjects were eligible and the machine had, as far as possible, to be constructed in

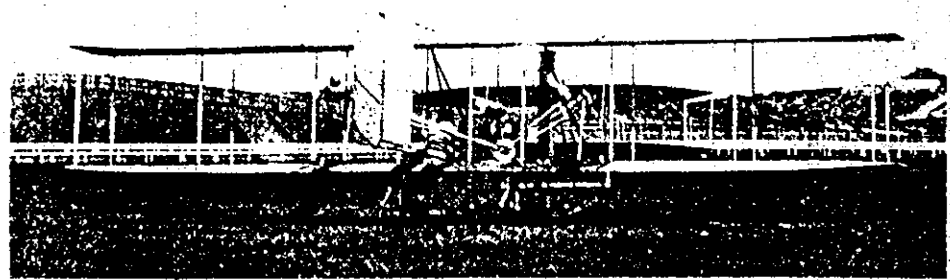


Hargrave spent many years experimenting with aeroplane engines. He invented the rotary engine, although he never developed it. This partially built sea-plane was powered by a small steam engine



George Taylor soars over the sand dunes near Narrabeen Heads, NSW, on 5 December 1909. This was the first heavier-than-air flight in Australia. Of the 29 flights made that day, the best covered 100 metres

Harry Houdini in his Voisin biplane during his Australian tour in 1910. The Voisin was a development of the box kite pioneered by Hargrave



Colin Defries in his Adamson's Wright biplane at Victoria Park racecourse in Sydney. Defries made his first flight on 9 December 1909, four days after Taylor's flights at Narrabeen. As there is no proof that he could steer the machine he is not given credit for the first controlled flight

Australia by Australians. It also had to be capable of remaining over a given area long enough for military observations to be made, of attaining a speed of at least 32 km/h, and of staying in the air for five hours.

The Government's offer was discussed at a crowded meeting held in the vestibule of the Sydney Town Hall on October 7. Many members of the Aerial League were present, and several of their model flying machines were exhibited on the platform. Two were 'flown' round the chamber.

The £5000 offer was subsequently withdrawn because, perhaps not surprisingly, there were no entrants.

### The first powered flight

Who had the distinction of making the first *powered* flight in Australia is a much disputed question. There are three contenders: two obscure Australians, Colin Defries and Fred Custance, and the famous American escapologist Harry Houdini.

On 4 December 1909, the day before Taylor's historic ascent at Narrabeen, Colin Defries made three attempts to fly a Wright biplane at Victoria Park racecourse, Sydney. This plane and a Bleriot monoplane had been imported by L. A. Adamson, headmaster of Wesley College, Melbourne, who had sent Defries to England and France to buy them.

### The Great Mechanical Bird

Thousands of people paid 2s 6d [$3.50] each to see Defries fly. His biplane, *Stella*, was advertised as 'The Winged Wonder of the World', and 'The Great Mechanical Bird', but it did not live up to these flattering labels. At first towed by a car, and later in two unassisted attempts, it failed to take off. Five days later, Defries was more successful. Again watched by a big crowd, his machine left the ground and covered a distance of 105 metres in 5½ seconds, at heights of half to four and a half metres. The crowd cheered enthusiastically. 'As he left the ground there was an involuntary cry from about 150 spectators, "He's up" and he was up,' reported the *Sydney Morning Herald*.

On 18 December, in the early hours of the morning, Defries flew 400 metres in a straight line, again at a height of 0.5 to 4.5 m, and crashed. He lost control of the machine when his cap was bumped off and he grabbed for it. He was unhurt.

'Never in the history of human ingenuity had invention moved with such swiftness as in the improvement of the aeroplane,' Defries said, when interviewed while playing billiards in a leading Melbourne club. And in another interview he said:

'I have felt the thrill of rushing in a motor car over curving roads at 90 mph [145 km/h]; I have experienced the sudden surprise of the earth dropping away from me as I sat in the basket of a balloon; but there is no thrill, and there is no sudden surprise when flying. It is, after the feeling of security is fixed in the mind, simply a state of ecstasy.'

Many aviation historians deny that Defries flew, in the strict sense. He was airborne, but he did not show that he could turn or otherwise control the machine.

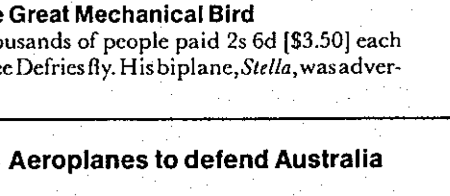
Some give the credit for the first controlled flight to Fred Custance, a young Adelaide mechanic. On 17 March 1910, at Bolivar near Adelaide, Custance flew a Bleriot monoplane for 5 minutes 25 seconds, making three circuits of a paddock, a distance of about four kilometres. The machine had been imported by F. H. Jones, an Adelaide businessman, at a cost of £1000 [$22,000], and Custance, who had helped to assemble it, had taught himself to fly simply by reading the handbook which came with the aeroplane.

### Houdini takes the trophy

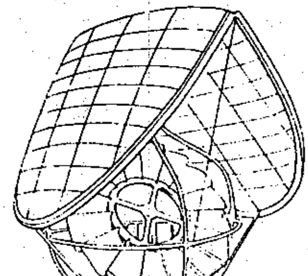
The day after Custance's flight, Houdini made three flights in a Voisin biplane at Diggers Rest, near Melbourne. The flights ranged from one minute to 3½ minutes, and nine witnesses certified that Houdini had attained a height of 30 m and covered more than three kilometres on a circular course. On 21 March, he made another certified flight of seven minutes 37 seconds, covering about nine kilometres. 'The rope is unleashed and the machine starts off with me in it downfield like a bounding greyhound set at liberty . . . The sensation is indescribable . . .' he said. Houdini, whose real name was Erich Weiss, was on a theatrical tour of Australia, and had been invited by the Aerial League to bring his French-built biplane with him. The League awarded him its trophy in the belief that he had made the first flight in Australia.

### Aeroplanes to defend Australia

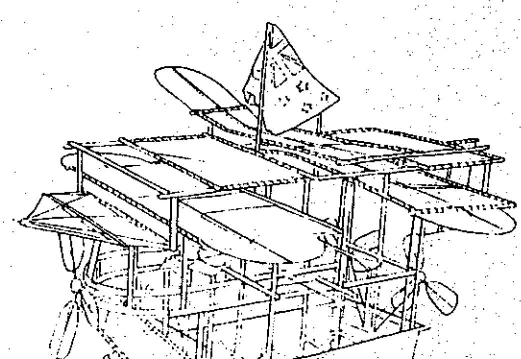
**Three models exhibited at the Aerial League's meeting on 7 October 1909 in response to a Defence Department offer of £5000 [$140,000] for an Australian-built military aeroplane. Despite the fact that flights in America and Europe had demonstrated the form that an aeroplane must take, many Australians were still experimenting with alternative designs. The offer had to be dropped because there were no candidates**



Ewing's aerocar



Green's floating aeroplane



Garty's flying ship

FROM READERS DIGEST

# THE ILLAWARRA AMATEUR RADIO SOCIETY

P.O. Box 1838, Wollongong, 2500

**Meetings:** Second Tuesday of every month except January at 7:30pm in the S.E.S. Headquarters, Montague Street, North Wollongong.

**Repeaters:**

| | | |
|---|---|---|
| VK2RAW-6850 | VHF | Mt Murray |
| VK2RUW-8225 | UHF | Hill 60 Port Kembla |
| VK2RIL-7275 | VHF | Sublime Point |
| VK2RIL-8725 | UHF | Sublime Point |

**Broadcasts:** On Sunday evening prior to the club meeting - 7:00pm RTTY, 7:15pm-Voice : Transmitted on 7275 VHF and by relay to 3.562 MHz. Callbacks after the voice broadcast.

**W.I.A. Relay:** On 6850 at 11:00am and 7:30pm each Sunday.

**Club Nets:** 3.562 MHz SSB on Sunday at 8:00pm and slow morse net on 28.440 MHz on Tuesday at 8:00pm.

**Newsletter:** "The Propagator", published monthly to reach financial members in the week preceeding the meeting. All articles, ads, etc to the editor by 3rd Tuesday each month.

**Membership:** The Secretary, I.A.R.S., P.O. Box 1838, Wollongong, 2500. Full membership $10.00 per annum; students and concessions $5.00 per annum.

**Awards:** The award of the Illawarra Amateur Radio Society 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. Alternatively contact with VK2AMW is sufficient for the award. Band, details of time, day, frequency, stations worked + $2 or 4 I.R.C.'s to Award Manager, I.A.R.S., P.O. Box 1838, Wollongong, 2500.

**Committee:** President -Keith Curle VK2OB, 24 Beach Dve, Woonona.
Vice President - Bill Chadburn VK2DYU, 45 Belatine Ave Dapto.
Secretary - Jim Hayes VK2EJH, 1 Kathleen Cres, Woonona.
Treasurer - Andrew McEwan VK2XGC, 7 Nioka Ave, Keiraville.
Auditor - Geoff Cuthbert VK2ZHU, 1 Nioka Ave, Keiraville.

**General Committee:** Ian Callcott VK2EXN, Wojciech Tomczyk VK2OE, Martin Hutchings VK2BMH, Jim Mead VK2EJM, Gerhard Mueller VK2XGA, Dave Routledge VK2NGS, Paul Suters VK2KPS.

**Repeater Chairman:** Graeme Dowse VK2CAG

**Repeater Committee:** Bill Jut VK2KWJ, Rob McKnight VK2JRC, Morry Van De Vorstenbosch VK2EMV, Peter Woods VK2VCK, Ian Callcott VK2EXN, Mike Keech VK2DFK, Dave Colless VK2EZY.

**EME Co-ordinator:** Lyle Patison VK2ALU

**Store:** Ray Ball VK2XCC

**Publicity Officer:** Dave Myers VK2DFL

**Broadcast Officer:** Paul Suters VK2KPS

**Propagator Editors:** Paul Suters VK2KPS, Jim Hayes VK2EJH, Gerhard Mueller VK2XGA.

**Life Members:** Graeme Dowse VK2CAG, Keith Curle VK2OB, Lyle Patison VK2ALU.