

# *The* **BROADCASTER**



Newsletter of the Broadcasting Division

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**ABT2 HOBART, MT WELLINGTON**

## THE BROADCASTER

The Broadcaster is the in-house newsletter of the Broadcasting Division and is published three times a year to inform and recognise the people who make up this organisation.

Articles appearing in *The Broadcaster* do not necessarily reflect the views of the management of Telecom Australia.

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## EDITORIAL

Sixty years ago, Australians witnessed the start of the period which later became known as the "Golden Decade of Radio". The 1930 decade was a period of phenomenal growth and development in AM broadcasting and showed signs of continuing into the 1940's when the Second World War broke out in 1939.

At the start of the decade, broadcasting had been in operation for some seven years and 19 stations were in operation. By the end of 1939 the number of stations had increased to 126 with 27 stations being operated by the National Broadcasting Service.

The decade saw the introduction of 10 kW transmitters, antifading radiators, crystal controlled transmitters, negative feedback in transmitters, low noise amplifiers, improved microphones and pick-ups and the installation of disc recording equipment in studios.

Domestic receiver development also left its mark. All electric models, the widespread use of the super-heterodyne circuit, miniaturisation of components, multifunction valves and improved circuit technology were introduced.

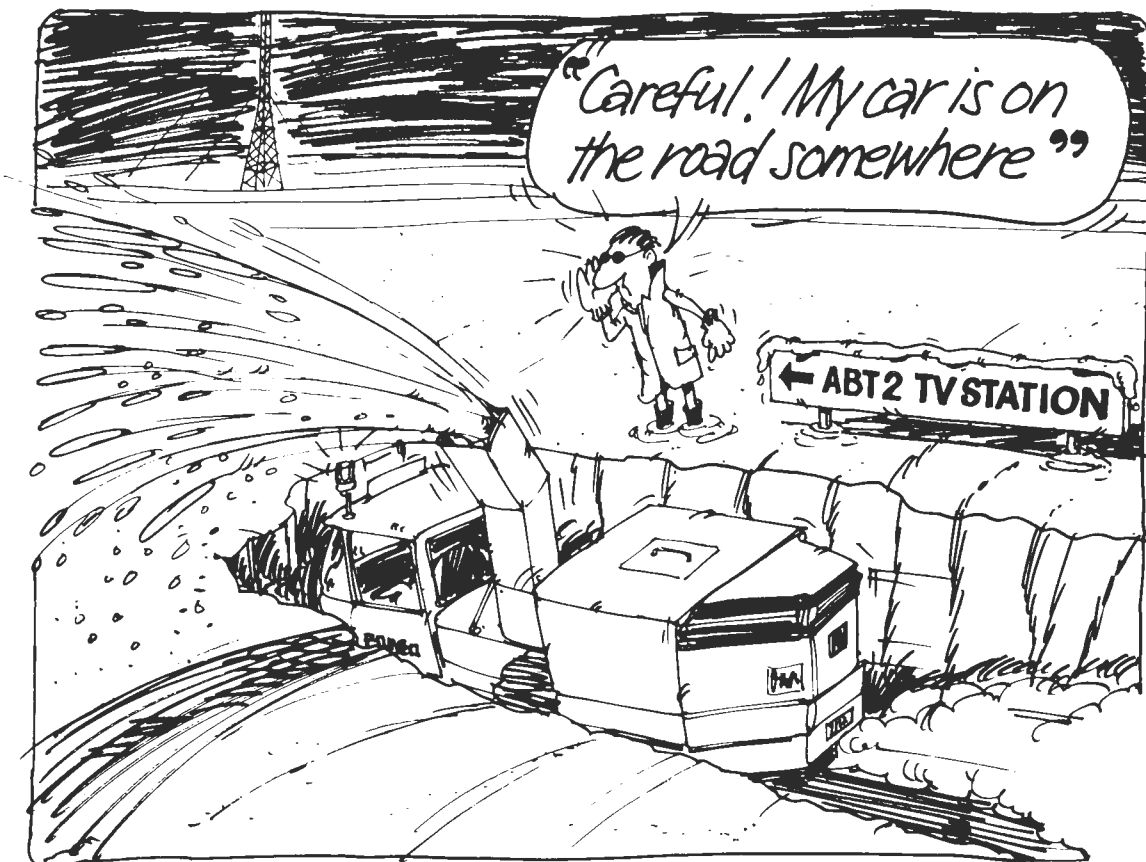
In the present decade we are witnessing another resurgence in sound broadcasting with the enormous growth and development in FM technology being just as exciting as those halcyon days of the 1930's.

JACK ROSS,  
Editor.

*Front Cover:* Typical winter scene at ABT2 Mount Wellington, Hobart.

*Contributors to this issue:*

Leon Sebire	Brian Robb	Noel Brown
Graeme Parkinson	Neil Staveley	Ray Jackson
Doug Sanderson	Alison Hatfield	Ralph Denison
Ron Johnson	West Hatfield	Mario Klauzer
Ron Lewis	John Nott	Barrie Morton
Kay Nichol	Glen Clements	Jack Ross
Bill Owen	Joe Brown	





## ABTN 1 MIDDLE BROTHER MOUNTAIN

National television station ABTN 1 is located on the 558 metre high Middle Brother Mountain situated 39 km north of Taree and 56 km south of Port Macquarie on the NSW Mid-North Coast.

Middle Brother is one of the three Brothers, so named by Captain Cook as he sailed up the coast in May 1770.

The Mountain, until recently, had been used by hang gliders from all around the world. It was the scene of the World Hang Gliders Championship for Women in 1988.

The area has had a rich historical past. Port Macquarie was named after Governor Macquarie when the area was discovered by explorer John Oxley on 8 October 1818. Port Macquarie was established as a convict settlement three years later, but is now a thriving tourist centre with a permanent population of 26,000. The first sugar cane in Australia was grown in the town.

Television transmissions began on 29 April 1966 with ABT 1 using two AWA TVB 10 transmitters working in parallel. A Commercial transmitter ECN8 began operation on 27 May 1966 with a single TVH5 transmitter. ECN8 currently transmits with an NEC PCN 1413 AH 10 kW model as main transmitter and a Thomson CSF 10 kW model as standby.

Some major changes will occur shortly as a result of Equalisation, with ABTN 1 being replaced by a new transmitter on Channel 6. Commercial and National transmitters will share a common antenna system and a SRRN FM service will be commissioned.

The station is maintained by the NSW Broadcasting Branch District 7 staff.

**NEIL STAVELEY**

## 2 KP KEMPSEY

Construction work for the establishment of 2KP Kempsey began in 1953. Transmission commenced on 29 January 1954 using an AWA Model J50952 10 kW transmitter with a 2 kW standby unit. A temporary antenna was employed until completion of the 168 m sectionalised radiator during 1959. Program originated from Sydney with a local program being fed from the ABC Grafton studio until opening of the Kempsey studio in 1956. The initial ABC staff at Kempsey comprised a Regional representative, a part-time announcer and a part-time typist. A local news service was launched in 1960.

In 1965, the AWA 10 kW transmitter was retired and two STC type 4-S-55B units of 5 kW output operating in parallel were installed. Automatic operation of the station began in 1966, it being monitored and controlled in turn by Kempsey Telephone Exchange, TV station ABTN 1, station 2NR Grafton and currently MIC.

During its lifetime, the station staff have had to contend with a major flood and a tornado.

In 1963, the nearby Macleay River broke its banks and flooded the station property. The water rose 2 metres but with the base insulator 2.75 metres above ground level, transmission was maintained. Staff used a row boat between the transmitter building and the radiator anxiously keeping watch on the situation.

In 1964 when a tornado swept through the district damaging homes in the area, a HF antenna system crashed to the ground and one of the staff houses was twisted off its foundations. Fortunately, transmission was not interrupted.

**RON LEWIS**



Leon Sebire.

## FROM MY DESK

Reviews, reviews and still more reviews! Our involvement in the National Broadcasting Service must have been one of the most often reviewed activities in this country over the past 30 or so years. And the reviews continue.

The 1991 Review being undertaken by the Department of Transport and Communications for the Government is once more addressing what organisational arrangements might be best for handling the construction and operation of transmission facilities for the National Service—our traditional responsibilities. Whether these should remain with Telecom, pass to the ABC and SBS, transfer totally to the Department or be placed with yet another special Government Authority are all options being considered. Should the functions be managed from Canberra, Sydney or Melbourne has been defined as a matter of less importance but in reality probably represents the crux of the matter. The answer to this latter question will greatly influence the ultimate efficiency and practicality of any new arrangements.

Earlier in the year the Department retained the services of Management Consultants, Price, Waterhouse and Urwick, to review the present arrangements and make recommendations for change. But the outcome of that study was not received enthusiastically by any sector of the National Broadcasting industry and many believed if offered simply another AUSSAT—a commercially oriented venture, with a limited customer base with even more limited finances.

We are yet to see the outcome of the latest round of reviews but I am sure of one thing; there will be some changes. In the present climate of economic reform it is inevitable that the Government will wish to devolve more and more of its operational responsibilities to industry proper.

It is important that we be ready for change. The difficulty is to know in advance the precise outcomes that will need to be faced. A considerable amount of the time spent at this desk is concerned in planning for the possible eventualities. I like to think we are ready and I am fairly confident that we are.

**LEON SEBIRE**  
General Manager



**THREE OF A KIND**

Service Awards were recently presented to Broadcasting staff in Tasmania by Acting State Broadcasting Manager Glen Clements. Recipients were Bruce Berwick and David Howard.

Bruce, who is PTTO1 and currently Officer-in-Charge of Broadcast District South, a multifunction Broadcast and TV district, was presented with a 30 Year Service Award. He commenced service as a Technician-in-Training on 18 January 1961 and has been employed in the radio and television area ever since.

David, Admin Officer 3, the Branch Budget and Resources Officer was presented with a 25 Year Service Award.

Incidentally, Glen Clements chalked up 25 years service in the same week.

The Awards were presented at an office morning tea function, and all those present enjoyed the humorous stories told by the three officers whose combined service totalled 80 years in the PMG's Department and Telecom.

**GLEN CLEMENTS**



*(L to R) Bruce Berwick, David Howard, Glen Clements.*

**NEW POWER PLANT**

In order to accommodate the requirements for additional emergency power for new and upgraded facilities at the Passchedaele Ridge transmitting station ABSQ1/4 approximately 200 km south west of Brisbane, the power plant was recently replaced.

The need for the additional power was brought about by changes for TV Equalisation, three 20 kW FM transmitters for ABC programs and the needs of planned future services for SBS TV and Commercial FM Services.



*Main power board and battery chargers.*

The new plant is an MTU 396 series, V12, 890 kW engine rated at 1500 rpm and driving a Stamford Model HV6340, three phase 950 kVA alternator of Star configuration. Fuel supply for the engine comprises a 20 000 litre underground tank with an above ground 850 litre day service tank.

The output and control supervisory system of the plant are monitored by a Sy/Max system 8010 SFW-324 PLC supplied by the Square D Company.

A 500 kW load bank was installed to handle surplus capacity as part of the facility.

The electrical equipment was supplied by AVLON Switchgear Pty. Ltd., of Brisbane.

**GRAEME PARKINSON**



*Emergency supply power board and day service tank.*

**RETIREMENT—GEOFF BARRON**

A farewell function attended by State Broadcasting Manager, Mike Stevens and Broadcast Operations Manager, Ron Johnson, was held at ABMNO Mount Ulandra on 16 January 1991 on the occasion of the retirement of Geoff Barron, Acting PTTO 1.

Geoff completed 38 years service with Telecom with the last 26 years being at Mount Ulandra. Prior to moving to Cootamundra, he spent six and a half years at ABS2 Mount Lofty near Adelaide.

In addition to present and retired station staff, and Commercial station representatives, colleagues came from stations at Cumnock and Mount Canobolas to farewell Geoff and wife Margaret.

**RON JOHNSON**



*Geoff Barron retirement function.*

*(L to R) Geoff Black, Tom Meale, Geoff Barron, Allan Wright, George Peacey, Ian Somers, John Roby, Neil Grey, Mike Stevens (SBM), Peter Baxter, Dave Taylor.*

## REHABILITATION OF RADIO AUSTRALIA FACILITIES

Radio Australia once more demonstrated its worth during recent events in the Persian Gulf and attention was focused on the inadequacies of ageing and inadequate transmission facilities.

The Government has now set aside funds for limited upgrading of the facilities and work has commenced on the design and provision of two additional transmitters and several replacement broadband antenna arrays.

Under this new development the Radio Australia station at Cox Peninsula near Darwin will receive two additional 250 kilowatt transmitters and associated extensions to the antenna switching and computer control systems.

The Shepparton station, which has recently been equipped with a new 6 x 12 antenna matrix switch will receive several broadband antenna curtain arrays aimed at providing improved coverage of important Pacific targets. At the same time rationalisation of the pre-existing single band antenna systems will take place.

The work which in total accounts for almost \$12.0m will take place during the 1991/92 and 1992/93 financial years.

**LEON SEBIRE**

## THE PASSING OF STATIONS 4QA MACKAY AND 4QY CAIRNS

In recent years there has been considerable pressure from Commercial AM radio broadcasters for approval to convert their services to FM. There are several reasons for this, not the least of which are reductions in transmitting plant costs and a more up-to-date public image. In the Capital Cities several such conversions have occurred and no doubt others will follow as additional VHF spectrum becomes available.

The Broadcasting Division has been pressing the Department of Transport and Communications for funds to replace the obsolete 2 kilowatt transmitters at MF stations 4QA Mackay and 4QY Cairns, both of which serve relatively large and important areas. These transmitters which are more than 40 years old are also of insufficient power to cope with the general increase in man-made electrical noise levels and a changing distribution of population in the service areas.

The Department, in conjunction with the ABC, has now decided that 4QA and 4QY are to be replaced with wide area coverage FM services operating, respectively, from the National Television sites on Mount Blackwood and Bellenden Ker. The replacements are in hand and should be completed by the end of the year.

Thus, these old MF stations which have served the important sugar cane farming areas of North Queensland for almost half a century will shortly become only memories to those who have been associated with them.

It is of interest that transmitters at both stations are STC 4-SU-14C types and have been in service since commissioning of the stations.

The transmitter was designed and manufactured after the Second World War to meet the projected expansion of broadcasting stations in Australia and was supplied in large numbers for both National and Commercial services.

The design incorporated high level anode modulation which was a departure from pre-war designs which were designed around low level modulation systems. The main valve type was the 4279Z an Australian made version of the British made 4279A type. It was characterised by extremely long life. Operating hours of 20 000 hours were typical but many exceeded 40 000 hours. However, in recent years, factory production ceased, making it necessary to consider replacement of the transmitters. The high tension supplies originally employed HCMV rectifier valves but these had been replaced by solid state devices some years ago because of supply difficulties and also to take advantage of the improved reliability of solid state rectifiers.

**LEON SEBIRE**

## CONGRATULATIONS LEON DUDLEY SEBIRE, AM

Our General Manager, Mr Leon D. Sebire has been made a Member of the Order of Australia in this year's Queen's Birthday Honours for service to communications, particularly broadcasting.

He joined the Postmaster General's Department in 1956, after working in the radio manufacturing industry since 1947. Mr Sebire was attached to the Broadcasting Stations Installations Division of the Headquarters Radio Section where he remained until 1962. During that period he was responsible for the implementation of the Joint Australian Broadcasting Control Board/PMG Development Plan for the improvement of the National Broadcasting Service with some of the major projects being the establishment of medium frequency stations at Armidale, Wollongong, Mt Isa, Tennant Creek, Katherine and Rabaul. Another important engineering involvement was the increase in power of 12 existing National stations to 50 kilowatts.

He then moved into the communications field where he was responsible for the provision of small capacity radio telephone bearers in all States. The highlights of his career in this area were the development of the SSB radio telephone subscriber networks for the Northern Territory and the Darwin-Gove (Nhulunby) tropospheric scatter radio system. He returned to the broadcasting discipline to develop the major Phase 7 Television Extension Plan for Remote areas.

Mr Sebire has been a long term proponent for recognition of the broadcasting function within Telecom and was the architect of the proposal which led to the eventual formation of the Broadcasting Directorate in 1983. He was the first Director and later became General Manager Broadcasting with change of name of the group to the Broadcasting Division. The Division is responsible for the design, construction, operation and maintenance of all transmitting facilities including Radio Australia for the Australian Broadcasting Corporation, Special Broadcasting Service and many Commercial stations.

As most readers will know, Mr Sebire has represented Australia in many International forums including attendance at ABU and CBA General Assembly where his contributions have been invaluable to world broadcasters. He has presented numerous papers at these conferences, many of which have been published worldwide.

All staff in the Broadcasting Division extend heartiest congratulations to our General Manager on achievement of this distinguished honour.



## MELBOURNE AND SOUTH EAST

The Melbourne and South East District covers approximately 3 000 square kilometres, extending from Mallacoota in the east to Melbourne's outer western suburbs and from Foster in South Gippsland to Marysville some 40 kilometres to the north east of Melbourne. The district serves the most populated area of Victoria.

District Headquarters are at the Mt. Dandenong transmitter facility, with an outposted cell at Mt. Tassie near Traralgon in Central Gippsland.

Mt. Dandenong staff are responsible for nine Class "A" services including ABV2 and SBS28 television, 3ABCFM and 3JJJ FM radio, 3LO and 3AR 50 kW AM radio, along with 3PB (Parliament), 3RPH (Radio for the Print Handicapped) and 3EA (Ethnic Radio). Twelve sibling television translators are also serviced by the District staff. The translators provide both National and SBS to areas of the Dandenong Ranges and further afield to Marysville and the Mornington Peninsula.

The Mt. Tassie cell is responsible for three class "B" services, ABLV4 National Television, 3ABCFM and 3GI Sale (AM Regional Service), and four sibling television services (Foster, Orbost, Bairnsdale and Cann River) and 3MT, a further AM Regional Radio Service at Omeo. With Commercial Equalisation, the Mt. Tassie site will see a substantial increase in equipment and services. Provision is being made for five high power UHF TV services, one ABC, one SBS, two Commercials and one spare. Also, a new 20 kW FM service for Radio Regional is to be installed.

The Victorian Monitoring and Information Centre is also located at the Mt. Dandenong facility. Five STTO2's provide 24 hour per day staffing on one man shifts. They are responsible for surveillance of the present 72 services throughout the State.

**JOHN NOTT**



*ABV2 Mt. Dandenong.*



*Melbourne and South East District map.*



*Mallacoota station.*



*District staff.  
Back row (L to R) Wes Ford, John Chomenko, Gerd Messig, Phil Lowe, Ernie Attwood.  
Front row (L to R) Rudi Baranauskas, Guy Sansom, Doug McArthur (District OIC).*



### MR J.D. (JOCK) CAMPBELL

Jock Campbell, M.B.E., who retired from the position of Assistant Director General (Radio), Central Office in 1968, became interested in wireless about 1921 while a youth in Colac. He was an avid reader of the English publication, "Wireless Encyclopaedia" which was printed at regular intervals and eagerly looked forward to each new issue to read about the marvels of the new science.

He joined the Postmaster General's Department as a temporary Telegraph Messenger during Christmas 1921, and this opened up the way to acquire some scrap cable from the local Line Foreman. He twisted the lengths of paper covered copper wire together and wound the wire on a drum and made a sliding contact inductor for a crystal set. After acquiring a piece of galena, a catswhisker and using a long length of wire thrown up to a tree branch as an aerial, he prodded the galena with the catswhisker and with a borrowed single earpiece heard his first spark signals from the Coastal Radio Station VIM located in the Melbourne Domain not far from where the Shrine is today.



*Jock Campbell.*

Not content with listening to a spark transmitter, he decided to build one of his own. With a Ford spark coil he was able to communicate with an Amateur friend about 3 km away, at the same time keeping a sharp lookout for the Radio Inspector.

Experimental sound transmissions were being conducted from time to time by A.W.A. from their building in Queen Street, Melbourne, and Jock was able to pick up these transmissions during the night. The first song he heard on the crystal set was "Oft in the Still of Night".

In 1923, he acquired sufficient parts to construct a valve receiver for reception of short and medium waves. Overseas reception was good and he was thrilled to receive broadcasting stations in Auckland and San Francisco, as well as Australian Amateurs, including such well known experimenters as Ray Allsop and Max Howden.

By the 1930's, Jock was an operator at 3AR when it was taken over by the Government as part of the National Broadcasting Service. As was usual practice at the time, his duties involved transmitter operation, studio control room duties and outside broadcast pick-up work.

Station 3AR went on air on Saturday 26 January 1924 and was the first A Class station commissioned in Victoria. It was owned and operated by Associated Radio Company of Australia Ltd., which manufactured and distributed radio apparatus.

The transmitting station was originally erected at the Company's factory at 51-53 a'Beckett Street, Melbourne, but this proved to be an unsatisfactory site from a technical viewpoint. There was considerable noise interference from nearby power lines, the earthing arrangement was bad, and the antenna system was inefficient and the signal strength from the low power transmitter was no match for the other station 3LO.

Following comprehensive tests by the Consulting Engineer, Donald MacDonald, a new site was selected at North Essendon, about one kilometre from the aerodrome.

A 67 m high mast was erected and there were over 600 guests at the opening of the station on Monday 21 September 1925.

During the ceremony, a document with the signatures of many notable people at the site was buried in a bottle, together with coins of the realm. It was buried beneath the building foundation stone.

Although Jock and many other people made enquiries as to the present location of the buried treasure—if indeed it is still buried there—the extensive housing development on the site has made the pin pointing of its likely location almost impossible.

In 1934, he transferred to the Research Section as Senior Mechanic and participated in a wide range of activities including frequency standards, measurements, site selection for broadcasting stations including 3WV, design of transmitters and receivers, aeronautical radio equipment, radio sondes and many others.

After the War, the emphasis was on the development of new services such as pulse modulation techniques, microwave relays and television broadcasting. There was also a great deal of national and international activity to prepare and implement frequency allocations for these and other radio services.

About 1954, he was appointed Chairman of Study Group 8 of the CCIR—the monitoring group—and held this office for some years. He attended Plenary Sessions of the CCIR in London (1953) and Warsaw (1956) where a proposal was put forward for the CCIR to start planning for the use of frequencies in outer space.

In addition to overseas visits to attend CCIR Conferences, Jock made a number of visits, particularly to Germany, U.K., Italy and Japan between 1953 and 1968 to oversight and arrange acceptance tests for broadcasting and radio relay equipment manufactured in those countries.

At that stage he was in the Radio Section and was concerned with the planning and establishment of television stations and associated relay systems for the National network. He also participated in the early plans for broadcasting in Papua and New Guinea before independence.

By 1964, he had reached the level of Assistant Director General (Radio) and his area of responsibility also encompassed licensing and planning for services for aeronautical, maritime, satellite earth station and co-operation with Commonwealth countries on broadcasting problems. He retired in October 1968.

Today, Jock is a fit 83 years of age, and still maintains a very keen interest in radio, and wonders at the fantastic developments that have taken place over the past 70 years. Gone are the days of the heavy current drain one valve receiver—he now wears a wrist watch radio that operates for weeks on only a small torch cell; radio links via satellite enable him to dial his friends anywhere in the world in a matter of seconds; he can take his vest pocket TV receiver out in the garden and watch the Grand Prix in Adelaide, and best of all he can silence the lot by the flick of a switch.

**JACK ROSS**



### BORROLOOLA

Borroloola is a typical isolated community where a television and two FM Radio services have been established using programs fed via satellite.

It is located on the McArthur River in the Northern Territory, about 60 km from the coast of the Gulf of Carpentaria. It received its first white settlers in 1864 when seven police officers took up residence. Today, there are 90 white inhabitants and 600 aboriginal people in the community.

Borroloola is an aboriginal word for "place of the paperbarks" and the town's original purpose was to develop a centre for handling beef, seafood and minerals.



*The station mast and aerial systems.*

The people have enjoyed a high quality television service since 13 April 1983 and Radio National and Regional Radio on the FM band from 6 November 1987. The facilities are located adjacent to the police station in what was originally a thermally transparent shelter. The shelter has now been insulated to allow an air conditioner to cope with the additional thermal load of the two FM radio services. The television service uses a 100 watt LGT transmitter and the FM radio has two 100 NEC transmitters. Maintenance of the plant is minimal and requires only a yearly inspection visit by maintenance staff based in Darwin, some 700 km away as the crow flies.

The town does not often receive much publicity in the newspapers, but it hit the front pages in September 1986 when a man was killed by a crocodile 4.5 m in length. The crocodile was tracked down, and the torso of the man was found in its stomach. Within a period of three months there

were four suspected crocodile attacks in the Northern Territory.

As animals go, crocodiles do not engender affection. They are neither furry nor cute, do not respond to pats or kind words, and every so often, attack people. One herpetologist noted that crocodiles "are perversely unable to see the special nature of the human animal, and absent-mindedly eat him from time to time."



*On the prowl.*

Recent attacks have done nothing to help the crocodile's public relations problem. Nor has the success of the film "Crocodile Dundee".

Crocodiles are among the largest living reptiles. They have a long, low, cigar shaped body, short legs and long powerful tails with which they swim. They have tough hides, long snouts and sharp teeth to grasp their prey. Their sharp teeth are set in strong jaws that can snap a heavy board in two.

Crocodiles live in the tropical area of Australia and prefer large bodies of shallow water, sluggish rivers, open swamps and marshes. Their webbed feet allow them to walk on soft ground. Their eyes and nostrils are higher than



*It's time to leave.*

the rest of the head. This arrangement fits in with the crocodile's life in the water, for it likes to float with only its eyes and nostrils above the surface. Its throat has a slit-like valve just in front of the tube leading to its nostrils. This valve shuts tight when the animal is under water. It keeps the water from entering through the mouth when the reptile seizes its prey.

**BARRIE MORTON and  
RALPH DENISON**



## THE LIBRARIAN

Radio was the miracle of the age in the 1920's, and it brought forth a proliferation of books, and particularly magazines and journals which taxed the resources of Librarians at Public Libraries and those Technical Colleges fortunate enough to possess a library. It has been estimated that more than 250 magazines and journals on radio subjects appeared at one time or another up to the outbreak of the Second World War in 1939. A great many of these publications have been forgotten, and those which have been preserved, lie in closed storage boxes in the dark corners of libraries collecting dust.

Many of the publications were imported from Great Britain and the USA, but Australian publishers also made a major contribution to filling the shelves of libraries. Well-known early Australian radio magazines included *Sea, Land and Air* (1919); *Radio in Australia and New Zealand* (1923); *The South Australian Wireless (Monthly)* and *Radio Magazine* (1924)—changed to *The South Australian Wireless and Radio Weekly* in 1925; *Radio Experimenter* (1923); *Radio Broadcast* (1925); *The Wireless Weekly* (1922); *The Listener-In* (1925); *Radio-vision* (1928); *The Queensland Radio News* (1925); *QTC* (1927); *The Boys Wireless News* (1924) and many others.

The first library in the Postmaster General's Department was established by Sid Witt about 1925 as a repository of technical information to assist the work of the Research Laboratories. Originally, it comprised personal collections of books and technical journals of the Laboratories' staff, together with official reports and technical notes documenting the work of the Laboratories. About 1928, Miss Belle Robertson joined the staff as the first Librarian to be employed in the Department with one of her first tasks

being to institute the use of the Universal Decimal Classification System to re-classify the growing amount of library material.

Just as the role of the Engineer has developed over the years, so has that of the Librarian, who is now known as an Information Specialist. In Telecom, the National Information Resource Centre has replaced the library, and the concept of more general information access has replaced the limitations of books and periodicals alone. With the emergence of the competitive telecommunications market, it is essential for information to be timely and relevant. To facilitate this, the Centre Information Specialists access the latest sources of published and electronic information through online databases.

To request a search on a particular topic, details of the subject, and any limiting factors such as time or geographical, are provided on an Information Search Request form. A preliminary discussion between the Information Specialist and Engineer may be necessary to define the topic. Thesauri used with various databases may provide the appropriate search terms for the request, or may be used in conjunction with free text searching. Whilst the Information Specialist may have the skills to elicit the information, it is up to the Engineer to evaluate the retrieved information. Further refining of the search may be carried out if the initial information is not satisfactory.

In addition to the provision of books, periodicals, reference material and traditional library services, the Centre provides several other services to enable Telecom staff to keep up with news and information from external sources.

These include Daily News Bulletin, Infotopics, Update, Infosearch, Infopackage, Selective Dissemination of Information and Forthcoming Conferences in Science, Technology and Management.

ALISON HATFIELD



*"If you want a book on OHMS LAW—try the Legal Section down there"*





*Hobart as viewed from Mt. Wellington.*



*Snow plough at work on deep drifts.*

## SNOW PROBLEMS

### ABT2 MT. WELLINGTON

Had knowledge of the problems associated with operating a capital city TV station at an altitude of 1270 metres and a latitude of 42 degrees south been known to the early planners, Hobart's National TV station on Mt. Wellington may well have been sited elsewhere. However, lacking the benefit of hindsight, construction of the tower and building commenced on the mountain top in February 1959 and transmission commenced in June 1960.

The honeymoon with Mt. Wellington was short lived. A few weeks after the station went on air, a large build-up of ice on the tower damaged the dipoles and reflectors of the antenna system. When thawing commenced, ice shed from the upper antenna section resulted in further damage to the lower section. The steel sheet protection provided for the styroflex feeder cables at the base of the tower proved inadequate and both cables also were damaged. The tower itself had been designed to carry 100 tonnes of ice and did the job well. Most damage occurred when it shed the unwanted load. Extensive strengthening was carried out on the antenna system and railway sleepers used as protection for the cable and feeder runway.

The initial year of operation indicated the problems to be expected with ice build-up on the tower and in March 1961 a form of antenna heating was installed. This system was comprised of pyrotenax cables interwoven with the reflector screens at the rear of the dipoles. No heating was attempted for the tower structure. This system proved efficient only if switched on before ice actually formed and when in operation consumed 85 kW of electricity.

As a result of high operating and escalating maintenance costs, coupled with the need to anticipate icing conditions, the heating and original antenna system were removed in 1982 and a fibreglass radome installed to cover the new antenna section of the tower. The radome, known to Hobartians as "the milk bottle in the sky", now successfully protects the antenna system of two TV and four FM services.

Problems of station access became apparent in the early years of operation. Snow drifts of up to four metres in depth blocked the road at several points and proved beyond the capabilities of the existing grader-type snowplough available within the State. Local Autoplant staff developed and constructed a worm-type plough which was used with varying degrees of success. This was replaced in March 1975 with an imported Swedish Rolba snowplough. This unit has proved to be extremely reliable and efficient, clearing drifts of up to 1.5 metres at a rate of 2 km/h. This speed is reduced to metres per hour in the deep drifts.

Overnight rostering of staff was introduced early in the station history to reduce the amount of travelling involved and eliminate night travel. Despite this, many instances have occurred where the incoming shift have been unable to reach the station and the duty shift have been forced to stay on.

NOEL BROWN



*Helicopter on site for repairs to nearby Commercial transmitter.*



*National transmitter site and Telecom R/T site on right.*



## AUSTRALIAN BROADCASTING CONTROL BOARD

From the very beginning in 1923, broadcasting was firmly controlled by the Postmaster General's Department. It allocated licences for the transmitting stations and for receivers used in the home, it determined the studio and transmitter technical standards and undertook inspections to ensure that the standards were observed, and it also set guidelines for program standards.

The Commercial station operators were far from happy with the arrangement. They considered the A Class, and later the National service, was given preference over the Commercial system by the allocation of more suitable frequencies for extended service area coverage and the use of high power transmitters. They also felt they were being unduly criticised when they would not "raise their cultural standards" by imitating the Government funded ABC service, by broadcasting concerts of symphony orchestras etc.

The Government, after much consideration, agreed that there was a need to change the arrangement which had existed for some 25 years. On 28 September 1948, the Prime Minister announced that legislation would be introduced into Parliament to take responsibility for broadcasting out of the hands of Post Office officials and to establish a Board to control radio broadcasting and coming television.

The Australian Broadcasting Control Board was constituted on 15 March 1948 with three Members. The number was later raised to five, with two part-time Members. The first Chairman was Larry Fanning, a former head of the PMG Department.

The Board assumed a number of powers and functions in relation to broadcasting, with those concerning technical matters being:

- To ensure that technical equipment and operating stations were in accordance with standards and practices considered appropriate by the Board.
- To determine the locations, transmitting powers and operating frequencies of radio broadcasting and television stations.
- To detect sources of interference and furnish advice and assistance in connection with the prevention of interference with the transmission or reception of the programs of radio broadcasting and television stations.
- To fix the hours of transmission of stations.

The Board came to an end on 31 December 1976 with its functions being split up and given to the newly created Australian Broadcasting Tribunal and the Postal and Telecommunications Department. During its period of control, the number of National AM and FM Stations had increased from 37 in 1948 when it commenced operation, to 92 in 1976.

Some of the major achievements of the Board included:

- Oversighting the rapid expansion of National and Commercial radio broadcasting and television stations.
- Increase in radiated power of radio broadcasting stations up to 50 kW for National stations and 5 kW for Commercial stations.
- Introduction of television to Australia in 1956.
- Introduction of colour television in 1975.
- Introduction of directional aerials to increase the occupancy of medium frequency broadcast channels.
- Reduction in broadcast channels from 10 kHz to 9 kHz.
- Ongoing investigations and reports to the Government regarding introduction of FM broadcasting.

It is of interest that the majority of Engineers and Technical staff employed by the Board had previously been employed by the PMG Department.

WEST HATFIELD





## NEW TRANSMITTER

### 5CK CRYSTAL BROOK

In January this year, work commenced on replacing the S.T.C. 5 kW transmitters at Crystal Brook in South Australia's mid-north. Crystal Brook is located approximately 200 km north of Adelaide and 30 km south east of Port Pirie at the southern tip of the Flinders Ranges. The station operates with the call sign of 5CK on a frequency of 639 kHz and carries South Australia's ABC Radio Regional program. The existing transmitters had been in service since 1966 and were the third of a series of M.F. transmitters to be installed there since 1932. The original 7.5 kW transmitter was commissioned on 15 March 1932.

The new transmitters were manufactured in Canada by Nautel. They comprise two 5 kW ND-5 Ampfet transmitters operated in parallel providing 10 kW into a 190 metre sectionalised radiator. The Ampfet ND-5 transmitters are fully solid state each using four identical Power



*The replaced STC 2x5 kW transmitter.*

of 5CK. Bruce played a significant role in the installation of the S.T.C. transmitters in 1966, so it seemed appropriate for him to be involved in the de-commissioning of transmitters he helped install nearly 25 years ago.

The installation, commissioning and handover of the Nautel transmitters to the Spencer Gulf staff was completed on March 7 1991.

**RAY JACKSON**

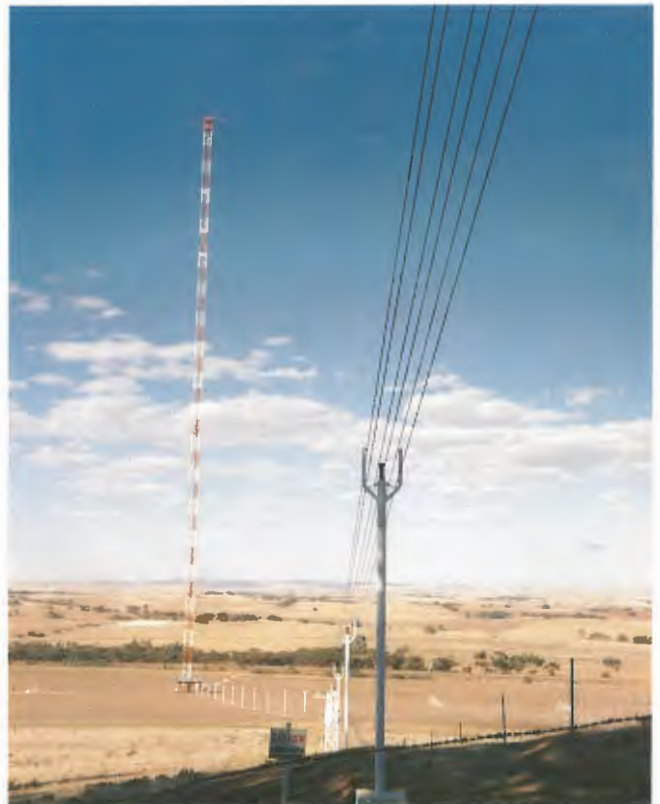


*New Nautel 2x5 kW transmitter.*

Subsystems containing 3 FET power amplifier modules and its associated Pulse Duration Modulator. The configuration is combined to give an output of up to 5.6 kW per transmitter. The exiter and modulator driver units are housed in a pull-out drawer below the power amplifiers with the alarm and control circuitry accessible behind a panel just above the amplifiers. With the PDM modulating system and solid state componentry, significant savings in operating and maintenance costs are expected over the previous transmitters.

The program input equipment remained unaltered except for minor modifications required for transmitter alarm and control. The main program source is via Telecom program line from Port Pirie where local program is derived from the ABC studio or switched through from the Adelaide studios.

The installation team comprised Tom Pascoe (Project Engineer), Ray Jackson (STTO 2), Bruce Combe (TTO) and assistance by the staff from the Spencer Gulf Broadcast District who are responsible for the maintenance



*Station transmission line and 190 m radiator.*



## RADIO HISTORY AS A HOBBY

There has always been some magic in the radio-electronic craft which has captured the imagination of those who become involved with it. In these days many people from all walks of life are discovering the fascination of radios of the past. Many are active or retired technicians and engineers, others are reviving a hobby interest now that the pressures of business and raising a family are less demanding. Still others have had no technical training, but have fallen in love with the beautiful cabinets and styling of some of these relics of an earlier technology. Many of these old radios are now 50, 60 or more years old, but can usually be coaxed back into performing as well as they did when they were new.

All around the world, groups of enthusiasts have formed clubs or societies to promote their interest in the history of radio, or wireless. Initially wireless was a name coined to describe a means of communication between two parties without a connecting telegraph or telephone line. With the commencement of broadcasting after the 1914-1918 War, the word radio came into use to describe a system of transmitting news and entertainment to many listeners. However, many people still use the term wireless when describing both styles of transmission.

In Australia, in 1982, a group of enthusiasts held a meeting in Melbourne, and decided to form the Historical Radio Society of Australia, now an incorporated body. In the

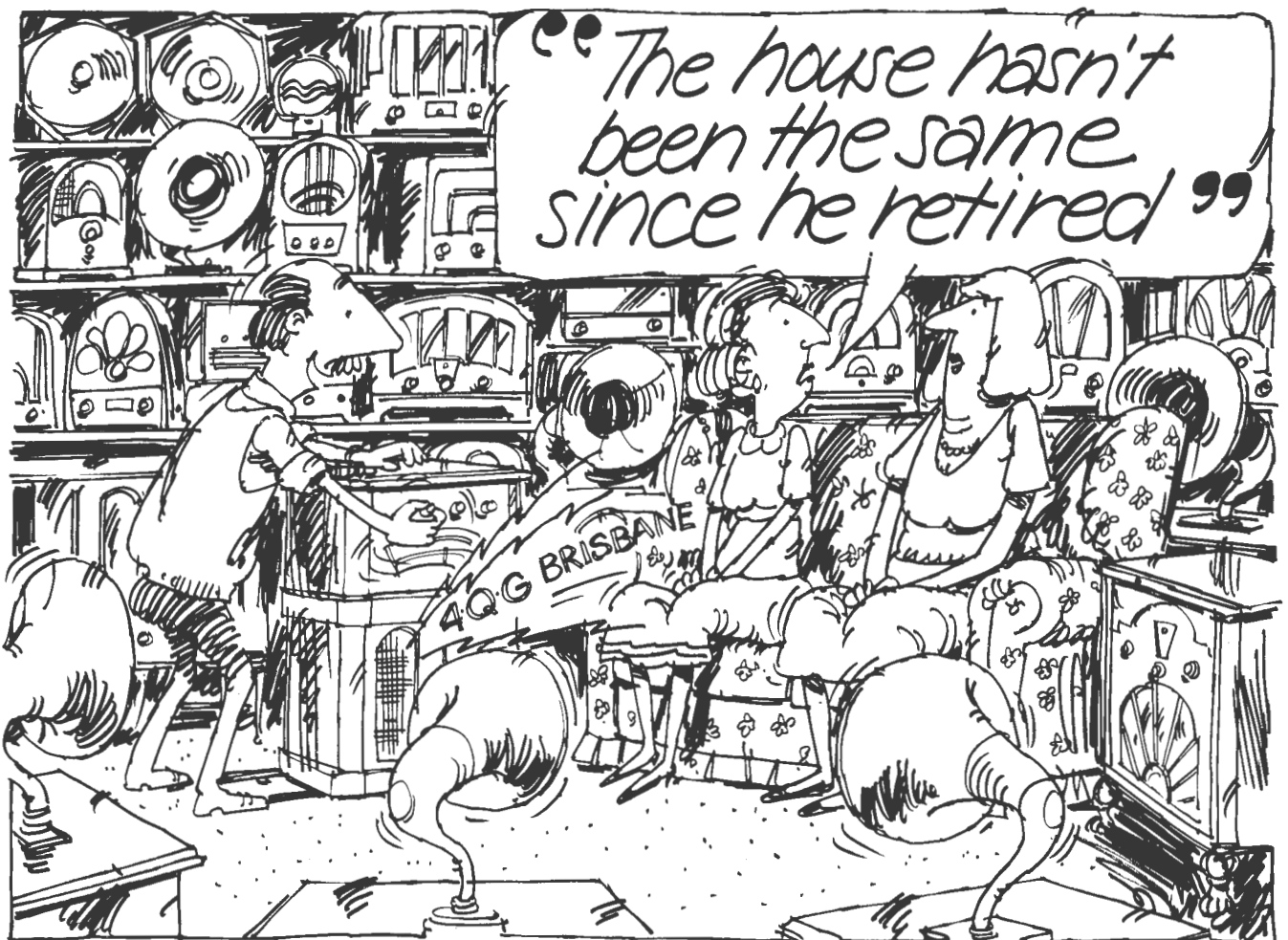
intervening years the Society has enrolled around 550 members, ranging in age from 16 to 93, and has a current active membership of around 400, located in all States of Australia, plus some in New Zealand, U.S.A., the United Kingdom, Europe and Japan.

The aim of the Society is to cater for the needs of those interested in preserving the equipment and records of past times in radio and wireless telegraphy, especially in Australia. Monthly meetings are held in Melbourne, and regular meetings in the Sydney, Bathurst and Coffs Harbour areas of N.S.W., and also in South Australia. Details of these meetings are given in the "H.R.S.A. Newsletter", which is mailed to members four times a year, and carries descriptions of classic radios, with circuits, often articles on military radio, hints on restoration, and memories of the way things used to be in the days when radio was the wonder of the world. Members may advertise, free, with a line limitation on the advertisement, for their needs in restoring a radio, or to dispose of any surplus items related to the aims of the Society.

The Society is also collecting files of service data on Australian made radios in particular, and offers a circuit service to members at cost.

The membership includes many former, and even some current staff of Telecom Broadcasting. If any reader of *The Broadcaster* would like to know more details of the Society, the Membership Secretary Mr J. R. Wales, PO Box 283, Mt Waverley, Victoria 3149 would be happy to assist.

RAY KELLY





## 9RB RABAUL PAPUA NEW GUINEA

Between 1946 and 1970, Queensland broadcast staff of PMG/Telecom installed some 28 medium and high frequency transmitters in Papua New Guinea, designed to transmit the Territory Administration's local area information services and the programs of the Australian Broadcasting Commission. The 9RB Rabaul station was one of these services.

Prior to the advent of 9RB, MF broadcast reception in the daytime at Rabaul was what would be achieved in a well earthed double screened room. In other words, nothing, an unnerving experience for one used to metropolitan Australian listening. The first reaction was to assume the receiver was faulty.

Reception of the HF services VLT and VLK from Port Moresby was possible of course, and these provided a valuable news and information service for most of the country.



*Tom Pearson (L) and Ralph Bongers with the survey vehicle.*

The Radio Laboratory in Brisbane had at that time a war surplus left hand drive GMC van fitted with a 500 watt Federal HF transmitter and a generator driven by the vehicle engine. The van was painted Post Office Red and drew a great crowd of awe-struck sightseers when it was unloaded in 1960 from the "Malekula" onto the wharf at Rabaul at the eastern end of the island of New Britain. As the transmitter tuned down to the top of the broadcast band, a site survey for a station to serve Rabaul district was made using 1542 kHz.

The author and Supervising Technician Ralph Bongers set about the job in somewhat un-Australian conditions.

Tom Pearson, Engineer of the local Post and Telegraph Department borrowed men from the nearby jail to cut a clearing in the tall kunai grass, sufficient to accommodate the van and a 20 metre vertical aerial with surface radials.

Testing was carried out at two likely sites, at Kurakukaul and at Vunakanau, the latter being an old wartime Japanese airstrip. These sites were most "likely" from the possibility of acquisition from the owners, rather than being the best electrically.



*Rabaul township and Simpson Harbour.*

A local Administration vehicle and driver facilitated the survey, and all that was necessary was the ability to instruct the Tolai driver when to "stop along here" and to "round him car" (turn around). Many interesting tracks through the rain forest leading to coffee and coconut plantations were explored, and a field strength coverage pattern developed.

Due to local volcanic activity over several million years, the whole country was covered to a great depth with compressed pumice, a kind of powdered glass which seemed to be great for vegetation, but ruinous for electromagnetic propagation. The extremely poor ground conductivity was beyond the limits of any graph we had ever seen. Consequently the 2.5 kW STC transmitter finally installed gave a seriously restricted coverage, but being only 5 km from town where most listeners lived, it served its purpose.

A temporary installation of transmitter and studio was made in town in 1962 and the permanent site at Kurakakaul was completed and became operational in July 1966.

One of the highlights of the tour was the canoe ride across the harbour to the base of Matupi volcano, and the scramble up the rocky slopes to the rim of the crater, to be greeted by an awe inspiring view and the smell of sulphur.

**DOUG SANDERSON**



*Doug Sanderson at the 9RB station gate.*



**PETER VINE**

Peter Vine, Officer-in-Charge District No. 7 N.S.W., commenced as a Technician-in-Training with the Postmaster General's Department in 1955. During the final year of training, he completed three months of National Service and worked at the ABC Studios in Forbes Street, Sydney.

In 1960, Peter was appointed to Radio Telephone Installation group where he remained for 10 years occupying positions of Senior and Supervising Technician. He was involved in the installation of a wide range of systems and associated support plant. One of the most memorable projects was the installation of the first VHF single channel systems in the far west of N.S.W. Many of these systems were powered by wind or thermo-electric generators.

In 1971, Peter was promoted to STO1 in Broadcasting Services where he gained valuable experience in most broadcasting areas and when the Broadcasting Districts were introduced in N.S.W. he became OIC of District No. 8 which consisted of numerous sites and services which were not appropriate for incorporation into other Districts. The District headquarters was based in Sydney with an outpost at Bourke.

When the District boundaries were redrawn in 1989, Peter moved from Sydney to Taree as OIC of the new District No. 7.

In his spare time Peter likes to fish and play a game of bowls or golf.



*Peter Vine*



*Brian Robb*

**BRIAN ROBB**

Brian Robb, Officer-in-Charge, District No. 6, Lismore, N.S.W., came to Australia from England in 1949 and after completion of education at Richmond High School, entered the Postmaster General's Department as a Junior Postal Officer at Granville in 1954. In 1955 he took up a position of Technician-in-Training at the Strathfield Training School.

After specialising in radio and television and graduating as Technician, Brian travelled widely throughout the State installing radiocommunication systems. In 1963 he joined the team installing television equipment at Mt. Nardi near Nimbin and following commissioning of the station, stayed on as a member of the operating staff. Following success in the Senior Technician Examination, he was promoted to Shift Leader.

When the OIC position of the station became vacant he was appointed to the position in 1983 and later to the present position after formation of the District. In addition to the normal local technical and managerial functions, Brian has assisted in the conduct of numerous job interviews for other areas.

Although in recent times, Equalisation has claimed a great deal of his time, he has found time to become involved in other interests such as sailing, adult education, a parent group for deaf children, broadcasting over the local community FM station, home building and travelling in his motorhome.

**KEN MOORE**

Ken Moore, PTT02 and Officer-in-Charge Tamworth District N.S.W., joined the Postmaster General's Department in 1959 as a Technician-in-Training. He qualified as Technician Radio in 1964 and worked on the installation of radiocommunication systems until transferring to the broadcasting area where he joined the installation party at Middle Brother Mountain, Taree for the National and Commercial transmitters.

On commissioning of the station, Ken remained at Middle Brother as Technician on shift until he qualified as STTO1 in 1966. Ken then spent a year on the installation and maintenance of translators throughout the State and in 1968 accepted a short term relieving position at ABUN7 Mt. Dowe as STTO2. It turned out to be a permanent transfer, and in 1984 he was promoted to the OIC position at Mt. Dowe.

In January 1987, Ken was promoted to STTO3 in charge of District No. 5. He moved to Tamworth with wife Heather, leaving his grown up family behind at Narrabri.

Ken was promoted to PTT02 in 1988 and has since spent a number of periods in the State Office as Acting PTT0 Stations or Acting BOM.

Ken's outside interests while his family was growing up included involvement with local sporting authorities, but in more recent times he is involved in Philately, specialising in the pre Commonwealth, Australian Colonies period.



*Ken Moore*



*Allan Wright*

**ALLAN WRIGHT**

Allan Wright, PTT02, and Officer-in-Charge Orange Broadcasting District, N.S.W., joined the Postmaster General's Department as a Technician-in-Training at the Strathfield Training School in 1961 after completing the Leaving Certificate at Grafton High School.

After completion of training, Allan married Brenda and took up appointment as Technician at ABDN2 Dorrigo, where he worked as part of the team for the installation and maintenance of the shared station at Mt. Moombil. He remained at Dorrigo until 1971 when he was promoted as Shift Leader at ABCN1 Mt. Canobolas, Orange.

With the reorganisation of the Branch in 1985, Allan was promoted to STO2 and OIC of the original Orange Broadcasting District and later to PTO1 level in 1990 when rationalisation of the Districts took place. The District comprises two television station complexes, two MF stations and ten translator or low power TV stations. During 1989 with Equalisation, two extra Commercial transmitters were provided at many of the sites.

While at Orange, Allan gained an Amateur Operators Certificate and Television Operators Certificate and participated in a number of community activities including Junior Soccer referee, a Scout Leader and Vice-Captain of a Volunteer Bushfire Brigade.

In his spare time, Allan can be found fishing, gardening or operating his Amateur Radio Station.



## THE GREEN TRAIN

### THE ABC AND AUSSAT MAKE BROADCASTING HISTORY

Australian broadcasting history was made during a two week period in June when the ABC and AUSSAT joined forces in a project which enabled television and radio news studios to broadcast while travelling along the Queensland coast from Cairns to Brisbane, a distance of some 1 700 km.

The technological feat was part of the ABC's Green Train environmental project aimed to inspire Queenslanders to become "Guardians of the Environment".

Queensland Railways, a co-sponsor of the train, provided 15 carriages for the travelling environmental displays. Exhibitors leased full and half carriages for displays on the train. Telecom Australia was one of the exhibitors. A feature of the train was a stunning 200 metre long mural featuring possums, dolphins, cassowaries and gekos.

ABC Television broadcast the Queensland news bulletin live from the train every week night while ABC Radio broadcast more than 55 hours of programs from the train.

The live broadcasts were made possible through AUSSAT's Transportable Earth Station (TES) which travelled with the Green Train by road, mounted on a 12.5 metre long semi-trailer towed by a large prime mover unit. TES is a complete earth station in itself with uplink/downlink capability for television plus associated sound. Staffed by a crew of two it can also provide two by two-way voice circuits. The TES is mounted on a semi-trailer with special air-cushion suspension. A collapsible dish antenna receives and transmits the satellite signal through telecommunications equipment housed in an air conditioned shelter.

Working under the project theme "Finding Common Ground", the Green Train was open to the public free of

charge at eight major centres. The project was designed to encourage the community to come together and learn more about the many areas of environmental concern in the world today.

On World Environment Day, 5 June, a special edition of "The 7.30 Report" was broadcast from the Green Train while it was in Townsville.

KAY NICOL



Rod Henshaw ABC 4QR Brisbane staff.



Artist's impression of the ABC Green Train.



## HUMOUR FROM THE LOGS

In the days when transmitting stations and studios were staffed, it was normal practice to use logbooks in which day-to-day activities were entered. These activities included such things as interruption to transmission, marred program, maintenance works, station visitors and many other matters. It was not unusual for the operator to add a personal touch to the entry and in some cases these had humorous overtones.

The following remarks recorded in logbooks by operators over the years are typical:

*Antenna collapse*

The antenna wasn't built in a day but it fell down in a night.

*Microphone trouble*

At 6.00 a.m. the announcer intended to hit the gong with the mallet but hit the microphone instead.

*Injury to operator*

Too many Volts will cause you to bolt.

*Another injury*

When standing near high voltage, remember that a pickpocket isn't the only one who keeps out of trouble by keeping both hands in his pockets.

*Following visit of local Ladies Club to the transmitter*

Generally speaking, a woman is generally speaking.

*First broadcast from a new large studio room*

The largest room in this organisation is the one for improvement.

*Interview at country studio*

That farmer made a real goat of himself, he kept butting in.

*Fault on the program line from the studio*

When you hear a whistle in the speaker you can be sure it isn't the kettle in the lunch room.

*Announcer blundered in switching*

That new announcer is like a match without a head—useless.

*Injury to technician when an item fell on his head in the storeroom*

He made a false step by not moving.

*Visitor to station backed his car into transmitter building*

The building corner post struck back in self defence and injured the car.

*On installation of a septic toilet at transmitter to replace earth closet*

Our new toilet is like a sweet potato, the best part is underground.

*Announcer spilt cup of coffee on studio carpet*

Take heart man, the worst is yet to come. The cleaning lady hasn't seen it yet.

*Announcer pushed the wrong button*

Some announcers use their brains but some use less than others.

*Man bumped head while working inside transmitter*

Don't use your head, you might damage equipment.

*Visit by Rawleigh salesman*

He had everything in his display cases except transmitting tubes so I did not buy anything.

*Catfight outside transmitter building*

For a moment I thought it was my wife having a go-in with the neighbour.

*Snake slid out doorway when operator came on duty*

Joe Blake slept here last night but forgot to sign the logbook.

*Local Policeman called in on his round.*

I thought he came about my expired car registration.

*OIC's wife brought up some hot scones for morning tea.*

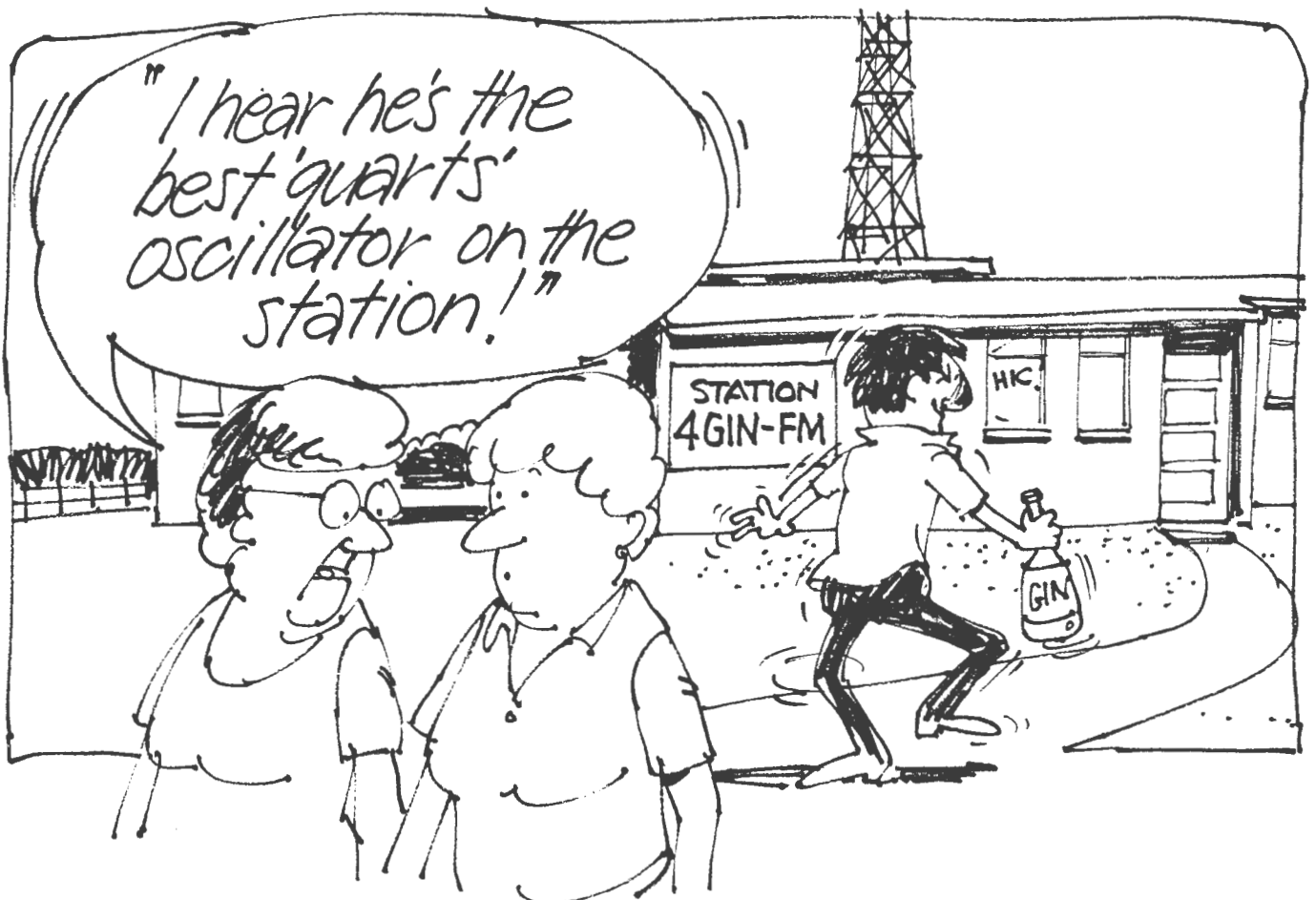
No wonder the boss wouldn't eat them. They were like rocks.

*Senior Technician showed his girl friend over the station.*

Snr Tech: "This black box is the quartz oscillator"

Girl friend: "The only 'quarts' oscillator I've seen before is when you staggered out of the pub after drinking a quart of gin"

JACK ROSS



## LETTERS TO THE EDITOR

Contributors to Letters to the Editor are reminded that full names and addresses must be supplied. Letters should be brief and to the point. Long letters may be edited. The Editor's decision in respect of the suitability of letters for publication in *The Broadcaster* is final and no correspondence on the Editor's decision will be entered into.

During the depression years the Postmaster General's Department took over the technical operation of A Class stations to form the National Broadcasting Service. The staff at the Hobart Station 7ZL was a Senior Mechanic located at the studios, in charge of three Mechanics at the studios and three at the transmitter. The transmitter was located on "Radio Hill" near South Hobart. A more popular name was "Keen's Curry" due to a large advertisement formed from white stones which shared the same hill.

In 1935, I had just finished schooling and jobs were scarce so I decided to get a "Broadcast Operators Certificate" as another "B Class" station was supposed to be opening here. The examination was conducted by the Radio Inspector who was also the "Transmission Engineer" in charge of radio operations for the Postmaster General's Department. The depression was ending at this time and the Department wanted to get its telephone Mechanics back to their proper occupation and as a result I was offered a job at the 7ZL transmitter. However, it wasn't that easy as the Senior Mechanic refused to have me on the basis "that you couldn't trust a temporary employee". For a few months I did odd jobs in the radio field and filled in time at the Workshop on such soul deadening jobs as repairing faulty switchboard cords. Eventually, the Senior Mechanic was either overruled or decided I could be trusted after all, and I was posted to the transmitter.

The transmitter as I found it, has been commissioned in the early 1920's and was mostly built from a transmitter previously used in Melbourne. The exciter had a 150 W triode of the 203A type connected as a Hartley type oscillator with frequency controlled by a variable inductor—there was NO crystal. This drove a Power Amplifier using a SILICA tube made by Mullard which was made of material which could stand a lot of heat. The anode consisted of a basket woven from tungsten and the envelope was made from silica. The catch was that no leads could be found that would match the thermal expansion of silica and so the normal method of making seals could not be used. This was overcome by taking the leads out through long stalks which were filled with lead which took up the difference in expansion. The tube was then mounted in a fibre tube through which air was blown to prevent the lead plugs from melting.

The final tank circuit was the old spare transmitter, the condenser of which was mounted in a glass case about a metre in each dimension and with spacing to match. The large tank coil sat on this and was tuned by adjustable tap. This was then coupled to the aerial tuning coil mounted on the wall near the lead-out to the T type aerial. There were a couple of hairy things there. Firstly, the lead from the PA valve to the condenser ran across the floor and was covered by a piece of timber—you had to step between these units to read the aerial current. Secondly, if there was an electrical storm nearby, sparks would bypass the coil and jump two metres to the floor with a resounding crack.

The audio arrived from the studio on land line and was fed through an equaliser to the driver valve. There were no preamplifiers, level controls or VU metres. This stage used a large triode of the 100 W class and drove the modulator consisting of four Marconi "Football" type tubes (MT7B) in

parallel, connected to the PA on the Heising principle. Grid bias for these tubes was provided from receiver type B batteries; those for the modulator stage were a bank of heavy duty 45V types. The only test meter at the station (apart from a MEGGER) was a DETECTOR No. 4 which was a fairly insensitive meter used to test these batteries. The anode voltage for the modulator was 8 000 volts and was fed to the PA through a bank of 32 carbon filament lamps in series. The 8000 volts bus was a 6mm copper tube which ran across the top of the equipment. This was kept polished with "Brasso" by an ex-Navy operator.

Power was drawn from the public mains and no standby was supplied. The 8 000 V supply was produced by a 3 phase motor which drove a single phase alternator, the output of which was stepped up and then bi-phase rectified by two silica tubes, similar to the one in the PA but without a grid. All this was followed by a condenser input filter.

The low power stages were fed from a 1 400 V DC generator. Somewhat smaller rotary machines were provided for emergencies.

At first the method of changing over to the spare plant went as follows: "Lift the RED floorboard and remove the wire with the GREEN tracer from the wire with the BLUE



*7ZL transmitter building during erection at Radio Hill, December 1926.*

tracer and connect it to the wire with the ORANGE tracer" and so on. The Department soon installed change-over switches. The station was at the end of a long power supply line and at peak periods, the voltage would drop quite substantially. Although the HT voltages could be controlled by the alternator and generator excitation, the filaments were directly fed from the mains via transformers, and so their voltage would drop. It was not unusual for the Class C modulated PA to run without any grid current—but no one seemed to notice the difference. The power supplies were replaced in 1937 when space was needed for the installation of a second transmitter 7ZR. The 8 000 V supply then came from a Philips designed 6 phase, grid controlled mercury vapour rectifier set whilst the 1 400 V supply came from a small rectifier unit using two 866 rectifiers.

All the various pieces of equipment stood around on the floor or were separately mounted on wooden racks. This combination of mighty machines produced, from memory, 1 700 watts input to the PA with a modulation capability of about 70 per cent. With all its limitations it provided a reasonably satisfactory service and was only replaced just before the Second World War.

**JOE BROWN**

*(Since receipt of this letter I have been advised that Joe passed away.—Editor)*



## 2NR LAWRENCE

Shortly after the Postmaster General's Department took over responsibility for the Government initiated National Broadcasting Service in 1929, planning began for the establishment of Regional broadcast transmitters. The plans included a station to serve the population of the Northern Rivers area of New South Wales.

A field strength survey was conducted during mid 1933, and a site for the station was selected at Lawrence, about 31 km north of Grafton.

The station was officially commissioned on 17 July 1936 following a speech by Postmaster General, Senator A. J. McLachlan. Acceptance tests had been completed during the previous month when field intensity measurements confirmed the theoretical work and preliminary measurements that resulted in the selection of the Lawrence site. It was the third Regional station of the NBS to become operational in New South Wales.

The 7 kW water cooled transmitter was manufactured in Sydney by Standard Telephones and Cables Ltd, and installed by PMG staff under the supervision of a company engineer.

The radiator was a type not previously constructed in Australia, the main feature being a 153 m lattice steel mast mounted on a base insulator and surmounted by a horizontal steel armature of cartwheel form about 20 m in diameter and insulated from the mast itself by large porcelain insulators.

The first OIC was E. J. Halcrow who took up residence on 19 August 1935.

Primary power for the station was normally derived from the three phase mains of the Clarence River County Council but to provide for line interruptions, an engine alternator set of 88 brake horsepower was provided on site.

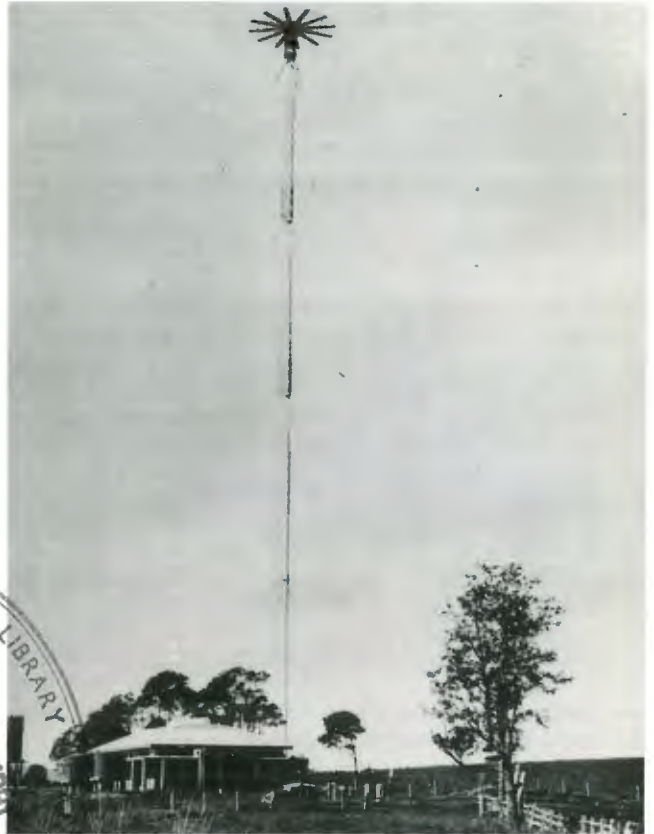
A standby transmitter of AWA manufacture rated at 2 kW was installed and put into operation on 27 July 1946.

On 13 November 1946, the radiator collapsed during a violent storm and was replaced in November 1951 by a similar type.

384-5495  
V6  
BRD  
During June 1952, the original transmitter was modified to give 10 kW output. It was replaced in July 1958 by the present STC 50 kW main and 10 kW standby units.

The Golden Jubilee of the station was celebrated on 17 July 1986. The occasion was marked by broadcasts by the ABC and a number of civic activities by the people of Grafton. Banners decorated Grafton's main street, and 50th Anniversary car stickers were widely distributed.

**BRIAN ROBB**



Building and radiator 1936.



Present 2NR 50 kW transmitter.