

# *The* **BROADCASTER**



Newsletter of the Broadcasting Division

No. 21

November 1991



**4RK ROCKHAMPTON**

## 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.

Written and photographic contributions are welcome. All material should bear the contributor's name and location and be directed to:

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## EDITORIAL

Reading Peter Williams' Letter-to-the-Editor concerning his experiences in Darwin, brought back memories of how isolated Darwin was in 1942 when I first went there as a member of the Royal Australian Air Force.

Radio reception was almost non-existent from Australian stations for most of the time. The MF band was dead except for high noise during daylight hours, but after dark there was a cacophony of distorted and fading signals of zero entertainment value. The HF band was just as bad. Although transmissions were taking place from Lyndhurst and Perth, signals were weak and very few Servicemen listened-in. The best signals came from the enemy transmissions in the north and BBC transmitters based in England. Some time during the War years the Army established an amenities station 5DR in Darwin but it was not operational during my term there.

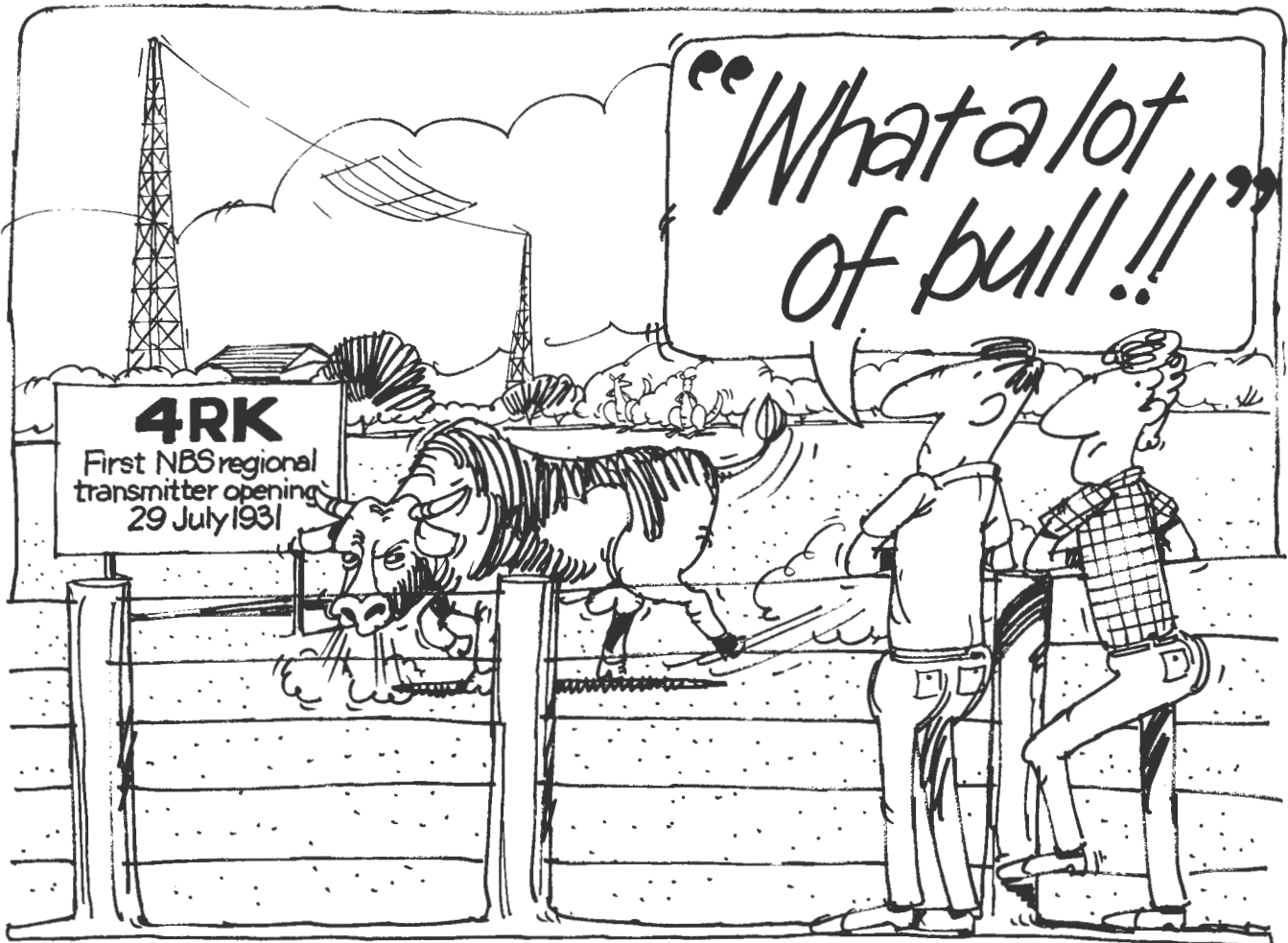
Today of course, people living in Darwin have access to the full range of National and Commercial television and radio services equal to those provided elsewhere in Australia.

**JACK ROSS**

*Front cover:* The 4RK 128 m radiator.

*Contributors to this issue:*

Leon Sebire	Rex Wales	Peter Williams
Mike Dallimore	Bruce Wilson	Betty Ross
Graham Smith	Jim Finch	Ross Kearney
Brian Cleary	Iain Fraser	Terry Sellner
Jeff Cirson	Mario Klauzer	Bob Hinrichs
Dave Taylor	Jerome van der Linden	
David Duffin	Norm Scott	Jack Ross



**ABW2 PERTH**

ABW2 channel 2 was established as the first National TV transmitting station in Western Australia and commenced operation on 7 May 1960. The station is situated at Bickley which is 20 km from Perth city at a height of 348 m, near the edge of the Darling scarp.

The area is mainly natural bushland but is becoming more populated as people move in to escape the city area.

The installation consisted of two Marconi 10 kW transmitters with a Marconi antenna on a 127 m tower to produce an omnidirectional ERP of 100 kW. The antenna is horizontally polarised. Transmission was originally in black and white format but during March 1975, facilities were upgraded to provide for colour transmission.

In 1990, the Marconi transmitters were replaced with a pair of NEC PCN 1410AL units operating in parallel.

The Marconi antenna system has reached the end of its service life, and is currently being replaced with an antenna using RFS 606L panels.

The original station standby power plant was replaced in early 1991 with a unit supplied by Detroit, comprising a Detroit 12V92T turbo charged diesel with a Stamford HC534E alternator giving a total unit rating of 400 kVA.

Other services on the Bickley site include SBS, 6ABC-FM, 6JJJ, Multicultural Radio and a number of paging and mobile services. The station is also the home of the Monitoring Information Centre (MIC) which is staffed on a 24 hour basis.

**TERRY SELLNER**

**6WF HAMERSLEY**

Station 6WF was the first broadcasting station to commence operation in Western Australia when it began transmission on 4 June 1924. It was an A Class station operated by Westralian Farmers Ltd, using an AWA manufactured transmitter providing about 650 watts at the low frequency of 140 kHz into a cage type aerial located on the roof of the company building in Perth.

On 20 December 1928, the station was taken over by the Postmaster General's Department as part of the Government's plan to establish a National Broadcasting Service. Programs were provided by the Australian Broadcasting Company until 1932 when the Australian Broadcasting Commission took over the role.

Because the transmitting plant was outdated technology, and in need of considerable maintenance, the Research Laboratories staff designed a new transmitter for installation at a new site at Hamersley about 13 km north of Perth. The transmitter was manufactured in the Melbourne Workshops and produced 3600 watts carrier power into a multiple tuned flat top aerial at a frequency of 690 kHz. The transmitter was commissioned on 14 December 1932 and employed a single 4220B water cooled valve in the final stage. The station was the first in Australia to employ a rigid copper tube coaxial transmission line to connect transmitter to the aerial.

In 1953, a 180 m antifading radiator replaced the flat top aerial and 6WF shared the facility with 6WN. The flat top is now used as a standby radiator.

The water cooled transmitter was replaced by an air cooled STC 50 kW model 4-SU-38B on 18 June 1961, and this transmitter is still in operation.

**TERRY SELLNER**



*Leon Sebire*

**FROM MY DESK**

Over the years, our Broadcasting staff have been called upon to provide technical expertise in small or developing countries in our region. Many of our older readers will remember the days when this included the establishment and operation of the National Broadcasting Service in Papua New Guinea, a task which presented a particular and somewhat unique set of problems.

My own involvement in overseas activities occurred in the late 1950's when Australia provided a number of 10 kilowatt M.F. transmitters to India under the Colombo Plan. These were A.W.A. BTM10 units similar to those being installed in our network at the time and I understand several still remain in service within All India Radio.

Since then we have undertaken development and maintenance projects in the Solomon Islands, Vanuatu, Tuvalu, Vietnam, Cambodia & Kiribati. Most of this work has been performed under Foreign Aid arrangements sponsored either by the Australian Government or the United Nations Development Fund.

I believe these international activities are beneficial to us as they present opportunities for travel, often quite different technical challenges to those experienced in our normal activities and a high degree of satisfaction from providing a much needed service to the community concerned.

Why then are we not seeking out and undertaking more international activity? The answer is that it is normally unprofitable because there is intense competition, largely from equipment manufacturers or specialist international organisations who can offer substantial discounts or sometimes interest free or low cost finance. Nevertheless, we will, in the approaching national competitive environment, continue to pursue all such opportunities.

As this is our last issue of The Broadcaster for 1991, I would like to take this opportunity to offer T.B.D. staff and readers my sincere best wishes for the forthcoming Christmas period and New Year.

**LEON SEBIRE**  
General Manager

## MAX CHADWICK— DEPUTY GENERAL MANAGER

Max Chadwick, Deputy General Manager, retired in July after 43 years service with the Postmaster General's Department and Telecom.

Max commenced with the PMG's Department in Adelaide as a Technician-in-training in 1948. After gaining a Cadetship in the Drafting Section in 1949 he worked as a Draftsman in the Building Services area.

In 1959, Max decided to pursue an Engineering career and began a 4 year full-time course at the South Australian Institute of Technology. After graduating in 1963, he was appointed to the Broadcast Studios Section and soon after, transferred to the TV Sub-section where he was responsible for the installation of several high power TV stations in regional South Australia, including The Bluff and Mt Gambier.

After a brief period in the Workshops and Training Sections, Max transferred to Darwin as Project Engineer responsible for the completion and commissioning of the Radio Australia transmitting station where he continued as Senior Engineer-in-charge for three years after commissioning.



*General Manager Leon Sebire (L) making presentation to Max Chadwick.*

Following the devastation by Cyclone Tracy, resulting in severe damage to the Radio Australia, Darwin station, Max moved back to Adelaide. Only a short time later, he transferred to Melbourne in 1976 to head the National Office Broadcasting Operations Branch. In 1980, he was promoted to Assistant Director and subsequently became Deputy General Manager, Broadcasting.

During his time at National Office, Max was responsible for the determination of operational policies and staff arrangements for the Division. Industrial negotiations played a major part in these activities. Max was also heavily involved in the formation of Broadcasting as a separate Directorate and subsequently, a Division of Telecom. This was a significant event in the Division's history and a major highlight of Max's career.

On the evening of 4 July, Broadcasters from around the country gathered at 'Le Chateau' to celebrate Max's retirement. Attendees included current Divisional staff including Regional Managers, several of Max's former colleagues from Adelaide, ABC and Department of Transport and Communications executives and industry representatives.

The night was hosted by Leon Sebire, General Manager, who presented Max with a Service Medallion and an arc welder.

We wish him well in his retirement.

**GRAHAM SMITH**

## ALLAN GARNER—QLD REGIONAL MANAGER

The Queensland Regional Manager, Allan Garner retired in July after 43 years service in PMG/Telecom and D.O.T.A.C.

Allan commenced in the then PMG's Department in Brisbane in January 1948 as a Technician-in-training. As a Technician he worked in various areas of Broadcasting and Radio Communication Construction throughout Queensland.

During this period, Allan continued his studies which led him to becoming a Trainee Engineer and subsequently an Engineer appointed to the Queensland Television Division. There, he became involved in TV antenna installations at the major regional sites in the State until 1966, when he accepted an appointment in National Office.

In National Office, he worked on numerous TV antenna projects and Phases 6 and 7 TV. He then moved to the Radiocommunications area and was involved in the design of microwave systems and the Darwin to Gove tropospheric scatter system. He then returned to TV where he became Supervising Engineer, TV New Works.

He was in this position until 1980 when he left Telecom and joined what is now the Department of Transport and Communications as Assistant Secretary in the National



*General Manager Leon Sebire (L) presenting Service Medallion to Allan Garner*

Broadcasting Branch. There he was responsible for the implementation of the Capital Works Program and the operational aspects of National Broadcasting.

The prodigal returned to Telecom in 1986, and became the State Broadcasting Manager, Queensland, a position he held until his retirement. In this position he was a major contributor to the management of the Division as whole and because of his knowledge of both areas was instrumental in facilitating lines of communication and creating greater understanding between the people in T.B.D. and D.O.T.A.C.

In the last three years of his career, he led the Queensland Region in what was the biggest Capital Works program since Broadcasting began. Allan was the driving force in this, and his direct involvement with the major participants in the projects, staff motivation by example and the injection of his considerable experience and intellectual talent was the most significant factor in the Region's achievements.

The General Manager Broadcasting, Leon Sebire presented Allan with his Service Medallion and a barbecue unit for use on his yacht at a function in Melbourne on 4/7/91. He expressed best wishes and thanks on behalf of Allan's many friends and colleagues.

**BRIAN CLEARY**

**MR W C ROHDE**

News has been received that Mr W C (Bill) Rohde, former Supervising Engineer, Radio, Queensland and one of the pioneers of the National Broadcasting Service passed away in Toowoomba on 7 July 1991. Bill's interest in radio began in the early 1920's before the establishment of broadcasting stations in Australia. As a teenager he joined the YMCA Wireless Club in Brisbane and soon graduated beyond the stage of the crystal set and one valve battery receiver to multi-valve models employing sophisticated and complex circuits of the period such as the Grimes inverse duplex circuit, Acme and Erla reflex circuits, Rice regeneration circuit, inverted Reinartz circuit and others before the days that neutrodyne and superheterodyne circuits became popular. He was a recognised expert in this field and was the envy of his mates in being able to construct receivers which worked when first switched on. In April 1924, he joined the Postmaster General's Department as Junior Mechanic-in-training and qualified as Telephone Mechanic in 1929. In the same year, he obtained his AOCPL licence and operated Amateur station VK4RW.

When the Government legislated in 1929 to take over the A Class broadcasting stations to form the National Broadcasting Service, the Postmaster General's Department assumed responsibility for station 4QG Brisbane as from 1 February 1930. Two days later, Bill Rohde was instructed to report to the station OIC as a member of the technical operating staff to be responsible for the AWA transmitter, studio facilities and outside broadcast technical activities.

Thus began an association with broadcast engineering until 1937, and included such highlights as the arrival of the record breaking aviatrix Amy Johnson at Eagle Farm airport in 1930, the visit of the Duke of Gloucester in March 1934 and the Forster Cup yacht race in Moreton Bay in February 1936. Bill was also associated with the installation of 4RK Rockhampton in 1931. The station was the first regional station in Queensland.

Because of difficulty in obtaining good quality microphones for outside broadcast work, Bill was given the task of manufacturing Reisz carbon types. He spent hours chipping away at marble blocks to shape the microphone body and to cut out the cavity to contain the carbon granules. At one stage, he had visions of becoming a stonemason because there seemed to be no end to the work. During the period 1938 to 1953, he worked in the Transmission and Trunk Service areas and included among his many activities was the installation of the HF Direction Finding system at Cloncurry for aircraft navigation purposes. During the War years, he installed similar stations at other centres. In between jobs, Bill used every opportunity to study for the Open Engineers Examination and eventually qualified.

In 1953, he transferred back to the broadcasting area, this time as Divisional Engineer. At the time, there were 14 MF transmitters in operation in Queensland as well as stations in Papua New Guinea, also the responsibility of the Queensland Radio Section. Bill was well known for his wit, humour and happy disposition. Staff recall that on returning to radio after an absence of some 15 years his first question to staff was, "Are we still using coherers"?

Promotion in 1961 to Supervising Engineer, Radio saw Bill being in charge of all sound broadcasting, television and radiocommunications facilities during a period of rapid growth in all areas.

Bill retired on 7 December 1972, but maintained an active interest in broadcasting, particularly historical aspects, through the Postal-Telecommunications Historical Society and the GPO Museum in Brisbane. He provided a number of contributions to *The Broadcaster* and I for one, will miss his comments and helpful advice.

**JACK ROSS**

**JAPANESE VISITORS**

Just before last Christmas, a group of Japanese Journalists, during a fact finding tour of Australia, visited the Radio Australia transmitting station on Cox Peninsula near Darwin and stayed the night at the Mandorah Motel which has been established on the Peninsula. Before construction of the Radio Australia station, the present Motel was no more than a weekend hide-away for Darwin residents. To get to it meant a 160 km drive from Darwin over a narrow dirt track. On their return to Japan one of the Journalists wrote of his experiences at the Motel and sent a copy of the magazine article to a member of the station staff.

The article has been translated by ABC Radio Australia staff in Melbourne and the text is as follows:

"No point of going anywhere else but the very Top End", I thought as I arrived in Darwin, but was told that it is extremely difficult to travel in the area even by a 4WD and that I had to apply for permission.

While looking at the map, I felt fortune smile on me and allow me to find this place called Mandorah, which is two hours away from Darwin.

As I approached the place, my instinct told me that this was going to be a great holiday.

I stayed at the only motel in Mandorah, monopolizing the swimming pool for the next several days.

"I wish to go fishing", I told the receptionist, who called up a fishing mate for me. This is how I met Tony "the cowboy". Despite his rough appearance, Tony was a warm-hearted bloke, who taught me how to catch barramundi.

The night fell, all the neighbours gathered at the motel restaurant, which is the only meeting place around. I met David, who had been an extremely hard-working public servant for 20 years before he obtained what he had dreamt for—life in the bush. David showed me around and I enjoyed inspecting giant anthills and admiring the movement of wild horses.

Every evening when I came back to the motel, the friendly restaurant owner, Bev, would ask, "How was the catch?". "I learned what is called patience" was my reply.

Mixing with the locals with a can of beer in hand, I said to myself, "This is exactly the sort of place I had been looking for in Australia".

**MARIO KLAUZER**

**EYRE PENINSULA DISTRICT**

The Eyre Peninsula District was established in 1984, and comprises seven sites housing ten services supplying the area delineated by the major townships of Ceduna in the north-west, Whyalla in the north-east and Port Lincoln in the south. Although the district extends to the W.A. and N.T. borders, east of the central highway there are no services currently in this remote and sparsely populated area.

Over the last six years, the District has steadily changed, with the closure of Thevanard to allow Commercial television to take over the channel 7 allocation at Ceduna; the addition of Winter's Hill and Coffin Bay to maintain coverage with the reallocation of TV services to band 4 at Borthwick Hill during the band 3 clearance, and the addition of Mt. Damper to provide services to the townships of Wudinna, Minnipa, Kyancutta and surrounding areas plus the expansion of the SRRN network with services added at Borthwick Hill, Streaky Bay and Wirrulla.

The local economy is squarely based on two industries. Rurally, grain production predominates, making up 75% of the rural economy, with 1.2 million tonnes produced annually of which 95% is exported through the two ports at Thevanard (Ceduna) and Port Lincoln. Port Lincoln also, is home to the largest fishing fleet in Australia with boats ranging from the small fast trailered boats of the Abalone divers to the monster trawlers of the Tuna and deepsea fisheries.

Southern Bluefin Tuna provide the background for one of the biggest single tourist events on Eyre Peninsula, "The Port Lincoln Tunarama", which is held over the Australia Day weekend each year. This includes the now famous sporting event of Tuna tossing, where contestants struggle to hurl an 8 kg tuna over the greatest distance.

With a staff of only four and usually one on leave over the busy summer period, it can be hectic. Since the furthest site from the depot is a mere 410 km, the district staff do a lot of driving in the line of business and are seldom inclined to tour the area preferring to spend their spare moments fishing, shooting clay pigeons, tinkering with computers, sport or with their families.

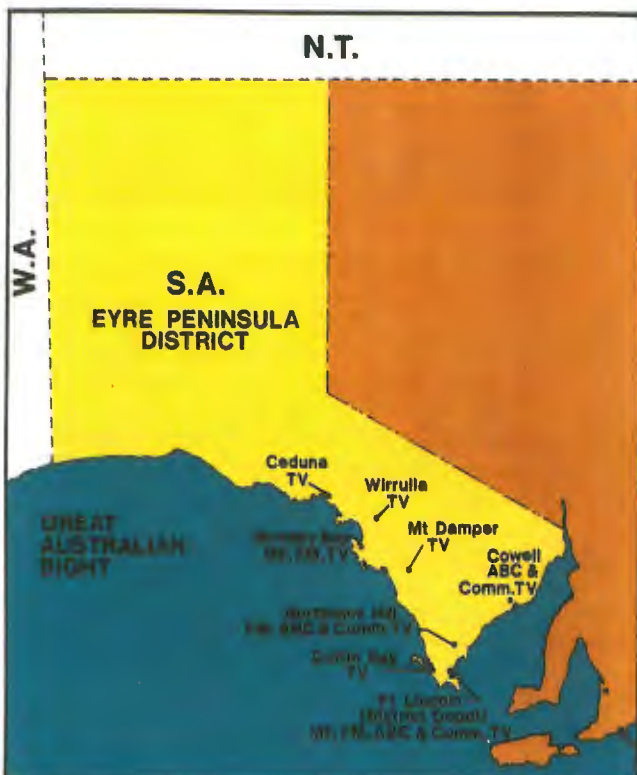
**IAIN FRASER**



*District staff (L to R) Iain Fraser (OIC), Marty Morris, Mark Osborn, Sophie the camel, Colin Burk.*



*Mt Damper TV station*



*Eyre Peninsula District Map*



*Prawn trawler*

### MR S V (STAN) HOSKEN

Stanley Victor Hosken was born on Christmas Day 1894, and joined the Engineering Branch of the Postmaster General's Department in Victoria in 1914.

His early career was spent on the expanding telephone service of the Department. It was an exciting period in communications technology with the first automatic telephone exchange in Australia being commissioned at Geelong in 1912. The rapid developments in telegraphy and telephony made a great impression on Stan, but it was the advancements in the science of wireless telegraphy—the newcomer in communications engineering—that really fascinated him. It subsequently resulted in a change in



*Stan Hosken (at bottom of ladder) with friends inspecting his 102ft (31 m) aerial used with station 3MP which began operation in 1924 on 219 metres (1370 kHz).*

direction of his career into broadcasting when the Department became involved in the design, installation and operation of broadcasting facilities in the late 1920's.

As an impressionable young teenager, he followed with interest the great publicity given in the newspapers in 1906 of wireless telegraphy stations set up at Port Lonsdale in Victoria and Davenport in Tasmania by engineers of the Marconi Company to demonstrate the practicability of communicating across Bass Strait by wireless telegraphy. Little did Stan know that many years later, he was to

establish a radio link to maintain communications across the same Bass Strait when the submarine cable failed in 1931. It was not long before Stan passed the examination set by the Radio Inspector, and obtained licence No 6 to operate Amateur station 3MP from his home in Queen Street, Surrey Hills. He constructed an elaborate station and established many contacts throughout the world. He was an active 200 metre band operator providing programs for listeners before the advent of official broadcasting stations in Victoria.

With Government approval being granted for the establishment of broadcasting in Australia with 2BL, 3AR, 2FC and 6WF, Stan was among the group who designed radio receivers known as Sealed Sets in 1923 to meet the Regulation requirements for broadcast receivers.

The Sealed Set Scheme did not last long, and designs were changed to allow receivers to operate across the full broadcast band. In Melbourne, 3AR was soon joined by 3LO and Stan took a great interest in the rapid developments in broadcast engineering. When the PMG Department took over the A Class stations, including 3AR and 3LO in Melbourne in 1929 to form the National Broadcasting Service, he transferred into the broadcasting area as Mechanic. Included among his involvement in broadcasting activities were the construction of an early VLR short wave transmitter at Lyndhurst and a new transmitter for 6WF Perth to replace the original long wave AWA transmitter which had been installed in 1924 for Westralian Farmers Ltd.

The Lyndhurst station was originally used for experimental purposes by the Research Laboratories with the first transmitter operating in 1928 to provide programs beamed to Northern Australia using 600 watts on 9580 kHz. The transmitter was put into regular service for ABC programs in 1934 using call sign VK3LR.

The original 6WF transmitter was outdated technology by 1930 and was located in a bad position in the city to provide efficient transmission. The Research Laboratories staff designed and constructed a new transmitter using the Melbourne Workshop facilities. The transmitter provided 3.6 kW carrier power using a 4220B water cooled valve and was commissioned at a site at Hamersley about 12 km out of Perth on 14 December 1932. It was the first major design and transmitter construction project undertaken by the PMG Department for the National Broadcasting Service. Prior to that, transmitters had been obtained from commercial sources.

Stan later became Foreman Mechanic at 3WV Doon, the first station in Victoria to operate with an armature radiator when it was commissioned in 1937. One of the unusual operating features of the station was that it generated power on site using large Ruston Hornsby diesel generators for the 10 kW transmitter. When 3LO/3AR transmitters were brought together at a common site at Sydenham using a dual frequency radiator, Stan was the first Officer-in-Charge and lived in the residence provided adjacent to the station.

He was also an author of some merit. In the October 1938 issue of The Telecommunications Journal of Australia he was author of the comprehensive article "Broadcasting Station Maintenance" which was based on a lecture he delivered before the Postal Electrical Society of Victoria on 8 August 1938. In the 1950's he wrote a number of articles on "Linear Detectors" published in Radio and Hobbies.

Stan retired from the Department on Christmas Eve 1954 while occupying the position of OIC 3LO/3AR.

**REX WALES**

## MT. NELSON SIGNAL STATION

Before the advent of broadcasting, wireless telegraphy and even the electric telegraph system, communication over long distances was carried out by various means. These included smoke signals, bugles, drums, horns, shells, pigeons, heliograph and semaphore.

The most widely used method by the early white settlers in Australia was the semaphore. This started by the employment of hand held flags and later developed to the mechanically operated semaphore or Chappe system.



**The Mt. Nelson Semaphore Telegraph c. 1870**  
 This Mt. Nelson Semaphore Telegraph was an important communication link between Hobart and the Port Arthur penal settlement. It was built in 1831 and was used until 1888. The photograph shows the mast and the building at its base. The mast is made of wood and has several arms extending from it. The building is a small, simple structure with a gabled roof. The background shows a hilly landscape with some trees and a small building in the distance.

*Photograph inside the Signal Station showing facilities about 1870.*

One of the early stations established in Australia was at Mt. Nelson overlooking Hobart. In December 1811, Governor Macquarie, during a visit to Hobart, ordered that a flagstaff and guardhouse be erected at Mt. Nelson to announce the appearance of ships entering the Port of Hobart with a Corporal guard stationed at the signal post with the necessary flags and instructions for making signals. On his return to Sydney, Macquarie forwarded a Spy Glass, Bunting for flag colours and a copy of the Signal Book being used at Sydney.

In the 1820's a Semaphore Telegraph system was introduced between Mt. Nelson and Hobart. The system used an upright post with arms to send signals.

After the opening of Port Arthur as a penal settlement in 1830-31, the system was extended to allow transmission of messages between Hobart and Port Arthur with four intermediate repeater stations. The Mt. Nelson signal mast

still stands today and the Chief Signalman's cottage built of oregon pine weatherboards is now the home of the Mount Nelson Signal Station Tea House.

Semaphore communication between Hobart and Port Arthur continued until the closure of the Port Arthur penal settlement in 1877.

In 1858, the newly established Marine Board of Hobart took over control of the Signal Station and introduced the Electric Telegraph between Mt. Nelson and Hobart. There was considerable public outcry on the decision. In 1880, Tasmania's first official telephone service was established between the Mt. Nelson station and Hobart.

About 1888, the Semaphore Telegraph ceased to send signals from the site ending an era in visual telegraphy.



*The Signal Station today.*

In 1958 a radio telephone base station was established on the site, but later removed to another location.

The Mt. Nelson Signal Station ceased operations in 1969 ending 158 years of Tasmanian communications history.

However, in September 1991, the Tasmanian Tourist Minister announced that plans were being prepared to revive the convict-era stations to working condition as a tourist attraction. The Hobart based Colonial Semaphore Company plans to restore at least four stations on the original Hobart to Port Arthur circuit. The stations being considered for restoration are Mount Nelson, Battery Point, Richmond and Port Arthur. The proposal would be subject to all historical and archaeological values of the sites being protected.

**BETTY ROSS**



## **COMMONWEALTH ASSETS REGISTER**

During the month of May 1991, the Broadcasting Division undertook a major stocktake of all Commonwealth owned assets. At the same time, all assets were re-labelled with barcoded tags and full details of each asset were recorded on a standard proforma. The exercise which took staff to all sites within Australia with National Broadcasting facilities was a major undertaking and as a result, around 50,000 Commonwealth Assets have now been tagged and recorded on a centralised system.

Although asset registers previously existed within each State, no policies or guidelines had ever been issued which standardised the content of the registers. This had in the past complicated the compilation of a central database. Planning for the new database began in June 1989 with the purchase of the ORACLE Assets package and a SUN



*National Office computer equipment.*

Microsystems Mini computer. But that was the easy part. Much of the implementation work, which was ongoing since then, centred on the production of a complex category system and the relationship of the Assets register with the National Faults and Outages Database. Messrs Norm Scott and Graham Ward and our SA/NT Region are to be congratulated for their fine effort in completing much of the work associated with the category system.

With the rules defined and suitable proformas designed, it was then necessary to guess how many assets were involved. Using the definition of an asset which we had developed, we considered 250,000 to be the highest figure and probably 100,000 to be the lowest. By restricting the initial requirement to assets with a purchase cost of \$500 and above, the total quantity was probably reduced by 40%. Thankfully, our lower guess was closer to the actual quantity, although the data entry process was dimensioned for the higher figure of 250,000.

To cope with the large volume of paper which was received, and to allow the data entry process to continue at night and on weekends, office space was hired in suburban Melbourne where a data entry centre was established. The data entry terminals were connected to the National Office computing facilities by modem and twelve data entry operators were trained in the use of Assets software package.

By working nights and weekends we had the capacity to cope with 30,000 entries per week but were able to limit



*L to R. Paul Taylor Systems Administrator and Ken Spicer Systems Development Officer.*

operations to normal business hours due to the lower quantities of proformas received.

At the time of writing this article, the data entry work is complete and the tedious process of ridding the database of errors is underway. Soon all Regional offices will be given access to the National Office computer in order that each Region manages its portion of the data base. Procedures are also being implemented to track the movement of Assets around Australia and this is a process which will affect every Broadcasting staff member. Since the management of the Commonwealth Assets and the assets register is one of our contract requirements with DOTAC, it is a task with which we must soon become familiar.

**MIKE DALLIMORE**



*L to R. Ken Spicer and Neil Cornell Administration Office Class 4 examining printout.*



Jeff Cirson District OIC and current 10 kW Nautel transmitter



New transmitter building. Original building at rear.

## DIAMOND JUBILEE

### 4RK FIRST NBS REGIONAL STATION IN QUEENSLAND

When the Australian Government gazetted Regulations on 1 August 1923 to enable the establishment of a broadcasting service, the Queensland Government immediately took up the challenge and sought licences to operate stations in Brisbane and Rockhampton by a State sub-Department called the Queensland Radio Service. The station in Brisbane with call sign 4QG commenced transmission on 27 July 1925 but Rockhampton residents had to wait until 1931 before they received the benefit of a local broadcasting station.

With the establishment of the National Broadcasting Service in 1929, the PMG's Department developed plans for expansion of broadcasting to country or regional areas. The first station to be erected in Queensland was 4RK on a site at Gracemere about 10 km west of Rockhampton.

The original transmitter providing 2 kW output, was designed and manufactured by Standard Telephones and Cables Ltd., London in 1929, and installed by Post Office staff under supervision by an STC representative. It comprised two units mounted on angle iron frameworks which lined up to present a continuous front panel mounting all meters and operating controls and enclosed at the back by an expanded metal cage. The units comprised the oscillator-modulator unit and the power amplifier unit.

The whole of the power to operate the transmitter was provided by machines which were installed in an adjoining room which also contained the motor driven pump supplying cooling water for the power amplifier valves.

The power supply machines comprised two three-unit motor generator sets. The generators of the first motor generator set furnished the filament and grid bias supplies while the other set furnished the high tension voltages.

All the apparatus necessary for the generation, modulation and subsequent amplification of the carrier to a sufficient power level to feed the power amplifier was contained in the oscillator-modulator unit. Power amplification was performed by a single stage consisting of two water cooled 4228A type valves. The transmitter was one of the first transmitters to operate with a crystal controlled oscillator.

A control desk was located opposite the transmitter, and in the amplifier room with three racks of audio and test equipment, was a studio desk fitted with microphone and two turntables.

The antenna was an 18 m long multi wire T type suspended between two tapered self supporting towers 39 m high.

The station was commissioned on 29 July 1931 with a function being held in the Rockhampton School of Arts.

During 1948, an AWA 2 kW type 4J5129R using 833A type valves in parallel push-pull for the modulator and power amplifier replaced the STC transmitter.

Additional land was acquired and a 128 m sectionalised and top loaded radiator was erected in 1954, and fed by a newly installed 10 kW STC transmitter.

In October 1963, a 2 kW STC 4SU-14C transmitter replaced the AWA 2 kW standby unit.

In 1988, a small Logan type building was erected behind the original building and a 10 kW Nautel solid state transmitter commissioned on 30 June 1988 resulting in the station being operated in an unattended mode 24 hours a day after years of staffed operation.



Original 2 kW water cooled transmitter installed 1931



Original transmitter power supply motor-generator sets.

JEFF CIRSON

## BROADCASTING DIVISION ON SHOW

Broadcasting Division exhibited some of its wares and services at the Institution of Radio and Electronics Engineers, Australia, IREECON International Convention and Exhibition held at Darling Harbour, Sydney from 17 to 20 September 1991.

On show were examples of our main "products"—*installation*, represented by a 100 watt FM transmitter with monitoring and surveillance equipment, *broadcasting structures construction and maintenance*, depicted through photographs and captions, *maintenance*, illustrated by a map showing the extent of the network we manage and the suite of test equipment developed to automate transmitter performance testing and *surveillance*, illustrated using the Mini-ACTTS connected to the 100 watt transmitter and a computer on the stand serving as an MIC.

The display was constructed by the South East Queensland District, and was manned for four days of the Exhibition by Bob Hinrichs, Queensland Region Finance Manager and Ian McFarlane from SEQ District, while Graham Smith and Mike Dallimore from National Office



*Mike Dallimore (L) and Ian McFarlane manning the Broadcasting Division stand at the IREECON Exhibition at Darling Harbour.*

served for two days. Valuable local assistance was provided by New South Wales Region staff.

While sales which alone usually justify the Exhibition appear likely to arise from the week, the display was probably of even greater value in raising the awareness of the Division in the commercial world, one small step in paving the way to a successful future in the competitive marketplace.

Concurrently with the Exhibition was a Lecture Program which attracted some 180 technical papers covering a broad range of subjects from Australia and overseas, with authors coming from as far afield as California, USA. Areas covered included Communications, Radar, Broadcasting, EMI/EMC, Microelectronics, Antennas, Optical Fibre Technology, Microwave Technology, Simulation, Broadband Networks, Manufacturing, Intellectual Property Rights, Software Productivity and Education.

IREECON which is held every two years provides the most widely recognised regular forum for presentations, meetings and discussions among engineers, technicians, scientists and management executives engaged in every field of electronics. It brings together the most significant contemporary knowledge on research, development, manufacturing and applications and offers widespread benefits to all participants.

**BOB HINRICHS**

## A BROADCASTER IN SAUDI ARABIA

Having missed the initial selection of people to join Telecom Australia (International)'s Saudi Arabia project, I was pleased to be selected in early 1990 to join the team as its Finance Manager on a twelve month contract.

As most readers of *The Broadcaster* will appreciate, it turned out to be a very eventful year with the impact of the Gulf War on Saudi Arabia and scud missiles coming into Riyadh right over the Saudi PTT compound which is the home of the Australian team there.

Saudi Arabia has modern TV and radio facilities including English television and radio services for many hours daily. The programming even includes a number of Australian shows like *Beyond 2000* and *Hey Dad*. However, being a radio hobbyist since the mid 1960's, I had made a point of taking a Sony 2001D shortwave receiver with me for the purpose of keeping up with the latest news and sport from home.

In the Riyadh compound, a small suburb effectively, Telecom Australia people have the choice of three NTSC, two Saudi PAL (or was it MESECAM?), and an Australian PAL channel occasionally in addition to a cable FM radio service, all on a single cable. As some villas were limited to two system sets, some initially only had the Australian PAL signals in black and white and without sound until, with typical Aussie ingenuity, the sound was put on a second cable FM channel, so that with the aid of an FM radio, everyone could at least watch replays of taped Australian TV in black and white.

As the second FM channel was only used part time, one of my contributions to the after work scene in Riyadh was to relay Radio Australia and the BBC. This was accomplished by using the Sony 2001D's programmable feature to switch the set to particular frequencies for certain transmission times, as my arrival time home was unpredictable.

When Iraq held Westerners from Kuwait and its own cities hostage from September 1990, Radio Australia was the first International broadcaster to commence special programs for the hostages, (and later of course the Navy). I was able to provide regular reports and alternative frequency suggestions to Radio Australia and the team at Cox Peninsula, which mounted the special transmissions after Darwin's normal close-down, as it had the most suitable antennas for Middle East transmissions.

Though I was in Riyadh at the commencement of Operation Desert Storm, and was there for the city's first night of frightening pyrotechnics, I spent several of the war weeks in Jeddah with the many other Australians who were removed from Riyadh. From Jeddah, during February 1991, with the sunspot cycle near its maximum, I was able to confirm that the first regular transmissions from Darwin on 25 MHz since the station's restoration in 1984 were being well received.

On the local broadcasting scene, it had been a pleasant surprise to the thousands of Western expatriates in Riyadh to find the US, and later the British forces very rapidly establishing FM radio stations with contemporary music and up-to-the-minute news fed in by satellite. "Desert Shield Radio" part of the AFRTS, and BFBS quickly became very popular, even with the local population, many of whom have been exposed to Western media through visits to the US and Europe.

**JEROME VAN DER LINDEN**

## FOUR 25 KW UNITS

### NEW SYDENHAM TRANSMITTERS

The old faithful STC valve transmitters at Sydenham which have broadcast the Australian Broadcasting Corporation's programs to the greater Melbourne area for many years are finally being replaced with the latest Nautel ND25 solid state PWM types. Whereas the old equipment was configured with 50 kW main and 10 kW standby, both of the ABC services (3RN/3LO), will now each operate with parallel 25 kW Nautel units.

Each of the four 25 kW transmitters has multiple redundancy in the PA's in the form of 12 x 2.3 kW modules and any individual failures will only result in a minimal power reduction. Faulty modules can be replaced without interrupting the service. The main DC power supply in each 25 kW transmitter supplies a nominal 72 volts at 670 amps under 100% sine wave modulation.

The work at Sydenham has extended well beyond the simple replacement of the transmitters. New program input equipment, voltage regulators, control circuitry, earthing, building modifications and the installation of a new 480 kVA alternator has required many hours of work by Branch staff.

A number of special features have been designed into the internal and external transmitter control to take account of the inevitable lightning strikes and for VSWR protection. Previous experience with solid state transmitters has pointed out the VSWR problems associated with high structures during storms and the fact that modern transmitters may not be as tolerant as older valve types.

As the Nautels are fitted with coaxial outputs, new 50/200 ohm balanced to unbalanced coupling units have been designed to match to the existing open wire feeders. The coupling units incorporate switching to allow the use of standby antennas during maintenance activities and as precautionary measure during severe electrical storms. A new 50 ohm water cooled 50 kW RF load has been installed for maintenance and testing.

**DAVID DUFFIN**



*Complete 3LO transmitter comprising parallel 25 kW units.*



*L to R. Station OIC Gerd Messig, Project Engineer Hartley Fernando and Rudy Baranauskas inspecting RF modules.*



*L to R. R.O.E.S. rack, standby program link, 3RN input equipment, 3 LO input equipment, miscellaneous equipment.*



*Station OIC Gerd Messig with main and standby RF exciter unit.*



*3 LO transmitter with balanced load in foreground.*

## GRAEME CHRISTIE

Graeme Christie, PTT02 Broadcast Operations, Queensland joined the Postmaster General's Department in Brisbane as Technician-in-training in 1954. Following completion of training in 1959, and a period of service in the Army as a National Serviceman, he worked as a Technician at Bald Hills and Atherton.

In 1962, Graeme was promoted to Senior Technician Radio, Proserpine, where he was kept busy maintaining early valve type radio telephone systems linking the mainland and the Whitsunday Islands until 1964 when he took up a position of Shift Leader at ABWQ6 Mt. Goonaneman.

In 1970, he moved inland to Mt. Isa as OIC of the Mt. Isa Radio District where he was involved in the maintenance of major radiocommunication systems on the Townsville to Darwin route as well as television services in the area.

Graeme's next move was to Mt. Gravatt as Assistant OIC of the Radiocommunications Centre in 1975. He remained there until 1986 when he returned to the Broadcasting fold as PTO Operations.

Graeme and wife Jan, who have daughters Sonya and Wendy and son Kim, live on an acreage block near Beenleigh where they enjoy their rural lifestyle and spend most of their leisure time working towards self sufficiency and preparing for a life after Telecom.



Graeme Christie



Richard Womack

## RICHARD WOMACK

Originally from the United Kingdom, Richard Womack on graduating from Brunel University, London in 1977 joined Marconi Communications Systems Ltd., as an installation and commissioning engineer. As a result, he travelled extensively both within the UK and worldwide working mainly on high power HF turnkey broadcasting projects.

After eight years of globetrotting for Marconi, Richard decided he was disenchanted with living out of a suitcase, so he resigned and donned a backpack instead! After spending six months travelling in Australia in 1986, Richard decided Australia was where he wanted to live.

He joined Telecom in 1988 accepting a vacant Engineer Class 1 position, but is currently Senior Engineer, Engineering and Construction Section, Queensland.

For one of his first projects with Telecom, Radio Australia at Brandon, Richard drew on his previous experience on HF curtain arrays to commission the new TC1 antennas. However, since joining Telecom, most of his time and energy has been devoted to the Equalisation Project as Project Engineer for the Townsville and Cairns Districts.

Richard, and his Australian wife, whom he met and married since his arrival in Australia have one daughter. Richard's interests include driving, maintaining his Lotus sportscar, bushwalking and watersports.

## BOB HINRICHS

Bob Hinrichs, Finance Manager, Queensland Broadcasting Branch since July 1990 graduated with a Degree in Applied Science and worked for several years with the Queensland Water Resources Commission on major dam, weir and hydro-electric projects throughout the State.

Bob then moved to Alice Springs where he was Project Manager for field investigation on the Alice Springs to Darwin railway.

His next move was to South Australia where he worked for the NH and MRC Road Accident Research Unit based at the University of Adelaide while he studied for a Master of Business Administration Degree.

In 1988, Bob returned to Brisbane as Business Systems Manager for an engineering consulting firm where he was responsible for management information systems, corporate computer systems, marketing strategy and business planning. The business eventually merged with an international organisation and Bob then joined the Broadcasting Branch.

Bob has a wide range of private interests. He is a Commercial Pilot, being mainly involved in aerobatics since 1981; has participated in Formula 2 and sports Car racing events, including State and National title wins and lap records at a number of circuits during 1975 to 1980; boating with his Bertram power boat acquired in 1977 and, when time permits, he enjoys a game of golf or squash.



Bob Hinrichs



Bob Horsley

## BOB HORSLEY

Bob Horsley PTT02 Officer-in-Charge of the Dalby Broadcast District Service Centre commenced service with the Postmaster General's Department in New South Wales as a Technician-in-training in January 1960.

During his period of training he spent time in Radiocommunications installation, ABN2 Sydney maintenance, and the installation of ABRN6 Lismore. He qualified as Technician in December 1964, and was despatched to Taree for 12 months where he worked on the installation of ABTN1 and ECN8 Middle Brother. He then transferred to the installation and maintenance of ABQN5 and CWN6 Mt. Cenn-Cruaich, Coonabarabran, where he remained for 15 years.

In December 1980, Bob moved to Queensland to become Officer-in-Charge of ABDQ3 Darling Downs. Two months later, Bob and his family together with members of his staff saw their homes inundated by the worst flood in Dalby's history.

He formed the Dalby Broadcast District in 1986 when the bulk of the district broadcast services was transferred from the control of the Radiocommunications Centre at Roma. When shiftwork ceased in January 1988, the District headquarters was moved to 4QS Dalby and he was appointed Officer-in-Charge.

Bob and his wife have five children, four of whom are leading their own lives away from home. In his spare time, Bob is kept busy with voluntary community work and enjoys a good book.

## BROADCASTING AND PUBLICATIONS AUTHORITY-KIRIBATI

As outlined in the November issue of *The Broadcaster*, a visit was undertaken to Kiribati, a small island country in the south west Pacific Ocean to assist in determining requirements for upgrade of the local broadcasting facilities. The mission was undertaken as an Aid Project under sponsorship from the Asia-Pacific Broadcasting Union.

During the first visit, Jim Finch undertook a detailed examination of the badly deteriorated aerial system. Subsequently, Jim and Norm Scott, also from the Adelaide office, visited the site where Jim oversighted the installation of a new aerial and Norm carried out a comprehensive evaluation of the studio and transmitter equipment.

The original aerial consisted of a T type supported by two 48 m high lattice steel masts. Steelwork and fittings were so badly corroded that there was no option but to replace the entire system.

Due to space restrictions, and the need to minimise spares requirements, it was decided to erect a base insulated 66 m high mast matched to the transmitter via a network using a simple series and shunt inductor arrangement.

With the exception of the mast body which was obtained from the NSW Broadcasting Region, aircraft warning light fittings which were purchased commercially and the guy and base foundation design which came from National Office, everything else was designed by SA/NT Broadcasting Region and manufactured in the Broadcast Lines Workshop, including the matching network. Five island people were engaged by the Authority to assist in all facets of the new installation which included pegging out, excavating, mixing and pouring concrete, laying the earth mat, mast erection, installing 240 volt power cabling from the transmitter building to the coupling unit and installing mast lights.

All of the excavating was done by hand, the concrete mixed by hand and all the time, in bare feet.

The whole job went very well considering the only rigging experience that any of the local people had, came from climbing coconut palms.

The studios are located on Barriki Island, the commercial centre of Tarawa, while the transmitter and aerial are located on Nanikai Island about 1.6 km east of the studios.

The original station transmitter is a Marconi 10 kW type BD227A but was not operational during the inspection due to a fault in the 6V DC filament rectifier for the BR1122 final RF amplifier. There is a complete set of valves for the transmitter but no other spares.

The main transmitter is a Pye LDM1235 10 kW AM broadcast transmitter installed in 1984. The low level solid state modulator drive system operating on the series modulation principle is capable of a nominal 40 watt CW output. This is followed by the power amplifier that uses two identical air cooled ceramic RF tetrodes type 4CX15000A as a carrier stage and a peaking stage in a Doherty type high efficiency linear amplifier.

The transmitter is turned on and off remotely from the studios.

The original studios designed by the Marconi Company comprise a large square shaped Music studio in the north east part of the building and a smaller square shaped Talks studio to the south east. Both studios are in a line through

their north east and south west diagonals so that they are joined by their common overlapped corners and are separated by a common small diagonal wall running north west, south east.

A Recording Control Room is located to the south of the large Music studio and to the east of the Talks studio, sound proof windows between the recording Control Room and the Music and Talks studios provide a visual link between technical operators in the Recording Control Room and artists in either studio. There is also an Announcing Control Room to the west of the Music studio and north of the Talks studio arranged in a similar fashion to the Recording Control Room. The two studios and control rooms are interconnected via sound lock passages along the south and west walls.

Studio 3 was added later, and is used as the main on-air announcer controlled working studio.



*One of the old masts on the way down.*

As a result of the inspection and testing program undertaken, twelve recommendations were made to upgrade the facilities, to improve service reliability and to provide more effective maintenance of the facilities.

The local environment has a considerable influence on the rapid deterioration of plant. The ground surface consists of coral sand and frequently the wind blows a stream of salt spray across the transmitting site.

Numerous problems occur with the transmitter due to condensation within the cubicles resulting in high voltage arcing. The cabinets are made of aluminium panels which have become coated with a fine salt like white powdery coating which is difficult to remove. The studio areas are very dusty, even though the building is air conditioned, and this creates a major problem with record wear and surface noise during playing.

**JIM FINCH/NORM SCOTT**

## **HF MATRIX ANTENNA SWITCH—SHEPPARTON**

The Radio Australia transmitting station at Shepparton in Victoria commenced service in May 1944 as a support service to the BBC in combating Axis radio propaganda and to provide news and entertainment for the armed services in the Pacific and Europe.

Initially, the site operated two 100 kW and one 50 kW transmitters, and was equipped with 24 antenna systems. Transmitter-to-antenna switching was accomplished by groups of in-line three position switches, however this approach reduced transmitter access, and restricted transmitter flexibility.

In 1960/61, the station underwent a major rebuild which included upgrading of transmitters, antennas and antenna switching.

Australian Post Office Radio Engineering staff designed and installed a fully motorised matrix antenna switching system which allowed the RF connection of any of ten transmitters to any of the 36 available antenna systems.

Switching was accomplished by the horizontal movement of transmitter "arms" around a large semicircle steel frame, and the vertical movement of antenna "arms" up/down the frame to enable an RF connection between transmitter and antenna open wire transmission lines.

Transmitter and antenna arms were 5 metres long, fabricated from a sandwich of plywood and aluminium. Within each arm an insulator supported a two conductor transmission line.

Over the years, the switching mechanism, arms, wiring and other components reached the stage where reliable service could not be guaranteed. In addition, slow transmitter-to-antenna switching negated the advantage of modern transmitter 20 second band change times.

Late in 1989, a contract was let to G.E.C. Marconi Defence for the supply of a 500 kW Antenna Matrix Switch which provided for seven transmitter inputs and twelve antenna feeder outputs as the basis of a new modern switching system for Shepparton.

As the site is currently equipped with a large number of single band antenna arrays there was a need to accommodate switching facilities for at least 22 of the existing antenna systems. The lack of antenna feeder outlets was overcome through the provision by Marconi Defence of 11, two position remote RF field switches. This approach allows connection of two antennas via field switch to each of 11 antenna feeder outlets. The twelfth antenna feeder output is used for connection of an existing Brown Boveri, 600 kW artificial load.

Each field switch is designed to switch between a high/low band antenna system, and in doing so, provides for day/night transmission scheduling.

Of interest is the fact that in excess of 30 km of control/power cable was required to connect the 11 secondary field switches back to the matrix switch and transmitter building. In addition, Broadcasting Lines staff constructed 11 primary four wire, 300 ohm transmission lines and 22 secondary lines to the selected antenna systems.

Installation was under the supervision of PTTO, Kevin North, with STTO, Doug Brodie and staff as the installation

team. Kevin was a Senior Technician involved with the installation of the original matrix switch, and as a qualified A Grade Electrician as well as Technical Officer, is able to provide a valuable range of experience in planning, design and installation.

Project Engineers Tech Chua and Mark Stevens provided overall direction, and supervision as well as contract interpretation, company liaison etc.

Specifically, the Marconi Matrix is of modular construction comprising 84 individual crossover switch boxes all interconnected by short sections of screened, balanced feeder lines. This arrangement allows optimum isolation performance, and overcomes the old problems of RF induction between switching feeders.

Owing to shipping requirements, each of the modular switch boxes had to be constructed on site. The temporary storage and movement of 84 switch modules as well as the fabrication of 40 actual RF switches proved to be quite an exercise in logistics.

The body of modular switch sections is supported above head height to allow safe and easy access, and as such, all actions concerned with operation and maintenance are carried out below the switch.

The overall assembly is contained within a roofed building to provide weather protection as well as beam support for individual crossover switch boxes.

The control system allows for remote operation of any matrix cross point or field switch and consists of two major components—the first, a personal computer for the operator machine interface and systems control, and the second, a control unit for the switching and monitoring of cross points and field switches.

In addition, the system provides facilities for entering a set of commands in the form of a transmitter movement schedule, and has the capacity to carry out all switching at predetermined times. Overall, sufficient capacity exists to store in excess of 10,000 switch combinations.

Control and monitoring functions are monitored by displays. The first of these is a Switch Matrix Display which is a graphical display showing the transmitter to antenna selections, while the Schedule Displays show the schedule switching combinations and allows the operator to add or delete additional combinations.

The switch fabrication and installation progressed smoothly, and involved the maintenance of six 100 kW scheduled Radio Australia transmissions within the installation environment. Safety was of prime importance, and in this respect a range of steps were taken to overcome the ever present problem of radio frequency radiation in the installation work area.

Liaison with Radio Australia Frequency Management staff resulted in agreed time slots for reduction of transmitter power and other arrangements to ensure program outages were kept to a minimum. The switch was recently placed into service and completion of the project has upgraded station switching standards allowing the interface of modern transmitter plant. Future replacement of single band antenna systems with multiband antenna arrays will finalise station upgrading and confirm a reliable international broadcasting service well into the next century.

**BRUCE WILSON**



Kevin North (L) and Glenn Kiernan running out switch cables.



The switching system constructed 1961/62.



Doug Brodie and Lawrence Hester installing transmitter trunking.



View of switch showing six antenna outlets.



Artwork by Ralph Denison, Northern Territory Section.



## 2CR CUMNOCK-AWA 50 KW TRANSMITTER

Part of the plan for the establishment of NBS Regional transmitters in the 1930's allowed for 10 kW transmitters to be installed at 2CR Cumnock, 3WV Dooen and 6WA Wagin and for the power of these stations to be ultimately increased to 60 kW. Identical STC 10 kW water cooled transmitters were installed at these stations during 1936/37 and subsequently 50 kW transmitters replaced the original 10 kW units.

Stations 3WV and 6WA were equipped with STC 50 kW models but 2CR was equipped with an AWA HTM50 type 2J60640 transmitter commissioned during April 1963.

Although similar STC 50 kW transmitters were installed at other NBS stations, 2CR is the only station to be equipped with an AWA model. The original design incorporated a number of interesting features including the following:

- The main HT rectifier originally employed English Electric AR63 mercury arc excitrons of a single anode mercury pool type. Ignition of the rectifier was obtained by means of a pivoted electrode which rested in a pool of mercury which formed the cathode. A gapped choke was mounted outside and close to the valve wall. When energised, it attracted an armature plate attached to the pivoted (ignition) electrode lifting the latter out of the pool. At the instant of switching, the total excitation current passed

through the ignition electrode as it rested in the pool of mercury.

The energising of the choke lifted the ignition electrode and established an arc at the point of contact at the surface of the mercury. The hot spot in the mercury took the place of the cathode in an ordinary rectifier valve. Attraction of the armature by the choke due to the normal excitation current flowing through it, kept the ignition clear of the mercury pool. During normal operation, the rectifier glowed blue and the anode frequently operated at dull red heat.

In 1966, the system was converted to solid state rectification.

- Another original feature, was an electronic crowbar in the HT using an AR63 excitron to prevent damage to the high power valves in the event of an internal flashover. A high current surge from the HT rectifier triggered the excitron placing a short circuit on the HT line absorbing the high energy content of the supply. The crowbar action was so rapid that the HT line was shorted and the HT breaker tripped before the faulting arc had reached sufficient energy level to cause damage.

- The filament of the directly heated triode type BR189 used as the power amplifier is powered by a DC supply. The supply unit comprises a transformer, six silicon diodes, limiting resistors and a stepping contactor. A regulated three phase 415V AC supply is connected via the limiting resistors to a star connected secondary to which is connected a full wave bridge rectifier. Relays connected across the output of the rectifier control circuit operates contacts which successively short out sections of the limiting resistors. Normal operating voltage is 9 volts.

DAVE TAYLOR



10 kW standby transmitter (L) and 50 kW main transmitter.

## 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.**

Sir,

As I approached the end of my days as a Technician-in-training early in 1958, and was wondering what the future had in store for me, the Officer-in-Charge of PMG staff at the Adelaide studios of the ABC, Jack Grivell, called me into his office. "One of our Darwin people has been killed in a motorbike accident, and so a vacancy exists. Would you like to go up there?" "Not really", I replied, all sorts of terrible images of Darwin flashing through my mind. But Jack, together with Engineer Brian Perkins, worked on me, and a few weeks later I was on my way north in my Morris Minor 850, packed to the gunwales. I travelled to the great unknown in convoy with Keith Sommer and his family in his Holden. He was to fill another vacancy at 8DR, but which had a more fortunate background.

Ken Soar was the PMG's Department OIC at 8DR (then 5DR) at the time. He was a Territorian through and through, and was known the length and breadth of Northern Australia. He did not suffer fools gladly, and left no doubt about his views on one's shortcomings. He made the mistake of having me paint his filing cabinet soon after my arrival. My "unusual brushstrokes" were of considerable concern to Ken, and I was very quickly dubbed "Picasso", which name I took several years to shake off. I don't recall ever having to do another painting job for Ken again!

In those days, 8DR consisted of two Sydney Williams huts joined end-to-end on a site at the end of Blake Street overlooking the beautiful Gardens Oval from a cliff-top vantage point. A prime spot indeed. More recently, it was home to the PINT Club, which has now moved out into the suburbs. In the evenings, a lovely cooling breeze would waft through the trees and into the building through the open louvred windows. The building housed both the PMG technical staff and equipment, and the ABC staff and studios. In those days, PMG staff were responsible for the operation of studio equipment as well as the transmitters. The control room was flanked by the two studios, and the transmitter room was at one end of the building alongside Studio 1.

Despite the double glazing, the studios were anything but sound-proof. The only means of personal cooling was by way of fans, both portable and overhead. Airconditioning was a luxury and had not yet arrived on the scene. So it was quite understandable that the louvre windows were open at all hours to provide relief from the tropical heat. ABC news bulletins from Darwin were quite famous for their bird punctuations from the trees atop the cliff only metres behind the announcer's chair. One bird in particular, exasperated many an announcer with its loud calls of "woo-woo, woo-woo" in the middle of the news. The transmitter room blower was another source of noise pollution. It had to be switched off whenever Studio 1 was in use. The room would get mighty hot then.

There was never any shortage of a light moment. I remember Peter Ross (well known these days for his TV interviews in the art circles) reading the weather forecast for Darwin just before the close of program one night. It was

his last night in Darwin prior to a transfer south. "No snow is expected in Darwin tonight!" was his closing comment.

Announcer Graeme Story, now in the higher echelons of the ABC in Sydney, was chatting with me in the control room. Unexpectedly early, the gong to "go local" was sounded from Adelaide. As I faded off and reversed the channel to feed the program to Alice Springs, Graeme, a solid chap, hurled himself out of the control room and bounced off the passage wall to deflect himself into the studio. He would have got there even quicker had he not gone straight through the caneite wall!

Perhaps I should balance the ledger with a story against the PMG staff. There was the occasion when Keith Sommer was enjoying a cup of coffee in the lunch-room while the tape of the Sunday afternoon play was on air. The only replay units we had in those days were Byer 77's fitted with outriggers in order to accommodate the large spools, which could hold a one-hour program played at 7-1/2 inches per second. About half-way through this (one-hour) play, the takeup spool had distorted sufficiently (due to the nature of the tape) to cause it to bind on its mounting bracket. Tape spooled onto the floor and built up into a sizeable heap. Usually, this would not have presented a problem, but for the presence of a nearby portable fan sitting on the floor and running at full speed. Eventually the tape found its way across the floor to the fan. Keith almost choked on his coffee when he heard the play suddenly "Donald Duck" its way to a very premature conclusion!

Finally, an incident which befell me late one night. I was working back after closedown on a problem with one of our crystal controlled oscillators, which had gone excessively off-frequency. The transmitters were two Philips 2 kW units operating in a main/standby configuration. By now, it was about 1.00 a.m., and I was becoming increasingly aware of feeling unsteady. I decided that I must be getting tired and was about to give it away for the night when suddenly I lurched off my squat-box. As I leaped to my feet I saw the two transmitters part quite some distance at the top, as though a large wave had just passed under them. They then settled back to their normal positions. Only the violent bouncing up and down of the open wire transmission line convinced me that I was not hallucinating. I was to experience a number of earth tremors before I left Darwin after six memorable and enjoyable years.

**PETER WILLIAMS**

## BROADCASTING MILESTONES

### 6GF KALGOORLIE

Station 6GF Kalgoorlie was the second National Regional station to be commissioned in Western Australia. It began transmission on 720 kHz with an STC 2 kW transmitter on 9 December 1936, shortly after station 6WA Wagin began service.

Kalgoorlie is famous for its goldfields. Gold was found at what is now known as Kalgoorlie in 1892 by Patrick Hannan, Thomas Flanagan and Daniel Shea. Over the next few years there was a rush to an area known as the Golden Mile. Gold production reached a peak in 1902-3 and nickel is now the main mineral mined in the district.

When the station began broadcasting, aircraft warning lights were not required in the district and instead, piles of rocks painted white were placed in a ring around the base of the tower at a radius of 67 metres. Now the aerial is painted and lit at night.

In 1958, the STC transmitter was replaced by a Philips 2 kW model and the station operating frequency changed to 600 kHz in 1962. At the same time the 123 m radiator was modified with the provision of top loading to improve performance.

A Westrex (Commonwealth Electronics) 2 kW transmitter was installed in 1964 and operated in main/standby configuration with the Philips 2 kW unit. The station went to unattended operation with the local PMG/Telecom staff attending to fault conditions and routine maintenance.

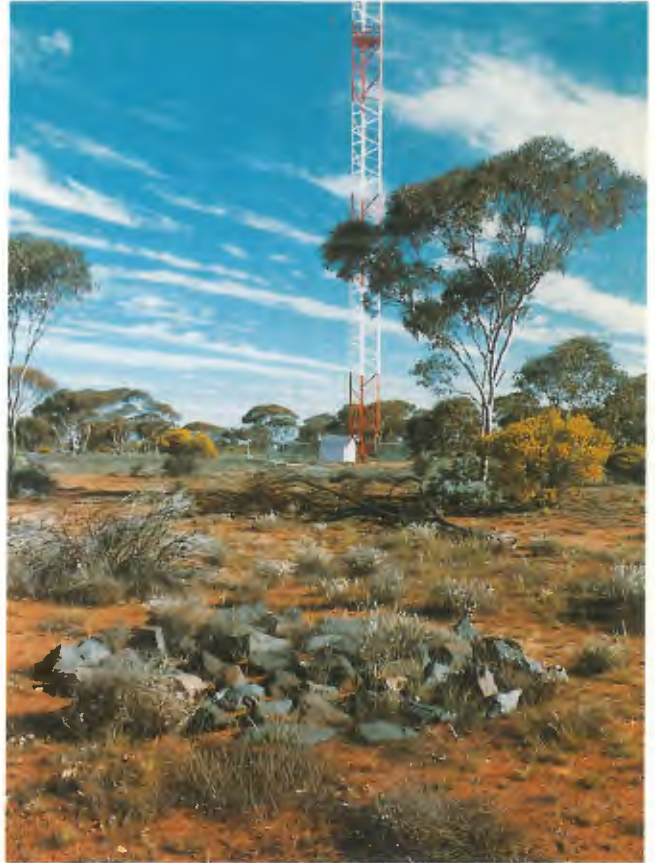
The standby power plant originally installed was a Ruston three cylinder diesel engine followed by a Southern Cross 20 kVA unit which had been removed from 6WA Wagin. In recent times, a modern 15 kVA Dunlite-Perkins plant was put into operation.



*Original transmitter building erected 1936.*

On 1 April 1991, two Nautel ND-1 solid state transmitters giving a combined 2 kW output replaced the two valve models. The equipment was installed in a small prefabricated building with a power plant being provided in a container adjacent to the transmitter building.

ROSS KEARNEY



*Bottom view of main radiator. Pile of stones in foreground were originally painted white and placed in circle around the radiator for aircraft warning purposes.*



*Present transmitter building erected 1991.*