

# *The* **BROADCASTER**



Newsletter of the Broadcasting Directorate

No. 5

July 1986



ABC FM STEREO STUDIO

## The Broadcaster

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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Senior FM Officer

## Editorial

Several readers representing staffed country stations have expressed their delight in the contents and format of The Broadcaster and have asked whether the number of articles could be increased. In order to satisfy these colleagues and others who find the newsletter of interest, we have decided to increase the size of the publication by another four pages.

It is evident from the many 'phone calls we receive and a typical letter reproduced in 'Letters to the Editor' column of this issue that copies find their way into the homes of staff where the families also can be kept abreast of what we do in Broadcasting. This is encouraging as it was the hope of the Director that this would be so when he decided to produce the newsletter.

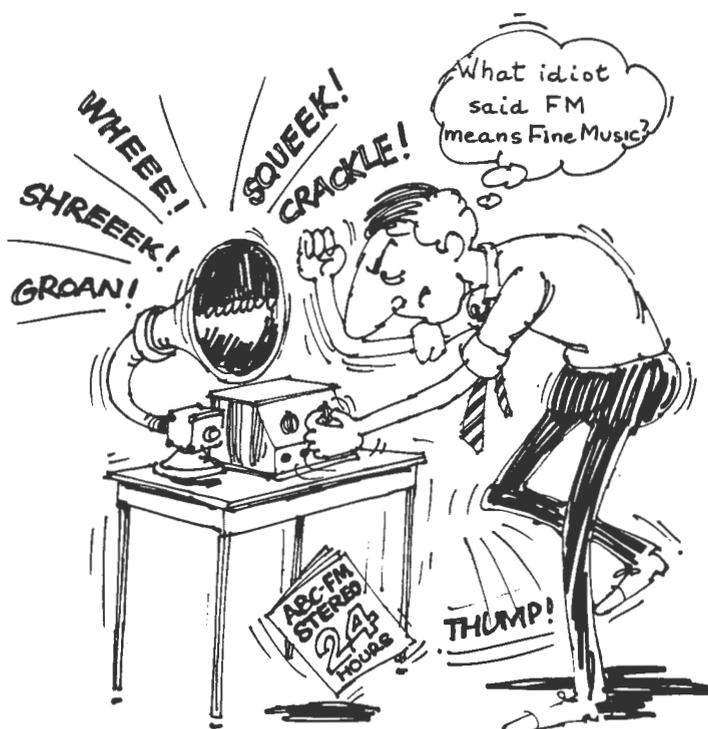
We have some interesting concepts being developed for future issues, but we are heavily dependent upon you, as a staff member, to provide regular inputs so that staff in other States, and out at distant stations, can appreciate what our great team is achieving in this exciting field of Broadcasting.

JACK ROSS  
*Editor*

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## Station Roll Call



Leon Sebire

### From the Director's Desk

The development of frequency modulation broadcasting in Australia has been a fascinating process for those of us who have had the good fortune to be involved. However, after more than 40 years we only have an FM system providing, in general, one service to about 90% of the Australian population. Where will FM broadcasting go from here and will it take another 40 years?

As long ago as 1972 the top priority for expansion of Government broadcasting was a 'Second Regional Radio Network' for the ABC. It was recognised early as requiring an FM solution overlaying the basic TV service because of the difficulties of finding adequate frequencies in the medium frequency band. I can now say with confidence that this initiative is to commence next year and should proceed apace despite all the years of waiting. This will indeed represent the main capital works initiatives for Broadcasting installations over the next few years.

But what of commercial FM which has been so slow to emerge? Limited frequency spectrum availability due to the pre-existence of Band II television, problems of ownership and control and questions of financial viability for all elements of the commercial broadcasting sector have been matters exercising the Government mind for some time. The several capital city commercial FM stations which have been permitted have set striking examples by adopting program formats with tremendous audience appeal and exploiting the benefits of this medium to the full. It is not surprising that the long-standing AM radio operators are looking on with envy and even pressing for the right to re-establish in the FM band.

Undoubtedly, dramatic expansion of FM services will occur over the next five or so years as the 'packaged program' delivery capabilities of B-MAC, the progressive clearance of VHF television from the 88-108 MHz band, a general thrust for higher quality radio services and the relatively low cost of establishing FM transmitting facilities, all impact on the further development of broadcasting in Australia.

LEON SEBIRE

### ABGSI MT BURR

Television station ABGSI is built on Mt Burr in the middle of a pine forest some 40 km from Mt Gambier in the South East of South Australia.

Mt Burr was named after Thomas Burr, the father of the Deputy Surveyor General who was in a party led by the Governor of South Australia, George Grey to the South East in 1844. A small nearby settlement once supported a hotel — The Bush Inn — and a Post Office which closed more than 100 years ago.

The station is on a leased site which is part of the Government State Forest. *Pinus Radiata* was first planted in the area in 1907 with the first milling taking place in 1932. This led to the establishment of a State mill and school which celebrated its golden jubilee in 1984. Currently there are some 14,000 hectares of trees in varying stages of growth in the forest.

ABGSI is a conventional high power TV station, opened in April 1966. During construction the 153 m mast collapsed when an inner guy anchor point failed during stress tests. In addition to the national TV service the building houses a local commercial transmitter SES8, a stereo FM service and a broadband microwave repeater.

The station is staffed during transmission hours with staff living in nearby towns, mainly Mt Gambier and Millicent. They travel to work by private transport.

In the summer of 1983 a fire swept through the pine forest causing enormous damage to the plantation, but fortunately only small damage to the station building due largely to the magnificent effort of staff on duty. A wooden observation hut atop a 30 metre steel tower burst into flames as the fire passed through. The fire burnt right up to the station walls and destroyed a flock of 30 sheep on the property.

RON MITCHELL

### 5CK CRYSTAL BROOK

Broadcasting station 5CK Crystal Brook was the first Regional station of the National Broadcasting Service in South Australia when it was commissioned on 15 March 1932. Installation was under the direction of Mr F.P. O'Grady who later became Director General of the Australian Post Office.

The area received its name from a small stream named Crystal Brook by explorer Edward John Eyre in 1839. A large sheep station and township were subsequently established on the stream.

The station is located some 240 km from Adelaide and programs were originally relayed from 5CL, the only other NBS station, over a pair of copper wires without any line repeater.

The transmitter was manufactured by Standard Telephones and Cables and rated at 7,500 Watts. Two power amplifier and three high voltage rectifier tubes were water cooled types. Motor-generator sets provided power for filaments, grid bias and plates for RF tubes up to the modulated amplifier. The antenna system was a three lead multiple tuned system supported by two lattice steel towers 55 m high and 110 m apart. It is now used as a standby.

A residence was provided for the station OIC but when the station was converted to unattended operation in 1970 the residence was sold and removed from the site. Control is exercised from television station ABNS-1 The Bluff.

The station currently operates with twin 5 kW STC transmitters in parallel feeding a 190 m sectionalised radiator located on an adjacent property.

The ABC maintains a studio at nearby Port Pirie and provides local program for transmission over 5WM Woomera, 5LC Leigh Creek, 5LN Port Lincoln, 5SY Streaky Bay as well as 5CK.

BRIAN BEYER

# News Round Up

## 2NR GOLDEN JUBILEE

The New South Wales Northern Rivers regional station 2NR celebrated its Golden Jubilee on 17 July 1986. The occasion was marked by special broadcasts by the ABC and a number of civic activities by the people of Grafton.

The transmitting station located at Lawrence some 31 km north of Grafton, was opened by Postmaster General Senator A.J. McLachlan during a ceremony in the Saraton Theatre Grafton at 9 o'clock on 17 July 1936. At the function the ABC Dance Band played and Gladys Moncrieff sang.

The facilities included a 160 m high top loaded radiator and a 7 kW water cooled transmitter manufactured by Standard Telephones and Cables. A 2 kW standby transmitter was installed in 1946.

At 6.48 p.m. on 13 November 1946 the radiator collapsed during a violent storm. Staff worked with great dedication throughout the night and by means of a makeshift antenna were back on air on the normal 6 a.m. schedule the following day.

The station now operates with a replacement mast installed in 1951 and a 50 kW transmitter commissioned in 1958.

The Saraton Theatre took a step back in time during July when the ABC 42 member Sinfonia performed a special concert to mark the anniversary. It was the first time in many years that a professional orchestra had played in Grafton. Another function was the broadcast of the 1986 Grafton Cup. The first race event broadcast by 2NR was the 1936 Grafton Cup.

Special banners decorated Grafton's main street and 50th Anniversary car stickers were widely distributed.

DOUG BRODIE



2NR transmitter building.

## ANTENNA SCREENS REPLACED

While repairing a coaxial cable connector fault on the National FM antenna at Mt Burr, staff observed signs of fatigue cracking with some of the elements of the antenna screen. A subsequent detailed examination by the Broadcasting Radio Lines staff revealed that some 63 per cent of all reflector tubing elements on the 14 panels were cracked adjacent to the mounting clamps.

The screens were modified by using aluminium tubing with thicker walls and by fitting aluminium angle stiffening sections to dampen vibrations caused by the wind. All manufacturing and assembly work was undertaken by the Radio Lines group and the modified screens fitted to the structure.

As there was no standby antenna available, arrangements were made to disconnect one half of the antenna system at a time in order to provide safe environmental working conditions. Radiation measurements were carried out and the power fed to the working half of the antenna dropped so that the radiation field in the work area was reduced to an acceptable level in accordance with standards.

ALEX BROWN

## SBS ON AIR IN PERTH

Special Broadcasting Service transmissions commenced in Perth on UHF Channel 28 at 6.30 p.m. on 16 March. The first program featured an opening address by the Prime Minister Mr R.G. Hawke.

A small function was held at Bickley, the transmitting site, and was attended by representatives from the SBS, ABC, DOC, Telecom State Management, and the local Broadcasting Branch.

State Broadcasting Manager Don Purdy welcomed the guests and invited Mr Len Caudle, State Manager Telecom, to declare the transmission facilities open and ready for program.

DON PURDY



L to R. Don Graham DOC, Bryan Madeley SBS and Terry Sellner, Project Engineer at SBS Function.

## NEW RADIO LINES DEPOT

The Northern Territory Radio Lines group late last year moved into new premises at Berrimah some 18 km from the Darwin City Centre. The group comprises seven staff and they are responsible for all Broadcasting Branch new works and maintenance activities throughout the Northern Territory. Together with a group in Adelaide responsible for activities in South Australia, they operate under the control of an SLO2 based in Branch headquarters in Adelaide.

The formation of the group can be traced back to the days in the early 1960's when they set-up camp at the Charles Point Lighthouse for the establishment of the Radio Australia transmitting station on Cox Peninsula. They occupied the new Line building erected at the station in June 1968 and were based there until they shifted to the new Berrimah premises.

The relocation became necessary because of the District responsibility and the difficulty of access to the Cox Peninsula site by road during the wet season.

JIM FINCH



L to R. Jim Finch SLO1, Brian Hodges R/L, Phil Farrell LS3, Terry Whalen R/L, Jim Logan LS1, Peter Carlsson LS1, Alois Specht R/L.

## SBS ON AIR IN TASMANIA

Tasmania's first SBS TV service commenced operation in Hobart on 16 March 1986.

Sharing the Mount Wellington building originally provided for national television station ABT2, the transmitter is a Pye unit with a peak vision power output of 25 kW. It has two identical klystron equipped linear power amplifiers, which in normal operation operate as separate vision and sound power amplifiers. In the event of failure of either chain, each power amplifier is capable of amplifying vision and sound signals together and transmitting a peak vision signal of 9 kW.

Program is received from the SBS Sydney studios via Aussat and a 4.5 metre dish installed at the transmitter site, providing high quality vision and sound using the B-MAC encoding process.

The service is initially using a slot antenna recovered from the Mount Dandenong (Vic) service and provides an excellent signal to most of the Hobart metropolitan area. The temporary antenna is to be replaced with a multichannel omnidirectional array next summer.

BRIAN HALL

## END OF AN ERA

With the removal of the terrestrial radio links into Nyngan and Cobar in central western New South Wales and the installation of new transmitters, an era of special training for Broadcasting staff came to an end during March 1986.

Television service for the two townships began operation on 14 December 1971 using equipment manufactured in France by LGT. Staff were immediately confronted with components and circuitry which were new to them and many long hours were spent in learning new principles of operation and endeavouring to come to grips with testing and maintenance problems. They were soon heavily involved with such devices and terminology as integrated circuits, radio frequency transistors, varactors, pin diodes, circulators, parametric mixers, pump frequency, standard multipliers, trap filters and others, so common today but latest state-of-the-art at the time.

Broadcasting staff are a pretty resilient lot and being thrown in at the deep end of such technology brought out the best in them. Lightning was particularly bad at the site and many long hours were spent in repairing damage to the equipment. Such items as circuit boards were particularly prone to damage by lightning.

The original transmitters were replaced by NEC types with program being provided via Aussat satellite and the experience gained from the original equipment has helped considerably in maintaining this latest version of television transmitter.

BRYAN EAGLE

## OFFICIAL OPENING — VL8A ALICE SPRINGS

At 1.15 p.m. CST on 20 February 1986 Station VL8A, the Northern Territory high frequency service, went to air with taped opening speeches by the Minister for Communications Mr Michael Duffy, and the Minister for Aboriginal Affairs Mr Clyde Holding.

The NT HF service has been a long time coming. Mooted in the 1960's, the 'Inland Service' had recognised project status with equipment on order in 1974 when Cyclone Tracy struck Darwin where the transmitters were to be installed.

A delay in availability of funds and a change in design philosophy saw the system evolve as three vertical incidence stations at Alice Springs, Tennant Creek and Katherine, with target on air dates in early 1986.

The broadcast speeches were followed by an official opening ceremony where dignitaries representing different authorities spoke. They included Neville Bonner ABC Commissioner, Vic Jones First Assistant Secretary Department of Communications, Charles Perkins Department of Aboriginal Affairs, Freda Glynn Director Central Australian Aboriginal Media Association. Master of Ceremonies was Graeme Steele Senior Project Officer of ABC Head Office, Sydney.

Guests were present from all interested and involved authorities, and included Robert Bell Assistant Secretary National Broadcasting Branch of Department of Communications, Can-

berra, Bob O'Sullivan ABC Manager for Northern Territory, Leslie Oldfield Mayor of Alice Springs and Philip Batty CAAMA Projects Manager.

GRAHAM SHAW

## ISLAND HOPPING

The Northern Territory maintenance group based in Darwin not only get to trip up and down the track (Darwin-Alice Springs) servicing broadcasting stations, but are able to take a trip with nostalgia by flying in an historic DC3 aircraft. A local company, North Air, operates two DC3's. One previously owned by MacRobertson Miller Airways was purchased from the Royal Australian Air Force in 1947 after having served throughout New Guinea and the north of Australia during the War.

Flying in light aircraft is not new to Northern Territory staff as many stations are located on off-shore islands or mainland sites not accessible by vehicle. However, they have a particular fondness for the old DC3 because of its special place in aviation history.

An important feature of the DC3 is that there are no restrictions on the amount of test equipment and spare part which need to be taken when a visit is required to one of the island stations. Another factor is that very little shelter, if any at all, is provided at the airports and the large wing span gives shelter from the burning tropical sun or pounding rain during the wet season.

Flying in these areas is not without its hazards. On a recent inspection by Northern Territory Manager Graham Shaw and Senior Technical Officer Murray Fopp in a Cessna 402, an engine failed during take off and disaster was narrowly avoided by a calm but perspiring pilot. The aircraft was slowly circled back to land and with a great deal of courage both staff boarded another aircraft, guaranteed like the one that failed, to be in top working condition.

BARRIE MORTON

## SAFETY AWARD

Staff at the Adelaide Broadcast Service Centre are to be congratulated in achieving 250,000 manhours worked, without a lost time accident over the period November 1981 to July 1985.

This excellent record has been recognised by the National Safety Council of Australia by the representation of an "Award of Merit" certificate together with a suitably endorsed banner for prominent display in the work place.

The heavy installation and maintenance program presently being undertaken by this group have made it impossible to get all of the staff together at the same time for an official presentation. Nevertheless, OIC, Wes Graham has accepted these items on behalf of the group and is arranging for them to be prominently displayed.

Congratulations to all Staff.

LEW GRUBB

## WILD PIGS PUT TO ROUT

After staff at the Radio Centre Bald Hills, the home of 4QG, 4QR, VLM and VLQ, noticed one morning that a large area of the station lawn had been uprooted by feral pigs, action was taken to put a stop to their cultivating habit.

Nev Cole and Des Allen, two agile members of the staff, and a couple of Sherlock Holmes' fans followed the tracks of four piglets and ran them down, much to the disgust of the boar and his two sows.

Des built a trap to capture the larger members of the family and the morning shift were surprised to see a sow in the trap when they arrived for duty. The same evening another sow was trapped and both were promptly despatched to the happy hunting ground in the sky for all feral pigs.

The big boar was too smart. He was sighted near the trap but after making a full assessment of the situation threw his snout in the air, gave a couple of grunts and wandered off to look for a couple of new sows.

For some time, passers-by were intrigued by the frequent aroma of cooked pork which wafted from the station lunchroom.

GEORGE MARSHALL

## Official Visit

### DIRECTOR VISITS WESTERN AUSTRALIA

The Branch welcomed the Director Broadcasting, Mr Leon Sebire, and his wife when they recently visited Western Australia. It was the first visit to the State by the Director since the establishment of the Directorate in December 1983.

During the visit Mr Sebire addressed Broadcasting staff on the future developments in Broadcasting and outlined the role the Directorate will play in such developments besides highlighting some of the many challenges the Directorate faces in the future. The opportunity was also given to staff to raise matters of concern, and this was very much appreciated by the staff.

Visits were made to all manned stations in the South West of the State where the Director and Mrs Sebire were accompanied by State Broadcasting Manager Don Purdy. At these stations Mr Sebire met and spoke to as many staff members as was possible.

The visit was a tremendous success and all staff expressed their appreciation of the value of the visit, indicating that such visits should be undertaken more frequently.

DON PURDY



Visit to Broadcast Installation Depot. L to R. Mrs Sebire, Ross Kearney (partly hidden), Mr Sebire, John Gregory STOI, Harry Respini Tech.



The Director presenting Technicians Certificate to Mark Barnett at 6WF.



Don Benck (L) OIC Bickley and Mr Sebire inspecting SBS installation.



# THE DIRECTOR TAKES HIS DESK WEST!

## FM Pioneer

### E.H. ARMSTRONG

A little over 32 years ago broadcasters and high-fidelity buffs throughout the world were stunned to learn of the tragic death of Edwin Howard Armstrong, inventor and pioneer FM broadcast Engineer. Some time during the late evening of 31 January 1954, Armstrong, meticulously dressed in hat, overcoat, scarf and gloves, fell to his death from an apartment on the 13th floor of the New York's River House.

No major invention of recent times has had a longer, harder, more heroic struggle for existence and recognition than FM broadcasting.

At the time of his death, Armstrong was in the midst of a mammoth, seemingly hopeless legal battle with a potent group of radio manufacturers who had refused to recognise him as the inventor of wideband FM and who were attempting with skilled patent lawyers, to break his patents and evade payment of royalties for their widespread use of the invention.

Armstrong, the most significant inventor in frequency modulation broadcasting combined exceptional gifts with a passionate interest in radio. His interest in radio technology began even before his student days at Columbia University prior to the First World War. He early won recognition through his work on the regenerative or feedback circuit (1912) and later the superheterodyne (1918) and super-regenerative (1922) patents. The subsequent sale of these patents netted a small fortune. His appointment to a professorship at Columbia provided a stimulating environment for pursuit of research.

One of the major problems which Armstrong had been eager to solve was the elimination of static. He wrestled with the problem for eight years from 1914 until 1922 without making any significant progress. In 1924 he again took up the challenge, but this time he attacked the problem from a different angle. He worked to produce a new kind of wave for broadcasting — different in character from that of static. This led him to examine frequency modulation as a possible solution.

Towards the end of 1933 Armstrong had perfected a system of frequency modulation which seemed to overcome natural, and many forms of man made static. He then set about to put his invention to work.

Trials were arranged with RCA engineers using a low power television station in the Empire State Building, but the RCA people were reluctant to co-operate. They put forward many technical objections on the use of FM but subsequently when the better quality of FM was demonstrated, they advanced the proposition that the public would not appreciate it, and did not want it.

Armstrong was a man of considerable means at the time and decided to go it alone in promoting the merits of frequency modulation broadcasting. Work virtually ceased



*Armstrong and his wife Marion 1913 with an Armstrong invention — a 'portable' radio. (Courtesy Armstrong Memorial Research Foundation).*



*Edwin Howard Armstrong (Courtesy Armstrong Memorial Research Foundation)*

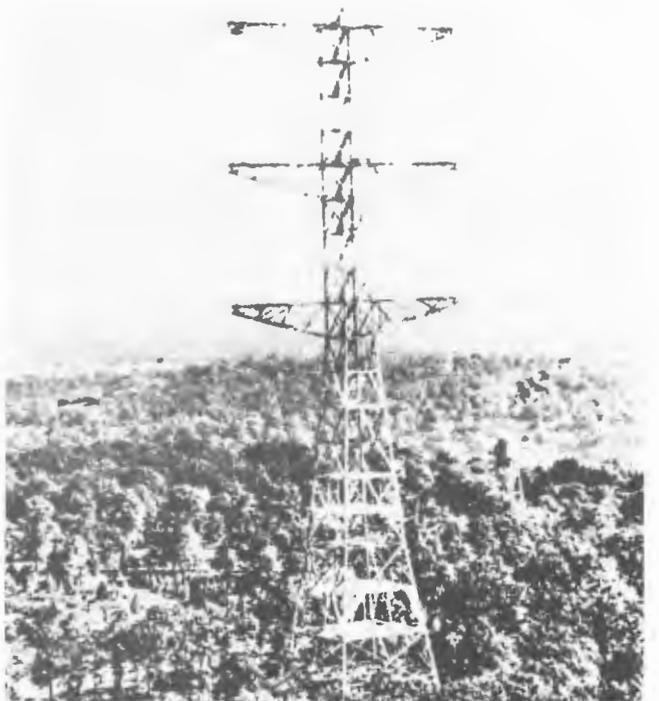
during the Second World War, but after the War, Armstrong was anxious to encourage the spread of FM services. By 1954 he had spent some \$2 million in developing and promoting his pioneer FM station W2XMN with almost no return on his investment.

Progress was slowed down when the FCC put FM broadcasting into a new frequency band with limited power of transmission. To add to his troubles, he was challenged by a coterie of corporations on the basic rights of his invention. Pressures became too great. They exhausted his spirit, his energy and his wealth, and left him a broken man.

After his death, his widow took the initiative and pressed twenty one infringement suits against as many companies and was subsequently awarded \$10 million in damages.

Ironically, shortly after his death, the superior quality of FM broadcasting was newly 'discovered' by the listening public. The steady growth of interest in high fidelity stimulated a new and greater appreciation of the unique quality offered by FM and today the modern version, stereo FM, is now well established world wide — a fitting memorial to an outstanding broadcasting pioneer.

JACK ROSS



*Antenna and tower for station W2XMN (Courtesy Armstrong Memorial Research Foundation)*

## Fine Music

### ABC FM STEREO

ABC FM came into being in somewhat of a flurry when the FM band was opened up for radio broadcasting in 1975. The ABC had no wish to be left behind in establishing its place in the FM band. To its credit, the ABC took a bold step in decentralisation by making Adelaide the headquarters for ABC FM. The trend has continued in ABC Radio. There are now several Federal Heads of Departments and national production units outside of Sydney.

Just as FM broadcasting brought about a revolution — now coming to a head — within the commercial radio sector, it also required the ABC to reconsider the nature of its own long-established radio services.

With only four transmitters initially — Sydney, Melbourne, Canberra and Adelaide — ABC FM was something of an adjunct to the existing national networks for the first four years of its life. Its predominantly fine music programming paralleled that of the 50 year old AM network, Radio 2.

From 1980, the ABC FM network grew rapidly to 37 transmitters — to all capital cities and out into the country. Remote areas of Australia have now been added via satellite. The country extensions made available an alternative ABC radio service to several million Australians. ABC FM is arguably one of the largest FM networks in the world.



*ABC Admin and Studio building Adelaide.*

Time differences have been a challenge for a totally relayed network. Western Australian listeners hear all programs at equivalent local time to the Eastern States, thanks to a digital delay system in Perth. When transmission began in WA, on-air practice was to give the time as, for example, '5 o'clock, half past four in South Australia', thus, it was thought, satisfying Eastern States listeners, South Australians — and WA listeners who would hear the time-call at 5 o'clock local time.

But no. WA listeners started to complain and did not stop complaining that if it was 5 o'clock in WA, it could not be half past four in SA. It was to no avail to argue that it did not matter because WA listeners did not live in SA, and vice-versa — just enjoy the music. Eventually, ABC Engineering had to install switches in the studio desk so that presenters could isolate the SA time call from those heard in WA and the other States. It was a reminder that though the network was new, it could not escape the awe-inspiring responsibility placed upon the ABC by the public for accuracy in language.

In the meantime, consideration of ABC FM's new national role within ABC Radio proceeded. In 1984, the Board of the new Corporation rationalised its radio services and declared ABC FM to be its principal fine music performance network.



*State-of-the-Art FM receiver and hi-fi equipment. (Courtesy Bang and Olufsen)*

ABC FM has attracted a loyal following. It seeks to offer variety within its relatively homogenous programming. The key is discovery — new discoveries for existing listeners, a discovery in itself for new listeners.

The network maintains a Listener Panel throughout Australia who are surveyed every quarter about the network's programs. Five hundred strong to begin with, the panel has been expanded this year to 1000.

ABC FM has become increasingly well-known, due much in recent times to its collaboration with ABC TV in simulcasts. Simulcast seasons have now been extended to simulcasts every Sunday night for the whole year. In the future, if stereo TV becomes the norm, we may look back upon this present radio/TV marriage as quaint, reminiscent of early experiments in stereo requiring two receivers. Should that day come, there will just have to be another discovery all over again.

DENNIS HARRISON



*Julie Howard, Record Library Officer.*

## New Section

### ENGINEERING SERVICES SECTION

Two years on and no doubt many were wondering whether the Directorate's objective to have an independent civil engineering and structural design capability would ever be realised. The organisation was approved and when we moved to St Kilda Road, offices were constructed and furniture set in position. The facilities seemed destined never to be used for their intended purpose, but at long last, under the enthusiastic guidance of John Bray, the Engineering Services Section has made its debut and is already contributing significantly to the work of the Directorate.

John is currently supported by Bruce Cook who many would know from his previous fifteen years with the Radio-communications Structure Section, Garry France who recently joined us from the commercial world where he was a design engineer with Johns and Waygood for eight years, and Alex Brown from the South Australian Branch who is the inaugural occupant of the recently created Principal Lines Officer position. At the time of writing, action is in train to recruit at least one more engineer, a design draftsman and a clerical officer to assist with the rapidly increasing workload.

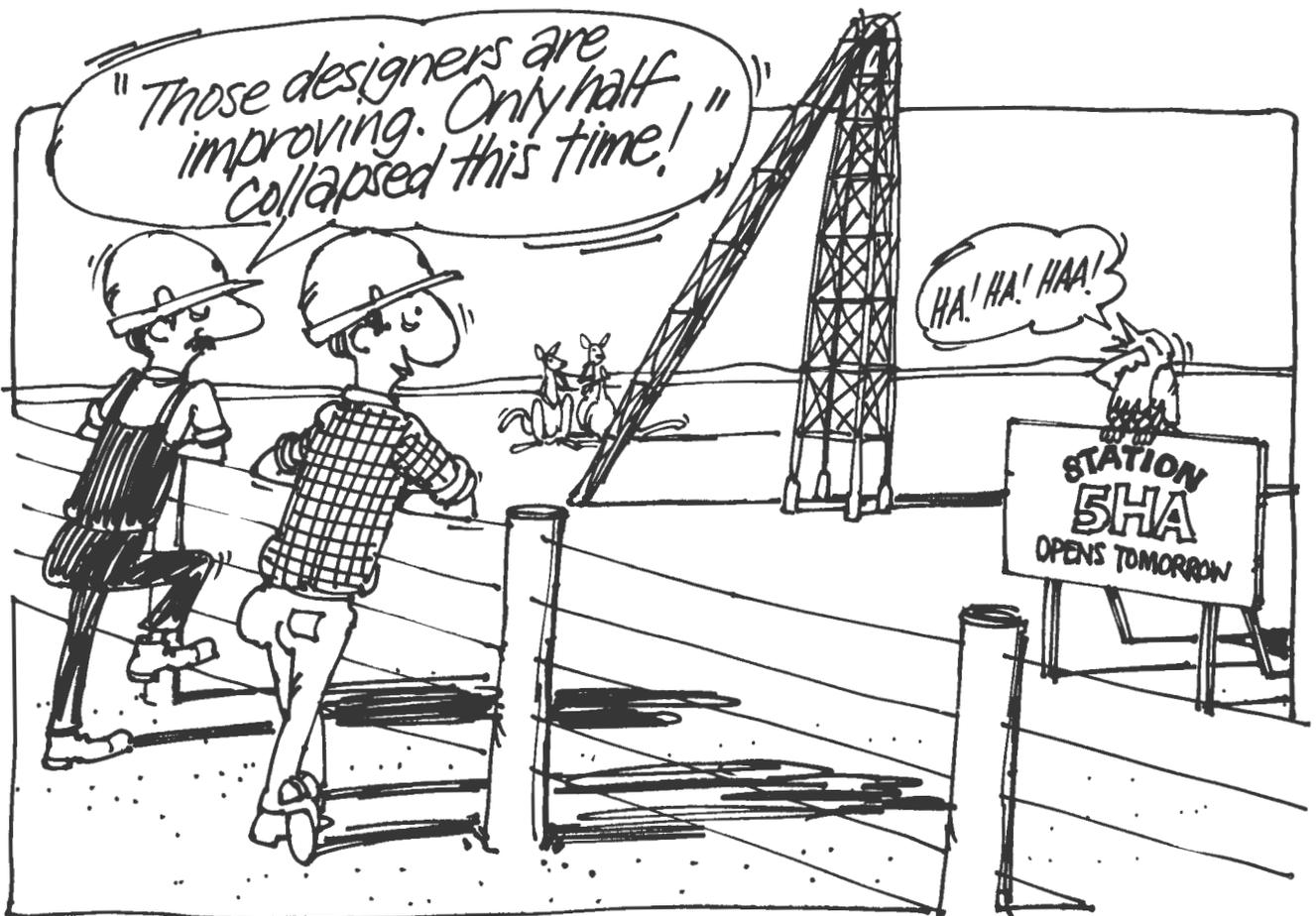
The section will initially concentrate its efforts on the structural design aspects of providing facilities to cater for additional regional TV services and the transfer of existing Band II television services to other channels, an essential prerequisite to further FM development. In the longer term the role of the Section will expand to embrace other common facilities such as sites, accommodation and primary power supplies, all of which impact on major sharing arrangements. An ability to fully evaluate the civil engineering aspects of site development proposals will be of significant benefit to the Directorate as a whole and to the Development Branch in particular.

In addition to providing professional consultancy, the Section will be a focal point for the co-ordination of major projects, standardisation of methods and practices and provision of specialised construction plant and equipment. In this regard the Principal Lines Officer necessarily has an important role. Design Engineers will naturally look to the PLO for expert guidance regarding construction practices and other field related activities and additionally it is expected that the PLO will be consulted in the first instance should any unusual problems arise at the workplace.

One of the more abstract but none the less important functions of the Section is to co-ordinate major sharing arrangements. Whilst the Department of Communications has assumed full responsibility for the formal contractual negotiations, the Directorate must of necessity continue to offer expert advice and comment regarding the technical feasibility of sharing proposals. Most of the critical issues involved in sharing with other broadcasters relate to the use of major facilities such as sites, buildings, masts or towers and power supplies. Since all of these aspects fall within the ambit of the Engineering Services Section there are obvious advantages in placing the primary responsibility in that area. The Operations Branch will however continue to process the bulk of minor proposals relating to the accommodation of lower power communication and broadcasting services, consulting with the civil engineering specialists as necessary.

There can be no doubt that fulfilment of these functions is essential to the Directorate achieving one of its principal establishment objectives and while it might have been a little slow out of the blocks, the Engineering Services Section is rapidly becoming a dynamic and productive part of the Broadcasting organisation.

MAX CHADWICK





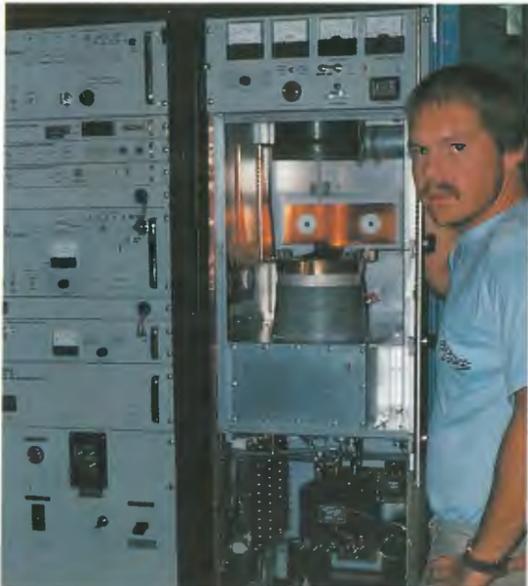
GERALDTON WA  
Doug Blackney Engineer 2



DARWIN NT  
Terry Wooster TO2



MT GOONANEMAN Q  
Ken Smith TO2



NEWCASTLE NSW  
Mark Spurr Tech



ADELAIDE SA  
Harold Stanford OIC  
(now retired)



HOBART TAS  
Haydyn Brunton Tech

## FM Transmitter Network

### FREQUENCY MODULATION BROADCASTING

The question of whether FM broadcasting should be introduced in Australia was raised as early as 1942 and was to become the subject of a number of inquiries over more than 30 years. Throughout the history of broadcasting development there were strong lobbies from entrenched broadcasting and manufacturing interests opposing, on a number of grounds, the introduction of FM broadcasting services.

Various Australian Governments had difficulty with the topic but in 1947 the then Government concluded that:

"decisions in connection with the introduction of FM broadcasting as a means of providing a regular service to listeners should be deferred pending the outcome of practical tests in capital cities by the PMG's Department."

Engineers of the PMG's Department were enthusiastic with the historic 1947 decision as it provided a long awaited opportunity to demonstrate the capabilities and advantages of the FM technique. Hastily, experimental FM transmitters were established in Melbourne, Sydney, Brisbane and Adelaide and a service was commenced taking some 84 hours of program material weekly from the more serious of the two ABC program sources then available. These experiments were to continue until mid 1961 when the VHF radio frequency spectrum being used was reallocated for regional television services following recommendations of the Huxley Committee.

For the next 14 years the future of FM broadcasting looked pretty grim notwithstanding an enquiry by the Australian Broadcasting Control Board followed by another by Sir Francis McLean CBE formerly Director of Engineering at the BBC.

In 1975, the 'Broadcasters of Telecom' made a bold move. As part of the TV colour conversion program in Melbourne, old monochrome TV transmitters at ABV2 Mt Dandenong became surplus to requirements. By the skilled efforts of Ivan Crisp at ABV2, one of the old TV transmitters was converted into an FM transmitter capable of operation on 105.7 MHz. A stereo modulator was obtained 'on appro' from a well known German equipment supplier and an antenna system hastily made operational. A stereo turntable and miscellaneous other items were collected and installed at ABV2 to complete an installation capable of providing stereo FM transmissions from the station. Contacts, 'sympathetic to the cause', were established in the ABC's Melbourne record library and a selection of stereo recordings, notable both for their musical value and their technical excellence, were borrowed. Simultaneously, a high level 'Telecom Broadcaster' (today even higher level still) visited, incognito, all 'Hi-Fi' retailers in Melbourne to advise that 'tuning FM stereo receivers to 105.7 MHz on subsequent evenings would produce a pleasant surprise'.

At 7 p.m. on an historic evening in July 1975, a group of 'in-the-know' listeners who had carefully set up their receivers and speakers to best advantage were treated to the first Australian FM stereo broadcast which opened with 'The Road to Marrakesh' by Enoch Light. The program continued for an hour without announcements and provided a wide range of entertainment of popular taste. This was repeated nightly with new selections for some months during which time enormous publicity resulted from the broadcasts.

This unorthodox and bold move produced the desired results. The following year saw the establishment of the first transmitters in the current FM stereo network when stations were commissioned during January 1976 at Canberra, Sydney, Melbourne and Adelaide with programs originating from ABC Studios in Adelaide.

Early expansion of the network was slow but during 1980 new transmitters went to air at Newcastle, Brisbane, Perth, Launceston and Hobart. Today, there are 37 stations in operation employing transmitter powers mainly 10 kW or 20 kW and effective radiated powers (ERP) up to 100 kW at some centres.

LEON SEBIRE



MT GOONANEMAN Q  
Keith Ross OIC



LOXTON SA  
Roger Hedley OIC



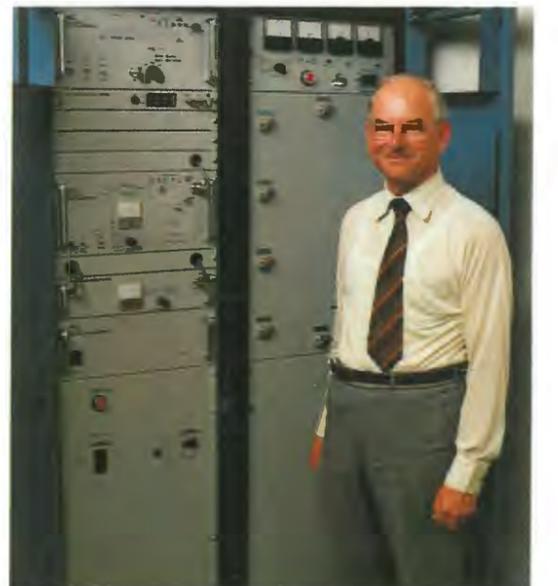
BICKLEY WA  
L to R. Albert Abreu Tech and Laurie Priest Tech.



BENDIGO VIC  
Russell Sheen TO2



MELBOURNE VIC  
L to R. Alan Henley OIC, Jack Carnell BOM and Brian Rowland E&C Manager.



MOUNT GAMBIER SA  
Ron Mitchell OIC

## Achievers

### LET'S GO TO THE OPERA

*I'm very well acquainted too with matters mathematical,  
I understand equations, both the simple and  
quadratical,*

*About binomial theorem I'm teeming with a lot o' news—  
With many cheerful facts about the square of the  
hypotenuse.*

*I'm very good at integral and differential calculus,  
I know the scientific names of being animalculous;:  
In short, in matters vegetable, animal, and mineral,  
I am the very model of a modern Major-General.*

Who would have thought that these words written by that great team William S. Gilbert and Arthur Sullivan for their comic operetta 'The Pirates of Penzance' would be so popular more than 100 years later through broadcasting, an entertainment medium not even conceived at the time. It is of interest that the first broadcast in Australia of a complete performance of a Gilbert & Sullivan operetta took place through 2FC on the occasion of a command performance for the Duke and Duchess of York during their visit to Sydney in 1928.

Brian Cleary Broadcasting Operations Manager in Queensland is a real fan of G&S and he probably sometimes finds a great deal of similarity between his roles in singing in opera and operetta and situations in his every day work. The strange costumes he dons on the stage may be a far cry from what people wear at work but the plots, the pathos and the humour may not be so far removed from the real world.

Brian has appeared with the Brisbane Light Opera Company in several Gilbert & Sullivan productions and with Queensland's State Opera Company — the Lyric — in stage and concert versions of Grand Opera. Last year this company staged 'Aida' in its inaugural season in the newly constructed Lyric Theatre of the Performing Arts Centre.

In between stage performances he sings with the Verdi Choral Society in Brisbane of which he has been a member for ten years. It is worth noting that both he and the other non-Italian member of the thirty-five strong choir are predominantly of Irish extraction. Perhaps there is a message there somewhere.

Brian is also involved with a small group called Opera Musicales which performs opera excerpts in smaller Brisbane theatres and nearby provincial centres. He is a bass with a preference for singing Grand Opera and is still a singing student learning, he says, from a patient and understanding man. He claims that he possesses the main prerequisite for an opera singer, a tolerant and uncomplaining (at least openly) family and neighbours who listen to all that practice which is so necessary for what is really quite a demanding hobby.

JACK ROSS



Brian (centre) as a gentleman in the Gilbert and Sullivan 'Ruddigore' with colleagues.

## Our Broadcasting Pioneers

### MR V.F. (VERN) KENNA

Vern Kenna joined the Postmaster General's Department in Brisbane as a Junior Mechanic-in-Training in 1924. Following the re-organisation of the Australian broadcasting system in 1929, he was one of the group who took over 4QG from the Queensland Government in 1930 and then operated the station as a unit of the National Broadcasting Service.

Between 1934 and 1936 Vern worked in the PMG Research Laboratories, then at 59 Little Collins Street, Melbourne. He qualified as an Engineer in 1936 and was appointed to the Transmission Section, Brisbane. At about that time the Department undertook a large program of work for other Departments for the provision of radio communication and navigation facilities along the Empire and New Guinea air routes. With the commencement of war these activities were extended to other areas, including the British Solomon Islands. Vern participated in much of this work as well as essential war-time activities for the National Broadcasting Service, including the establishment of 9PA, Port Moresby and the dispersal of 4QG and 4QR from the Brisbane city area to Bald Hills.

In 1954 Vern was transferred to Central Office to work on the establishment of engineering facilities for the National Television Service. In 1961 he was appointed Controller of Technical Services in the Australian Broadcasting Commission and remained in that post until his retirement in 1968.

JACK ROSS



Vern Kenna



West Hatfield

### MR W.H. (WEST) HATFIELD

West Hatfield commenced work in the Victorian Branch of the Postmaster General's Department in February 1926, as a Junior Mechanic-in-Training.

In 1934 he began his association with the National Broadcasting Service when he transferred to the Drafting Section of the Central Office Research Laboratories.

During that period he took a prominent part in the design and provision of tall half-wave radiators, then being developed in conjunction with high power transmitters.

On qualifying as Engineer in 1939 West was appointed to the Research Laboratories and his first assignment, in association with Engineers, the late R.B. Mair and A.J. McKenzie, was the design and construction of the International High Frequency Broadcasting Station at Shepparton.

He was associated with early experiments in the provision of Frequency Modulation broadcasting services and was responsible for the installation of the tower, antenna and transmission line and the subsequent field testing of the original station at Jolimont, Melbourne.

With the creation of the Australian Broadcasting Control Board in 1949, West joined the new organisation as Sectional Engineer (National Broadcasting Service) with responsibility for the development of plans for the further expansion of the Service.

In 1959 he was the Board's representative on the Australian Delegation to the Extraordinary Radio Administrative Conference in Geneva.

West retired in February 1977, after 45 years in the service.

JACK ROSS

# Engineering Highlights

## TRANSPORTABLE EMERGENCY BROADCASTING STATION

The Natural Disasters Organisation (NDO), having regard to the important role played by broadcasting stations in the dissemination of authentic disaster information and instructions to relief teams, and to the public generally in an immediate post-disaster period, requested Telecom to design, construct and to maintain in a standby mode, a transportable medium frequency broadcasting station.

The station is intended to be deployed to disaster areas which have been affected by cyclones, fires, floods or other natural disasters, where as a result, the existing local broadcasting stations have been disabled.

The main features of the station equipment which the design engineer had to take into consideration included portability, ease and speed of assembly of the facilities, reliable 24 hour per day operation under adverse conditions and the capability of operating at all standard 9 kHz spaced broadcasting frequencies in the range 531—1602 kHz.

Another important criteria was that the station had to be suitable for transportation to a disaster area using whatever transportation means were likely to be readily available. Air transport was considered to be the principal means of deployment into the disaster area with others means likely for final deployment to the actual operating site.

The station was originally designed and constructed by Broadcasting staff in Adelaide and shipped to Sydney where it is stored in thirty containers with an all up weight of 1,176 kg. It is completely contained with its own power plant, lighting, studio and outside broadcast equipment.

When the station is required, it is transported by road to the Royal Australian Air Force Base at Richmond and then, accompanied by two members of the Sydney based Performance and Support Group, airlifted to the affected area.

On arrival, the State or Territory Counter Disaster Authority provides manpower and transport to a selected operating site (the local football field is usually ideal). They also provide shelter for the studio and transmitting equipment and assist in the erection of the 20 metre mast radiator. Local ABC or Commercial announcers are familiarised with the studio equipment which includes a microphone, cassette recorder/player with prerecorded tapes, a communications receiver which can be used to monitor or rebroadcast, and two portable field cassette recorders. There is also provision to connect a reel-to-reel tape machine and an outside broadcast line. Depending on site and weather conditions, the station can usually be fully operational within two to four hours after arrival at site.

The station has been successfully deployed on Natural Disaster Organisation exercises at Mackay, Carnarvon, Port Heland and Mount Macedon. At the request of the Papua New Guinea Government, the station was on standby between February and April, 1984 for possible use following the then expected eruption of the Rabaul Volcano.

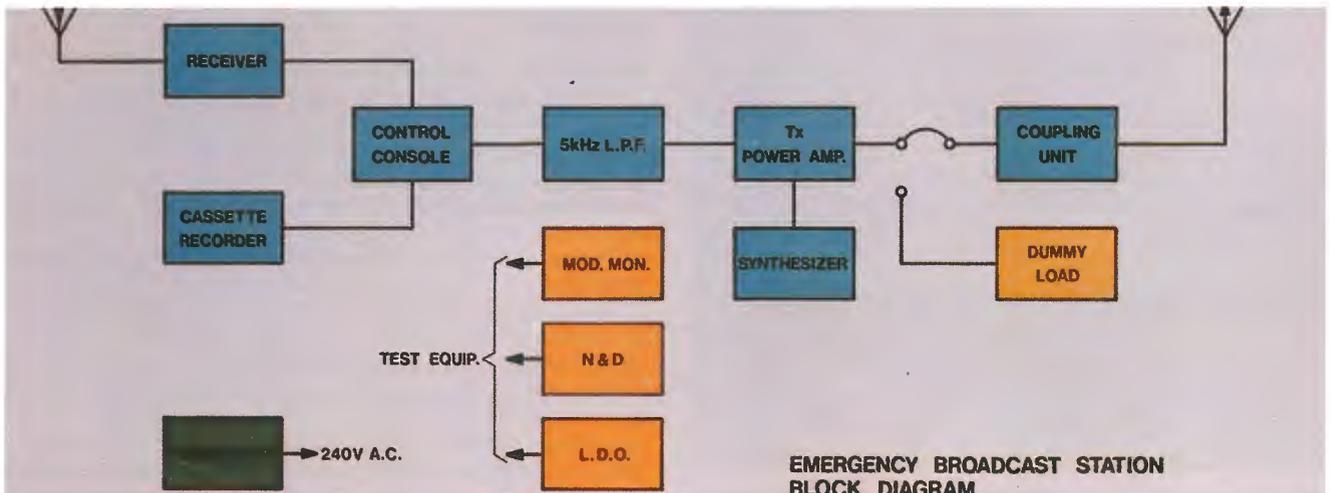
PETER VINE



Lowering mast onto base insulator.  
Norm Pearce TA2(L) and Bob Heggarty STO1



Announcers's panel



# Staff News

## NEW SOUTH WALES

Three members of the Branch have retired since the beginning of the year.

Keith Nisbet Manager Management Services retired on 31st January after 48 years service. Mrs. Dorothy Turner of the Resources and Budgets group retired on 29th February after nine years service with Telecom, and State Broadcasting Manager Vince Thompson retired on 4th July after 36 years service. Vince was the first State Broadcasting Manager to be appointed on formation of the Broadcasting Directorate in 1983.

All were heavily involved in the formation of the NSW Broadcasting Branch and all staff extend very best wishes to Keith, Dorothy and Vince in their retirement.

Bob Barrett Broadcasting Operations Manager transferred to another area of work in Telecom to become Manager of the City South Exchange Building during March and Ron Johnson is now filling the BOM position.

Jenny Murray currently with Broadcast Construction, has completed stage 4 of the Engineering Certificate with straight A's and has been awarded appropriately an Engineering Certificate with Honours. Jenny, originally from Coffs Harbour, came to Sydney to attend University, studying Pharmacy. Her interest diversified into Communications, in particular, Broadcasting, and in 1982 she joined Telecom as part of the TTO intake. With this behind her now, Jenny has indicated her desire to take another step forward, this time, an attempt to duplicate her success with an Engineering Degree.

## VICTORIA

Tony Dennis Technician has transferred from Radio Australia Shepparton to Mt Baranduda TV station, while Don Chilcott also from Radio Australia, retired due to illness after eight years service as Labourer at the station. Best wishes Don in your retirement.

Staff recently completed work to strengthen the antenna dipole supports on the tower at Mt Dundas TV station. The exercise required considerable expertise in setting up facilities and carrying out the work. It involved a number of staff including Martin O'Donohue Engineer 2, Peter Munro LS3, Roy Bowditch LS3, Mick Fitzgerald Radio Lineman and Paul Thomas TO1 Installation.

In the Admin area, Lisa Haylock Staff Clerk has transferred to the Wagga District Telecom Branch and Sue Killey Accounting Machinist resigned after completion of maternity leave.

Best wishes are extended to new Telecom recruits Michelle Coombes, Cathy Hawke, Cathy Murdoch and Edmund Payne.

## TASMANIA

David Llewellyn Broadcasting Operations Manager was elected to the House of Assembly for the seat of Lyons during the recent State elections in Tasmania. Campaigning was not new to David. He had built up a considerable amount of experience over a period of 10 years following unsuccessful attempts to win a seat in the Commonwealth House of Representatives seat of Lyons, previously Wilmot.

Lyons is one of the most diverse seats in the State, encompassing two thirds of Tasmania including rural, mining and fishing industries, but excluding the major population centres.

Good luck and best wishes David, from all your colleagues in Broadcasting.

## SOUTH AUSTRALIA AND NORTHERN TERRITORY

Bruce McGowan Supervising Engineer Engineering and Construction handed in his slide rule when he retired on 4 July. Harold Stanford OIC ABS2 Mt Lofty has also joined the ranks of those in retirement. Best wishes from all staff to Bruce and Harold.

Alex Brown SLO2 has temporarily transferred to Central Office to occupy the recently created position of Principal

Lines Officer. Alex joins Nadia Vernari who transferred to the dizzy heights in St Kilda Road earlier in the year as Admin Officer.

Denis Collins STO Electrical has left for a six month assignment in Sri Lanka for the International Telecommunications Union after a long waiting period. Ray Galliford ex Buildings Branch is relieving until Denis returns.

Mark Martin has taken up a new position in the Works unit. Mark previously worked in the Finance and Accounting Department. Fiona Harris, another recent arrival, has replaced Kay Middleton Works Assistant who left the Commission because of illness. Chris Fox Branch Admin Assistant spent some time on temporary transfer to another area of Telecom and Helen Curnow filled the breach.

## WESTERN AUSTRALIA

During his recent visit to Western Australia, the Director Leon Sebire, presented Mark Barnett with his Technician's Certificate following completion of the TIT (Bridging) Course.

Following the tremendous popularity of the Corporate Cup running events, a team of softballers was formed to contest the Softball Cup. The team comprised Ron Gablish, Chris Sneddon, Trish Hearne, Jeannie Young, Ian Gibbs, Jim McNally and Ray Plowman. Calling themselves Broadcasting Ball Busters, they chalked up one win, two draws and a loss from four games.

A team also contested the Swimming Cup. It included Ray Plowman, Mike Dallimore, Robert Deacon, Jim McNally and Doug Blackney. They competed as the Broadcasting Breaststrokes with considerable success.

A total of 14 members of the staff have now participated in major events and reflects the growing keenness for lunch time sporting activity.

## CENTRAL OFFICE

Mrs Jean Brooks, who has filled the demanding role of Secretary to the Director since the formation of the Broadcasting Directorate, retired at the end of May. Jean came to Broadcasting on joining Telecom early in 1981 after many years in the private sector.

Born in a country town near Bath, England, Jean travelled widely, living for periods in Malaya and Rhodesia before settling in Australia.

Well known throughout the Directorate, her pleasant personality, helpfulness and effective service will be greatly missed by all.

Nadia Vernari Admin Officer from Adelaide is settling down in her new job, but has some reservations about being perched so high in the sky when the freezing winds blast across the Bay. John Lawrence has become a father for the first time but the celebrations have been hindered somewhat as a result of injuries received following a motor cycle accident. Gary Watts from the Victorian office filled in while John was on sick leave.

Julie Hood has resumed duty following Maternity Leave and Gordon Evans has returned following a period with Network Engineering. Other arrivals include Robert Mews Engineer 1, Gary France Engineer 3, Alex Brown PLO, Greg Woolstencroft, and Arch Murphy STO who is on temporary transfer from Queensland.

## QUEENSLAND

The Broadcast Installation staff at South Brisbane's Peel Street Depot shifted into new premises at Maud Street, Newstead during March. In his 39 years service OIC Mick Pike former Navy man has completed the full span of Brisbane depots, including Ernest St, Perry Park, Mt Gravatt, Peel Street and Maud Street.

Two new Engineers Class 1 have been welcomed to the Branch. John Virtue ex Queensland Institute of Technology and Ken Alford ex University of Queensland soon became immersed in new works and are keen to become experts in the mysteries of broadcast engineering.

Other new faces in the office are Rosie Trim Works Officer, Patrick Page Registry, Judy Henderson Accounting Machinist and Hege Olausen Clerical Assistant. Graham Offer is now coming to grips with his new role as Assistant Personnel Officer.

## BOM Visits China

### PEOPLE'S REPUBLIC OF CHINA VISITED

During October/November last year Bill Edwards Broadcasting Operations Manager Central Office visited China and Indonesia in order to assess the technical quality of Radio Australia's transmissions into these particular countries. It is interesting to note that Radio Australia's listeners' mail from China exceeds that from any other country. Bill has contributed this article on his impressions and observations during his stay in The People's Republic of China.

Palaces, temples and pagodas silhouette against the ancient city skyline. Dim street lights glow like Halley's comet through the constant mist that pervades this mystic land. People everywhere. One thousand two hundred million. Thirteen million in Shanghai alone. I can hardly move in the crowded department stores. Bicycles A\$140, cassette radios A\$400 are expensive. Cotton clothing is cheap. Shirts A\$3 but nothing my size. Silks are a giveaway and I buy a bedspread for A\$20. Wool is a luxury for high ranking officers.



*The Great Wall — original length 6400 km.*

I am assigned a car, driver and interpreter. They drive fast. Reaching for a non-existent seat belt reminds me that these Western security blankets only recently gained widespread appeal. Police stop our car and display a flashing LED 75 km on a little hand held radar pistol. The driver accepts the A\$3 on the spot fine with a grin demonstrating an Eastern adage that the bigger the problem the bigger the smile.

Food is a speciality of the Chinese and each province has its own delicacies. Peking Duck in Beijing and Chenou curries are outstanding. At my request we ate with the local people in sidewalk cafes and at street stalls where bean curd, liquid and solid, is the staple diet. Meat dishes, derived from anything that walks, swims or flies, always taste delicious. The meal usually finishes with soup which frequently contains the type of noodles Marco Polo took back to Italy.

Classical music and theatre is popular and modern works involve ballet, singing, acting and the music in a single work. The music has a strong Russian influence. I was fortunate as a government guest to attend such a performance. Ballroom dancing is also enjoyed by the youth and large orchestras play Western melodies with Eastern harmonies and rhythm.



*Bridge in grounds Emperor's Summer Palace, Beijing.*

Accommodation varied and a wise traveller takes along soap, towel and paper. On one occasion I was a privileged guest at the Seventh Heaven, 17-storey hotel with only one other resident, a German medical professor. On another occasion I stayed in a luxury government residence on an island surrounded by guards.

Unforgettable experiences include:

- climbing restored and unrestored sections of the Great Wall
  - barebones Russian aircraft
  - the Chinese friendship, hospitality and eagerness to converse
  - visiting a university and noting that each tertiary establishment is run by a cultural or industry group with a vested interest
  - inspecting a large broadcasting station.
- Interesting observations include:
- equal opportunity, however, some are more equal than others, especially men
  - no aerosols — fly swats do the job
  - excellent beer with low or no alcohol content
  - very effective birth control — large salary cut for each additional child
  - non existence of social welfare payments — the retired and those awaiting employment are supported by their own families.

Freedom was felt and expressed as we departed China and I wondered how many Australians comprehend this blessing in our own country.

BILL EDWARDS



*Kunming — lake and mud brick houses.*

## Profiles

### JACK ROSS

Jack Ross, State Broadcasting Manager South Australia and Northern Territory started his career in broadcasting in 1938 when he was one of the first students enrolled in the Broadcast Engineers Certificate course at the newly formed Australian Radio Engineering Academy in Brisbane. He entered the PMG Department in the same year and in 1941 joined the RAAF where he worked on radar designs and installations for nearly five years. In 1948 he took up an Engineering Cadetship and except for short periods has spent all his time as an Engineer in radio. He was appointed Divisional Engineer Broadcast Transmitters SA in 1959, Supervising Engineer Radio 1969 and to his present position on formation of the Broadcasting Directorate.



Jack  
Ross



Bruce  
McGowan

### BRUCE MCGOWAN

Bruce McGowan, Supervising Engineer, Engineering and Construction Section, South Australia joined the Post Master General's Department as a Telegraph Messenger in 1940 and began training as a Junior Mechanic-in-Training in 1941. He completed the course, which was interrupted by two years in the RAAF, in 1947 and was despatched to 5DR (now 8DR) Darwin. On returning to Adelaide in 1949 he worked in the Radio Telephones Division until selected for the Trainee Engineer Scheme in 1958. On successful completion of the course he was appointed to the Broadcast Transmitters Division where he was blooded in broadcast engineering with his first project which was 'The matching and alignment of the 183 m anti-fading radiator at 5CK Crystal Brook'. For the next ten years he was involved with most aspects of MF and television services throughout SA and NT.

In 1973 Bruce was selected as Supervising Engineer to oversee the installation of the mail handling equipment in the new Adelaide Mail Exchange then under construction. With the creation of the two Commissions in 1975 this position naturally was allocated to Australia Post, so he elected to return to Radio Section in time for the introduction of ABC-FM network. From that time he was deeply involved with developments in the broadcasting field firstly as Senior Engineer and, following the formation of the Broadcasting Directorate, as Supervising Engineer.

Bruce retired on 4th July, and now spends his time spoiling grandchildren, on home improvements and silversmithing.

### LEW GRUBB

Lew Grubb, Broadcasting Operations Manager, South Australia joined the PMG's Department as Technician-in-Training in 1942.

His initiation into the mysteries of broadcasting took place at the ABC studio's in Adelaide where he was involved in the operation and maintenance of disc, wire and tape recorders and outside broadcast activities. In 1948 Lew moved into the transmitter area when he transferred to 5DR (now 8DR) Darwin. He returned to Adelaide in 1950 and for five years worked on transmitter installations, followed by a period of two years as OIC at 5PA Penola.

When television came to Adelaide Lew was one of a group selected for training in the new field. He subsequently worked at ABS2 Mt Lofty for six years from the first day of transmission.

In 1967 he transferred to the Radiocommunication area where he worked until appointed as Principal Technical Officer Radio Section in 1978. With the formation of the Directorate Lew became the Broadcasting Operations Manager.

Lew has many interests in sport and hobbies from which he obtains much enjoyment as well as being a work horse for his four children and ten grandchildren.



Lew  
Grubb



Graham  
Shaw

### GRAHAM SHAW

Graham Shaw, Manager Northern Territory Section, commenced with the PMG's Department in 1963 as a Cadet Engineer.

After 18 months on Radio Australia design work in Adelaide he moved to Darwin for the installation and commissioning of the transmitting station on Cox Peninsula.

System commissioning was an extended exercise and included much new design and the installation of a second computer system. To enable the system's potential to be fully realised, Graham visited the Collins Transmitter factory in Dallas, Texas and their computer manufacturing facility in Cedar Rapids, Iowa for a total period of four months. Opportunity was also taken to visit the Canadian Broadcasting Service installation at Sackville, Canada where an identical Collins transmitter system was installed in the early 1970's.

Cyclone Tracy forced Graham back to Adelaide for most of 1975, but staff shortages in Darwin after the cyclone resulted in his return in 1976 to work in the Darwin Engineering District.

In 1978 when Radio Australia received approval and funding for rehabilitation, Graham was appointed project manager — a position which lasted until the formation of the Broadcasting Directorate when he was appointed Manager of the NT Section. The station was put back on air in 1984 after being out of operation for 10 years.

### JEROME VAN DER LINDEN

Jerome van der Linden, Manager, Management Services, South Australia, joined the PMG's Department in Sydney in 1966 as Clerk. Before that, he had developed an interest in radio and attended the Marconi School of Wireless. However, he decided that pounding a Morse Code key on a ship wasn't for him, and in 1973 transferred to Buildings Branch in Adelaide where he worked in the Properties and Accommodation area and subsequently became Admin Manager.

On establishment of the Broadcasting Directorate, Jerome was promoted to his present position of Section Manager.

Jerome had commenced studies in Sydney toward the Bachelor of Business Degree, and completed this in Adelaide in 1978. In 1979, he felt a need for a diversion from studies and assisted in the establishment of Adelaide's first FM Public Broadcasting Station (5MMM).

The spare time that he can call his own after catering for two active boys is now devoted to his hobby of shortwave listening and as member of the Southern Cross DX Club.



Jerome  
Van der Linden

## Deep in the Forest

### LIFE AT ABRN6 MT NARDI

Nestled deep in the north eastern corner of NSW lies Mt Nardi, part of the Nightcap Ridge and part of the rim of an extinct volcano that has Mt Warning as the plug. Think of the staff if the plug pops.

Mt Nardi has the upper portion covered in rain forest, apart from the chopped off bit on which is located TV station ABRN6, along with sundry microwave and mobile systems.

The rain forest is home to many exotic creatures such as goannas, turkeys and snakes of various colours, size and deadliness. There is also a large variety of birds, including colourful parrots, and owls which entertain the night shift staff on their way home by either sitting on the road or flying straight at the windscreen of the car.

And there is the ubiquitous pademelon, a small wallaby that seems to be plentiful on many Australian hills. They haven't much road sense and their remains increase the hawk population.

Another strange critter encountered on the road is the size of a small dog with a bushy tail. This fellow sometimes runs in front of the car. No one has yet caught him — he ducks into a handy clearing when the pace gets too fast.

Then, if you explore the numerous paths leading from the access road, you find colonies of hippies (Alternativus Nausius), living in dens varying from plush small mansions to structures somewhat less sophisticated than a wurly.

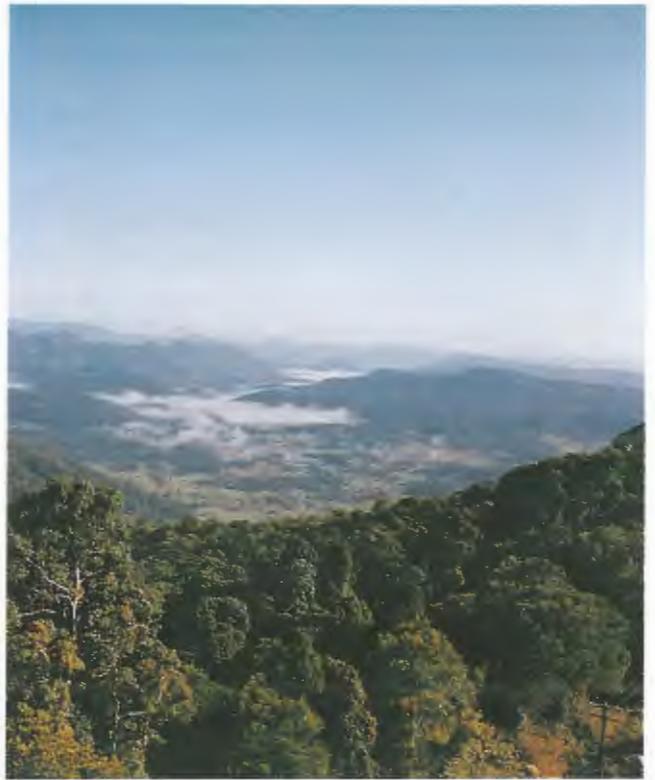
The hippie can often be identified by his characteristic odour. Either 'Aroma Unwashed No. 10 or 11 or 12' (the latter being the stronger and typical of the Droog variety that sleep under the park benches in Nimbin), to a powerful scent that will put you out of the room. A previous OIC dubbed this concoction 'Guru Juice'.

Hippie protests extended to setting abandoned cars alight on the road and to pulling up the cattle grids. They also had a clever trick of putting nails at the edges of the road, (a couple of staff members scored a few of these).

Naturally, these protests are popular with the police and the media. We had plenty of both. We had to talk our way through police and hippy road blocks to get to work. We used this opportunity to let the two groups know what we thought of the whole situation — they let us go anyway.

Some hippies were injured when they lay down in front of the trucks. Timber truck drivers aren't known for their sensitivity.

BRIAN ROBB



*Down the Tweed Valley*



*Brian Robb station OIC*



*The local guard takes a rest*



*Garry Childs keeping the grass in check*

# From the Back Room

## THE DRAFTSMEN

In spite of the tremendous technological progress and scientific advancements, it seems paradoxical that drafting, a tool that has been used in bringing about such progress has itself remained almost unchanged and today is done with nearly the same amount of elaboration of detail as it was in the early 1920's when broadcasting began.

Today, more than ever before, the challenge of modern broadcasting is to produce more and better technical facilities with less effort and expense. As a key function in our organisation drafting helps to meet the challenge. The old concept of drafting which permitted and often demanded that professional pride find expression in beautiful and artistically executed drawings with numerous accurately projected views and sections is now as outmoded as the grid leak detector.

In recent times new concepts of drafting have been implemented. Drafting has been stripped of its frills without losing clarity of presentation or accuracy of dimension.

Engineering drawings are the basic tools with which practically every engineer, radio lineman and technical officer, must operate. No matter how much design or development work is carried out in developing new ideas and concepts, there is very little that can be constructed or manufactured without the aid of drawings. It would be an almost impossible task to describe in oral or written language a piece of plant such as a mast or tower with data and dimensions sufficient to make possible its manufacture and construction through all the various sections of an engineering workshop.

Fortunately engineering drawings prepared by a draftsman can supply all the information needed with exactness and

detail to allow manufacture and construction no matter how complex the structure.

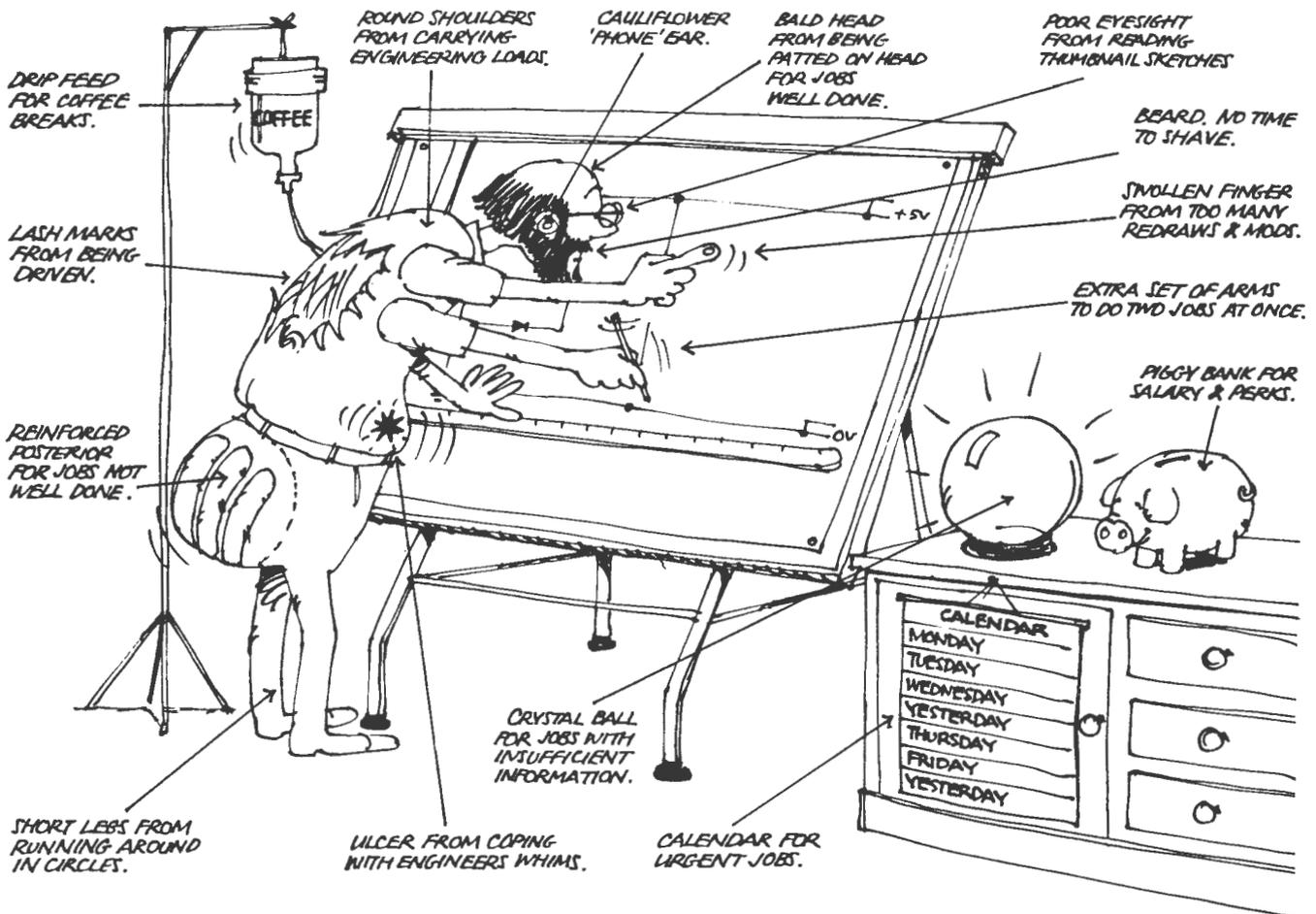
Drawings must be specific, clear and unmistakable in their meaning. The drawing is a legal document and if, for example, in a contract, it is subject to more than one interpretation, litigation may arise causing unnecessary delays and expense to both parties of the contract.

The draftsman has to work in very close relationship with the engineer in a wide range of disciplines. In our broadcasting work this covers such disciplines as civil engineering for foundations, mechanical engineering for masts and towers, electrical engineering for power equipment, radio and electronics engineering for transmitters and associated equipment, chemical engineering for plastics and dielectrics and others.

An important part of the draftsman's work is to ensure that a safe design is produced. He has to make a close examination of the techniques and practices which are to be used by the staff during the installation construction or operation process in order to obtain a proper appreciation of hazards which might have to be overcome. The handling of heavy or bulky equipment and components always presents a safety problem to the field staff and has to be taken into account in layout design etc. Awkward arrangements for changing large transmitting tubes and vacuum capacitors, adjusting switches, lubricating moving parts, reading meters and gauges and also designs which require elaborate preparation for handling and replacement, are potential safety hazards.

Broadcasting Branches are fortunate in having a group of very efficient, competent and highly motivated drafting people with specialist broadcasting expertise. Initially some States relied on Telecom Engineering Department for their drafting services, but now most States have their own groups well established.

BRIAN TURNER



**DRAFTSMAN BURNOUT**

## 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 —

It is a rude shock for a woman to discover that she is not only a wife but a BROADCASTING wife. Broadcasters are a race apart and to be married to one requires the skill and tact of a diplomat, the agility and balance of a tight-rope walker, and the patience of Job.

The most irritating thing about Broadcasters is that they are shift workers. They do not start work when normal people do, and do not have regular hours. Their off-duty never coincides with a public holiday, recreation leave rarely comes in the school holidays, and they have their weekends off in the middle of the week.

The Broadcasting wife has to try to balance the Broadcaster's schedule with those of the normal people in the family. She can be found dragging herself out of bed at ungodly hours of the morning to get breakfast and make lunch for her Broadcaster, and will then go back to bed in the attempt to sleep only to find that (1) sleep has fled, or (2) the toddler is wide awake, wanting to play, and wakes the rest of the children. At the other end of the day, she can be found doing the impossible — picking up the children from school at the same time as packing her Broadcaster off for evening shift. With split second timing she packs his dinner, plants a kiss somewhere in the direction of his face, grabs the car keys and jumps into the car heading for the school. Everyone is late out of school but she doesn't mind as he is already on the way to the station, so she takes her time getting home only to find the Broadcaster waiting for her with the story that his car is out of petrol and he has to take hers!

Then we have those Broadcasting wives who deserve sainthood. These are the ones whose men work the night shift at Radio Australia. They creep around the house all day trying to get their housework done, trying to keep the children quiet so that the Broadcaster can get his sleep. When everyone else is ready to drop, up bounces the Broadcaster refreshed and expecting to have something better than sandwiches for his midnight meal. Thank heaven for TV dinners!

Whenever a family crisis occurs, the family's Broadcaster can be found in his eyrie on top of a mountain or out in the desert. The Broadcasting wife, knowing that he cannot do anything, will take all the necessary action on her own, even if it means waking all the children, loading them into the car to take the ill or injured one to the hospital. This usually occurs at night when there is no relief. But relief can be found in extreme occasions; one wife went into labour early in the evening and the Broadcaster had to leave hurriedly to get her to hospital. One very bleary-eyed OIC finished the shift for him.

Social life for a Broadcasting wife can be rare, almost non-existent if she wants her husband to be there. She becomes used to attending functions on her own, and answering the question "Where's the Broadcaster?" Even if an event is planned months ahead, she will find that Murphy has had a finger in it. There will be a shift change, and guess where the Broadcaster is!

One day, when Parliament gives Broadcasting enough money, new robot controlled transmitters will be installed. Broadcasters will then become normal people and won't life be DULL.

MRS LYNNETTE WALKER  
MILDURA

## Let's Play It Safe

### 25 YEARS WITH KEY SAFETY INTERLOCKS

The recent installation of Pye UHF transmitters for the SBS service shows that the safety arrangements provided by key interlocking systems have changed very little from earlier designs. Those stations which are still operating with the Marconi 10 kW type BD371A VHF TV transmitters will see very little difference between the Marconi and Pye key safety equipment even though there is a span of some 25 years in technology.

In respect to the key interlocking systems, both transmitters have a lot in common. The two transmitters employ the use of a key exchange box. The keys are used for opening specific areas of the transmitter but cannot be removed from the exchange box unless the power has been isolated and the supply rails earthed.

In the case of the Marconi equipment, each vision transmitter has 12 keys and each sound transmitter has four. Separate isolating switches are provided for both vision and sound. In addition, the main supply areas require a key from the station power distribution board. This ensures isolation of the mains supply.

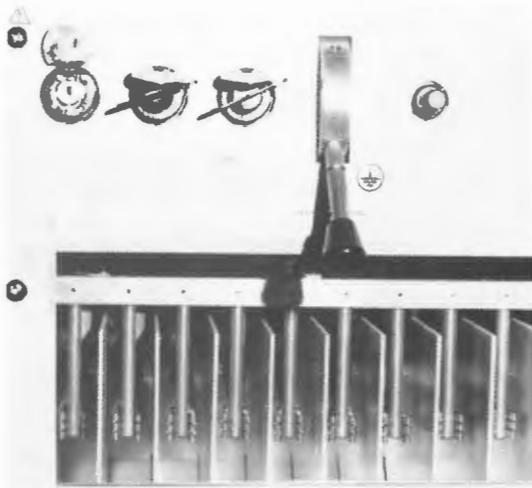
The Pye transmitter being mostly solid state, requires only three keys for each transmitter — one for the high voltage power supply cabinet, one for the klystron power amplifier cabinet and one from each transmitter to open the combining and switching unit.

Both transmitters use an interlock system on the feeder transfer/switching panels.

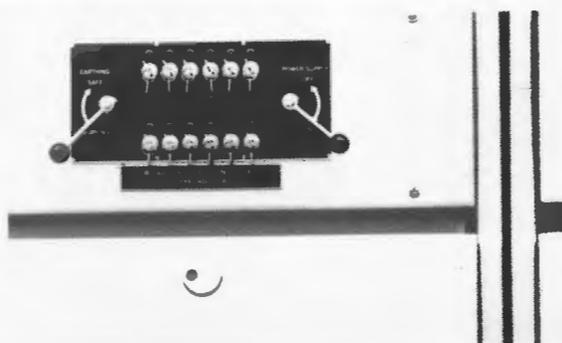
The Marconi transmitter designers established a very high standard a quarter of a century ago, and this standard has not been surpassed. It is slightly superior because of the incorporation of the power distribution board in its system. Pye does not include this feature which is the only area where it does not match the Marconi installation.

In both transmitters, high levels of protection are offered, but the extra refinement of the Marconi model still makes it a winner. After 25 years, that's not bad, Marconi.

ROGER HEDLEY



Keys and earthing switch Pye UHF transmitter



Interlocking keys Marconi VHF transmitter

## Broadcasting Milestones

### 7ZL HOBART

Tasmania's first A Class station 7ZL, began transmission in Hobart on 17th December 1924.

The Associated Radio Company of Melbourne held the licence and provided the program and technical services from that date until 3rd March 1926 when it was taken over by Tasmanian Broadcasters Ltd. On 25th June 1928 a Melbourne company again secured control when Domination Broadcasters Pty Ltd who operated 3LO and 3AR became the new owner.

The transmitter and studio were located in Macquarie Street Hobart but on 25th April 1927 the transmitter was moved out to a site on the foot of Mount Wellington known as Radio Hill. A more popular name was Keens Curry, due to a large advertisement formed on the side of the hill by large white stones.



*Building erection and earth mat installation Radio Hill 1926*

The transmitter was originally constructed about 1923 for use at 3AR Melbourne before being transferred to Hobart. It operated on a frequency of 590 kHz and produced 1 kW power into a T type antenna. Modulation was effected by the use of a high power Heising system. The oscillator was a Hartley type with frequency being adjusted by a variable inductor.

The power amplifier and main rectifier tubes were Mullard silica envelope types. The tubes were of unusual construction because of silica-to-metal sealing problems. The connect-

ing leads were taken out of the tubes through long stalks which were filled with lead to take up conductor expansion. The tubes were mounted in a fibre tube through which air was blown to prevent the lead plugs from melting. The plate of the power amplifier consisted of a basket of woven tungsten. The modulator employed four Marconi "football" type MT7B tubes in parallel.

Power was drawn from the public mains. The EHT 8000V supply was produced by a 450 Hz single phase alternator, the output of which was stepped up then bi-phase rectified by two silica diode tubes. The low power stages were fed from a 1400V direct current generator. The power supply system was replaced in 1937 when space was needed for a second transmitter, 7ZR. The 8000V supply then came from a Philips six phase, grid controlled mercury vapour unit and the 1400V supply was obtained from a small rectifier unit using two 866 types tubes.

On 14th December 1930, the Australian Broadcasting Company took over responsibility for programs for 7ZL and from the same date control of all technical services passed to the Postmaster General's Department, this being part of the Governments plan for establishment of the National Broadcasting Service. Staff comprised a Senior Mechanic located at the studios in charge of three mechanics at the studios and three at the transmitter.

In the early days of broadcasting Tasmania was unable to take on relay programs from the mainland States because of the absence of suitable communication facilities. However, this changed with the laying of a submarine cable early in 1936 and the provision of a high quality broadcast channel.

In 1937 the transmitter was replaced by a 2 kW unit designed by Philips and manufactured by Transmission Products. Ten years later, an AWA 2 kW transmitter replaced the Transmission Products model and in 1958 the transmitter was relocated to a new station site at Ralph's Bay about 14 km south east of the city.

An AWA BTM 10 transmitter was commissioned in 1958 and shares a common 198 m radiator with 7ZR. Present operating frequency of 7ZL is 603 kHz. A directional radiator system was put into operation in 1964.

31 JUL 1986

BRIAN HALL



*Graeme Wilmot OIC adjusting the present 7ZL transmitter*