

# The

# BROADCASTER



Newsletter of the Broadcasting Directorate  
No. 8 July 1987



Congo Rep  
1974

## GUGLIELMO MARCONI

1874 ~ 1937

INVENTOR OF THE FIRST PRACTICAL SYSTEM  
OF WIRELESS TELEGRAPHY



Newfoundland  
1928



Africa & The Isles  
1874



Turkey  
1974



Canada  
1974



Brazil  
1974



Great Britain  
1972



Italy  
1974



Italy  
1974



Ecuador  
1986



Niger Rep  
1974



Rwanda Rep  
1974



Rwanda Rep  
1974



Rwanda Rep  
1974



Rwanda Rep  
1974



Rwanda Rep  
1974



Rwanda Rep  
1974



Rwanda Rep  
1974



Newfoundland  
1928



Sweden  
1968



Italy  
1965



Monaco  
1974



Portugal  
1974



Portugal  
1974



Portugal  
1974



Czechoslovakia  
1968



Laos  
1974



Laos  
1974



Laos  
1974



Laos  
1974

Guglielmo Marconi, the inventor of the first practical system of wireless telegraphy, was born on 25th April, 1874, in Bologna, Italy.

When only a young man Marconi became interested in the work of Heinrich Hertz who demonstrated the existence of electromagnetic waves and decided to carry out experiments of his own. He assembled together various items of equipment including a coherer, an induction coil and a spark gap and was soon able to signal across the room which he used as a laboratory.

Towards the end of September, 1895, he commenced experiments out of doors and in order to increase the wavelength of the transmissions he replaced the two outside ball gaps of his oscillator with metallic sheets. Later he elevated one of the sheets and placed the other in the ground. By doing so he was able to increase the range over which signalling could take place to about one kilometre. Further experiments showed that the range could be extended by increasing the size of the elevated plate and also by increasing its height above ground.

The young Marconi tried to interest the Italian authorities in his system of communication but they gave little encouragement. With his mother he went to England in February, 1896, to talk to British Post Office engineers about his invention. He filed a provisional specification of his system with the Patents Office on 2nd June, 1896, shortly after his 21st birthday.

With the backing of the British Post office, Marconi improved the apparatus and on May 11, 1897, succeeded in signalling over a water path. The transmitter was located at Lavernock Point near Penarth and the receiver was on the island of Flat Holm in the Bristol Channel some 5 to 6 km away. Marconi was assisted by George Kemp who remained with him until 1933 when Kemp died.

By 1900 Marconi considered that he had sufficient evidence from observations of signals from ships at sea to indicate that long distance communication would be practicable if sufficient transmitter power could be developed. He decided that the time had come to try to bridge the Atlantic with wireless signals.

A site was acquired at Poldhu on the coast of South West Cornwall in October, 1900, and another at Cape Cod, Massachusetts, for an American station. On September 15, 1901, the Poldhu station had reached an advanced stage of construction with its high power transmitter and 70 metre high cylindrical wire antenna when a gale hit the station and the antenna crashed to the ground. Parts were salvaged from the wreckage and a fan shaped wire antenna erected between two support poles. The antenna at the Cape Cod station also fell to the ground when hit by a gale in November.

Marconi abandoned the Cape Cod project and set sail for Newfoundland where he intended to put up a temporary receiving station. Accompanied by two assistants he took a selection of balloons, kites, wire and receiving apparatus. The party arrived at St. Johns on December 6, 1901 and selected a site on Signal Hill near the Cabot Tower erected as a memorial to John Cabot who had discovered Newfoundland.

When all was ready a cablegram was sent to Poldhu arranging for signals of three dots corresponding to the letter 'S' in Morse Code, to be transmitted at certain times. Weather conditions were extremely bad. Gale force winds tore away balloons and kites and the rapid movement of the suspended antenna wire made stable reception difficult. However, Marconi persevered and on Thursday, December 12, he received the signals and wrote in his diary: "Sigs at 12.30, 1.10 and 2.20."

In 1902, Marconi was invited to join the Carlo Alberto, a ship of the Italian Navy, to carry out experiments on a journey to Russia where the King of Italy was to meet the Czar. He arranged for the Poldhu transmitter staff to send the Carlo Alberto call sign together with the news of the day during the period of the voyage. During the night he was able to receive signals right up to Kronstadt some 2600 km away. Later in the year Marconi went to Canada in the Carlo Alberto and made further long distance observations.

Marconi was awarded the Nobel Prize in Physics in 1909 jointly with Professor Braun of the German Telefunken Company, one of his commercial rivals.

During 1914 Marconi carried out wireless telephony experiments with apparatus installed in two Italian warships. Communication was established over a range of 70 km.

In 1920 Marconi purchased the Rovenska, a yacht which had been launched in 1904 and converted it into a floating laboratory. He renamed it the Elettra and after installation of wireless equipment sailed for the United States. While passing through the Bay of Biscay he succeeded in receiving a musical programme broadcast from London. With the equipment on board he demonstrated the practicality of carrying out radio telephone communications between ships at sea and land telephone subscribers. At various times he communicated with subscribers in Australia, South America, South Africa, India and Canada.

Marconi's Elettra experiments showed the importance of short waves in long distance communications and enabled him to put forward a new Imperial Wireless Scheme based on short wave beam stations as an alternative to a network of long wave stations.

On 26 March, 1930, while anchored at Genoa he pressed a telegraph key on the Elettra and operated apparatus in Sydney to switch on a 3,000 lamp display at the Electric and Radio Exhibition.

Another remote control operation was performed on 12 October, 1931, when the statue of Christ the Redeemer on top of Mount Corcovada overlooking Rio de Janeiro was flooded. Marconi was in Rome at the time when he pressed the signalling key.

When Guglielmo Marconi died in Rome on 20 July, 1937, he was mourned by people of many nations. In England where Marconi did so much of his early development work, the Post Office wireless stations and the BBC were silenced for two minutes as a mark of respect for the great pioneer.

MARCONI ON STAMPS

The Broadcaster is the in-house Newsletter of the Broadcasting Directorate 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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One of the initiatives taken at the inaugural meeting of the Broadcasting Management Committee last February was a decision to send copies of The Broadcaster to Commercial Broadcasting and Television organisations. Copies of the March issue were mailed from State Offices, and the response has been pleasing indeed.

I received calls from a number of Chief Engineers and Technical Directors offering congratulations on the high standard of the publication, with some offering to provide contributions to future issues. Several requests have been received for copies of previous publications.

One of the articles in this issue shows work which was undertaken by the Western Australian Broadcasting Branch for a commercial television organisation in that State, and it is hoped that other commercial people reading The Broadcaster will be aware that the Directorate has capacity to undertake work that may be beneficial to both organisations. All State Branches, as well as Central Office, have expert resources to undertake any work requiring the planning, design, installation or operation of a wide range of broadcasting projects, no matter how complex.

JACK ROSS  
Editor

*Front cover:* 50th Anniversary of death of Marconi

*Contributors to this Issue:*

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Leon Sebire

## From the Director's Desk

The Directorate operates one of the largest and most efficient broadcast transmitting networks in the world.

The management of this network of more than 500 services involving an annual expenditure of some \$70 million and a staff of almost 1100 distributed throughout seven States and Territories is a task of considerable magnitude. In the ever changing economic and political environment in which we find ourselves today, it is vital that the organisation be dynamic, innovative and responsive in order that we may be able to satisfy the demands being placed upon us.

To ensure that we can effectively meet these challenges, I recently established a Broadcasting Management Committee comprising all Branch Heads of the Directorate, the Deputy Director and myself to ensure that there is a continuous review of what we are doing and to plan and adapt to meet future developments. The Committee had its first meeting last February and will reconvene at least twice yearly.

A number of important decisions were made. These included the definition of Directorate objectives, the establishment and maintenance of an improved profile for the Directorate, the determination of specific productivity targets, improved accountability, the provision of job satisfaction and career opportunities for our staff, and the performance of work to appropriate standards.

Additionally, decisions were made on remote control and supervision of unstaffed transmitters and policies to be adopted in the determination of when to replace obsolescent equipment.

A range of issues for consideration at future Committee meetings was identified and working groups were established to review and report on such topics as an updated basis for the provision of standby facilities at stations, construction practices, engineering staff development and extension of Directorate activities into the commercial broadcasting sector.

The activities of the Broadcasting Management Committee will ultimately lead to redefinition of what we do, and how we do it, in a series of formal policy instructions which will be widely circulated throughout the Directorate.

LEON SEBIRE

## Station Roll Call

### ABHN-5A MT SUGARLOAF

Installation work for station ABHN-5 commenced on 11th October 1962. The transmitter, an NEC low level modulated dual transmitter combination, went to air at 3 p.m. on 3rd June 1963. The transmitter, of Japanese manufacture, was enormous in size compared with modern day equipment and generated a very large amount of heat.

The station service area includes Newcastle and the Hunter Valley area. Newcastle is the second largest city in New South Wales with a population of some 260,000 people. It is noted for its large steelworks and produces 40 per cent of Australia's iron and steel. The Hunter Valley is a rich agricultural and grazing area. It contains many large dairy factories which process milk for Sydney and Newcastle. The cultivation of grapes is also an important industry in the area.

The transmitters were converted to colour transmission in 1975, but were replaced on 14th February 1977 by a much smaller dual 10 kW NEC high level IF modulated unit. The new transmitters meant a change in channel from 5 to 5A so that the channel 5 frequency could be released for FM transmissions in the Sydney and Newcastle areas.

The change to channel 5A caused a problem to viewers in the Newcastle and Gosford areas, particularly in summer as Knights Hill, Wollongong is also on 5A. To minimise carrier beat problems rubidium standards (atomic clocks) were installed at both stations to control the carrier frequencies.

On 1st March 1980 a 10 kW NEC FM stereo transmitter on frequency 106.1 MHz was put into operation using the old channel 5 antenna.

An SBS transmitter employing dual Pye water cooled klystrons was commissioned on 30th June 1985 operating in the UHF band channel 45. The provision of this service required upgrading of the main power board to take the additional load. COL STEEL

### 2NC NEWCASTLE

Station 2NC is situated at Beresfield about 18 km from Newcastle.

Newcastle, which is about 160 km north of Sydney, has a population approaching 260,000 inhabitants, and is a major port and industrial centre. It is the second largest city in New South Wales.

When 2NC was commissioned on 19 December 1930, it was the first of a chain of regional stations erected for the National Broadcasting Service. The station operated on a frequency of 1244.8 kHz and an antenna power of 2 kW.

The transmitter, manufactured by Standard Telephones and Cables Ltd., featured a modified Heising method of modulation. The final amplifier comprised a pair of 4228A water cooled tubes operating as a Class B amplifier. The heat produced by the tubes was removed by a circulating water system which used insulated hoses.

The filament, grid bias and plate supply voltages were all obtained from motor generator sets which, with the water circulating pump, were provided in duplicate.

Emergency power was provided by a Gardiner petrol engine direct coupled to a 37 kVA alternator and exciter running at a governed speed of 600 rpm.

The radiator consisted of a T antenna with a very short flat top and a narrow cage down lead 100 mm in diameter and an extensive buried earth system comprising some 11 km of copper wire. The flat top was suspended from two self supporting lattice steel square towers 40 m high.

The transmitter shares the site with 2NA which went to air in 1943.

Both transmitters were upgraded to 10 kW in early 1959 and at the same time, a new top loaded radiator 91 m high installed. Two inverted L standby antennas were also provided with one 2 kW transmitter, with a second 2 kW unit being installed in the late 1960's.

On 24.8.75, 2NC began 24 hour transmissions, broadcasting the ABC Sydney rock station program between midnight and 5.00 a.m.

KEITH DARE AND COL STEEL

## Logo Competition

### THE DIRECTORATE LOGO

The competition announced in the March 1987 issue of *The Broadcaster* for the design of a logo for the Broadcasting Directorate was an outstanding success.

Sixty eight entries were received with all States and Central Office being represented. Three entries were received from staff outside the Directorate. The break-up of submissions is as follows:

Queensland 23, South Australia/NT 19, New South Wales 8, Tasmania 6, Central Office 3, Victoria 3, Western Australia 3 and Outside 3.

The panel of judges set up to select the winner comprised:

Leon Sebire Director, Chairman	
Max Chadwick Deputy Director	
Helene Plessias Victorian Branch	
Jack Ross Editor, <i>The Broadcaster</i> .	



The standard was exceptionally high, and the judges had a difficult task in selecting the winning entry to be used as a model for the official Directorate logo.

The winning entry was submitted by James Darling T01 of 7ZL/7ZR Hobart.

Runner up was Terry Comerford Senior Draftsman Brisbane, with one of several entries, and third placegetter was Ralph Dension Draftsman Grade 2 of Darwin.

Some States and even stations and depots have been using unofficial logos for some time, and now that the Directorate has decided on an official logo the use of these local identifications should be discontinued as soon as possible. A Policy Statement on the matter will be issued by the Director shortly.

It is evident that a great deal of effort was put into the preparation of many of the designs and all entrants are thanked for their contributions.

JACK ROSS

## Cyclone Damage

### TEBS DEPLOYED IN VANUATU

In response to an urgent request for the restoration of radio services at Port Vila, Vanuatu, following damage to facilities as a result of cyclone Uma the Directorate's Transportable Emergency Broadcasting Station (TEBS) was prepared for transport on 8 February 1987, and flown by a RAAF aircraft from Richmond to Vanuatu, the following day.

Bob Heggarty STO1 Audits and Advisory and Dick Willoughby Shift Leader 2FC/2BL Liverpool of the New South Wales Broadcasting Branch accompanied the equipment and arrived at the scene of the disaster at 5 p.m. local time.

They were met by Colin Schultz, Principal Engineer Radio of the Department of Posts and Telegraphs, and an inspection of the radio building showed that part of the roof and a rear roller shutter door were missing, allowing water to saturate most of the equipment.

The building housed 18 transmitters, used for various purposes such as marine and aeronautical communications, beacons and broadcasting. The broadcasting transmitters comprised a TBC 10 kW MF unit with a 5 kW spare, a TBC 10 kW HF unit, and STC 2 kW HF unit and two spares.



*Damage to ceiling and roof of transmitter building.*

Although the 10 kW MF transmitter had been put back on air at reduced power using a local power generating set, decision was made to put the TEBS to air so that one of the HF transmitters could be loaded on to the power plant.

A second generator was subsequently employed allowing both the MF and HF broadcasting services to be put into operation, but on reduced power.

Some days later, the power plant failed and whilst being repaired, the TEBS was put back on air using its own portable generating plant.

The TEBS equipment was employed effectively and efficiently for a total of five full days, plus two other periods whilst major problems existed with the local station mains supply and equipment.

The equipment was returned to Australia on 21st February by C130 RAAF transport and later taken to Liverpool where it was checked and made ready for the next emergency call-out.

BOB HEGGARTY

# News Round Up

## NEW RADIO AUSTRALIA OUTLET

From about mid 1988 Radio Australia services to Papua New Guinea and the South Western Pacific region will emanate from transmitters located at the 4QN, Brandon, MF site about 50 km south of Townsville. By ensuring one hop propagation it is expected that the effectiveness and reliability of transmissions into these prime target areas will be significantly improved.

The installation at Brandon will include three 10 kW transmitters comprising two operational and one standby units, using equipment recovered from Lyndhurst, Victoria. Two 2/2/0.5 broadband curtain arrays centred on bearings of 10°T and 80°T will provide continuous coverage over an area extending from the Irian Jaya border to New Caledonia. Initial operating frequencies will be in the 6 to 11 MHz bands but provision will be made to install additional antenna arrays to permit the use of higher frequencies, if necessary, during sunspot cycle maxima.

The Brandon site is well located for HF transmission having a seaboard outlook to both the north and east. The transmitter building which currently houses the 50/10 kW MF transmitters can accommodate the three HF transmitters without significant alteration.

The endorsement of this proposal by the Minister has pleased those who for many years have believed that Radio Australia needed an outlet on the north eastern seaboard to properly complement the facilities at Shepparton, Darwin and Camarvon.

MAX CHADWICK

## SHARING OUR SKILLS

Mention has been made in The Broadcaster from time to time of occasions when people with special skills have been able to share them amongst the broadcasting family. Several months ago Bill Tyquin, Electrical Fitter and Mechanic from Radio Australia Shepparton, visited Darwin to lend assistance to Radio Australia Cox Peninsula staff.

The oil circuit breakers (OCB's) at both stations are of a similar type, providing closing links and protection on the 11 kV high voltage supply switchboards. The skills required to service these large devices are not readily available in Darwin, and substantial savings in costs were realised by 'borrowing' Bill for a stint in the tropics.

The servicing process included filtering all oil in the eleven breakers, leading on to another task, the filtering of oil in H.V. transformers and other devices. Bill filled in every moment while the lengthy filtering task was in progress by attending to the servicing of electric motors, amongst other things.

When away from work, Bill enjoyed typical 'Top-End' hospitality with evenings and weekends spent with staff families and friends, including a four-wheel drive excursion to Florence Falls with a certain Station OIC.

TERRY SAID

## INTRODUCTION OF A.I.R.

The NSW Broadcasting Branch is presently trialling a locally developed Accident Investigation Report. (A.I.R.) The report is proposed as an aid to ascertain the cause(s) of an accident. The A.I.R. is intended to 'clear the air' about who or what was responsible for the occurrence of an accident.

The immediate investigation into the cause of an accident that is carried out and reported on the P400 Accident Report is still performed as normal and submitted within two days of the event.

The A.I.R. allows for further detailed investigation into certain accidents and allows this investigation to be presented to management in a standardised format.

The A.I.R. covers in detail such areas as work site conditions, equipment being used, safety equipment provision

and use, clothing being worn, contributing factors, and prevention measures already undertaken.

The comprehensive style of the A.I.R. should assist local management in the prevention of recurrences of similar types of accidents. The report should assist all supervisors to adopt the correct approach to be undertaken when investigating accidents.

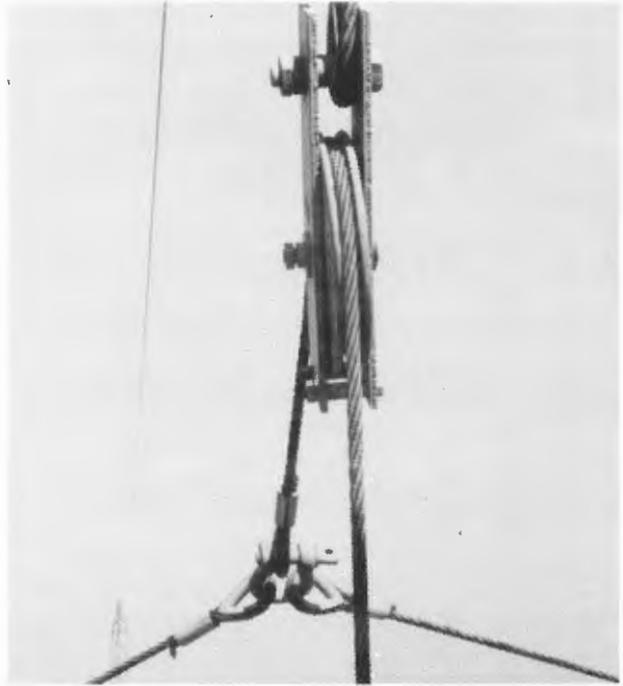
PETER ZIONEE

## PULLEY SHEAVES REPLACED

The curtain antenna arrays at Radio Australia Darwin are supported by counterweights which allow them to billow in winds up to cyclonic speeds. The largest antennas which cater for the low frequency bands have 10 tonne counterweights connected to each end of the antenna via steel wire rope halyards over single sheave pulley blocks.

During routine tension adjustments Broadcast Radio Lines staff discovered the sheaves had seized on their axles causing steel keeper blocks to fall out as each sheave was rotated.

One pair was replaced with a new set incorporating several



*Seized pulley wheel*

improvements. This exercise involved lowering the antenna. To limit outage times and reduce the job cost, the remaining sheaves were replaced in situ with each pair being modified by a local engineering firm to specification. The exercise was no mean feat, as temporary rigging had to be fitted at each mast head to beyond each pulley sheave, to enable it to be replaced. All this at up to 90 metres above ground level!

JOHN WILKINS

## COFFIN BAY SERVICE

During March 1987 a UHF television transmitter was installed at Coffin Bay, South Australia, to service the local community. The Coffin Bay township is located approx. 45 km west of Port Lincoln on the Eyre Peninsula along the shores of Kellide Bay. It is a popular tourist boating and fishing resort, as well as supporting a small professional fishing community.

The township and surrounding area suffered from poor and unreliable television reception from a transmitter located near Tumbly Bay. Naturally, encouraging reaction was received from members of the local community once knowledge of the new service became known.

The service now provides ABC television program from Adelaide, via the AUSSAT satellite, in the UHF band on Channel 45. Transmission is provided by a Thompson-LGT IF modulated television transmitter with an output power of 5 watts.

RAY JACKSON

## New FM Studios

### STUDIOS UPGRADED

ABC FM stereo operations began in January 1976 with a two studio installation in Adelaide, a somewhat simple facility relative to today's standards and requirements. The number of program sources requiring to be mixed into a composite output to the FM network was small and the original broadcast console with 10 input channels adequately catered for the needs at the time.

With the progressive expansion of program formats and source material the pressure grew to expand the capabilities of the mixing console. Hand in hand with the program need to change, came the need to substantially upgrade the technical standard of the control console with the greatest pressure coming when compact discs were introduced in 1983.

And so planning began in 1985 to replace the technical heart of the FM studios in Adelaide with a new console and facilities to meet the new demands. Apart from the increased input requirements to handle additional sourcing including compact discs, cassettes and remote inputs via satellite, the more stringent technical requirements had to be met.



*Original console.*

By far the greatest technical demand resulted from the introduction of compact discs which placed new standards on such performance parameters as noise, harmonic and intermodulation distortion, overload margins, left and right channel tracking and phasing, with perhaps the major emphasis on dynamic range capability. In the area of both visual (meter) and aural monitoring systems, the requirements also changed with, once again, major attention being directed towards dynamic range capability. In terms of visual monitoring, the long-standing VU meter is limited to displaying a range of 23 dB whereas compact discs have a dynamic range of 90 dB and although extremely low level sounds can present problems of audibility in a broadcasting system, if we are to attempt to broadcast the best possible representation of the source medium available, there is a need to monitor a much greater range than 23 decibels.

During the second half of 1986, actual studio installation took place using an 18 input, Series 85 stereo broadcasting console from MTE Electronics of Brisbane. Apart from high technical performance standards, particular features of the console included input-level control using voltage controlled amplifiers to ensure that left and right channel tracking errors are minimised and remain consistent over the life of the console, and LED metering covering a VU



*New console*

range of - 40 to + 3 with peak LED's set to operate at + 16dBm thus giving a visual monitoring range of 48 dB. Duntech Loudspeaker Monitors were installed to satisfy a requirement for natural and accurate sound reproduction.

Although the ABC FM stereo network was serviced from only two studios from its inception in 1976, demands for more studio time for production and 'pre-air' preparation of programs and presentation of trailers have markedly increased in recent years requiring another studio to be set-up primarily for this purpose. As part of the main studio's re-equipment program in 1986, another MTE console was installed in a third studio area with full facilities similar to the two major FM network studios. Thus three studios now have full capability for both network and pre-production operations.

As a result of the recent re-equipment program in Adelaide, FM network studio operations can be carried out with complete flexibility in sourcing any kind of program material currently available, and at a technical performance standard which should satisfy the demands of the FM stereo broadcast medium for many years to come.

RON EHRKE



*Malcolm Patterson at the controls*

# Timor War Hero

## WINNIE THE WAR WINNER

Many readers of The Broadcaster would have visited the Australian War Memorial in Canberra and observed with interest radio equipment labeled 'Winnie the War Winner'. How many know the background story of the equipment and the man who played a major role in putting it together?

The man was Max Loveless a former staff member of Tasmanian broadcasting station 7ZL/7ZR. Max first made contact with broadcasting in an unusual way. In 1926 he worked with his uncle on construction of the stonework facade of Broadcasting House, later to become home of 7ZL/7ZR. However, it was not until around 1938 when 7ZR went on air as the second National station in Hobart, that Max obtained employment with the Postmaster General's Department as Control Room Operator in the building.

Max was on relief duty at 7NT Kelso in Northern Tasmania on the night war was declared in Europe in 1939.

He joined the Army and became a signaller in the 2/2 Australian Independent Company 2nd AIF which later became the 2/2 Australian Cavalry Commando Squadron.



*Rear view of rectifier and power supply unit.*

He was one of 400 men on Dili, Portuguese Timor when 15,000 Japanese troops invaded the island on 19 February 1942.

The Australian garrison known as Sparrow Force carried on a bitter guerilla war against the enemy but all communication with Australia had been severed.

A group of men including Signalman Loveless set to work from scratch without any spare parts or batteries to build radio equipment in order to establish contact with the mainland.

How they obtained vital components by scrounging, by digging up parts that had been hurriedly buried in the mud before taking to the hills when the waves of Japanese soldiers surged ashore and by sneaking into Japanese camps, is a story in itself. In one particular instance commandos crept through the Japanese lines into the former Australian Headquarters, dug up a battery charger which had been buried, and brought it back without being discovered.

On 19 April, two months after the Japanese had landed on Timor, contact was established with Army Signals at Noonamah some 17 km south of Darwin.

For the first time people on the Australian mainland knew that the Aussies were alive and fighting in Timor.

As a fitting climax to her career 'Winnie' guided the rescue party which eventually took the guerillas out of Timor.

'Winnie' now resides in the Australian War Memorial as a symbol of Australian ingenuity in the face of great difficulty.

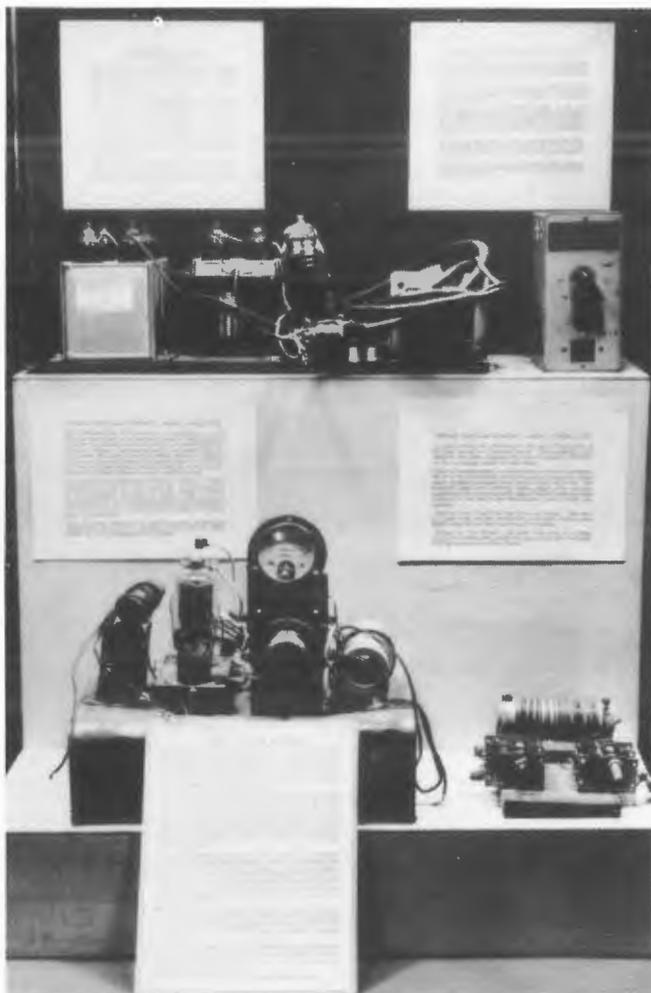
It is now well known that without the ingenuity and technical knowledge of Max Loveless, the story of Timor would undoubtedly have been very much different. For his efforts he was Mentioned in Despatches (M.I.D.) an honour so richly deserved.

Max was employed in the Postmaster General's Department for over 30 years and was a former State

Councillor of the Tasmanian Division of the Wireless Institute of Australia. He died on 24 April 1971.

Max was also a member and shop steward of the Technicians Union during his working lifetime and the Tasmanian Branch of the ATEA decided to honour Max by establishing the MAX LOVELESS PIONEER MEMORIAL COLLECTION.

The first official public display of the Collection of valve era communications equipment was opened by His Excellency, the Governor of Tasmania, Sir James Plimsoll at



*Top (L to R) Rectifier and power supply unit, switching unit. Bottom (L to R) Power amplifier, aerial tuning unit. (Courtesy Australian War Memorial.)*

Beumaris Training Depot, the Tasmanian home of the Royal Australian Corps of Signals, on 13 October 1985.

The Collection includes a wide range of valves and other components, domestic and radiocommunication receivers and also a complete AM broadcast transmitter. However there is a need for much more to expand the display and the group responsible would welcome donations of all items of radio equipment and especially an output transformer to complete an AR88 hidden away in a shack.

The group would very much like to hear from anyone prepared to donate old service gear such as an R101 or an R109 set - these were actually in service on Timor and are fundamental to the collection - no. 22, no. 19, HRO, AR8, AT5, B28, B40 and similar apparatus.

Plans are being developed for the Collection to be placed in a permanent museum environment and if any readers have equipment, books, or any memorabilia related to radio, they would like to donate, a call to the Hobart Office 002 286351 or a letter to GPO Box 215C Hobart, Tas 7001 would be very welcome.

BARRY RISELEY

# Engineering Highlights

## THE VICS SYSTEM

The Vertical Interval Control Signals (VICS) system was developed by the NSW Broadcasting Branch to the requirements of the Special Broadcasting Service. Its purpose is to remotely control SBS TV transmitters from the studio complex in North Sydney.

The VICS system was developed as an interim low cost control system pending clarification of the Special Broadcasting Service's long term requirements. The system inserts and reads code in the vertical interval of a PAL video signal and was adapted from a program identification and cueing device manufactured by IRT, Australia.

The VICS system consists of an encoder at Master Control and a decoder at the transmitting station.

The encoder has 15 on/off switches plus a master switch on the front panel.

The decoder has 15 LEDs on the front panel which reflect the state of the 15 on/off switches on the encoder. The decoder also has 8 on/off outputs. Each output can be set up to reflect the state of any one of the 15 on/off switches on the encoder.



*VICS encoder and decoder.*

The encoder inserts identification code on a horizontal line in field 1 and control code on a line in field 2 in the vertical interval.

The identification code is the same as that used in the standard IRT system. It is an 8 bit code which identifies the originator of the program. Each user is allocated a unique code. The code for the SBS Sydney studio is HEX 1E.

The control code is also an 8 bit code. The encoder uses control codes HEX 30 through to HEX 3F to provide 15 commands. Switch 1 generates code 31, switch 2 generates code 32, etc. One code is inserted on a line in each field 2, in ascending order and in a repeating cycle. Where a switch is off, the code HEX 30 is substituted, e.g. if switch 3 is off, HEX 30 is inserted instead of HEX 33.

By making use of control codes HEX 000 through to HEX FF the system can be expanded to 240 on/off commands.

If the decoder detects code errors or no code, various options are possible depending on how the decoder is internally strapped. Two examples of possible action are:

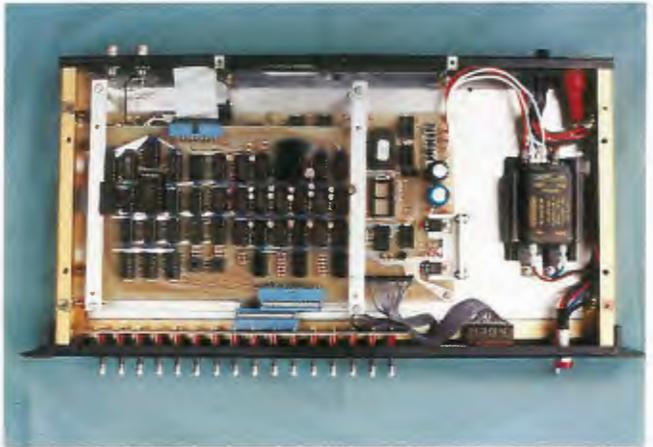
1. The decoder leaves outputs set up as for the last correct codes, that is, 'on' if previously on, 'off' if previously off.
2. A decoder output is strapped to provide an alarm during the absence of correct code.

The heart of the encoder and decoder is a Universal Asynchronous Receiver Transmitter (UART). In the encoder parallel data from the front panel switches is encoded and applied to the UART. The UART converts the data to serial



*Inside the VICS decoder.*

form for insertion on horizontal lines in the vertical interval. In the decoder the serial data is extracted from the video signal and applied to the UART. The UART converts the serial data to parallel data which is then decoded to drive the output relays.



*Inside the VICS decoder.*

The SBS program is distributed via four links from the studio, each having a separate encoder:

1. Satellite link to most transmitters.
2. Terrestrial link to the Sydney transmitter.
3. Terrestrial link to the Brisbane transmitter during NSW daylight saving, with a 60 minute program delay at the studio.
4. Terrestrial link to the Adelaide transmitter with a 30 minute program delay at the studio.

The studio switches the transmitters 'on' and 'off' and controls the sound mode, that is, mono, stereo or dual.

The VICS system was developed to provide an interim control system for SBS. Those currently in service are basically copies of the prototype version. A list of improvements is being compiled for a possible new version of the encoder and decoder should VICS be adopted as a long term solution.

CHRIS SCOTT



# Guglielmo Marconi

## 50TH ANNIVERSARY - DEATH OF MARCONI

This month is the 50th anniversary of the death of that great pioneer Guglielmo Marconi, who invented the first practical system of wireless telegraphy in 1896 and subsequently did so much to develop radio engineering to the great science that it is today. It is a tribute to his genius that he still make news today.

Our front cover tells the story of many of Marconi's great achievements through stamps issued by world postal administrations.

It is noteworthy that Australia is one of the few major countries that have benefited from Marconi's contributions to communications yet has not issued a commemorative stamp recognising his work. Even Niger Republic, a relatively small country in Africa, has seen fit to issue a stamp recognising one of Marconi's many links with Australian communications.

Marconi was born on 25th April 1874, in Bologna, Italy.

When only a young man, Marconi became interested in the work of Heinrich Hertz who demonstrated the existence of electromagnetic waves, and decided to carry out experiments of his own. He assembled together various items of equipment including a coherer, an induction coil and a spark gap, and was soon able to signal across the room which he used as a laboratory.

Towards the end of September 1895, he commenced experiments out of doors and in order to increase the wavelength of the transmissions, he replaced the two outside ball gaps of his oscillator with metallic sheets. Later he elevated one of the sheets and placed the other in the ground. By doing so he was able to increase the range over which signalling could take place to about one kilometre. Further experiments showed that the range could be extended by increasing the size of the elevated plate and also by increasing its height above ground.

The young Marconi tried to interest the Italian authorities in his system of communication, but they gave little encouragement. With his mother he went to England in February 1896, to talk to British Post Office engineers about his invention. He filed a provisional specification of his system with the Patents Office on 2 June 1896, shortly after his 21st birthday.

With the backing of the British Post Office, Marconi improved the apparatus and on 11 May 1897, succeeded in signalling over a water path. The transmitter was located at Lavernock Point near Penarth and the receiver was on the Island of Flat Holm in the Bristol Channel some 5 to 6 km away. Marconi was assisted by George Kemp who remained with him until 1933 when Kemp died. By 1900 Marconi considered that he had sufficient evidence from observations of signals from ships at sea to indicate that long distance communication would be practicable if sufficient transmitter power could be developed. He decided that the time had come to try to bridge the Atlantic with wireless signals.

A site was acquired at Poldhu on the coast of South West Cornwall in October 1900.

Marconi set sail for Newfoundland accompanied by two assistants, and took a selection of balloons, kites, wire and receiving apparatus. The party arrived at St Johns on 6 December 1901, and chose a site on Signal Hill near the Cabot Tower.

When all was ready, a cablegram was sent to Poldhu arranging for signals of three dots corresponding to the letter 'S' in Morse Code, to be transmitted at certain times. Weather conditions were extremely bad. Gale force winds tore away balloons and kites, and the rapid movement of the suspended antenna wire made stable reception difficult. However, Marconi persevered, and on Thursday 12 December, he received the signals and wrote in his diary: "Sigs at 12.30, 1.10 and 2.20".

Marconi was awarded the Nobel Prize in Physics in 1909 jointly with Professor Braun of the German Telefunken Company, one of his commercial rivals.

During 1914 Marconi carried out wireless telephony experiments with apparatus installed in two Italian warships. Communications was established over a range of 70 km.

In 1920 Marconi purchased the *Rovenski*, a yacht which had been launched in 1904 and converted it into a floating laboratory. He renamed it the 'Elettra' and after installation of wireless equipment, sailed for the United States. While passing through the Bay of Biscay, he succeeded in receiving a musical program broadcast from London. With the equipment on board he demonstrated the practicability of carrying out radio telephone communication between ships at sea and land telephone subscribers. At various times he communicated with subscribers in Australia, South America, South Africa, India and Canada.

Marconi's 'Elettra' experiments showed the importance of short waves in long distance communications and enabled him to put forward a new Imperial Wireless Scheme based on short wave beam stations as an alternative to a network of long wave stations.



*Guglielmo Marconi - 1910  
(Courtesy the Marconi Co. Ltd)*

On 26 March 1930, while anchored at Genoa he pressed a telegraph key on the 'Elettra' and operated apparatus in Sydney to switch on a 3,000 lamp display at the Electric and Radio Exhibition. Another remote control operation was performed on 12 October 1931, when the statue of Christ the Redeemer on top of Mount Corcovada overlooking Rio de Janeiro was floodlit. Marconi was in Rome at the time when he pressed the signalling key.

When Guglielmo Marconi died in Rome on 20 July 1937 he was mourned by people of many nations. In England where Marconi did so much of his early development work, the Post Office wireless stations and the BBC were silenced for two minutes as a mark of respect for the great pioneer.

JACK ROSS

## New Broadcasting Stations

### 4CH CHARLEVILLE

Charleville, a town with a population of some 3800 inhabitants, is located in the south western corner of Queensland, and until recently was among a number of centres in the area which had not enjoyed the benefits of a local National MF broadcasting service.

The only service available had been the High Frequency Inland Service VLM4 located in Brisbane and installed in 1949 to provide transmission to western Queensland. The nearest MF stations are 4QL Longreach some 400 km away and 4QW St George 300 km distant.

Charleville is well known for being the southern terminal of the QANTAS air mail and passenger service which began operating with worn out Armstrong Whitworth World War 1 planes in 1922. The service operated between Cloncurry and Charleville, and it was claimed that it would reduce the isolation of living in the outback and encourage the hardy settlers.

On 29th May, station 4CH began transmissions on a frequency of 603 kHz employing a 10 kW transmitter and two 90 m high masts giving a directional pattern. The station is located 18 km out of town on the Mitchell Highway.

The solid state Nautell transmitter of Canadian manufacture is housed in a 400 line telephone exchange type building. It was installed in Brisbane and transported by road to site. Emergency power is available from a 30 kVA diesel electric set installed in a small building adjacent to the transmitter building.

Lightning problems are expected and to minimise outages, lightning surge suppressors have been fitted to the power mains, the program and telephone lines. Particular attention has been paid to earthing of the semiconductor equipment.

Program is provided via the Longreach ABC studio over Telecom's inland broadband system to Charleville, and then by open wire on the old Augathella trunk line pole route to the transmitter.

DOUG SANDERSON

### 3WA WANGARATTA

Wangaratta, a town with a population of about 16,000 inhabitants, and situated some 230 km, north-east of Melbourne, is the latest centre in Victoria to have an MF broadcasting station commissioned.

The city is a prosperous market and commercial centre for a rich pastoral and agricultural region. Major products include beef cattle, sheep, citrus fruits, cherries, wool and grains. Substantial textile industries provide the back bone for employment and have also caused a demand for many smaller but skilled servicing industries.

External plant work for the station commenced in October 1986 and following its completion, a transportable building housing the transmitter and ancillary equipment was installed on site.

The transmitter is a 10 kW Nautel fully solid state model. It employs pulse width modulation and achieves an overall efficiency of 74%. The output is derived from 48 transformer coupled, power amplifiers, each with an output of 250 watts.

The directional antenna system uses two 90 m masts and provides protection to stations in Queensland, New South Wales, and New Zealand which share the operating frequency of 756 kHz. The coupling units are housed in weatherproof reinforced polyester cabinets, and are mounted close to the mast bases. The phase adjusting and power splitting networks are located in the transmitter building. A foam dielectric feeder is used to eliminate the need for cable pressurization. Phase monitoring transformers are installed in each coupling unit, and superflexible feeders connect these transformers to the phase monitoring equipment.

Commissioning of the station was streamlined by pre-installation and testing of the transmitter and associated equipment in a transportable building at the Broadcast Service Centre, Lyndhurst.

The station was placed in service on 12 June 1987 with standby program facilities comprising off-air reception from 2CO Corowa should the program line from Melbourne be interrupted.

SIMON MOORHEAD



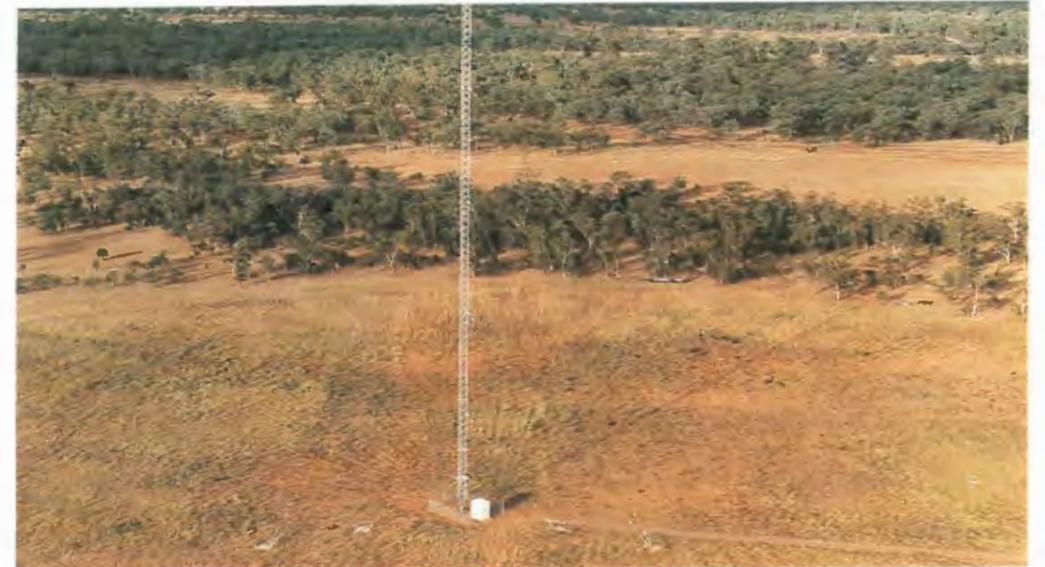
Directional antenna system and building - 3WA.



Simon Moorhead Snr Engr and 10 kW Nautel transmitter - 3WA.



Patching panel made by Shepparton ES&T group - 3WA.



One of the 90 m masts - 4CH.



Transmitter building being placed in position - 4CH.



Cable terminations and line current transformers - 4CH.

## New Encyclopaedia

### THE ENCYCLOPAEDIA OF AUSTRALIAN MUSIC RADIO AND RECORDED SOUND

One of the exciting projects being developed by The National Film and Sound Archive (NFSA) in Canberra is the production of the Encyclopaedia of Australian Music, Radio and Recorded Sound.

The work is expected to take four years to complete, to cost about \$1,000,000, and involve a General Editor, an Advisory Board, eight to ten consultants, and some 400 contributors, as well as the Sound and Radio Research and Acquisition Branch of the NFSA. The Editor is Dr Jane O'Brien.

There is a desperate need for a comprehensive, standardised and authoritative reference publication on Australia's interdependent music, radio and recorded sound traditions – a publication which presents unavailable, unknown or generally inaccessible information in addition to extensive non-print source listings.

From the Dreamtime, music has played a vital role – religious, educational, creative, entertaining, ceremonial and nationalistic – in the lives of all Australians; with the beginning of sound recording in Australia during the 1890s, and the introduction of broadcasting during the 1920s, the fields of music, broadcasting and recorded sound have been closely associated and largely interdependent in terms of performance, creation, management and information.

The Encyclopaedia will have four major purposes:

- To recognise and acknowledge the thousands of individuals, groups and organisations whose achievements and contributions have hitherto been unrecognised;
- To highlight the extent, richness and diversity of activity and achievement in all aspects of Australia's broadcasting, sound recording and music traditions;
- To provide sufficient information regarding the location of personal papers, collections and recorded materials in order to encourage and facilitate further research in the fields encompassed by the Encyclopaedia;
- To provide an extensive information base for industry, scholars, students and the interested lay person.

With an emphasis on facts and source listings, the Encyclopaedia will be a comprehensive coverage of the activities and achievements of the creators and performers, the management, the professional, amateur and industrial organisations, the research, the publication, the training and the technical endeavours involved with, developed through, and emanating from, Australia's rich and extensive sound recording, broadcasting and music traditions.

The two-volume Encyclopaedia will have approximately 4000 entries and will consist of almost 3,000,000 words.

It will include:

- Some 30 background articles;
- Approximately 2000 entries between 50 and 200 words;
- Approximately 2000 entries between 250 and 1000 words;
- Extensive discographical listings;
- Repertoire lists;
- Broadcast dates and performances;
- Filmographies;
- Videographies;
- Bibliographies;
- Composition lists;
- 1000 illustrations;
- location guide for relevant collections.

Entry selection will emphasise those individuals, organisations, recording companies, broadcasting stations etc., vital in providing the environment in which music, sound recording and broadcasting have flourished in Australia.

Entry selection will include those whose influence tends to be unknown, unheralded, or fading from living memory.

The proposed publication date is 27 June 1990 – the centenary of the first recording known to have been made in Australia.

JACK ROSS

## Achievers

### AWARD FOR COMMUNITY SERVICE

Les Duguid Technical Officer and relief Shift Leader at television station ABWQ-6 Mt Goonaneman near Childers in South Eastern Queensland is the recipient of a Telecom Advance Australia Award of Merit for his role in initiating the development of a park at Apple Tree Creek about 5 km north of Childers.



*Les Duguid at Apple Tree Community Park.*

Les began his career in broadcasting when he entered the Postmaster General's Department as a Technician-in-training in 1965. Soon after completion of the course he was involved in broadcast installation activities but in 1971 moved to the operational side as a Shift Technician at 4QO Eidsvold. Between 1973 and 1978 he acted as relief OIC at the station and then transferred to ABWQ-6 as relief Shift Leader. Except for some relief as OIC at 4QB Pinalba he has worked at his present station for some nine years and has taken a keen interest in local community activities.

The Apple Tree Community Park project took a lot of hard work and planning by many people and organisations, but it was the drive and leadership of Les which culminated in the Park reaching its present level of acceptability and enthusiastic praise by travellers who use the area as a welcome rest point.

Not long after he moved into the area, Les saw the need for an off-road park. He was the instigator in obtaining land from the Lands Department and formed a committee in March 1983 to set about bringing his dream to reality. Les was elected President of the committee.

The area obtained was a wasteland full of bullrushes, having been turned into swampland because draining pipes from the road drainage system had ended there.

The first job was to drain the land, and after a lot of hard labouring work by willing volunteers, the work was complete. Some low lying areas were filled in and barbecue areas, tables and a wishing well were soon set up. The main Roads Department came to the aid of the group and granted \$20,000 for the construction of a toilet block.

The committee was solidly backed by local service organisations including the Childers Apex Club which contributed a playground, local Rotary Clubs which helped with pathways, and the Bundaberg East Rotary Club which built some shelter sheds.

KEITH ROSS

## International Visitor

### MADAM DI GUIFEN – RADIO BEIJING

Madam Di Guifen, a Communications Engineer with Radio Beijing, inspected Radio Australia Darwin during a visit to Australia in March on a trip sponsored by the Australian Broadcasting Corporation. Radio Beijing is the external service of the People's Republic of China, and operates transmitters from a number of sites, with transmitters up to 500 kW output. The programs are broadcast in more than 40 languages.

The purpose of the visit was to monitor China's international broadcasts to the Pacific and Asian areas, an exchange for the visit and hospitality afforded Bill Edwards,



*L to R. Eric Newmann (OIC), Allan Hiscock (ABC), Mr Bai Lianxing, Madam Di Guifen, John Wilkins Snr Engr, Barrie Morton NT Manager.*

Broadcasting Operations Manager Central Office, during his visit to China in 1985 to monitor Radio Australia transmissions into the area.

Madam Di has a maintenance responsibility in the Administrative Bureau of the Ministry of Radio, Film and Television, and specialises in HF International Broadcasting. The Ministry in which she works has a function similar to that of the Broadcasting Directorate in relation to Radio Australia. Madam Di was accompanied by Mr Bai Lianxing, Public Relations Officer of the program department of Radio Beijing.

While in Darwin Madam Di took particular interest in the



*Madam Di examining antenna switching panel.*

HF transmitting facilities at Radio Australia. Many of the Radio Beijing transmitters and antenna systems are designed and built in China, and a lively exchange of design concepts and maintenance practices took place. China has a mix of manually operated and automated plant, and the Darwin visit enabled Madam Di to see the latest Australian use of computer technology in the operation of an international broadcasting complex.

The tour finished with a visit to Central Office where Director Leon Sebire and Bill Edwards discussed a wide range of broadcast engineering matters of mutual interest.

BARRIE MORTON

## Engineers Conference

### VISIT TO R.A. DARWIN

The Northern Territory Division of the Institution of Engineers convened the 1987 Engineering Conference in Darwin. Appropriately, the Conference theme was 'Developing Remote Areas' and allowed people from all over Australia the opportunity for interaction with particular emphasis on communication and transportation. In all, 75 papers were presented, many covering engineering problems and activities in the harsh interior and tropical north.

During the Conference delegates were given the opportunity to tour the Radio Australia facility at Cox



*Visitors inspecting antenna system.*

Peninsula. Thirty people with an interest in communications, took the public ferry across Darwin harbour and after a light lunch at Mandorah, were transported to the Radio Australia facility. All the visitors were welcomed by Barrie Morton, Manager Northern Territory Section, and divided into two groups to visit the antenna system and other external plant, and the transmitter building.

NT Senior Engineer John Wilkins, took charge of the external plant group and provided a lively and interesting commentary on all aspects of the facilities. The visitors were impressed by the large antenna structure which is particularly impressive when viewed from close quarters. Eric Newmann acting Officer in Charge, conducted the visitors through the



*Control room facilities being explained by Alan Holland Actg Asst OIC.*

computer controlled transmitters equipment. A high level of interest was shown in the modern automation provided by the computer control, and particularly the diagnostics and multi-coloured displays.

The Conference held in May brought together the knowledge and skills of engineering from the whole region, based on a wide range of projects. It provided a rare opportunity for Engineers who by the very nature of their work in isolated areas, seldom get a chance for learned interaction with their peers.

BARRIE MORTON

# Staff News

## CENTRAL OFFICE

After serving many years in the Radio and Broadcasting areas of Telecom, Fred Cromie Engineer Class 3 has transferred to the Network Engineering Department, Victoria.

Fred worked with the BBC in England from 1956 until 1972 after which he joined Telecom to work in the Network Services Branch, Victoria. He transferred to Central Office in 1980 and worked on many broadcasting projects.

New recruits to Central Office include Anthony Magris and Hugh Murray, Engineers Class 1. Chris Cooper, also Engineer Class 1 from New South Wales, is spending three months on project work.

Another new arrival is Libby Springveldt who commenced as Secretary to the Deputy Director in February. Libby hails from South Africa and recently appeared on 'The Midday Show' with Ray Martin where she spoke against racial discrimination.

## QUEENSLAND

Hedley Rice TOIT, has transferred from Dalby to the Emerald Broadcast District, replacing Ian Burrows who has taken up a TOIT position elsewhere in Telecom.

Peter Brass and Geoff Wilson, both engineering graduates from the Queensland Institute of Technology, have joined the Engineering and Construction Section as Class 1 Engineers.

Anne, wife of Mike Collins of Operations, was seen in the office recently proudly showing their new daughter to staff.

A number of Broadcast District centres and stations recently received Accident Prevention Merit Awards. Gold Awards were presented to 4QN Brandon, 4QS Dalby, ABWQ-6 Mt Gooneman, ABRQ-3 Mt Hopeful, ABSQ-1 Passchendaele, ABDQ-3 Mt Mowbullan, and Radio Centre Bald Hills. Silver Awards went to the Cairns, Townsville and Mackay Broadcast Districts. Congratulations to all staff at these places.

News has been received that Gordon Gilbert died in April. Before his retirement Gordon had served in many areas of broadcasting. After war service in the RAN, he joined the PMG Department, and whilst on installation work, worked on 4RK and VLM transmitters. He became OIC of the Radio Laboratory, and in later years was STO Radio Operations in the Brisbane Office

## NEW SOUTH WALES

Christine Iliopoulos has transferred into the Resources and Budget group as CA4 from Telegraphs and Data. Welcome to the Branch, Christine.

A number of members have left the Branch recently by way of retirement, transfer or resignation. Pasquale Ursino Cleaner at ABN2 retired on 22nd May and Peter Shalless Asst Tech transferred to the telephone area in Telecom during April. Resignations were submitted by Robert Studdert TTO, Nick Drakoulis TTO and Philip Voysey. Philip was a Cleaner at 2NA/2NC Beresfield and resigned on 16th April.

Ken Nugent passed his Elec. Eng. Cert. Course with Honours and qualified as TO. Congratulations, Ken.

Other recent appointments as TO include John Griffiths, Richard Rosberg, Gary Smith, Joe Prestia, Glen Fisher and Jenny Murray.

Stephen Allison and Grahame Arrell both obtained vesitbule grade and Craig Smith anticipates to qualify as TO in July.

Technician qualifications have been attained by Scott Pettit, Richard Taylor, Norm Pearce, Nick Tancevski and Grant Moehead. Congratulations to all.

## WESTERN AUSTRALIA

Merran Barrett CA3, has returned to the Broadcast Technical Centre after a term in the office as the Budgets and Resources Aide.

A warm welcome is extended to staff who recently joined the Branch. These include Kim Larsen APO, Cathy

McMillan Secretary, Isabel Deans CA3 and Phil Woods STO Buildings.

Several staff have departed from the branch to work in other areas. These include Lisa Monks Secretary, Richard King Personnel Officer, and Peter Collins APO.

Jenny Young Secretary, is currently on extended sick leave and is being relieved by Cathy McMillan who transferred over from Human Resources.

Kevin Buckland Manager Management Services, Ross Kearney OIC North District, and Ivor Chapman OIC South District, visited all stations and depots to advise staff on the Vision 2000 program for 1987.

Congratulation to Dave Bradey Personnel Officer and his wife on the recent arrival of the first addition to the family.

Stan Randell SLO Lines recently resigned from the Branch.

## VICTORIA

The Drafting Cell has finally been established with the transfer of Tom Jelliff and the promotion of Mario Castillo to Senior Draftsman and Drafting Assistant grade 2 respectively. Unfortunately Mario is currently on accident leave following an accident on his newly purchased motor bike.

Jack Carnell Broadcasting Operations Manager, proceeded on 3 months' leave in May to travel throughout Europe. To Jack and his wife, happy travelling.

David Rofe Staff Clerk, recently announced his engagement to Lynette Jones – congratulations Dave and Lynette.

Kathy Hawke Pay Clerk, resigned in February to return to University studies. Sue Loucopoulos commenced as a Clerk Class 1 in March, and Dora Dick Clerical Assistant, has returned following a period of maternity leave.

Mark Bellis Technician at Radio Lyndhurst, won first prize with an entry in the 'Best People Color Slide' category at the recent Warragul National Photographic Exhibition.

## SOUTH AUSTRALIA & NORTHERN TERRITORY

Carmine Porcaro Engineer Class 1, is working in the Engineering and Construction Section, Adelaide office, gaining broadcasting experience on rotation with other Telecom Engineers.

Brett Waterman TO1 South East Broadcast District, is moving to Melbourne to work in the Training School.

Three new trainees have been welcomed into the Branch. Paul Pyatt ATT, and Alan Mattiske, Trainee TO, are based in Adelaide, while Raymond Lawrence Trainee TO is base in Darwin.

John Wilkins Engineer Class 3 Northern Territory Section, has been busy clearing outstanding projects prior to travelling overseas on extended leave.

Ron Mitchell OIC South East Broadcast District, enjoyed a well-earned Recreation Leave break during April, and Rod Jolly STO2 Network Operations performed the relief duties.

Eric Koithan Technician Broadcasting Services Centre St Marys, retired during May after 38 years' service. Eric was involved in a wide range of projects during his career in Broadcasting, and all staff wish you well, Eric, in your retirement.

## TASMANIA

Sonia McKay Clerical Assistant, recently returned after an eleven month absence to give her new daughter Brooke a good start in life.

Sonia's relief, Karen Paice, intends to recover during a four month holiday in Europe. To say her colleagues were envious would not be an exaggeration, but they all wish her well nevertheless.

Brian McKenzie from Shepparton has taken up duty as SLO. Welcome to you, Brian.

Tasmania Branch will be reluctant in future to import relief staff from other Branches after a recent unfortunate financial experience. It seems that one Len Som-de-Cerff, an Engineer from Darwin helping out in Hobart for a few weeks, scored all three placegetters in the Branch's Hobart Cup Sweep. He then had the cheek next day to claim that as he had been busy on Mt Wellington (that part is true), he was not aware of the names of the horses he had drawn, and expressed complete surprise at his good fortune. Nevertheless, he took the money out of the State, and imposed considerable stress on the Tasmanian economy.

# Jubilee Broadcast

## A LOOK INTO THE FUTURE

As part of the celebrations to mark the Golden Jubilee of broadcast transmissions by 6WA Wagin, the Australian Broadcasting Corporation set up studio facilities in the station building on 7th December 1986, and broadcast a local program which normally would have originated in the Bunbury Studios.

In the course of the program, Bill Bunbury interviewed Director Leon Sebire by telephone on some aspects of the future of broadcasting, particularly as it related to stations similar to 6WA.

The following is an edited version of the interview:

B.B. "Leon, we are celebrating 50 years of broad-casting through 6WA down here in Wagin today.

We have been looking hard and interestingly at the past.



L to R. Dick Francisco, Reg Johns, Percy Eaton, Jaclyn Cornelius, Don Purdy (SBM), Jack Christensen, Ruth Cornelius.

What do you see as the future of broadcasting over the next 50 years?"

L.S. "Fifty years is a long time, and of course technology changes very dramatically. I think it is evident from what you will have found out about the place from the old timers, the sort of scope of the operation of the 1930's how the staff responsibilities to some degree dwindled down in the 1950's when we replaced the equipment, when we stopped having to generate power, and do all those other things that we had to do on stations in the early days.

It is a little bit like the motor car in the early days when one had to have the car serviced every 500 miles and have all manner of things done. Now we've reached the stage, even at 6WA, with the 30 year old transmitter in operation, where we are using a fairly small staff complement to run the station. But if one looks at the equipment available these days, of course, I think it is apparent that technology has advanced so far. All that we would need at a station like Wagin could probably be accommodated in Supervisor Bill Smallgange's office. The sort of equipment that is available for broadcasting now is very compact, highly reliable and capable of very little support."

B.B. "Well, that is the staffing situation.

What about the situation of people in the local scene being able to contribute more or receive more varied kinds of programs through the kinds of technology now created?"

L.S. "That is another good question, because technology is not the problem. We can do anything with

technology now. It is sociology that is the real problem. The means exist of course whereby we could cover the whole of Western Australia very readily from a satellite of the appropriate type, very economically, and much more cheaply than we can do it on the ground. The problem about that of course is that a State wide program is perhaps not particularly relevant to the interests of the sort of diverse people we find in such an immense State like Western Australia."

B.B. "People have been telling us today about the bushfires they have coped with and how the radio station was very much part of coping with that situation. How do you see that kind of service still being provided on local radio?"

L.S. "The thing we have to look at is in fact the next initiative we are taking as far as ABC services are concerned and that is the implementation of the Second Regional Radio Service which we are starting work on in the next few months and really what that is going to be doing in areas such as Wagin is providing a second service, not overlaying the vast coverage, in totality of a station such as 6WA, but picking up the towns and major centres with more localised transmitters which can of course be accessed with programs that perhaps have more relevance to the smaller communities rather than the larger community."

B.B. "And that could include day-to-day type information presumably?"

L.S. "Yes, of course. It will depend of course on how much in terms of resources the ABC is able to fund to these various transmitters. It is not the technical side that is going to determine how radio works, it is the demands of the people, because the technology exists. We can do it. We could deliver program readily by satellite or landline to smaller transmitters aimed at picking up the separate interest groups. It becomes almost community or local radio in the ultimate."

B.B. "There is a kind of paradox involved that you have to use outerspace to create a greater sense of community."



ABC Staff. L to R. Bob Murray, Edo Brand, Bruce Jones, Bill Bunbury.

L.S. "Yes. Another thing I might mention is that very soon, probably by the middle of 1987, 6WA will most likely be providing 24 hour a day service, and that may well be of interest to some of the listeners in the wheatbelt on their tractors working around the clock. At least it will be some program where no alternative exists at the moment."

B.B. "And maybe getting those sheep weather alerts right where they are needed."

## Profiles

### JOHN BRAY

After gaining his B.Sc. (Eng.) from London University in 1967, John commenced employment with Decca Radar where for the next three years he was involved with microwave antenna development. In 1970, John moved to Australia and joined the Postmaster-General's Department in the Broadcasting Branch where he was involved in the design and provisioning of television transmitting stations.

With the advent of FM Broadcasting, John joined the newly created FM Section as a Class 3 Engineer in 1974. In this area, he was initially involved with cost benefit studies for the introduction of capital city FM services and then later became Project Engineer for the establishment of the Sydney and Melbourne FM stations.

In 1977, John became Project Engineer for the Remote Area Television expansion program which involved the establishment of the satellite fed stations. In 1980 he was promoted to the FM Station Manager's position and oversaw the rapid expansion of the ABC-FM network.

The latter part of 1984 and most of 1985 saw John responsible for the establishment of SBS stations in Adelaide, Newcastle, Brisbane, Wollongong, Perth and Hobart, before becoming Manager of the newly formed Engineering Services Section.

John, who speaks fluent French, has two daughters aged 12 and 14. His interests outside of work involve squash, tennis and a little dabbling in the stock market.



*John Bray*



*Bruce Cook*

### BRUCE COOK

Since graduating from the Ballarat Institute of Advanced Education in 1971 and until early 1986, Bruce was employed in the Structures Design Section of the Radiocommunications Construction Branch at Central Office where as a Class 1 and Class 2 Engineer, he worked on projects involving detailed design and analysis of self supporting towers, guyed masts, antenna arrays, footings and a major association with the Black Mountain Tower design aspects.

Bruce was promoted to Engineer Class 3 at the end of 1980 and for a period of three years was Civil Project Engineer for the Dampier-Perth Pipeline System. At the completion of this, he became Project Engineer for the external plant provisioning and installation of the Digital Radio Concentrator System. In January 1986, Bruce decided it was time for a change and made the move to St Kilda Road where as an Engineer Class 4, he is responsible for the provision of expert structural consultancy to the Broadcasting Directorate.

In the period that Bruce has been with the Directorate, he has been involved with a number of important projects namely: the installation of the main SBS antenna at Mt Bickley and Mt Lofty, on-site assistance with regard to the re-guying of the Hamersley MF mast, provisioning aspects for the MF masts at Karratha, Charleville, Wangaratta, and the satellite installations at Coffin Bay and Mt Damper.

Bruce and his wife have four children ranging in age from one to seven, and whilst this tends to preclude most other interests, some time is found for competition basketball, kayaking and fishing.

### GARY FRANCE

Gary graduated from the Yallourn Technical College in 1969 with a Diploma in Civil Engineering and his first engagement was with the Consulting Engineering firm H.R. Keogh & Co. where for 18 months he gained experience in the design of property sub-divisions, drains and roads.

Gary spent the ensuing seven and a half years working for Standard Steel where as Design Engineer he was responsible for the design and testing of steel structures, including 'cold formed' products, used in various industrial buildings.

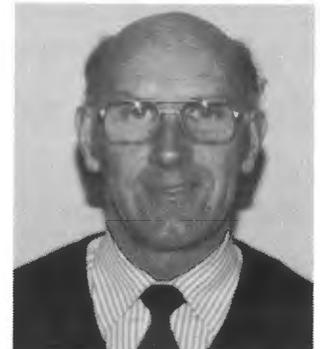
Gary then worked for Johns & Waygood and Maunsell & Partners for periods of eight years and 14 months respectively, where he was responsible for the design of a wide range of heavy steel structures such as cranes, industrial complexes, connection design and fabrication advice to consultants. Gary was also involved in checking the tower for TVW-9 Perth and the mast for TNQ-7 in Townsville.

In February 1986 Gary joined Telecom as Engineer Class 3 with the Broadcasting Directorate where he has been involved with a variety of projects such as the preparation of specifications for the cableway track rope replacement at Bellenden Ker, the Broome mast replacement, investigation of additional mast loading at Roebourne, the proposal for a new National Service at Gympie and the use of synthetic rope to support top loading elements on MF radiators.

Married to Milena with three children - Rohan, Marissa and Alicia, Gary is an active gardener and is treasurer of the Society for Growing Australian Plants, Springvale Branch. He is a keen photographer, enjoys bush walking, watching motor racing, and is an early morning swimmer.



*Garry France*



*Alex Brown*

### ALEX BROWN

Alex Brown, Principal Lines Officer Grade 1, Central Office, joined the Postmaster-General's Department as an exempt Radio Lineman in 1958 and was appointed to the permanent staff in the South Australian Radio Section in 1963.

From this point, Alex moved through the ranks achieving promotion as Line Foreman Grade 2 through to Senior Lines Officer Grade 2, Adelaide, on formation of the Broadcasting Branch.

In 28 years with the PMG and Telecom, Alex has had a wealth of experience in all phases of radio lines work in television, sound broadcasting and radiocommunications in both construction and maintenance areas.

Earlier this year Alex decided to broaden his horizons and at the same time, utilize his extensive knowledge by moving to a more hectic way of life in Melbourne where he commenced duty in his present position as a member of the Engineering Services Section, in which he is responsible for overseeing broadcasting external plant installation and maintenance work carried out by State Branches.

Alex has two sons and one grandchild, and his main interest outside of Telecom is tennis in which he has represented both South Australia and Australia (Japan 1982) in the Veteran Competition. A particular highlight in Alex's tennis career is the day he played former international star Ilie Nastase in a practice session.

At club level, he is currently a member of the Memorial Drive Tennis Club in Adelaide and the Glen Iris Club in Melbourne. Other hobbies include snow skiing, music and reading.

# Consultancy Service

## INSTALLATIONS BY WA BRANCH

The Western Australian State Broadcasting Branch has been playing an active role in recent times in providing a consultative service and an installation and maintenance function for communities and commercial broadcasting and television organisations.

Government policy allows communities to provide National Television Services by the following two methods:

1. Construction at community expense of a National station and then donation to the Commonwealth. This option does not require a licence, but must first be approved by DOC before work proceeds.

After donation, the Commonwealth is responsible for all operating and maintenance costs.

The station must be constructed to 'standards for donation' which have been approved by DOC.

2. Construction at community expense of a National Station and then reimbursement at a later date viz. the date the Commonwealth would normally have provided the station. This method is only applicable to stations already on approved programs and which communities wish to have installed in advance. Reimbursement must be approved by DOC before construction proceeds.

This option requires the community to seek a licence and



*Tom Read (L) OIC and Ross Kearney PTO at Mt Barker.*

operate and maintain the station at their expense till 'reimbursed' at which time it becomes Commonwealth property.

When a National facility exists or is provided by either of these two methods, it is possible for communities to share facilities to provide commercial television and commercial radio, and this is in the majority of cases, the most economic and desirable solution.

The policy allows the Directorate to install, operate and maintain National and commercial stations provisioned by all the preceding methods.

The distribution of ABC programs by satellite and the RCTS service has made programs available to all communities in Australia, and has precipitated a high demand for National and commercial television and radio transmissions.

The Branch has assisted communities in arriving at the 'best choice' for their community and where one of the above solutions is proposed, has competed with others to install and maintain the facility. To date the Branch has been in contact with fifty-two Shire Councils and community groups of which eight of the communities have selected one of the options to provide facilities for their community. Discussions are continuing with another eleven groups prior to finalisation of an agreement.

Communities for which successful solutions were obtained include Marble Bar, Mt Magnet, Cue, Denham, Meekatharra, Ravensthorpe, Lake Grace and Kununurra.

The Branch also undertook a major project for the Golden



*GWN NEC transmitter Mt Barker.*

West Network (GWN). When the Remote Commercial Television Service (RCTS) licence was granted to GWN, the Company examined various methods of providing the re-transmission facilities as required under their licence at fifteen remote locations in the Kimberley, Pilbara, Gascoyne and Murchison regions. The Company chose to share the National facilities which existed at most sites, and based on cost efficiency and known high standard of performance by the State Broadcasting Branch, requested the Branch to install and maintain the GWN stations.



*Peter Adams TO2 adjusting Mt Lennard transmitter.*

The installation work became a priority item when public pressure mounted on GWN to broadcast the VFL Football Grand Final. The staff tackled the work with enthusiasm and completed the project on time to the complete satisfaction of GWN and their equipment supplier NEC.

Golden West Network Engineer Hugh James subsequently sent a letter of appreciation to the State Broadcasting Manager thanking him for a job well done.

DON PURDY



*GWN NEC transmitter Mt Lennard.*

## From the Back Room

### THE BUILDINGS OFFICER

Sites and buildings required for sound broadcasting and television stations often have special requirements and conditions not normally found in facilities provided for other purposes.

A medium frequency station site requires land with soil possessing high conductivity, large enough to install an extensive radial earth mat system buried beneath the surface and sufficiently removed from large population centres to minimise signal blanketing problems.

A television station site usually calls for high elevation in order to give a line-of-sight coverage over the area to be served. To get to such a site an expensive access road gouged through mountain rock may be necessary.

For an International high frequency broadcasting station site, such as Radio Australia, a land area of hundreds of hectares may be required.

The building also requires special consideration. Good earthing, bonding and shielding are critical and must be incorporated into the building during its design and construction stages. Where high power transmitters are to operate, the costs associated with provisioning of the earthing and bonding systems may be a significant proportion of the total building cost.

The fact that a tall mast or tower forms part of the station facilities introduces another problem. The isolated structure is an ideal target for lightning discharge and the need to protect equipment and staff from such hazard involves additional project cost.

The Broadcasting Branch Buildings Officer has to be knowledgeable in these matters and scores of others. It has

been said that his fields of involvement cover architecture, engineering, quantity surveying, concreting, drainage, bricklaying, carpentry, joinery, metalwork, roofing, plumbing, plastering, tiling, painting, title searching etc. etc. You name it, the poor old Building Officer has to be expert in it.

He also has to deal with people. All shapes and sizes, all trades, all nationalities and all colours. One day he may be trying to convince an ex-Argentinian plumber to rip out, at his own expense, a 20 mm PVC pipe and replace it with a three-quarter inch copper pipe, lagged and supported with PVC brackets, sheradised screws one inch by six gauge at 1500 mm centres on the soffit of a 360UB45. No wonder passers-by stop and listen to two grown up men shaking fists and swearing – one in Spanish and the other in English.

Next day he may be sitting on a green ants' nest trying to convince the elders of the Yankunyjtjajara tribe that they should give up a sacred site for the construction of a TV station or even explaining to them why they can't get a picture on their VHF TV set from that UHF transmitter on the hill.

Before the week is over he may have to meet with an irate group of neighbours adjoining one of the broadcasting stations and convince them that it is stiff cheddar that the water from the station flows through their bedroom every winter. Yes, he has to be a PR man too.

So much for the official duties. They are easy. It is the office mates who make the job more interesting with many endless queries and pleas for help. "My ceiling is sagging from the leaking HWS. How do I fix it?" "How do I cut a cat door in my new security door?" "That remedy you gave me to remove moss from the roof doesn't work. It ate holes in the tiles." "My sewerage drain is blocked. Can you lend me a tool to fix it?"

Well, Building Officers have great knowledge and skills in all these things. Life wasn't meant to be easy. Who said that? Probably the Chief Buildings Officer in Central Office. There isn't one? Oh! excuse me.

DON HEYLEN



## 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 The Broadcaster is final and no correspondence on the Editor's decision will be entered into.**

Sir,

I am writing to let you know what I remember of the night the Second World War was declared, an experience which I shared with the late Max Loveless.

I was on the staff of 7NT Kelso, northern Tasmania's first National station, having started my career with the Postmaster General's Department about two years before.

Max was sent to Kelso, probably to relieve someone who was on Annual Leave.

At the time of which I am speaking, two Technicians (Mechanics) were always on duty at the 7NT transmitter and Max and I were on duty together when war was declared. We were to have finished our shift at 11.45 p.m. after 7NT closed down at 11.30 p.m. However, the station was kept on air all night so Max and I just remained on the job.

The station had been in operation only about four years at this time having been commissioned on 3 August 1935, and the original transmitter (6 kW) had a great number of valves. The Transmitter Operator (Max on this occasion) was required to read and record the plate current of each valve every hour.

It was the custom for the Control Room Operator (myself) to go into the transmitter room and write down the readings as our mate called them out. The meters were set back behind little 'port holes; and some of the smaller ones were hard to read.

We kept ourselves awake making numerous cups of tea and on one occasions, at about 4 a.m., I was writing down the meter readings while Max was trying to read them, when he said:

"Here let me do the writing, I can't see the bloody things anymore."

So we changed over.

Next morning, we were relieved by the morning shift at 6 a.m. and walked home to get some well earned sleep.

Max returned to Hobart after a week or two, and some twelve months later I was transferred to Hobart, it having been decided that only one man was required on duty at Kelso.

I did not see Max again until after the War.

The staff at Kelso in 1939 were as follows: Tom Merchant Officer-in-Charge, Tom Daniels, Bert Iles, Harry Blake, Harley Schell and myself.

Sorry, I just remembered. A squad of soldiers turned up the morning after war was declared and set up tents in the grounds of the station. The troops were still there guarding the station when I left.

It must have been a boring job.

One day a Private with fixed bayonet was patrolling the transmission line between the transmitter and the antenna. To see what would happen, he reached up and touched the live wire with his bayonet. The tip of the bayonet was burned in the flash and he landed flat on his back in the mud!

JACK READ  
RETIRED

## Let's Play It Safe

### CHECKING RF RADIATION METERS

In recent times the topic of radio frequency radiation exposure has received much publicity and many countries have issued Standards for use by organisations which operate transmitters and industrial appliances which are capable of generating electromagnetic energy.

The purpose of the Standard is to provide guidance on the exposure of the body either wholly or partly to non-ionizing radiation and to set limits to avoid known hazards of radio frequency radiation based on current knowledge of biological effects of such radiation.

However, it is one thing to issue a Standard defining levels of electromagnetic fields, but another thing to



*Giff Hatfield Supervising Engineer Operational Studies testing a probe.*

accurately measure those levels in the field situation. The measurement and interpretation of the readings is a complex matter, but one important point it to be able to check the performance of the meter in the field to verify its calibration.

The Telecom Research Department at Clayton, Victoria, has recently developed two prototype TEM cells for verifying the sensitivity of radiation meters.

In March 1987 a meeting of Research, Broadcasting Directorate, and Network Management staff was held to discuss the development of the cells, to give a practical demonstration of their use, and then decide on the type and quantity of the cells to be manufactured.

The two cells demonstrated were a large depot based unit and a smaller portable field unit. The depot unit will require the addition of an external oscillator, power amplifier, and power meter. An advantage over the smaller unit is its less distorted RF field which provides a more accurate probe isotropicity check.

The production model field unit will be self-contained with a selectable three frequency oscillator and power meter, although it will have the facility to connect an external oscillator for other frequency checks.

The two designs were accepted by the meeting as being most suitable for the checking facility, and Research Department was requested to proceed with the manufacturing arrangements. After discussion with some specialised test equipment manufacturers, tenders will be called for the supply of the test cells.

GRAHAM WARD

# Broadcasting Milestones

## 5CL ADELAIDE

South Australia's first A Class station began transmissions on 20th November 1924. The station was operated by Central Broadcasters Ltd and was originally licensed to use call sign 5AB. However, it was changed to 5CL after two days of operation at the request of the owners in order that the call sign might relate more closely to the company name.

The studio and transmitter were located on the roof of the Grosvenor Hotel, North Terrace, Adelaide.

The transmitter employed two Marconi 250 watt tubes with filaments being powered by a 12V battery system and high tension being provided by a 400 watt generator. A three wire flat top antenna was suspended by two wooden masts 20m high.

In September 1925, an AWA built 5kW transmitter was commissioned at Brooklyn Park with a 62m high lattice steel mast supporting a cage antenna 25m long and 150cm in diameter. The other end of the antenna was fixed to a 13m high strain pole and the feeder entered the building via a specially cast glass tile.

The transmitter was similar to units provided by AWA for other A Class stations in Brisbane, Melbourne, Sydney and Perth. New studios were fitted out in Franklin Street and provided with the most modern technical facilities. Chief Engineer was Mr H. A. (Harry) Kauper, well known for his invention during World War 1 which enabled a machine gun to be fired through the revolving propellor of an aeroplane.

During 1927, the high power stage of the transmitter was remodelled and fitted with water cooled tubes.

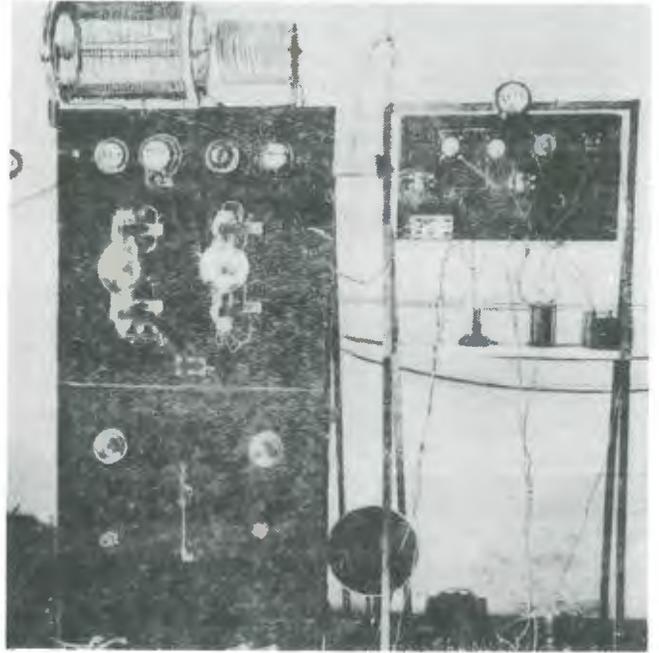
On 14 January 1930, the Postmaster General's Department took control of the technical facilities following Government decision to acquire A Class stations to form the National Broadcasting Service.

In 1936 the transmitter was replaced with one providing

34 = 400  
BRO  
5kW into the antenna. The output circuit employed 4220C type water cooled tubes in a Class B linear amplifier configuration. In 1944, the lattice steel mast was modified to rest on three procelain insulators and used as a radiator.

A new metropolitan broadcasting complex was established at Pimpala about 25km south of Adelaide on 20 September 1961. The 5CL installation comprising 50kW main and 10kW standby transmitters shared a 172m sectionalised radiator with 5AN. These facilities are still in operation.

DAVID CARTHEW



Original 5CL 100 watt transmitter 1924.



David Carthew (L) OIC and Lew Grubb BOM (now retired) with present 5CL transmitter.